



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

UNIVERSITY OF COLORADO **BOULDER**

New Features: Settings Manager, Outputs and Data Analysis

2025 RiverWare User Group Meeting

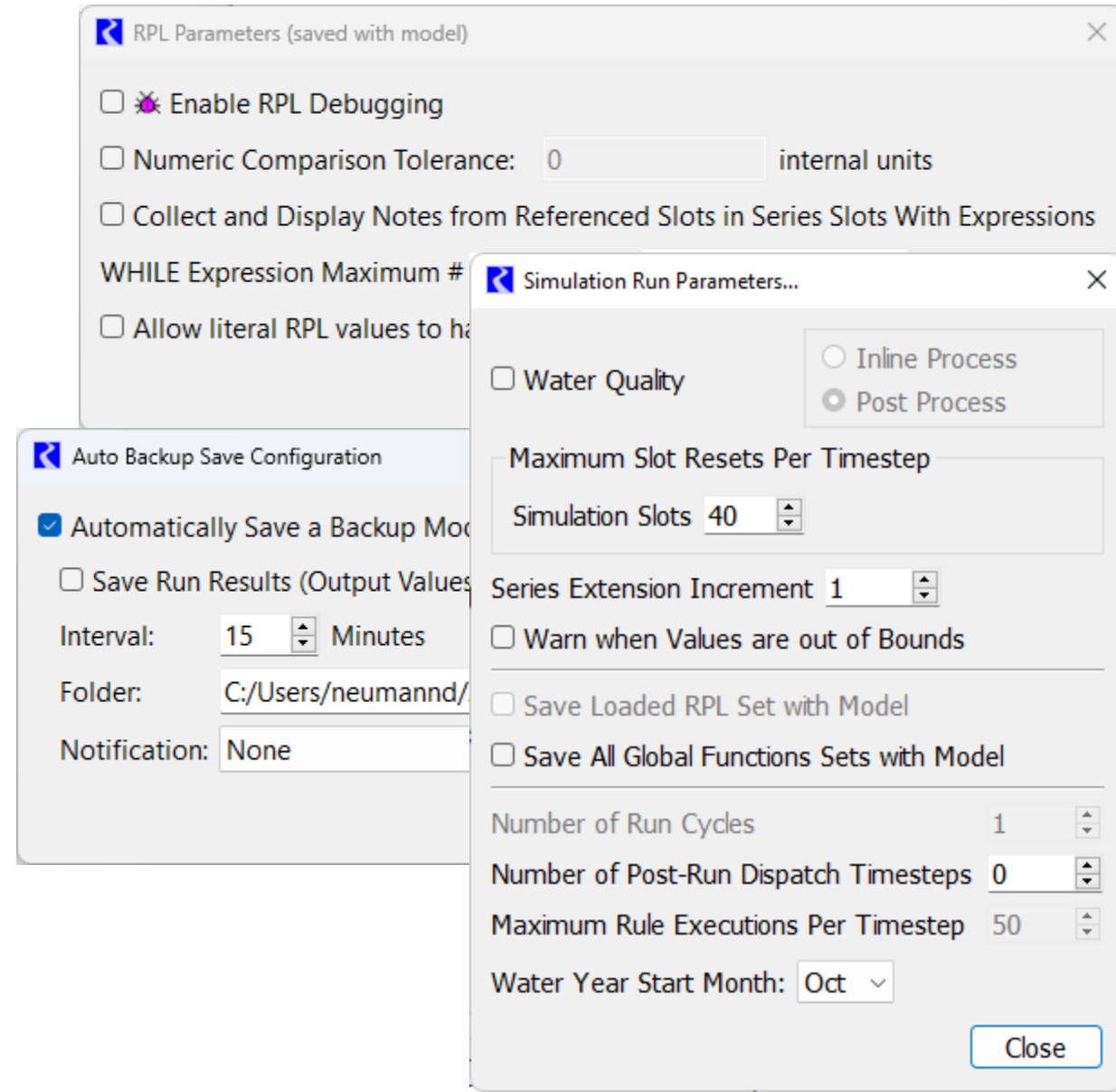
Presenter: David

Settings Manager

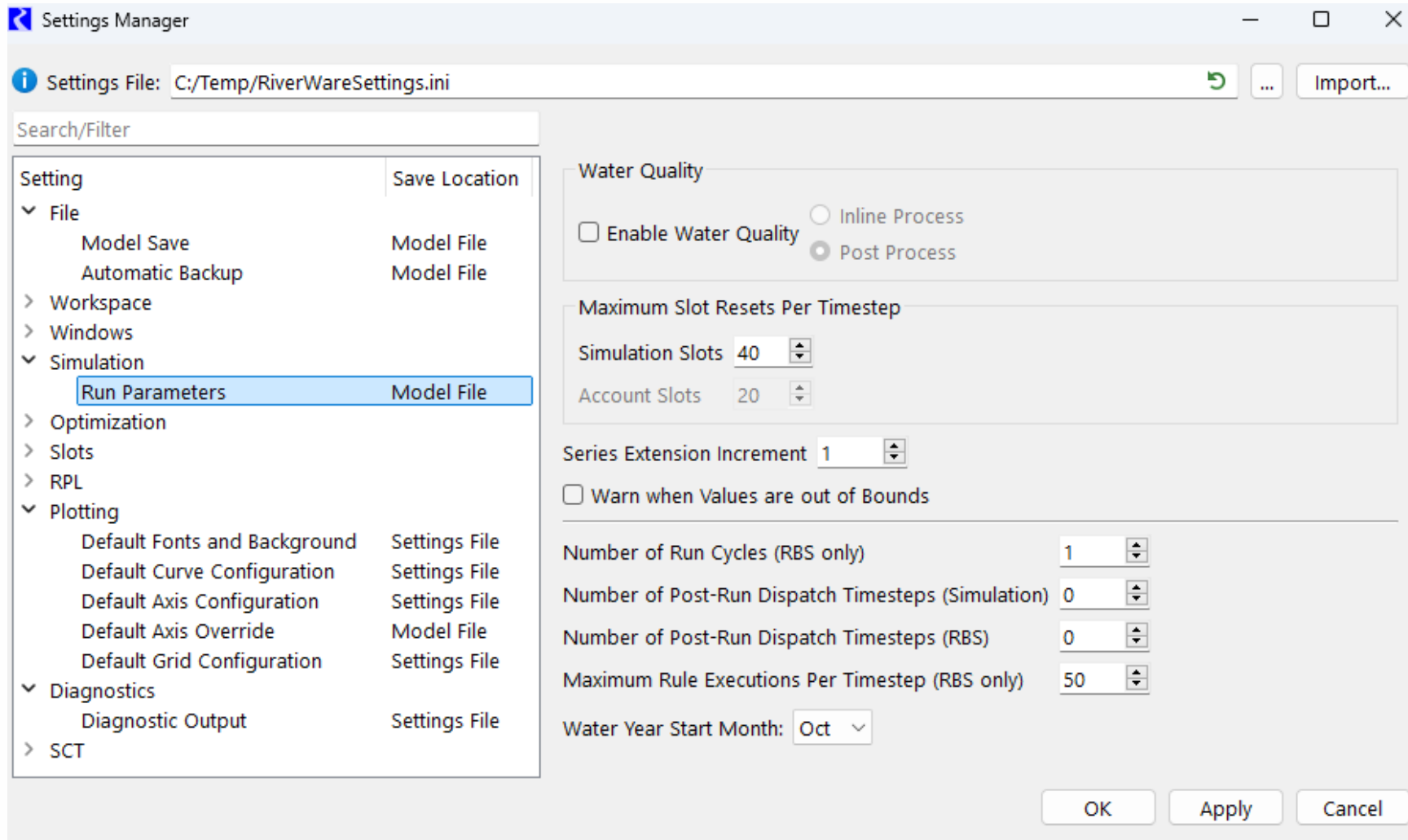


Need for a Settings Manager

- 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



Demonstration of Initial Implementation

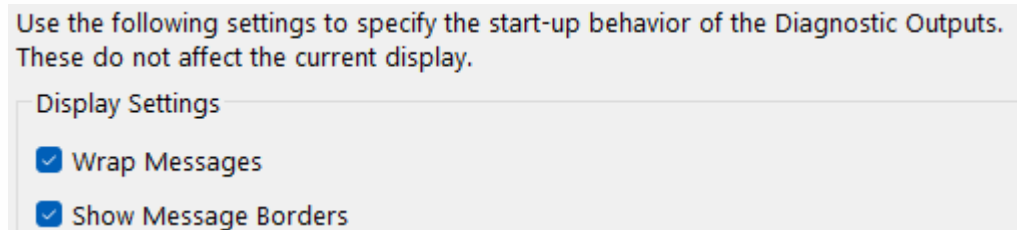


Details and Status

- 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)



Data Analysis Tool



Data Analysis Tool (DAT)

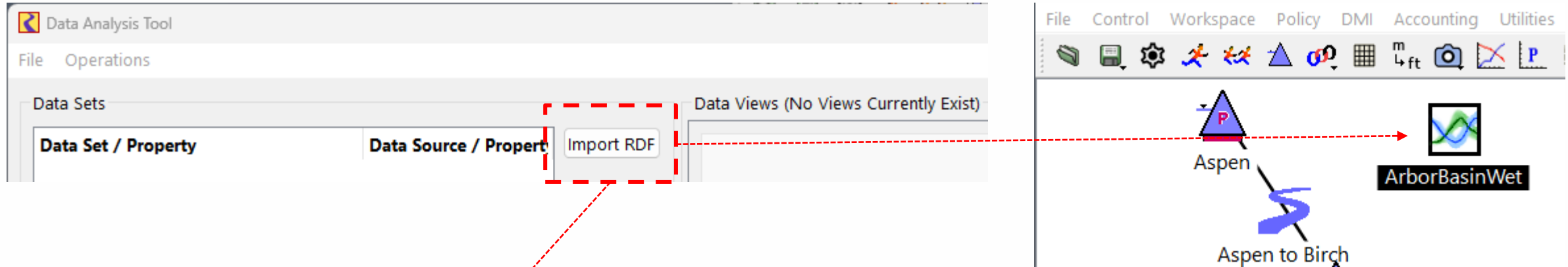
- Name changes:
RDF viewer → Ensemble Data Tool → **Data Analysis Tool**
- Old functionality: Read and visualize ensemble data (RDF)
- New functionality:
 - Analyze trace data
 - Various statistical analyses
 - Multiple ways to Visualize
 - Analyze slots in the model - Timeseries regression

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



Analyze Trace Data

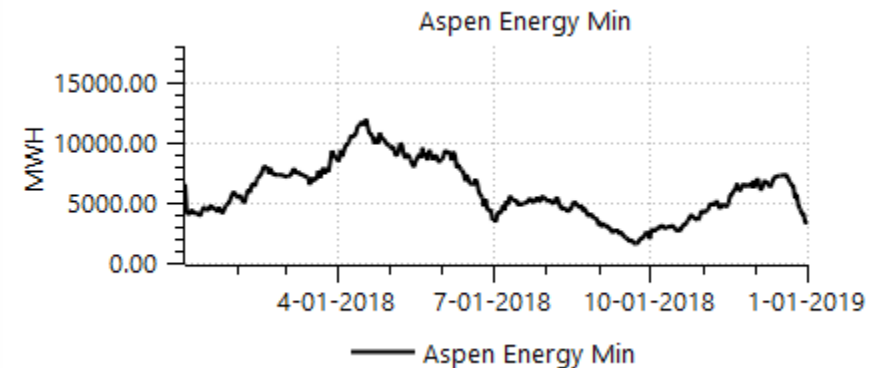
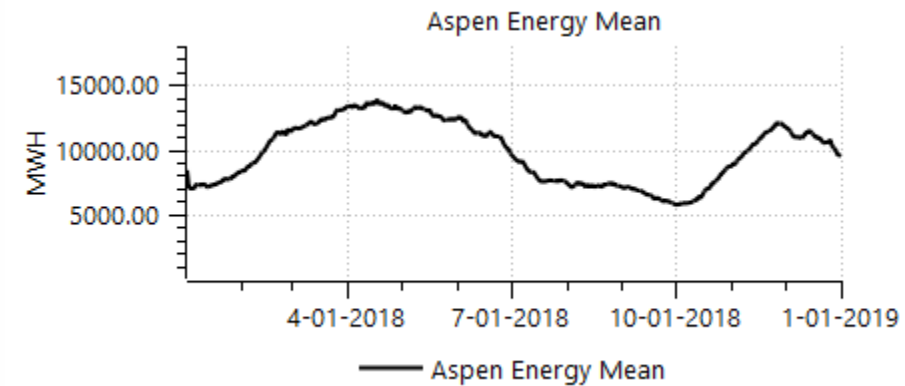
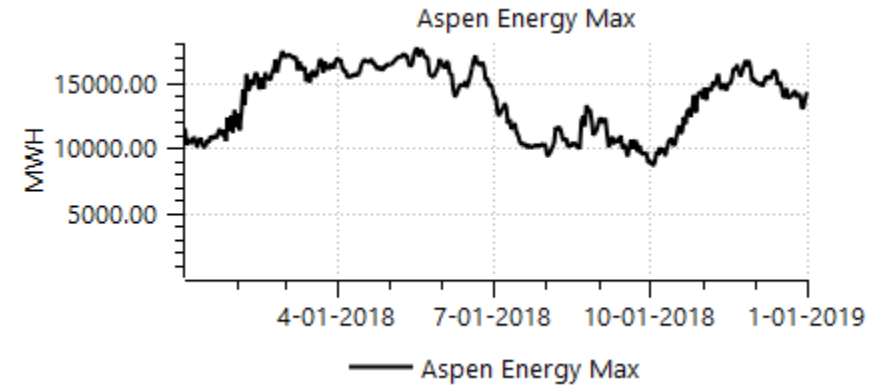
- Exceedance
- Percentile
- Max
- Mean
- Min
- Median
- Sum

Analyze Data Set: ArborBasinWet

Analysis Action: Analyze Ensemble Data Set (per timestep, across traces)

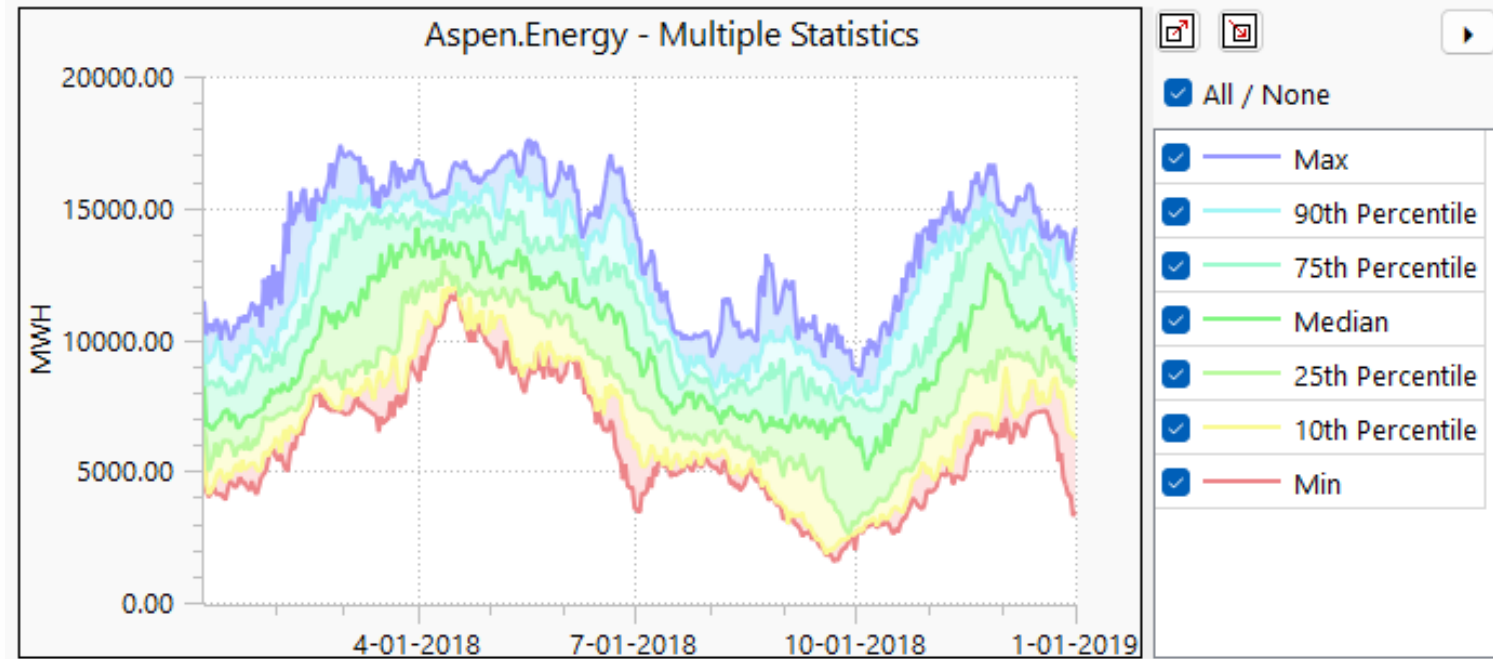
Setting	Value
Analysis Data Set Name	ArborBasinWet
How To Filter Slots	Include All Slots
How To Filter Dates	Include All Dates
How To Filter Traces	All Traces
How To Handle NaNs	Error If Any NaNs
Analysis Type	Mean
Write Results To Simulation Objects	Exceedance
Write Results To Data Set	RPL Function
Results Data Set Name	Max
Save Results Data Set With Model	Mean
Results Data Set Slot Group	Min
Results Data Set Slot Group	Median
Results Slot Tag	Multiple Statistics
Results Slot Column	Percentile
	Sum
	Series Regression

Perform Analysis Cancel



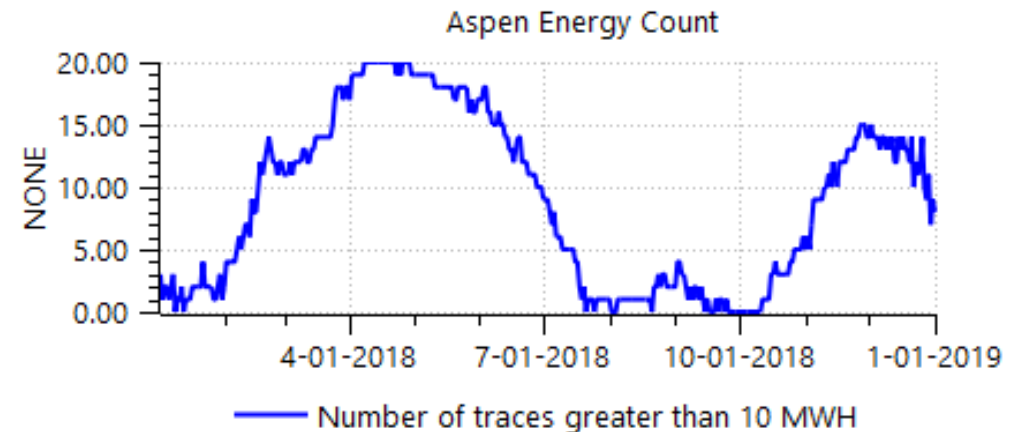
Additional Analyses

- Multiple Statistics



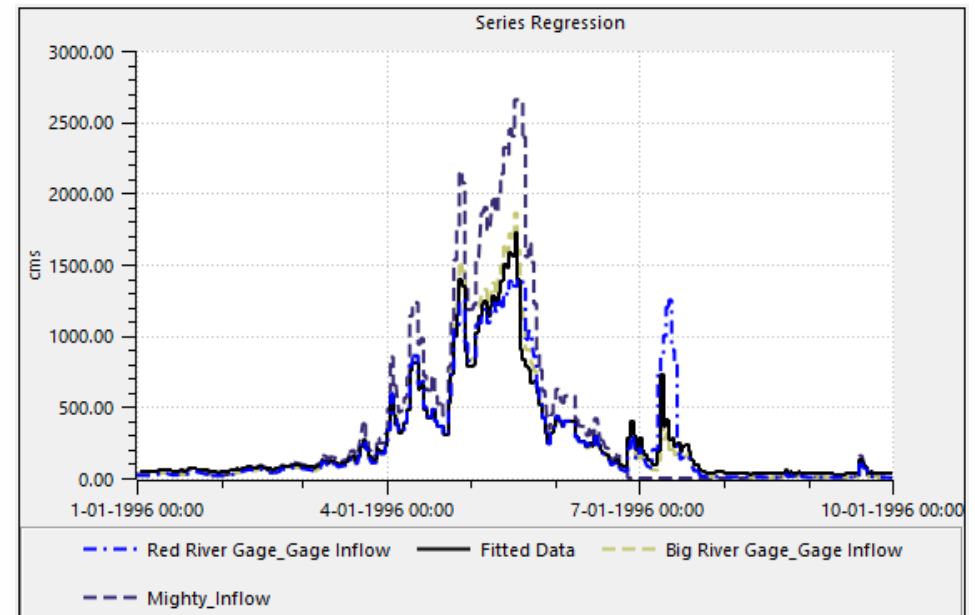
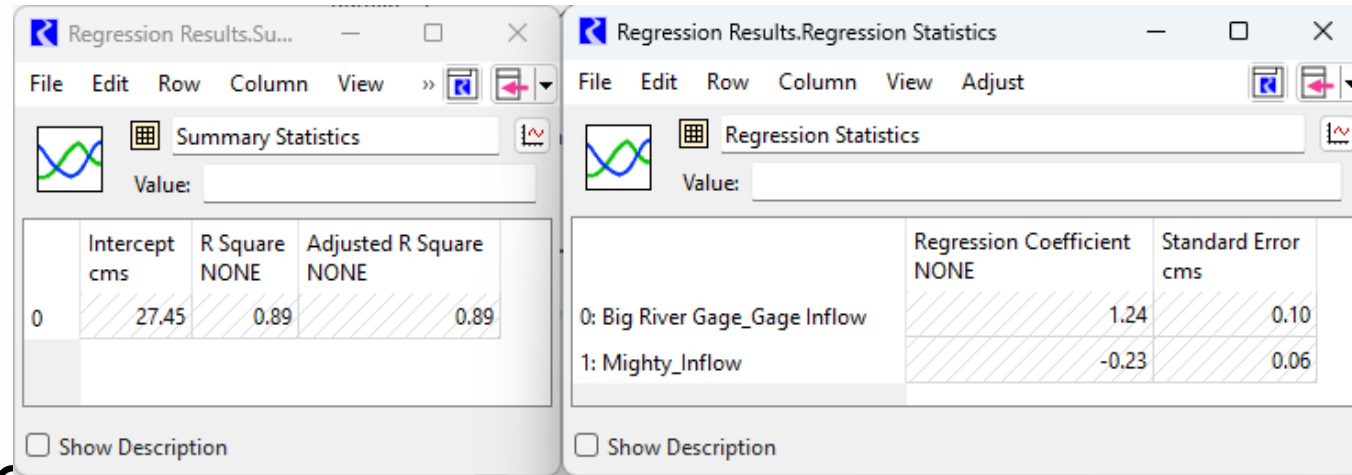
- Global RPL Function

- 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. R^2 , 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



Data Extractor Tool



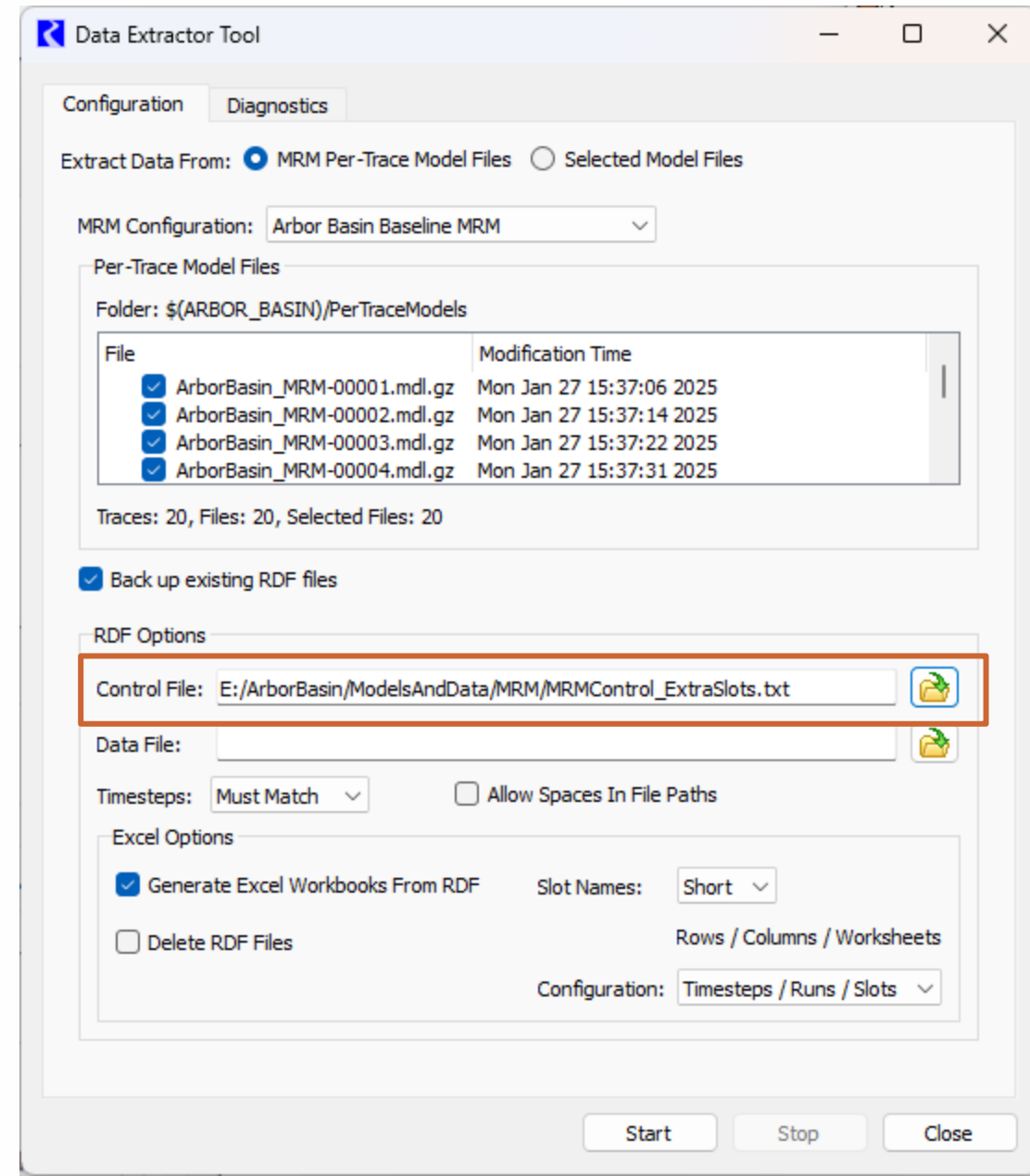
Data Extractor Tool (DET)

- 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
```

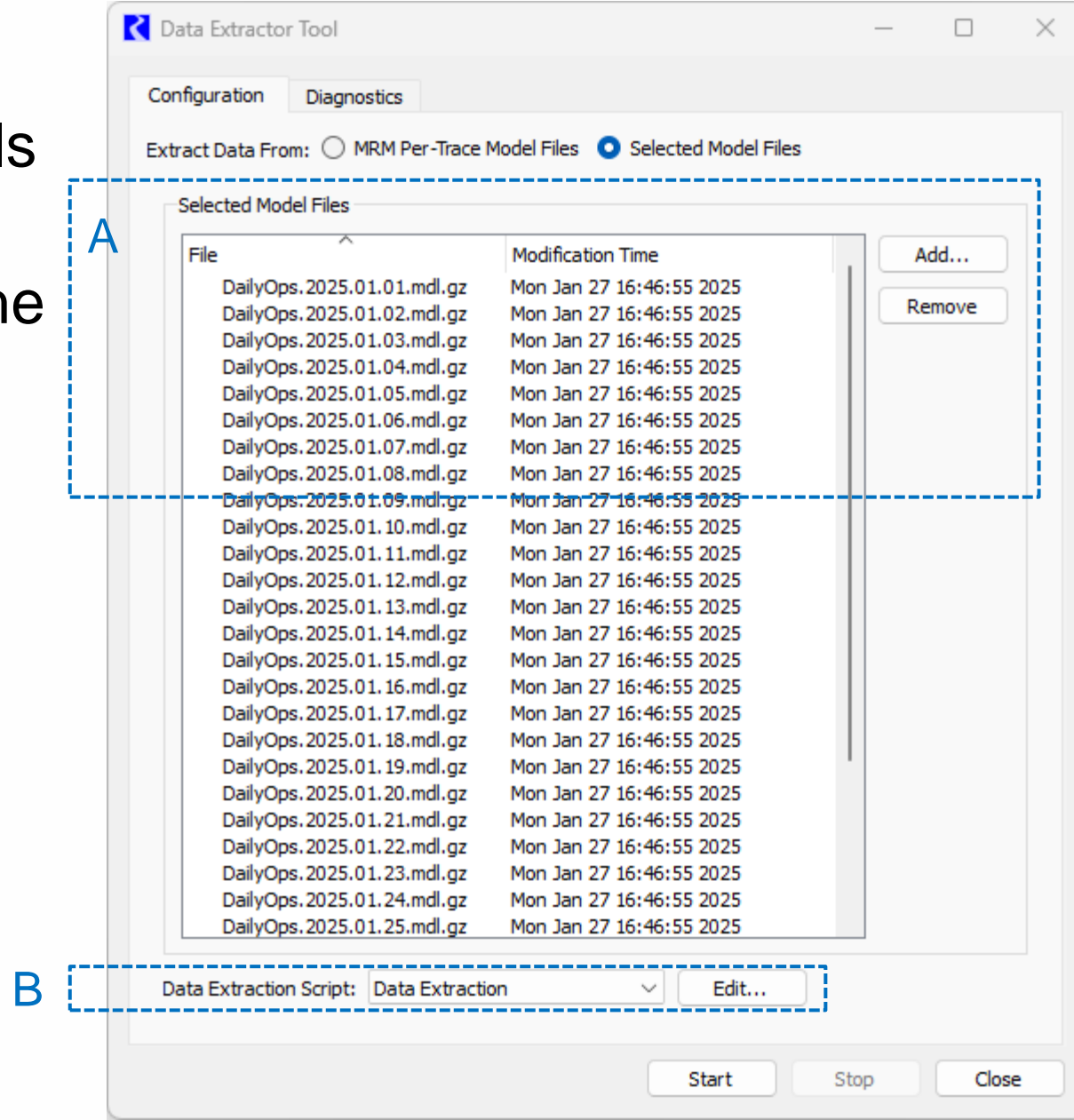


Arbitrary Model Files / Excel Output DMIs

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

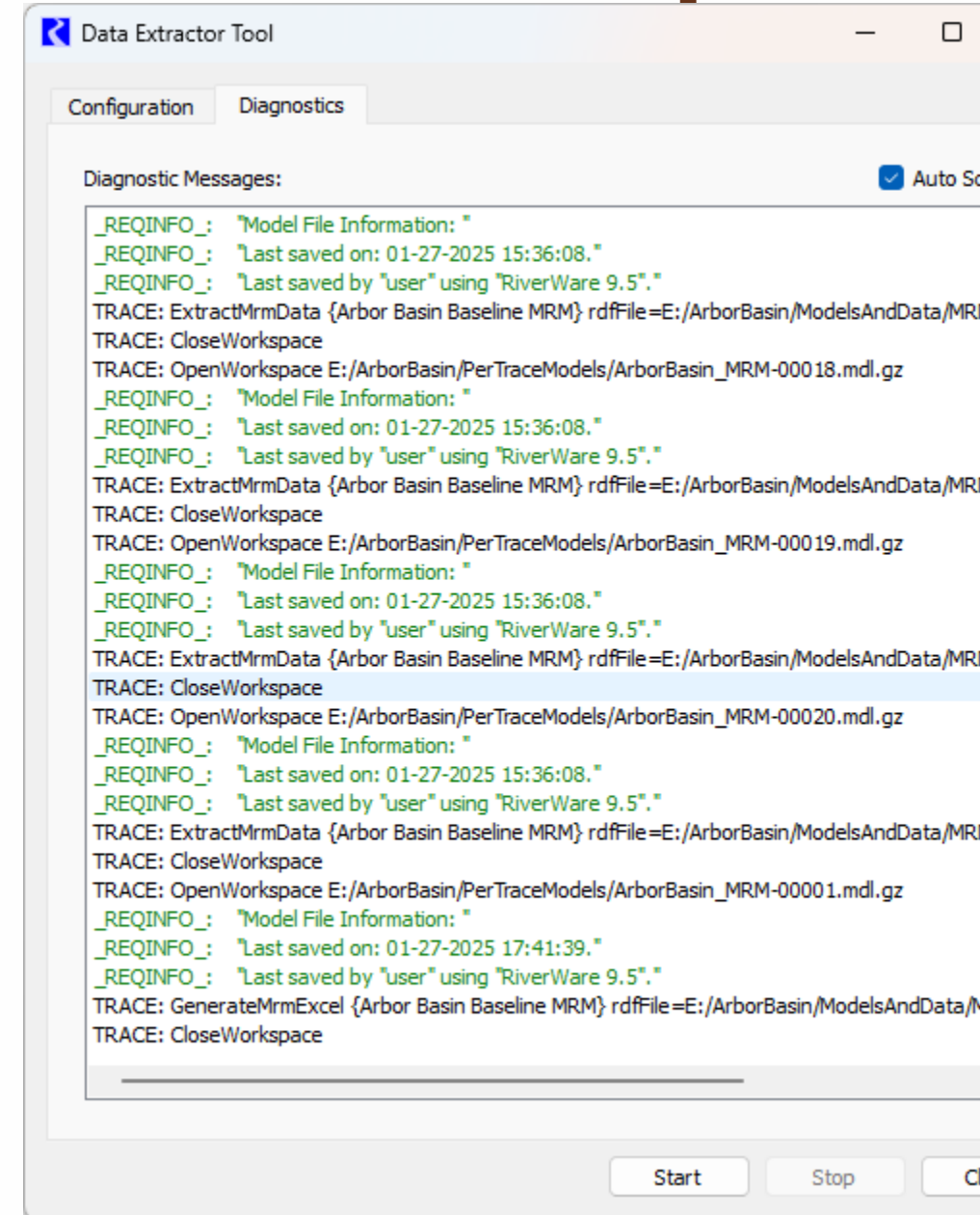


Arbitrary Model Files / Excel DMI Output

- 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



Questions? Comments?

