

Configuring Scenarios

To run a scenario, do the following:

- Select the **recorded parameters** (model outputs) of interest in the **Project Hierarchy** and **Parameter** pane. See [below](#).
 - Some model outputs are selected by default; these can be turned off by right-clicking on the Scenario's name and selecting **Record None**.
- Click **Select Analysis Type** on the Simulation toolbar to set the appropriate type of analysis. Depending on the scenario, Source offers several options for analysing your model data, including:
 - **Flow calibration analysis**, which calibrates a set of rainfall-runoff and flow routing model parameter values so that output from the model is representative of an observed data set;
 - **Run w/Warm Up**, which seeds the model with the available historical data and prepares for forecasting. This is enabled in River Operations scenarios only;
 - **Single analysis**, which simulates the river performance for a single set of conditions (as opposed to an iterative analysis which considers several possible outcomes); or
 - **Stochastic analysis**, which is used to generate flow replicates from stochastically generated rainfall inputs when dealing with stochastic climate data. See also [Incorporating uncertainty into climate variability](#).
- Click **Configure** on the Simulation toolbar to select the required time frame for the scenario to run. The resulting window depends on the type of analysis you chose in the previous step.

If you chose:

 - **Flow Calibration analysis**, the Calibration Wizard opens. Refer to [Calibration Wizard for catchments](#);
 - **Run w/Warm Up**, the Run w/Warm Up window opens when you run an [Operations](#) scenario;
 - **Single analysis**, the Single Analysis window opens (Figure 1). If constituents have been configured in the scenario, the **Constituents** tab will be enabled where you can choose to run constituents over a selected date range or over the entire time range (using the **Restrict** checkbox shown in Figure 2)
 - **Stochastic analysis**, the [Stochastic Analysis Tool](#) opens.

You can only configure a run time frame that is supported by the time spans in the time series associated with your scenario. A lowest-common-denominator approach is used. For example, if your project contains two time series where the first spans the period 1/1/1900 through 31/12/1990, and the second, the period 1/1/1960 through 21/12/2010, the available simulation time frame will be 1/1/1960 through 31/12/1990.

- Click **Run** on the Simulation toolbar to start the simulation run.

Figure 1. Configure single analysis

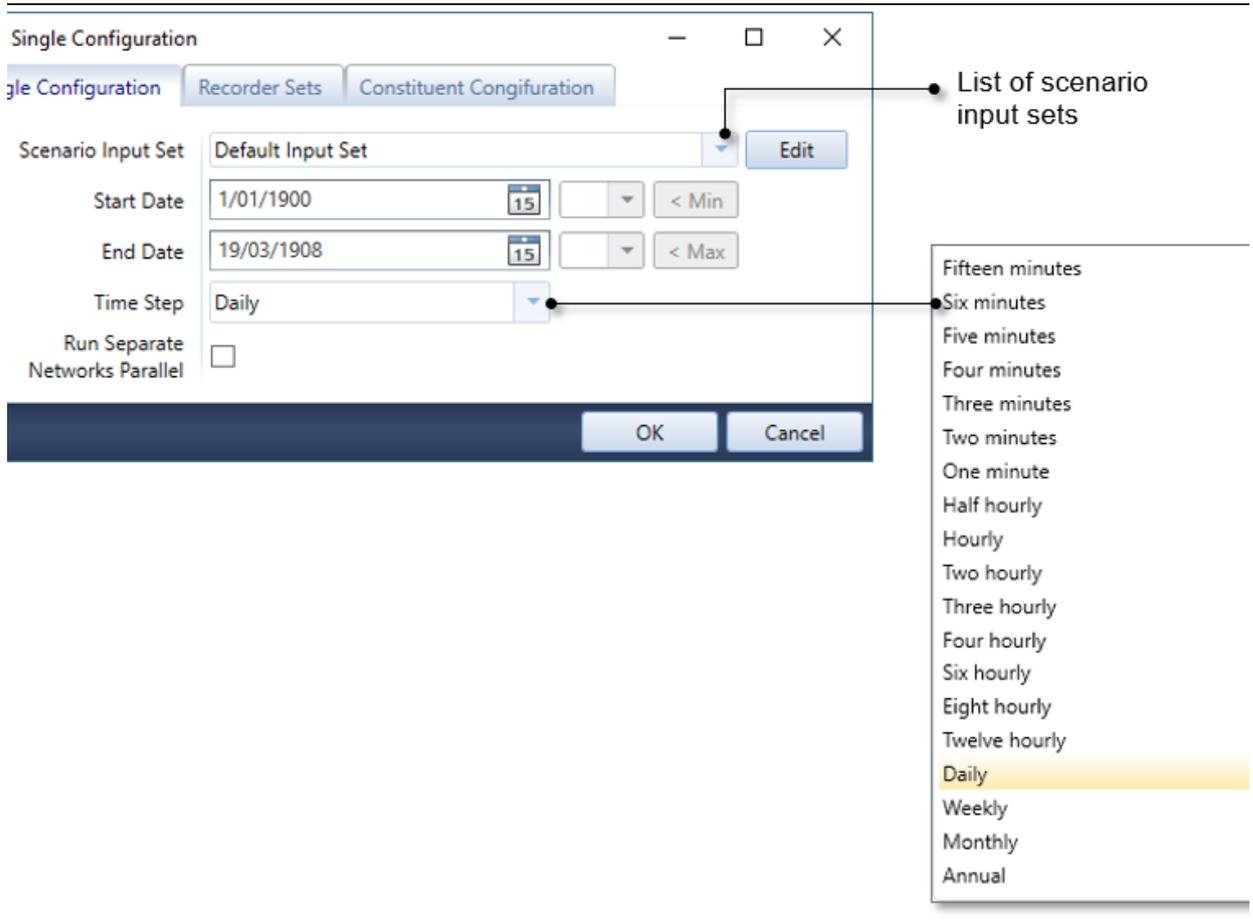


Figure 2. Running constituents

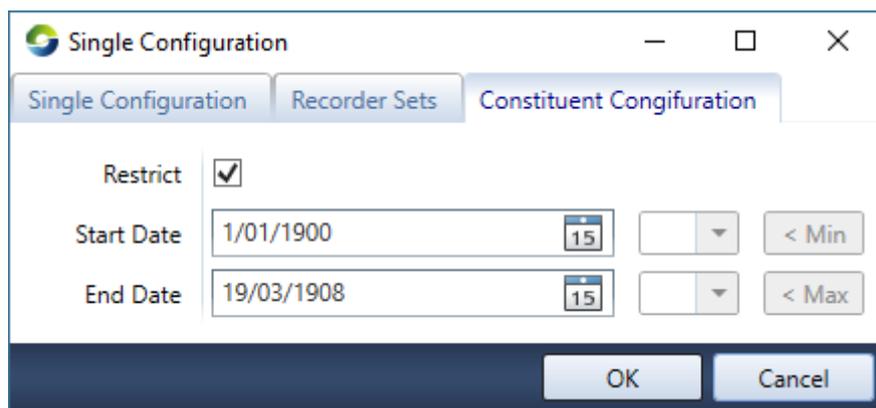
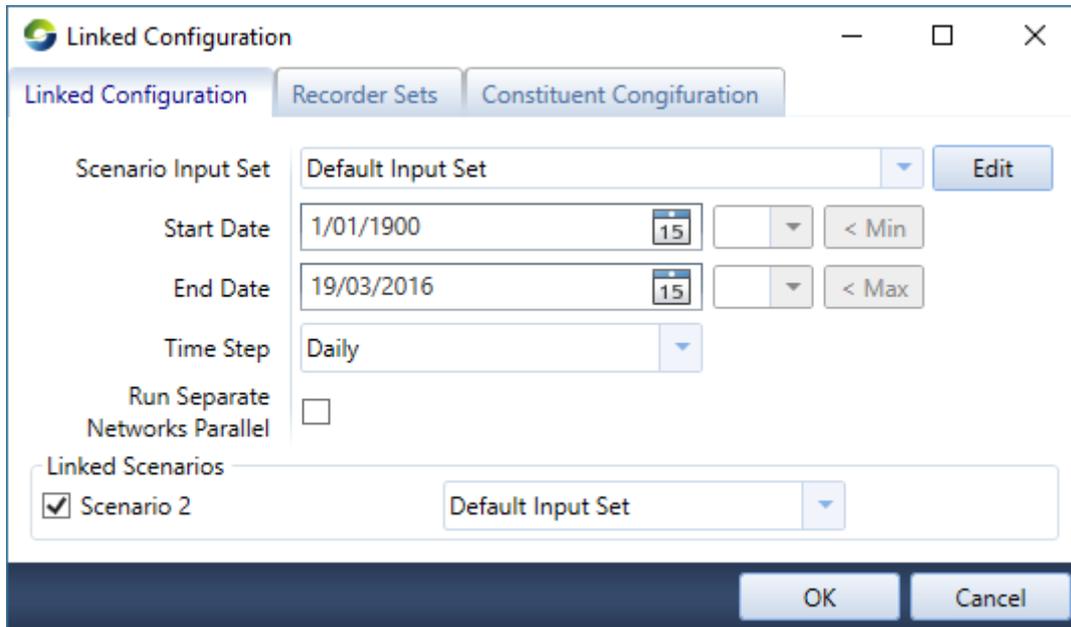


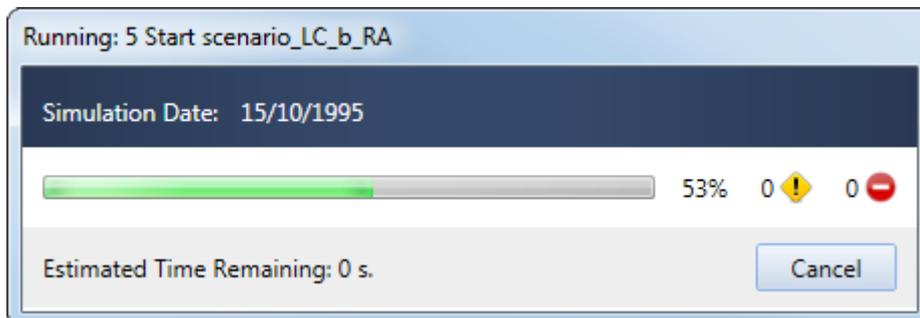
Figure 3 shows the dialog when you configure a linked scenario (using a [Connecting Models](#)).

Figure 3. Running linked scenarios



A progress bar indicates running times during a scenario run (Figure 4).

Figure 4. Running scenario (progress bar)



Running configurations

A scenario can be customised to run using a combination of specifically assigned dates and [Scenario Input Sets](#). This option is accessed through the Configuration Manager (Figure 5) or directly under **Edit » Scenario Options**. In Figure 6, the Single Analysis configuration is set to run for the dates 01/01/1981 - 31/12/2016 and will use values assigned through the HighDevelopment input set. A new configuration can be added with a customised name. In the **Of type** dropdown menu, first select the type of analysis to be run, e.g. 'Single analysis'. Then click the **Add new configuration** button. A new row appears at the bottom of the existing list of configurations. By default it is called **Custom 1**. To rename the configuration, double-click on the name and type in a chosen name. This new configuration option will appear in the configuration dropdown menu on the main Source toolbar. The Scenario Input Set to run and selected dates are set from the main configuration screen. These steps are illustrated in Figure 7.

To delete a configuration, select the relevant row and press the Delete button on the keyboard.

Figure 5. Accessing the Configuration Manager

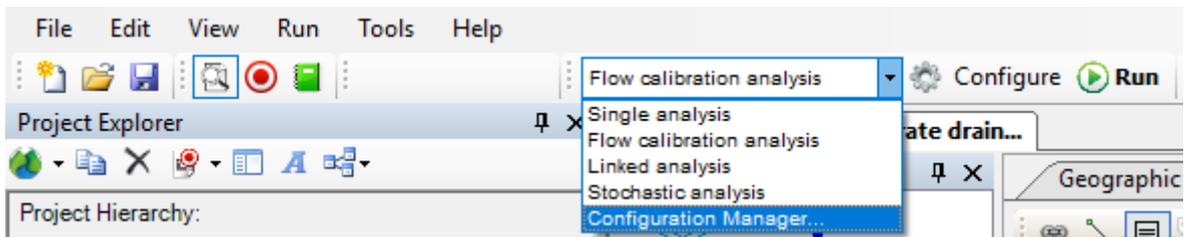


Figure 6. Specifying run configuration settings

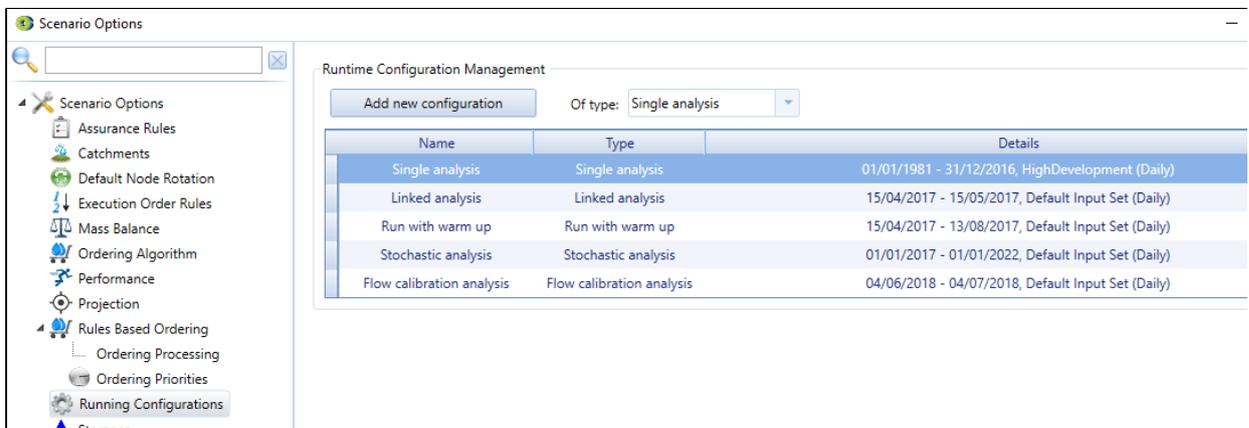


Figure 7. Customising run configuration settings

The screenshot displays the software's configuration interface. At the top, a dropdown menu is open, showing options: MyConfiguration, Single analysis, Linked analysis, Stochastic analysis, Flow calibration analysis, MyConfiguration, and Configuration Manager... The 'Configure' and 'Run' buttons are visible next to it.

Below this, the 'Single Configuration' dialog box is open. It has three tabs: 'Single Configuration', 'Recorder Sets', and 'Constituent Configuration'. The 'Single Configuration' tab is active, showing the following settings:

- Scenario Input Set: HighDevelopment (with an 'Edit' button)
- Start Date: 01/01/1981 (with a calendar icon and '< Min' button)
- End Date: 31/12/2016 (with a calendar icon and '< Max' button)
- Time Step: Daily (with a dropdown arrow)
- Run Separate Networks Parallel:

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Below the dialog is the 'Runtime Configuration Management' section, which includes an 'Add new configuration' button and a dropdown menu set to 'Of type: Single analysis'.

The main part of the screenshot is a table listing existing configurations:

Name	Type	Details
Single analysis	Single analysis	01/01/1981 - 31/12/2016, HighDevelopment (Daily)
Linked analysis	Linked analysis	15/04/2017 - 15/05/2017, Default Input Set (Daily)
Run with warm up	Run with warm up	15/04/2017 - 13/08/2017, Default Input Set (Daily)
Stochastic analysis	Stochastic analysis	01/01/2017 - 01/01/2022, Default Input Set (Daily)
Flow calibration analysis	Flow calibration analysis	04/06/2018 - 04/07/2018, Default Input Set (Daily)
MyConfiguration	Single analysis	01/01/1981 - 31/12/2016, HighDevelopment (Daily)

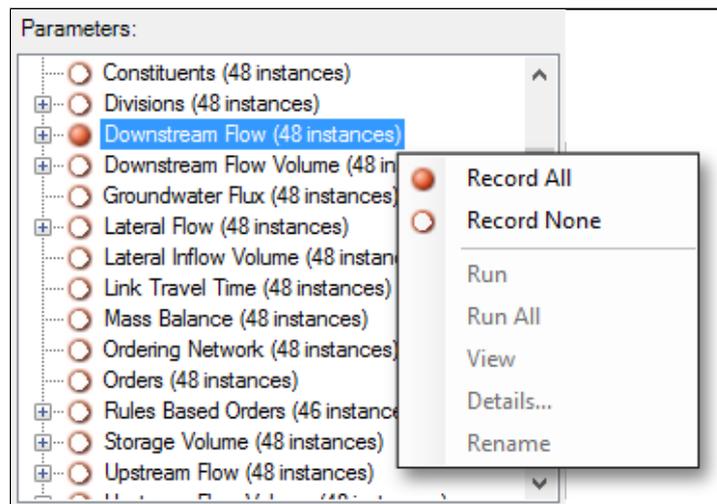
Model run times

Generally, the larger or more complex the model, the longer it will take to run. There are several user-configurable options in Source that you can use to increase performance (ie. reduce scenario run times) by ensuring only necessary functions and features are enabled during a model run. For example, you can reduce the number of recorded parameters (see below), or reduce the modelling period by choosing appropriate start and end dates when configuring your model (Figure 1). Other options include running various model components in parallel, these options can be enabled when configuring the model (Figure 1) and from within the Scenario Options dialog (**Edit » Scenario Options**). See [Improving Performance](#) for more information.

Recorded Parameters

Model results are only output from a model run for the **Parameters** that have been selected as recorded in the **Parameter** window (Figure 8). Custom **Recorder Sets** can be saved, or exported from a model and provide a quick method for changing the activated recorders within the model.

Figure 8. Recorded Parameters



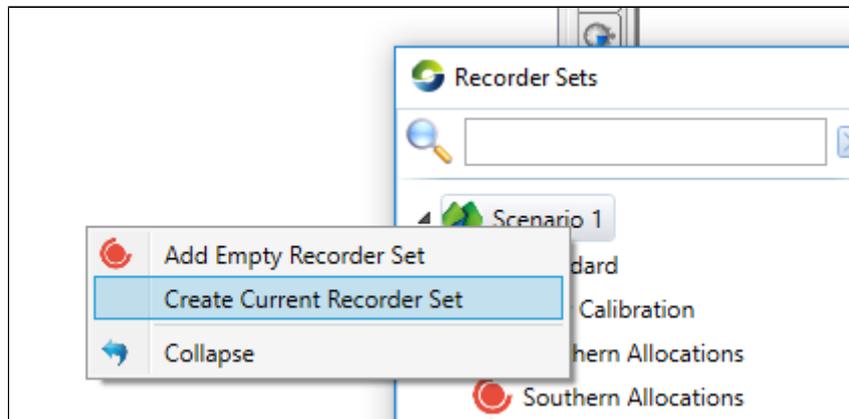
Recorder Sets

You can now easily switch between groups of recorders by using recorder sets. Similar to scenario input sets, they can be created from existing recorder configurations, specified manually using the text editor, or from a file. To access configuration, select **Edit >> Recorder Sets**.

Configuration Options

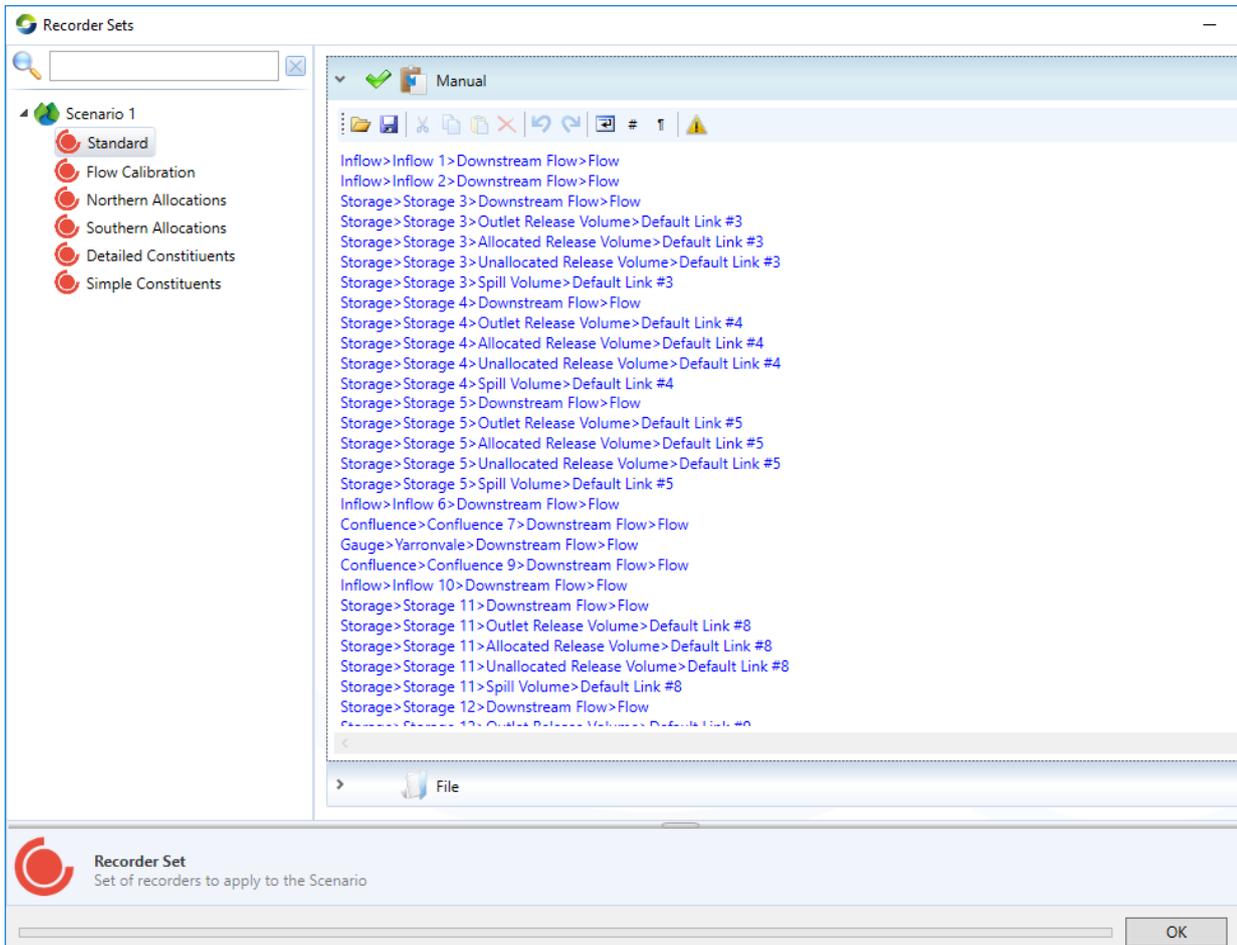
The quickest way to construct a **Recorder Set** is to enable recorders manually in the project hierarchy and parameter pane, and then select **Edit >> Recorder Sets**, right click on the scenario name and select **Create Current Recorder Set** (Figure 9), this adds all the selected recorders from the project to the Recorder Set editor pane. This Recorder Set can then be edited, saved or applied immediately to the project.

Figure 9. Adding a Recorder Set



Recorder Sets can be added manually using the inbuilt text editor. Select **Edit >> Recorder Sets**, right click on the desired scenario and select **Add Empty Recorder Set**. Text configuration can also be read directly from an external text file with reload on run enabled, by selecting the **File** instead of the **Manual** configuration option (Figure 10).

Figure 10. Recorder Set added to Recorder Set Editor



Searching Recorder Sets

Searching recorder sets can be done the same way as Scenario Input Sets (using **Ctrl+F**). More detail can be found in the Scenario Input Sets page

Using Wildcards

You can also define recorder sets with wildcards. e.g. `Inflow>*>Downstream Flow>Downstream Flow` will record the Downstream Flow for every node of type "Inflow". A recorder set must have at least 4 sections (separated by a '>' character).

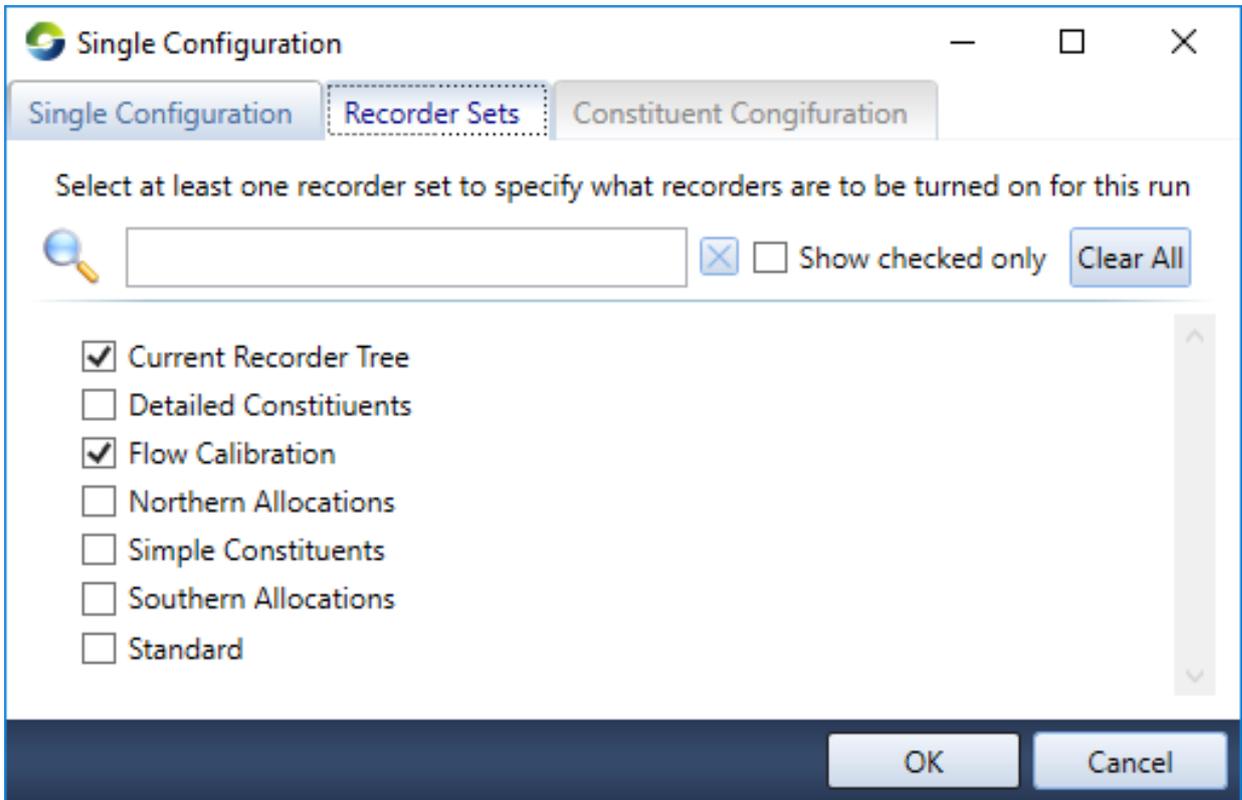
e.g: To record every inflow recorder, you must use `Inflow > * > * > *`

To record every downstream flow recorder, you must use `* > * > * > Downstream Flow`

When Running

When configuring the model run, multiple recorder sets can be enabled and recorded for the model run (Figure 11).

Figure 11. Configuration of Multiple Recorder Sets for Model Run



Performance Improvement

Networks with multiple outlet nodes (Figure 12) can be configured to run separate networks simultaneously by selecting Run Separate Networks in Parallel (see Figure 1 above). This should not be selected as an option if there are calculation dependencies across the separate networks, e.g. Subnetwork 2 calls a function which involves a value from Subnetwork 1.

Figure 12. Example of geographic and schematic scenarios with multiple outlets

