

New Features: Settings Manager, Outputs and Data Analysis

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Settings Manager

Need for a Settings Manager

- Many settings, preferences, and options
- Scattered in the interface
- Hard to find
- Saved in various locations:
 - per-user in the registry or
 - in the model file
- Hard to share or move

	RPL Para	meters (saved with model)						×	
	🗆 💥 Enal	ble RPL Debugging							
		ic Comparison Tolera	nce:	0	ir	nternal units			
	Collect	and Display Notes fro	om Referenced Slots in Series Slots With Express						
	WHILE Ex	pression Maximum #	2 5	imulation Run Parar	neters			×	
	Allow I	iteral RPL values to ha		Water Quality		Inline ProcePost Proce	ess ss		
ζ Δ	Auto Backup Save Configuration			Maximum Slot Resets Per Timestep					
- A	utomatical	ly Save a Backup Moo	Simulation Slots 40 👻						
	Save Run F	Results (Output Values	Series Extension Increment 1						
In	terval:	15 🗧 Minutes	$\hfill\square$ Warn when Values are out of Bounds						
Fo	older:	C:/Users/neumannd/		Save Loaded RPL	. Set v	vith Model			
N	otification:	None	0	Save All Global Fu	Inction	is Sets with Mod	lel		
			Nur	nber of Run Cyc	les		1	*	
			Nur	nber of Post-Rur	n Dispa	atch Timesteps	0	•	
			Ma	ximum Rule Exec	cutions	Per Timestep	50	*	
			Wa	ter Year Start M	onth:	Oct ~			

Demonstration of Initial Implementation

🔾 Settings Manager				-			×
Settings File: C:/Temp/RiverWareSet	tings.ini			e	(Impor	t
Search/Filter]					
Setting Y File Model Save Automatic Backup	Save Location Model File Model File	Water Quality Inline Process Enable Water Quality Post Process 					
 Workspace Windows Simulation 		Maximum Slot Resets Per Timestep					
Run Parameters Optimization Slots RPL Plotting	Model File	Account Slots 20 Series Extension Increment 1 Warn when Values are out of Bounds					
Default Fonts and Background Default Curve Configuration Default Axis Configuration Default Axis Override Default Grid Configuration V Diagnostics Diagnostic Output	Settings File Settings File Settings File Model File Settings File Settings File	Number of Run Cycles (RBS only) Number of Post-Run Dispatch Timesteps (Simulation) Number of Post-Run Dispatch Timesteps (RBS) Maximum Rule Executions Per Timestep (RBS only)	1 0 ↓ 0 ↓ 50 ↓				
> SCT	-		ок	Apply		Cance	el

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Details and Status

- Settings are saved in either:
 - Model File: affect the model such as tolerance, max iterations, etc.
 - Settings File: preferences including fonts and colors. Allows for sharing.

For some settings, you can select where to save

 Many settings are "start-up behavior", for example, Diagnostics Output wrapping (Demo)

Use the following settings to specify the start-up behavior of the Diagnostic Output These do not affect the current display.
Display Settings
Vrap Messages
Show Message Borders

Data Analysis Tool

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Data Analysis Tool (DAT)

- Name changes:
 RDF viewer → Ensemble Data Tool → Data Analysis Tool
- Old functionality: Read and visualize ensemble data (RDF)
- New functionality:
 - Analyze trace data
 - Various statistical analyses
 - Multiple ways to Visualize
 - Analyze slots in the model Timeseries regression

Analyze Trace Data

Process:

- 1. Perform the multiple runs create RDF file
- 2. Import RDF File
- 3. Visualize
- 4. Analyze
- 5. Repeat

Import RDF File and Visualize



9

Analyze Trace Data

- Exceedance
- Percentile
- Max
- Mean
- Min
- Median
- Sum

 Analysis Action: 	Analyze Ensemb	ble Data Set (per timestep, across traces)	~			
Setting		Value				
Analysis Data Set N	ame	ArborBasinWet				
How To Filter Slots		Include All Slots				
How To Filter Dates		Include All Dates				
How To Filter Traces	5	All Traces				
How To Handle Nat	Ns	Error If Any NaNs				
Analysis Type		Mean	Κ			
Write Results To Sin	nulation Objects	Exceedance	생			
Write Results To Da	ta Set	RPL Function				
Results Data Set Na	ime	Max				
Save Results Data S	et With Model	Min				
Results Data Set Slo	t Group	Median				
Results Slot Tag		Multiple Statistics				
Results Slot Column		Percentile				
		Sum				
		Series Regression	_			



Additional Analyses

Multiple Statistics



- Global RPL Function
 - Any computation across traces
 - For example, at each timestep, count the number of traces that exceed some threshold



Timeseries Regression Analysis - Demo

- Multiple linear regression
- Various statistics calculated (e.g. R², standard error)
- Automatically generate a plot containing residuals and input data
- Any units can be compared, though standard plotting restrictions apply for visualizations
- Can be automated with scripts

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0	Intercept cms 27,45	R Square NONE 0.89	Adjusted NONE	R Squar 0.	e 89	0: Big Rive	er Gage_G	age Inflow	Reg NOI	ression Coe NE	fficient	Standa cms	ard Erro 0.	r 10
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Data Extractor Tool

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Data Extractor Tool (DET)

- It can be difficult to know in advance which slots will be of interest, particularly for MRM
- Rather than re-simulate or open each model, extract output from model files = Data Extractor Tool
- Two modes:
 - MRM per-trace model files and RDF output (9.3)
 - Arbitrary model files and Excel output DMIs (9.4)
- Approach: automatically create and run a batch script that loads each model file and extracts its output

MRM Per-Trace Model Files / RDF Output

- Requirement to use: Run in MRM and save per-trace models
- User tasks:
 - Create the RDF control file which outputs the additional slots
 - From the DET...
 - Select the MRM configuration
 - Select the per-trace model files (default is all model files)
 - Configure the RDF control file

• Batch script created:

OpenWorkspace {ArborBasin_MRM-00001.mdl.gz}
ExtractMrmData {Arbor Basin Baseline MRM}
 {rdfFile=MRMControl_ExtraSlots.txt}
CloseWorkspace

```
•••
```

repeat

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Data Extractor Tool			_		×
Diagnostics					
tract Data From: 🗿 MRM Per-Trace Model	Files 🔘 Selected Moo	lel Files			
IRM Configuration: Arbor Basin Baseline M	RM ~				
Per-Trace Model Files					
Folder: \$(ARBOR_BASIN)/PerTraceModels					
File	Modification Time				
ArborBasin_MRM-00001.mdl.gz	Mon Jan 27 15:37:06 2	2025			
ArborBasin_MRM-00002.mdl.gz	Mon Jan 27 15:37:14 2	2025			
ArborBasin_MRM-00003.mdl.gz	Mon Jan 27 15:37:22 2	2025			
ArborBasin_MRM-00004.mdl.gz	Mon Jan 27 15:37:31 2	2025			
Traces: 20, Files: 20, Selected Files: 20					
RDF Options					
Control File: E:/ArborBasin/ModelsAndDa	ta/MRM/MRMControl F	xtraSlots.txt			1
	a,	and dono to rott			4
Data File:					
Timesteps: Must Match 🗸	Allow Spaces In File P	aths			
Excel Options					
Generate Excel Workbooks From RDF	F Slot Names:	Short 🗸			
Delete RDF Files	I	Rows / Column	s / Work	sheets	
	Configuration:	Timesteps / Ri	uns / Slot	ts ~	

Close

Start

Arbitrary Model Files / Excel Output DMIs

Requirement: have a set of similar models User steps:

- 1. Create an Excel DMI which outputs the additional slots
- 2. Export the Excel DMI to a file
- 3. Create a script with three actions:
 - Import Database DMIs
 - Configure Excel Dataset (new)
 - Execute DMI
- 4. From the DET...
 - A. Select the model files
 - B. Select the script

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Selected Mod	del Files			
File	^	Modification Time	Ad	Ы
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DailyOp	s.2025.01.02.mdl.gz	Mon Jan 27 16:46:55 2025		love
DailyOp	s.2025.01.03.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.04.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.05.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.06.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.07.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.08.mdl.gz	Mon Jan 2/ 16:46:55 2025		
DailyOp	s.2025.01.09.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s. 2025.01.10.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s. 2025.01.11.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s. 2025.01.12.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s. 2025.01.13.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s. 2025.01.14.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.15.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.16.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.17.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.18.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.19.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.20.mdl.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.21.mul.gz	Mon Jan 27 16:46:55 2025		
DailyOp	o 2025.01.22.mul.gz	Mon Jan 27 16:46:55 2025		
DailyOp	o 2025.01.23.mul.gz	Mon Jan 27 16:46:55 2025		
DailyOp	s.2025.01.24.mal.gz	Mun Jan 27 10:40:55 2025		

Start

Close

Arbitrary Model Files / Excel DMI Output

• Automatically generated batch script:

OpenWorkspace {DailyOps.2025.01.01.mdl.gz}
ImportScripts {Script001.xml}
ExecuteScript {Data Extraction}
CloseWorkspace

Repeat

- Diagnostics posted during execution
- Enhancement Ideas:
 - Additional types of output
 - Named, persistent configurations

Data Extractor	Tool	_	
Configuration	Diagnostics		
		_	
Diagnostic Mes	sages:	×	Auto S
REQINFO:	"Model File Information: "		
REQINFO:	"Last saved on: 01-27-2025 15:36:08."		
REQINFO:	"Last saved by "user" using "RiverWare 9.5"."		
TRACE: Extra	ctMrmData {Arbor Basin Baseline MRM} rdfFile=	E:/ArborBasin/ModelsAnd[Data/MR
TRACE: Close	Workspace		
TRACE: Open _REQINFO_:	Workspace E:/ArborBasin/PerTraceModels/Arbor "Model File Information: "	Basin_MRM-00018.mdl.gz	!
REQINFO:	"Last saved on: 01-27-2025 15:36:08."		
REQINFO:	"Last saved by "user" using "RiverWare 9.5"."		
TRACE: Extra	ctMrmData {Arbor Basin Baseline MRM} rdfFile=	E:/ArborBasin/ModelsAndI	Data/MR
TRACE: Close	Workspace		
TRACE: Open	Workspace E:/ArborBasin/PerTraceModels/Arbor	Basin_MRM-00019.mdl.gz	: :
REQINFO:	"Model File Information: "		
REQINFO:	"Last saved on: 01-27-2025 15:36:08."		
REQINFO:	"Last saved by "user" using "RiverWare 9.5"."		
TRACE: Extra	ctMrmData {Arbor Basin Baseline MRM} rdfFile=	E:/ArborBasin/ModelsAndI	Data/MR
TRACE: Close	Workspace		
TRACE: Open	Workspace E:/ArborBasin/PerTraceModels/Arbor	Basin_MRM-00020.mdl.gz	
REQINFO:	Model File Information:		
REQINFO:	Last saved on: 01-27-2025 15:36:08.		
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TRACE: Extra	ctmrmData {Arbor basin baseline MRM} rdtHie=	E:/Arborbasin/ModelsAndl	Data/MR
TRACE: Close	Workspace	Paoin MDM 00001 mdl as	
PEOINEO :	"Model File Information, "	basin_mkm-00001.mul.gz	
PEOINEO	"list saved on: 01-27-2025 17:41:30 "		
REQINIO_	"Last saved by "user" using "DiverWare 9 5" "		
TRACE: Gener	ateMrmExcel {Arbor Basin Baseline MRM} rdfFile	==E: /ArborBasin/ModelsAr	ndData/
TRACE: Close	Workspace		abatan

Start

Stop

Questions? Comments?

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