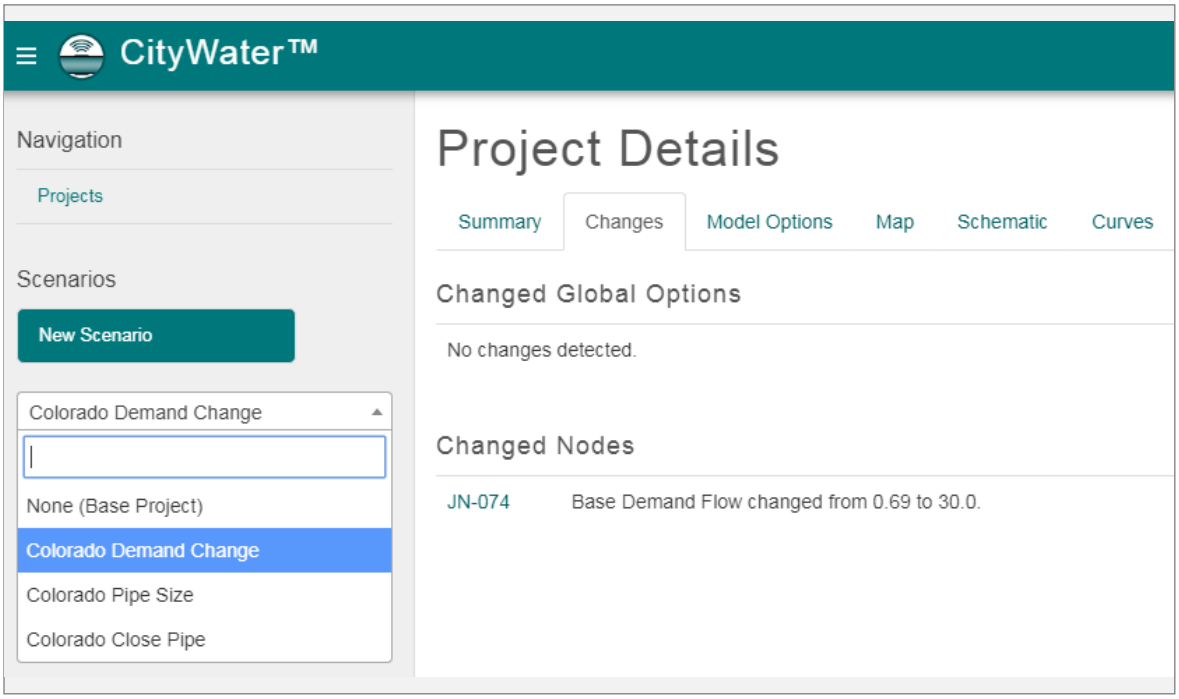
CityWater Tutorial

CityWater – Scenarios

How to use scenarios to create variant simulations



Objectives

This tutorial shows how to create variant simulations using scenarios.

Prerequisites

- View Project Details and Map

Requirements

- CityWater Account with the Scenario Management Add-on
- Internet access

Time

- 15–30 minutes

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1 Getting Started

CityWater™ provides a useful way to generate variant simulations in your project. Using scenarios, basic properties can be changed in the model then the model can be run again to show how the change affected the model. When using scenarios, the original model is preserved and left unchanged.

You will need to have the Scenario Management add-on for CityWater and at least one EPANET model uploaded to complete this tutorial.

If you are not already logged in to your CityWater account, access the Aquaveo™ Portal by doing the following:

1. Open a web browser. For the best experience, use Google Chrome, Mozilla Firefox, or Safari.
2. Navigate to Aquaveo™ Portal using this address: https://portal.aquaveo.com
3. Log in to your CityWater account.
4. Open the CityWater app by selecting its app icon in the Apps Library.

2 Changing the Demand on a Node

On the Projects page, all of the available EPANET projects are shown for your account. We'll be using the "Idaho City" project that was created in the "Create a New Project" tutorial. If you do not have the project, select any project available.

1. Click on the project name "Idaho City" to navigate to the Project Details page for the Idaho model.

This project simulation has already been executed and the results can be viewed in the Run Summary tab. In this tutorial, we want to examine how changing the demand on a node will affect the model.

2.1 Creating a New Scenario

Start with creating the new scenario.

1. Click on the **New Scenario** button to navigate to the New Scenario page.
2. Under Name, enter "Idaho City Demand Change".
3. Under Description, enter "Idaho City Demand Change".

4. Click **Create Scenario** to create the scenario and be directed to the Project Map.

2.2 Changing the Demand and Running the Scenario

In this exercise, we'll use a hypothetical scenario where there is an expected increase on water demand for an area. For example, the construction of a new apartment complex or new school is being considered.

1. Using the Jump to Node drop-down menu at the bottom of the map, select "12" to zoom to the node that will have an increased demand.
2. In the Properties tab to the left, change the Base Demand Flow to be "30.0" gpm.

This will represent a significant change from the existing simulation. Now run the scenario.

3. Click on the **Save Changes** button in the Properties tab.
4. Now, click on the **Run** button to start the scenario.

When the scenario starts running, the Project Details page will appear for the scenario.

5. Click the **Status** button to see that the simulation is running.

It may take a few minutes for the scenario to finish processing.

3 Viewing Changes

Once the simulation run has completed processing, the changes to the simulation are recorded.

1. Under the **New Scenario** button, use the drop-down to select "Idaho City Demand Change".
2. Select the **Changes** tab in the Project Details.

In the Changes tab, notice a note under the Changed Nodes stating the base demand node was changed. To see this change in the map, do the following:

3. Click on the link **12** to go to the Project Map with the map already zoomed in on the node.

To see the change:

4. Select the **Layers** tab on the left.
5. Change the Node Layer drop-down menu to be "Demand".

Notice node 12 is no longer the green color it was in the base project. To see the original project:

6. Under Scenarios on the left, click on the drop-down menu and select "None (Base Project)".

You can now zoom in on the node and look at the demand before the change. You can use the Scenarios menu to switch to any scenario created in the project. Changes can also be viewed using schematics if desired.

More than one change can be made in each scenario. All changes will be listed on the Changes tab.

Figure 1: The new scenario (left) and the base project (right).

4 Changing the Pipe Size and Diameter

Let's look at increasing the diameter of a pipe to see what else can be done with scenarios. To see how this might be modeled, do the following:

1. Navigate back to Project Details
2. Click on the **New Scenario** button to navigate to the New Scenario page.
3. Under Name, enter "Idaho Pipe Size Change".
4. Under Description, enter "Changes to the pipe diameter at link 44".
5. Click **Create Scenario** to create the scenario and be directed to the Project Map.
6. Using the Jump to Link drop-down menu at the bottom of the map, select link "44" to zoom to the link that will have an increased diameter.
7. In the Properties tab to the left, change the Pipe Diameter to be "30.0" inches.
8. Click on the **Save Changes** button.
9. Click on the **Run** button to start the scenario.

4.1 Viewing the Results

Once the scenario finishes processing, the effects of increasing the pipe diameter can be viewed.

1. Select the **Changes** tab.
2. Click on the link **44** to go to the Project Map with the map already zoomed in on the link.
3. Select the **Layers** tab on the left.
4. Change the Link Layer drop-down menu to be “Velocity”.
5. Use the Scenarios drop-down menu to switch between “None (Base Project)” and “Idaho Pipe Size Change“ in order to compare velocities on the Properties tab.

Note that the demand change made to the node in the last exercise does not appear in this scenario. This is because each new scenario will always be based on the initial base project. Changes from each previous scenario are not added to new scenarios.

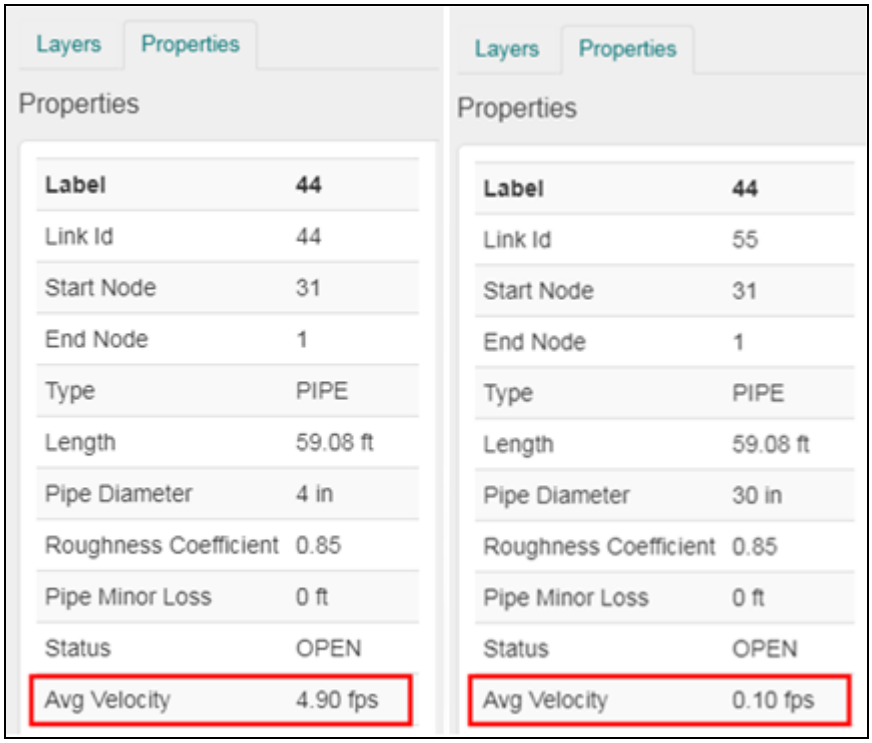

Figure 2: The base model (left) and the new scenario (right).

5 Closing Off a Pipe

Make another scenario to close off a link. Closing off a link makes the pipe no longer active in the simulation.

1. Navigate back to Project Details
2. Click on the **New Scenario** button to navigate to the New Scenario page.

3. Under Name, enter “Idaho Close Pipe”.
4. Under Description, enter “Changes to close the pipe at P-084”.
5. Click **Create Scenario** to create the scenario and be directed to the Project Map.
6. Using the Jump to Link drop-down menu at the bottom of the map, select “37” to zoom to the link that will have an increased diameter.
7. In the Properties tab to the left, change the Status to be “CLOSED”.
8. Click on the **Save Changes** button.
9. Click on the **Run** button to start the scenario.

5.1 Viewing the Results

Once the scenario finishes processing, the effects of closing the pipe can be viewed.

1. Select the **Changes** tab.
2. Click on the link **37** to go to the project map page with the map already zoomed in on the link.
3. Select the **Layers** tab on the left.
4. Change the Link Layer drop-down menu to be “Zone”.

Notice the link at 37 has been grayed out. Also notice that the links above link 37 have changed color to represent that they are now a different zone. Closing off the pipe disconnected the links, creating a separate zone.

If desired, you can switch between the base project and the scenario to explore the change.

6 Conclusion

This concludes the “Scenarios” tutorial for CityWater. Changes made in each scenario could also include changing model options in the project details or multiple changes can be made in the map. Items discussed in the tutorial included:

- Creating new scenarios
- Changing properties for a scenario
- Saving and running scenarios
- Viewing the Changes tab
- Viewing different scenarios in the project map