III. Tutorial 2: Reservoir_Gate_Transfer

The purpose of this tutorial is to add a reservoir, gate, and transfer to the simple channel-only grid created in Tutorial 1. As shown in the PowerPoint presentation, the channels have the following configuration and specifications:

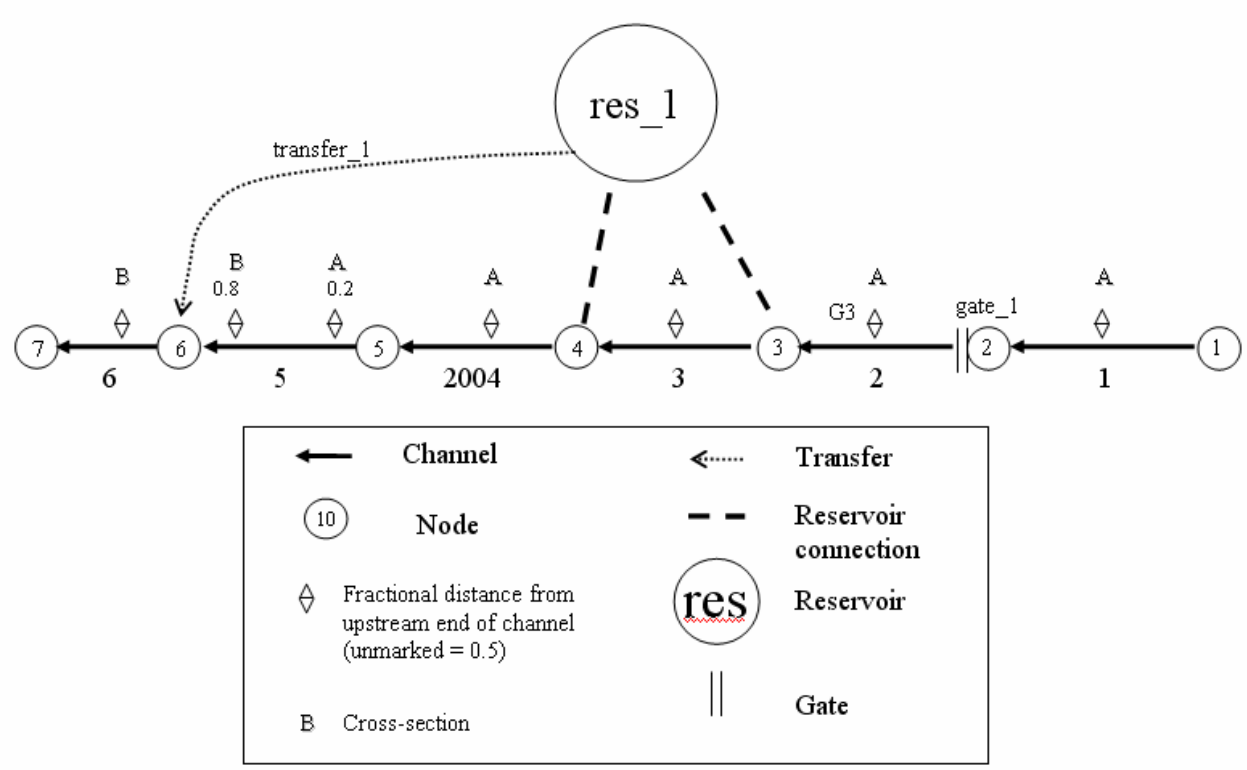


Figure 2 - Simple channel with a new reservoir, gate, and transfer.

The following steps will instruct you on how to create these new features and add them to the simple channel system.

1. Create the reservoir:

a. In the *Simulations Navigator*:
   1) Expand the *model: tutorial_hydro* folder.
   2) Expand the *Grid* folder.
   3) Double-click on *Reservoirs*.

b. In the *Layers panel*, right-click and select *Set edit layer*.

c. In the *Select Layers* window, double-click the *tutorial_grid* layer.

d. In the *Reservoirs table*:
   1) Right-click and select *Insert row*.

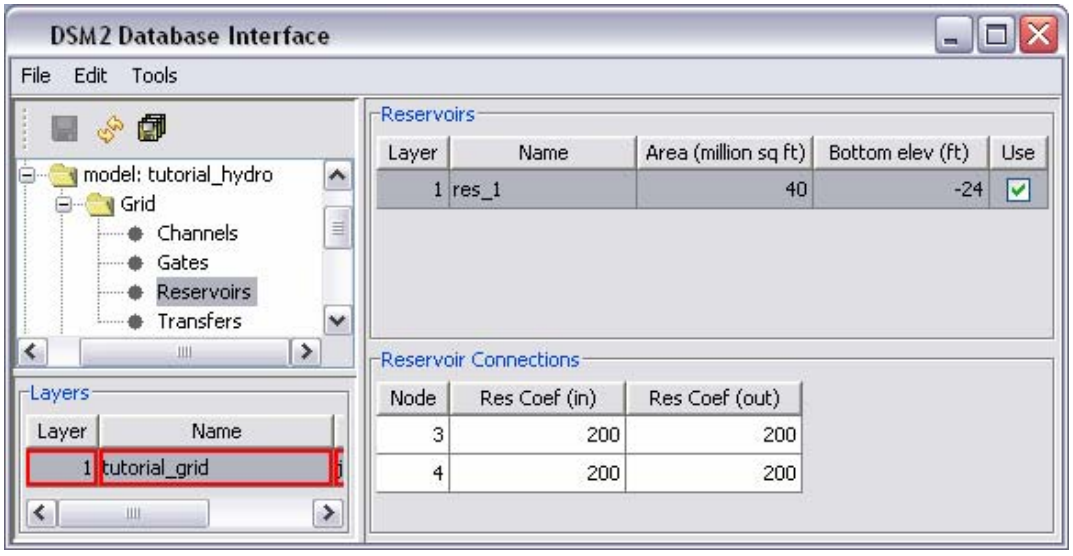
2) Enter the following values into the appropriate fields:
   i) Name: *res_1*
   ii) Area (million sq ft): *40*
   iii) Bottom elev (ft): *-24*
   iv) Use: Make sure that the entry contains a checkmark.

e. Note from Figure 2 that the reservoir has two connections; one at Node 3, and one at Node 4. Therefore, two rows of information will be needed for the *Reservoir Connections* table.

f. In the *Reservoir Connections table*:
   1) Right-click and select *Insert row*.
   2) Enter the following values into the appropriate fields:
      i) Node: *3*
      ii) Res Coef (in): *200*
      iii) Res Coef (out): *200*
   3) Again, right-click and select *Insert row*.
   4) Enter the following values into the appropriate fields:
      i) Node: *4*
      ii) Res Coef (in): *200*
      iii) Res Coef (out): *200*

g. Save the current settings.

h. At this point, the GUI should look as follows:



i. In the *Layers Panel*, right-click and select *Unset edit layer* [optional].

2. Create the Gate.

a. Note from Figure 2 that the gate is located at Node 2 of Channel 2. This gate consists of both a weir and a pipe. Therefore, two rows of information will be needed for the *Gate Devices* table.

b. In the *Simulations Navigator*:
   1) Remain in the *Grid* folder.
   2) Double-click on *Gates*.

c. In the *Layers panel*, right-click and select *Set edit layer*.

d. In the *Select Layers* window, double-click the *tutorial_grid* layer.

e. In the *Gates table*:
   1) Right-click and select *Insert row*.
   2) Enter the following values into the appropriate fields:
      i) Name: *gate_1*
      ii) Connected object: *Channel*
      iii) Name/No: *2*
      iv) to Node: *2*
      v) Use: Make sure that the entry contains a checkmark.

f. In the *Gate Devices table*:
   1) Right-click and select *Insert row*.
   2) Enter the following values into the appropriate fields:
      i) Name: *weir*
      ii) Structure: *weir*
      iii) Gate Control: *gated_top*
      iv) # Dupl: *2*
      v) Radius/width: *20*
      vi) Elev: *2*
      vii) Height: *9,999*
      viii) CF from Node: *0.8*

ix) CF to Node: *0.8*

x) Default Op: *gate_open*

g. Again, in the *Gate Devices* table:

1) Right-click and select *Insert row*.

2) Enter the following values into the appropriate fields:

i) Name: *pipe*

ii) Structure: *pipe*

iii) Gate Control: *no_gate*

iv) # Dupl: *2*

v) Radius/width: *20*

vi) Elev: *2*

vii) Height: *9,999*

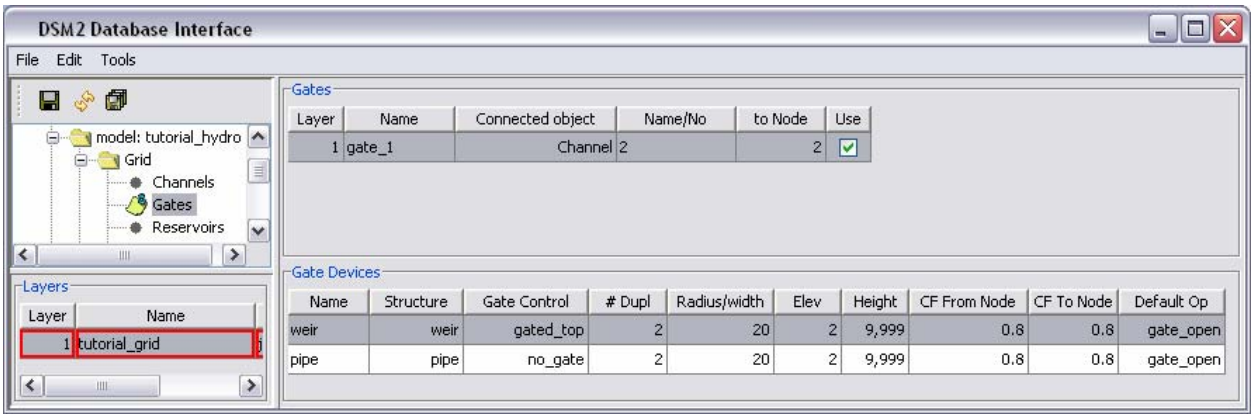
viii) CF from Node: *0.8*

ix) CF to Node: *0.8*

x) Default Op: *gate_open*

h. Save the current settings.

i. At this point, the GUI should look as follows:



j. In the *Layers Panel*, right-click and select *Unset edit layer* [optional].

2. Create the Transfer:

a. In the *Simulations Navigator*:

1) Remain in the *Grid* folder.

2) Double-click on *Transfers*.

b. In the *Layers panel*, right-click and select *Set edit layer*.

c. In the *Select Layers* window, double-click the *tutorial_grid* layer.

d. In the *Transfers table*:

1) Right-click and select *Insert row*.

2) Enter the following values into the appropriate fields:

i) Name: *transfer_1*

ii) From Object: *Reservoir*

iii) Name/Number: *res_1*

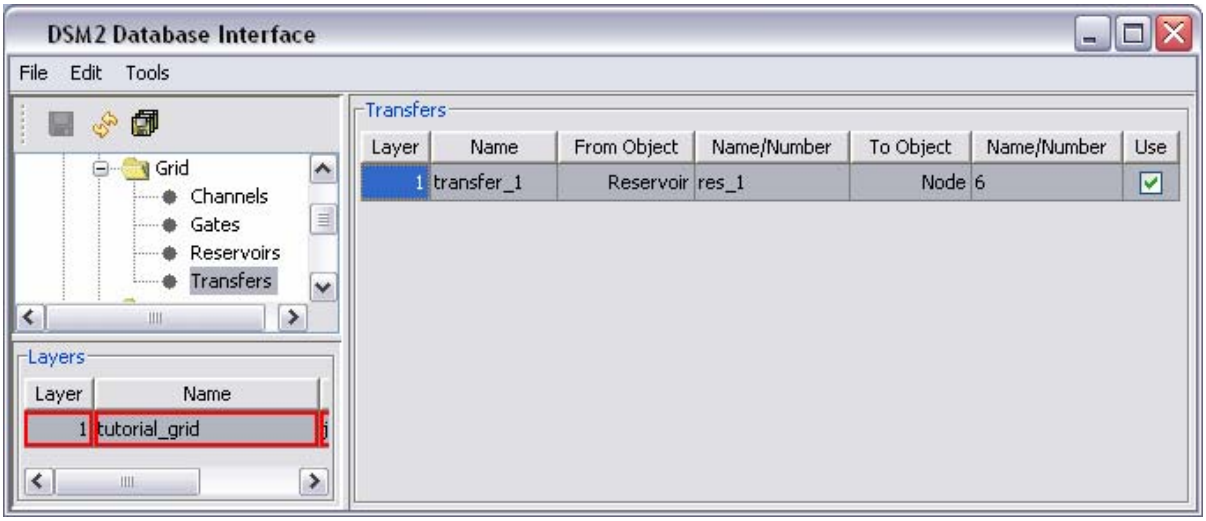
iv) To Object: *Node*

v) Name/Number: *6*

vi) Use: Make sure that the entry contains a checkmark.

e. Save the current settings.

f. At this point, the GUI should look as follows:



g. In the *Layers Panel*, right-click and select *Unset edit layer* [optional].

3. Add Initial Conditions for the Reservoir:

a. In the *Simulations Navigator*:

1) Collapse the *Grid* folder [optional].

2) Expand the *Initial Conditions* folder.

3) Double-click on *Reservoir IC*.

b. In the *Layers panel*, right-click and select *Set edit layer*.

c. In the *Select Layers* window, double-click the *tutorial_grid* layer.

d. In the *Reservoir Initial Conditions table*:

   1) Right-click and select *Insert row*.

   2) Enter the following values into the appropriate fields:

      i) Reservoir Name: *res_1*

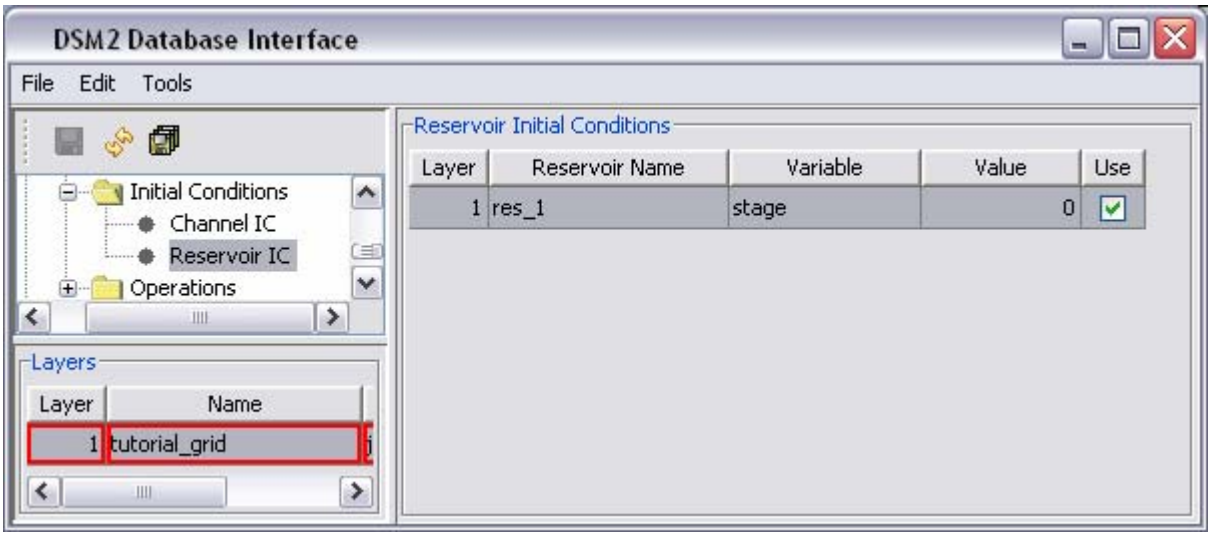
      ii) Variable: *stage*

      iii) Value: *0*

      iv) Use: Make sure that the entry contains a checkmark.

e. Save the current settings.

f. At this point, the GUI should look as follows:



g. In the *Layers panel*, right-click and select *Unset edit layer* [optional].

4. Add the Transfer Flow Time Series:

a. In the *Simulations Navigator*:

   1) Collapse the *Initial Conditins* folder [optional].

   2) Expand the *Input Time Series* folder.

   3) Double-click on *Transfer Flows*.

b. In the *Layers panel*, right-click and select *Set edit layer*.

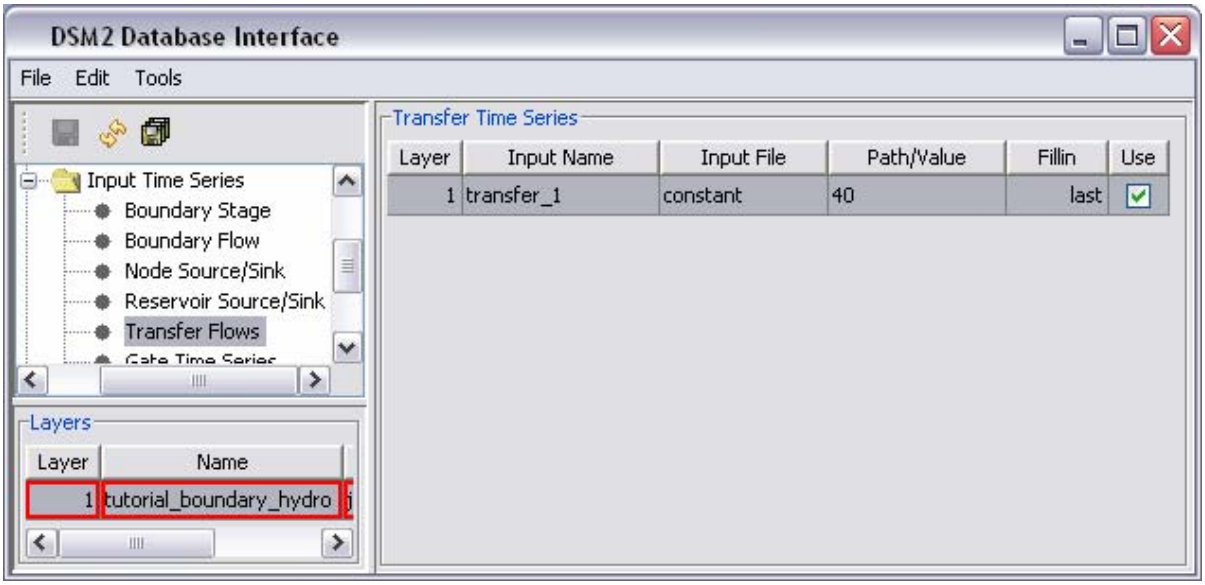
c. In the *Select Layers* window, double-click the *tutorial_boundary_hydro* layer.

d. In the *Transfer Time Series* table:

1) Right-click and select *Insert row*.
2) Enter the following values into the appropriate fields:
   i) Input Name: *transfer_1*
   ii) Input File: *constant*
   iii) Path/Value: *40*
   iv) Fillin: *last*
   v) Use: Make sure that the entry contains a checkmark.

e. Save the current settings.

f. At this point, the GUI should look as follows:



g. In the *Layers panel*, right-click and select *Unset edit layer* [optional].

5. Running HYDRO and QUAL

a. In Windows Explorer, navigate to the directory: *dsm2_training**tutorial**simulations**simple*\.

b. Right-click on the directory, *t2_reservoir_gate_transfer*, and select *Open Command Window Here*.

c. In the command window, type: *hydro hydro.inp*.

d. In the command window, type: *qual qual.inp*.

e. Open the *output.dss* file in the *t2_reservoir_gate_transfer* directory, and examine the results.