HEC-RTS RiverWare Plugin version 3.1 Installation and User Guide

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

November 17, 2026

The installation consists of three files plus supporting documentation:

- RTS_RiverWarePlugin.jar – The RiverWare plugin Java archive file.
- RiverWare.installinfo – The RiverWare installation information file.
- RiverWare.ver – The RiverWare version file.
- HEC-RTS RiverWare Plugin Release Notes.pdf – An overview of the changes in each release.
- HEC-RTS RiverWare Plugin User Guide.pdf – This document containing the RiverWare plugin installation and user guides.

1. Installing RiverWare and HEC-RTS

In this document we will refer to HEC-RTS, when referencing the user interface. Previously this was called the "Control And Visualization Interface" (CAVI).

Installing RiverWare

The HEC-RTS RiverWare Plugin version 3.1 integration requires RiverWare release 9.8 or later. This document assumes that RiverWare release 9.8 is installed in the default location:

C:\Program Files\CADSWES\RiverWare 9.8\

References to directory and file paths will need to be adjusted accordingly if a different RiverWare release is installed or if RiverWare is installed in a different location.

RiverWare plugin network connection

The RiverWare plugin communicates with RiverWare using IP address 127.0.0.1 (localhost) and port number 27002. If this port is unavailable due to firewall or other issues, a plugin using a different port number can be provided.

Installing HEC-RTS

This connection requires HEC-RTS release 3.6.0. Please follow the installation instructions for further information on HEC-RTS. This document assumes that HEC-RTS is installed in:

HEC-RTS	C:\HEC-RTS-3.6.0

References to directory and file paths will need to be adjusted accordingly if HEC-RTS is installed in a different directory.

2. Adding RiverWare to HEC-RTS

Install the RiverWare plugin Java archive file

Copy RiverWarePlugin.jar to the directory:

HEC-RTS	C:\HEC-RTS-3.6.0\HEC-RTS\jar\ext

The model plugins in this directory are named with prefixes which determine the order in which they appear in HEC-RTS, but which otherwise have no impact on model behavior. For example, HEC-RTS 3.6.x typically displays the models HMS, ResSim, and RAS in that order as the associated plugins have the following names:

S10hmsPlugin.jar
S15resSimPlugin.jar
S20rasPlugin.jar

If you would like the RiverWare plugin to appear before ResSim you would rename RTS_RiverWarePlugin.jar to S14RTS_RiverWarePlugin.jar; to appear after ResSim you would rename it to S16RTS_RiverWarePlugin.jar.

Install the RiverWare installation information and version files

Copy RiverWare.installinfo and RiverWare.ver to:

HEC-RTS	C:\HEC-RTS-3.6.0\HEC-RTS\config

RiverWare.installinfo contains the directory path of the RiverWare installation directory:

<InstallLocation>C:\Program Files\CADSWES\RiverWare 9.8\</InstallLocation>

The value is currently set to the default location for the 9.8 release; if a different release (e.g., 9.8.1) is installed or if RiverWare is installed in a different location then the file will need to be edited.

RiverWare.ver contains the RiverWare version:

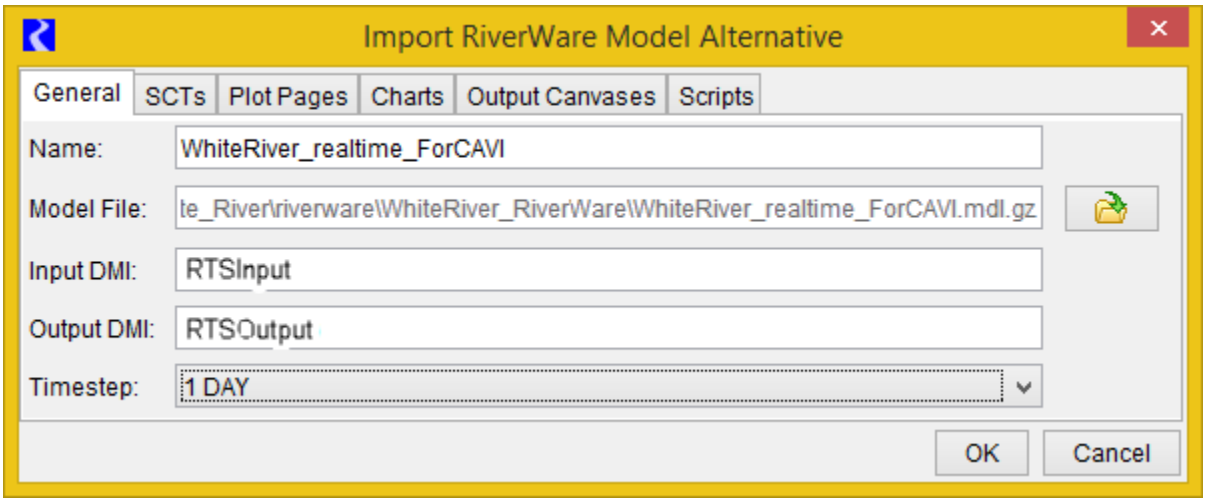
9.8+

The value is currently set for the 9.8 release (or later).

3. HEC-RTS RiverWare plugin user guide

The majority of the plugin's functionality is accessed via general mechanisms that apply to all models, as described in the HEC-RTS user manual. However, when one imports a RiverWare model alternative, the plugin presents a special dialog (Import RiverWare Model Alternative) for gathering the necessary information. This dialog has six tabs: General, SCTs, output devices (Plot Pages, Charts, Output Canvases) and Scripts.

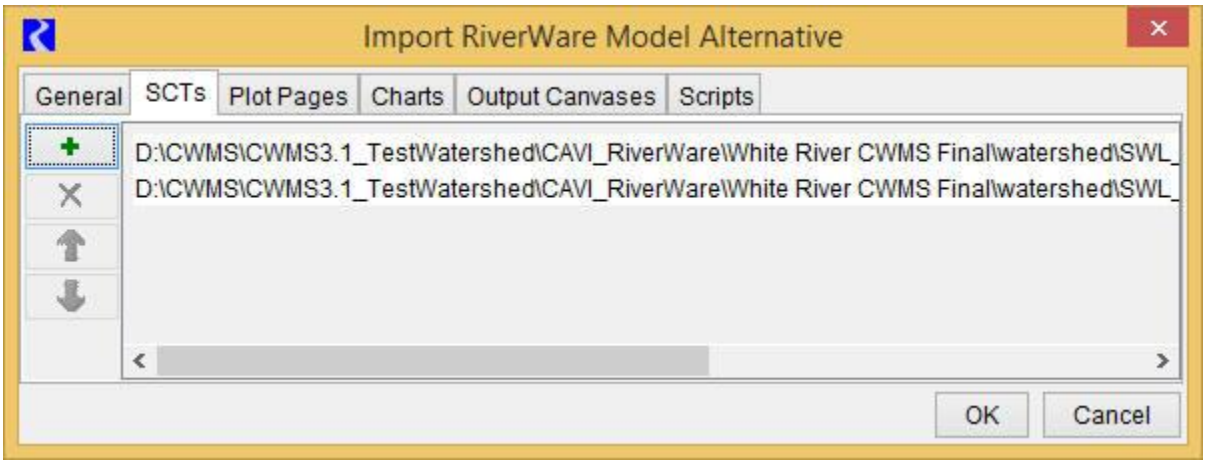
General Tab



The General tab enables you to:

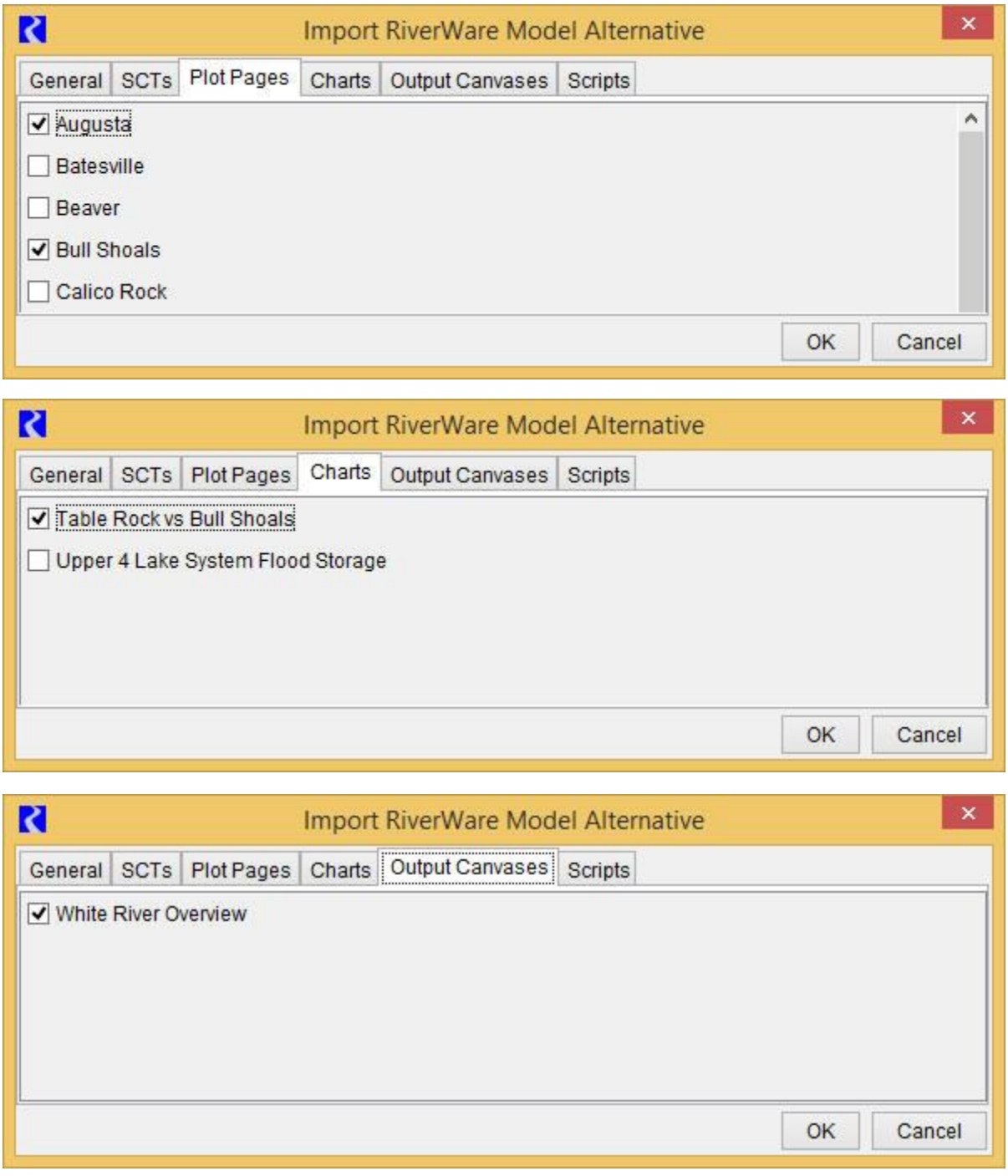
- Specify the model alternative name. The name defaults to the model file name with file suffixes removed.
- Select the model file. For rulebased simulation models, the policy (global function sets and ruleset) must be saved within the model file.
- Specify the input and output DMI names. The default names, RTSInput and RTSOutput, respectively, are shown in the figure above.
- Specify the time step of the model file. The time step is for verification purposes; if the time step doesn't match the model file time step the compute fails. See "Running a RiverWare model with a different timestep than the HEC-RTS models" on page 6 for more information on timestep size.

SCTs Tab



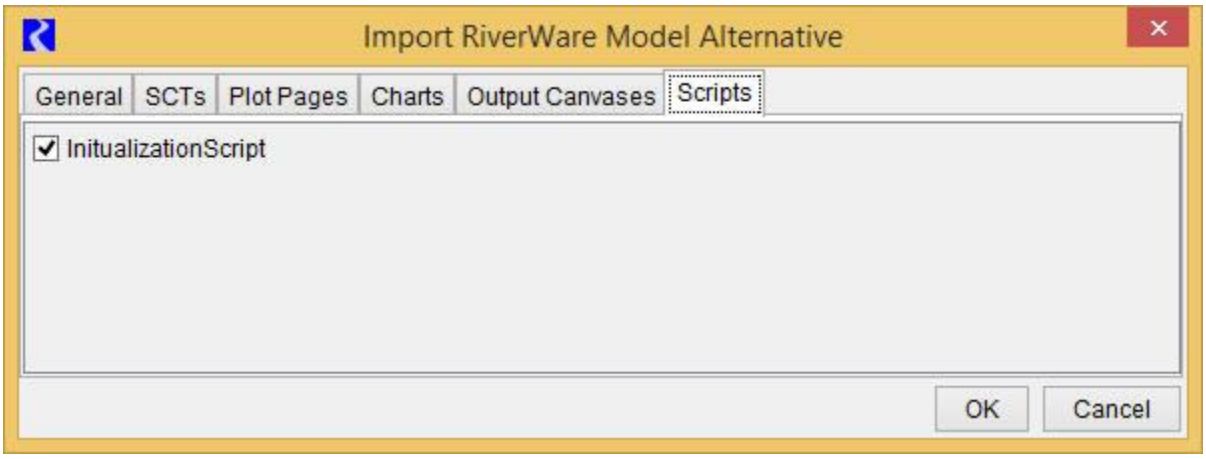
The SCTs tab enables you to create an ordered list of SCT files. There are buttons to add, remove and reorder the files. The file names, with suffixes removed, are shown on buttons and in context menus in HEC-RTS.

Output Devices (Plot Pages, Charts, Output Canvases) Tabs



The Plot Pages, Charts and Output Canvases tabs enables you to select the output devices which are shown on buttons and in context menus in HEC-RTS.

Scripts Tab



The Scripts tab enables you to select the scripts which are shown on buttons and in context menus in HEC-RTS.

4. RiverWare user interface

The following RiverWare dialogs are directly accessible from CAVI buttons and context menus:

- The RiverWare workspace (from which all RiverWare dialogs are available).
- RPL editors.
- SCTs.
- Plot dialogs.
- Plot Page dialogs
- Chart dialogs.
- Output Canvas dialogs.
- Script Dashboard dialogs.
- Open object dialogs.
- Diagnostic Output dialog.

Remember, from the RiverWare Workspace, you can get to any other RiverWare dialog.

5. RiverWare Usability Notes

RiverWare diagnostics

HEC-RTS presents important RiverWare diagnostic messages in the Messages window; for a complete set of messages refer to RiverWare's native Diagnostic Output dialog. The dialog can be opened from a button or context menu in HEC-RTS.

RiverWare debug files

The RiverWare plugin writes debug messages to the file:

C:\Users\<user name>\AppData\Local\Temp\RiverWarePlugin.log

and RiverWare writes debug messages to the file:

C:\Users\<user name>\AppData\Local\Temp\RwServer.27002.log

(The number in the second file name will change if the RiverWare plugin uses a different port number, as discussed above.)

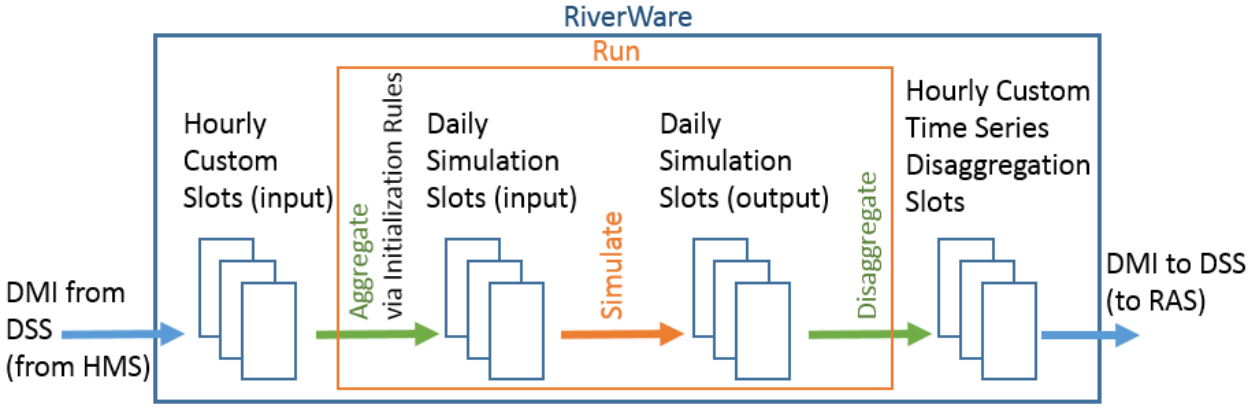
The files contain messages about the low-level interaction between the RiverWare plugin and RiverWare and will be useful if RiverWare isn't functioning properly in HEC-RTS.

Geolocation of RiverWare objects

For RiverWare simulation objects to be correctly located within CAVI map displays, the imported RiverWare model must contain coordinates for those objects as well as a description of the associated coordinate system. There are several ways to accomplish this; which method is most convenient will depend on the context. For example, if you have a map of the watershed which includes projection information metadata, then it will probably be most convenient to configure that as the background image of the geospatial view's canvas and then place icons by hand. Alternatively, if you have a WKT (well known text) representation of a coordinate system and object coordinates in a shapefile format with appropriate attributes, then these can be provided to the Geospatial Canvas Configuration dialog and Object Coordinate Manager, respectively. For more details, see the RiverWare online help.

Running a RiverWare model with a different timestep than the HEC-RTS models

In some basins, the HEC-RTS timestep is different than the desired RiverWare model timestep. Often the HEC-RTS timestep is 1 hour while the RiverWare model is at a 1 day timestep. 6 hour HEC-RTS and 1 day RiverWare or 1 hour HEC-RTS and 6 hour RiverWare are also common. To make the RiverWare model work in HEC-RTS, there are a few steps that must be performed to aggregate or disaggregate data within the RiverWare model. Following is a diagram that shows the RiverWare components and the needed aggregation and disaggregation. Following is a diagram of this approach:

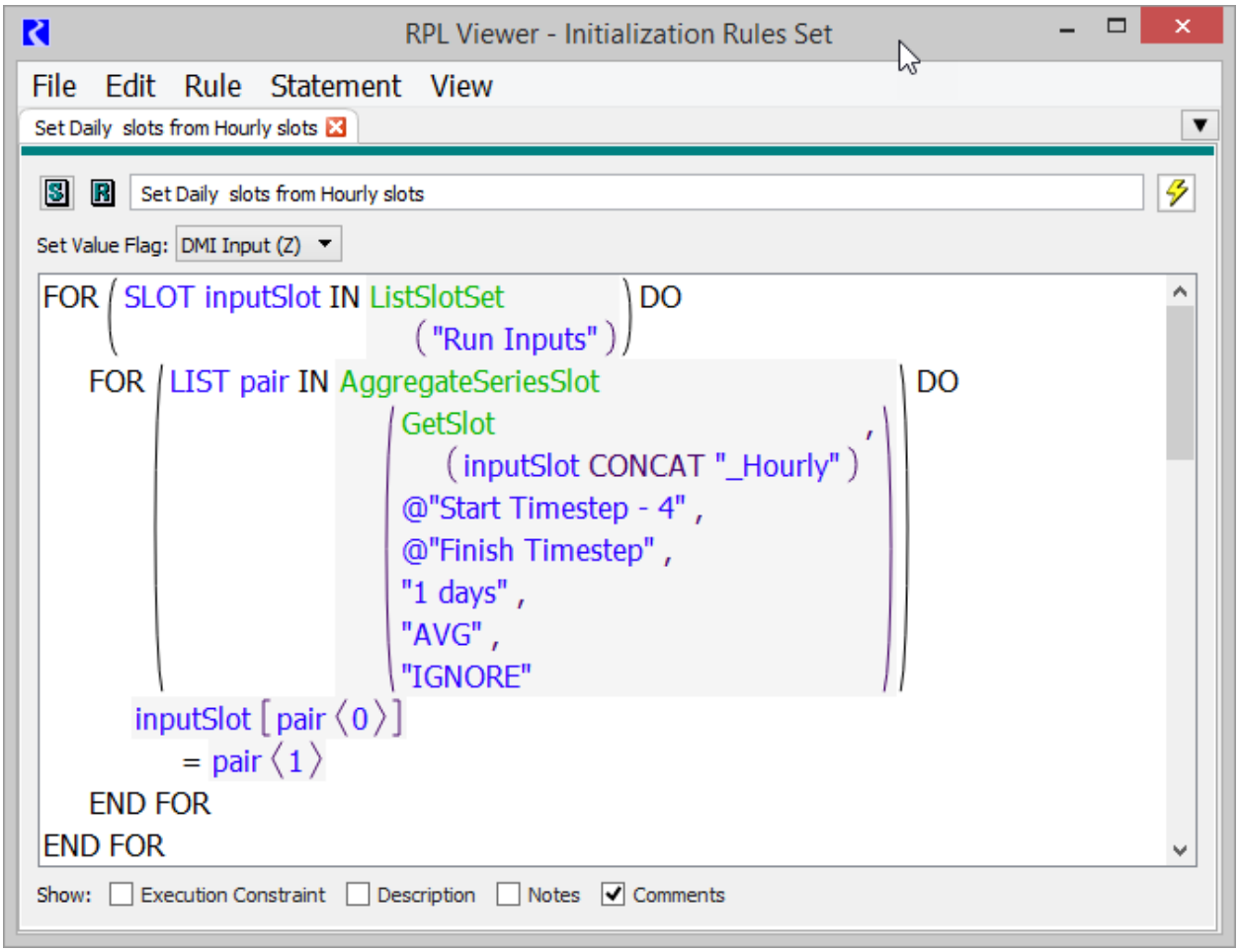


On the left is the input flow data from the upstream model, often HMS. The data must be imported from the FORECAST.DSS file via the input DMI to 1 Hour custom slots that are created on each relevant object. For example, on a headwater reservoir, the slot may be called Reservoir.Inflow_Hourly.

Aggregation is performed using Initialization Rules while disaggregation is performed via Time Series Disaggregation Slots. The run is performed at the larger timestep size, 1day. The following sections describe the Initialization rules, run, and disaggregation slots.

Aggregation via Initialization Rules

Initialization rules are executed at the beginning of the run before almost all other processes. Within the Initialization Rules, you would add rules that aggregate smaller timestep values (1 Hour) into the run's timestep (1 Day). The rule or rules would loop over all of the desired slots and all of the run's timesteps. Following is a mockup of a rule:



In this example, the rule loops over a list of slots in a slot set. These would include inflow locations. It then then calls a function AggregateSeriesSlot that returns a list of simulation slots and the values to set with the aggregated value. The rule then sets the values. The call to AggregateSeriesSlot includes a function to get the hourly slot based on the slot to be set (in the slot set), the date range, the timestep size to aggregate to, the aggregation function, and how to handle NaNs. See the RiverWare documentation for more information. In this case, the slot to set is: Reservoir.Inflow (Daily slot). The hourly data is imported to a custom slot called Reservoir.Inflow_Hourly. The function shown aggregates it to a daily slot, Reservoir.Inflow. The first timestep called in the function is early enough to include enough presimulation data.

Run within RiverWare

The run is then performed at the larger timestep size. When HEC-RTS sets the run range, it rounds the RiverWare timestep **UP** to the nearest Start Timestep and Finish Timestep that falls on that timestep size. For example, if HEC-RTS forecast Time is 25 April 2019 1300 and the end time is 30 April 2019 1300,

a daily RiverWare run will be set to Start Timestep of 24:00 April 25, 2019 and Finish Timestep of 24:00 April 30, 2019.

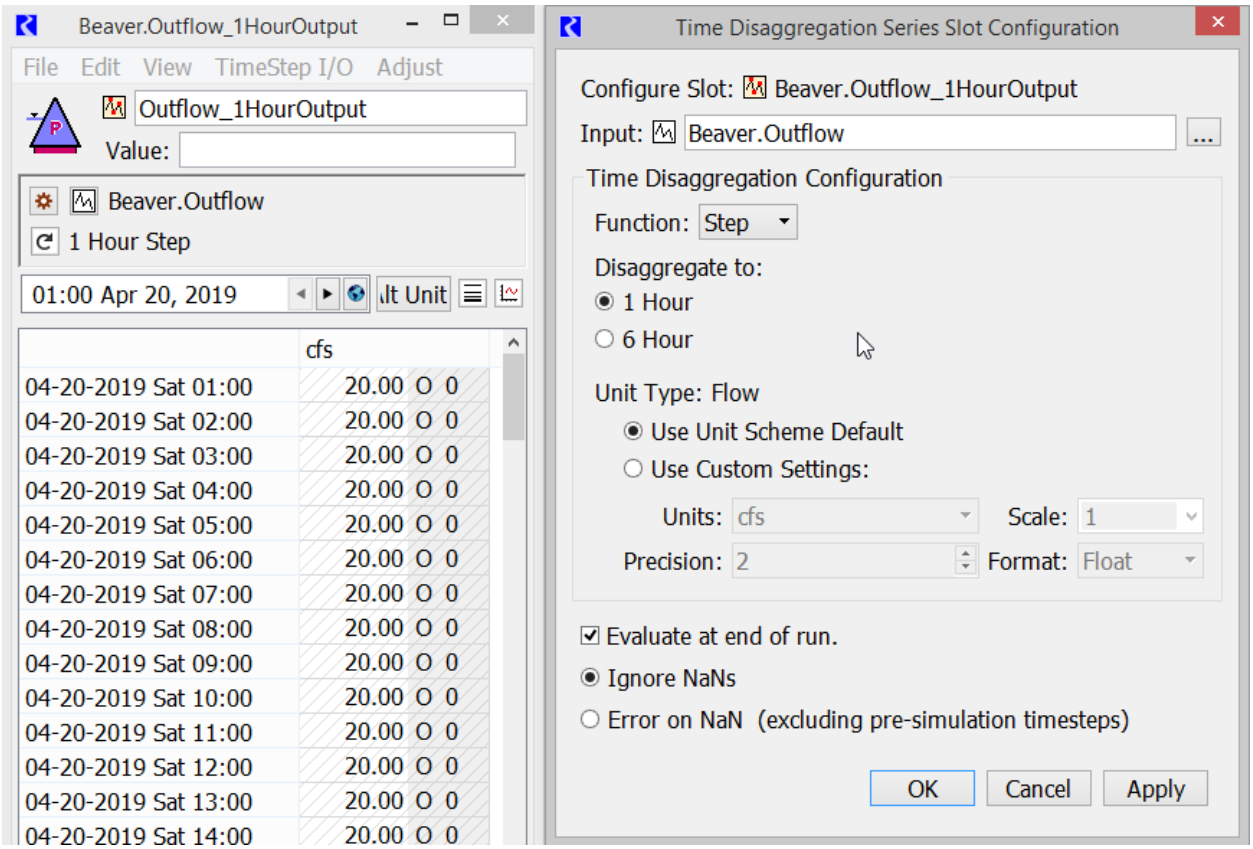
At the end of the run, the output data are disaggregated back to the forecast timestep. Time Disaggregation Series Slots perform this task as described next.

Disaggregation via Time Disaggregation Series Slots

Time Disaggregation Series Slots are custom slots that can be created on any object. There must be one slot for each output that is provided to the downstream model, typically HEC-RAS. These configuration includes:

- The slot to disaggregate.
- The timestep size of the disaggregated value. Initially only 1 Hour and 6 hour are supported
- The function to use for disaggregation:
    - **Step**: use the same value for all smaller timesteps. Typically this is for flow values.
    - **Interp:** Interpolate End of Timestep, linearly interpolate from one value to the next. This maintains the values at the end of the larger timestep. This is typically used for Elevation values.

The screenshot shows the custom Time Disaggregation Series Slot and the configuration for Beaver.Outflow.



The values of the Time Disaggregation Slots are then exported via the HEC-RTS Output DMI to the forecast.DSS file.

CAVI setup

Within HEC-RTS, the model linking must access the correct hourly slots in the RiverWare model. In the example, the RiverWare input should use the Inflow_Hourly slots. These should be linked to upstream inputs, either the HMS results or the Extract list. On the output side, the RAS model linking should look for data from RiverWare 1 Hour time disaggregation series slots, for example Outflow_1HourOutput. Note, in the RiverWare DMI, name maps can be used to map these custom slots to the correct locations and part information in the DSS file.