IV. Tutorial 3: Layering

The purpose of this tutorial is to demonstrate the use and benefits of layering. Instructions are given for modifying existing model information in the database by adding new data layers. Layers are key to the DSM2 management system. They allow input items to be grouped in logical bundles, and allow changes to be brought into an old simulation without erasing or altering archived items. The following steps will instruct you on how to create and use layers.

1. Creating and Disabling a new reservoir:

In this section, a new reservoir will be created by adding another layer. This new layer will then be deep copied to a second new layer. The second new layer will then be edited so that its *Use* column is no longer checked. This process renders the new reservoir invisible to the model, demonstrating that the new reservoir does not have to be erased from the database, it can simply be masked.

a. In the *Simulations Navigator*:
    1) Expand the *model: tutorial_hydro* folder.
    2) Expand the *Grid* folder.
    3) Double-click on *Reservoirs*.
b. Create a new Reservoir Layer:
    1) In the *Layers panel*, right-click and select *New layer*.
    2) Select *Yes* to confirm the refresh.
    3) Name the new layer, *tutorial_grid_add_reservoir*, and add a description.
    4) Enter *2* for the layer number.
c. In the *Layers panel*, right-click and select *Set edit layer*.
d. In the *Select Layers* window, double-click the *tutorial_grid_add_reservoir* layer.
e. In the *Reservoirs* table:
    1) Right-click and select *Insert row*.
    2) Enter the following values into the appropriate fields:
        i) Name: *dummy_res*
        ii) Area (million sq ft): *60*
        iii) Bottom elev (ft): -30

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

f. In the *Reservoir Connections* table:

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

2) Enter the following values into the appropriate fields:

i) Node: *5*

ii) Res Coef (in): *220*

iii) Res Coef (out): *220*

g. Again, in the *Reservoir Connections* table:

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

2) Enter the following values into the appropriate fields:

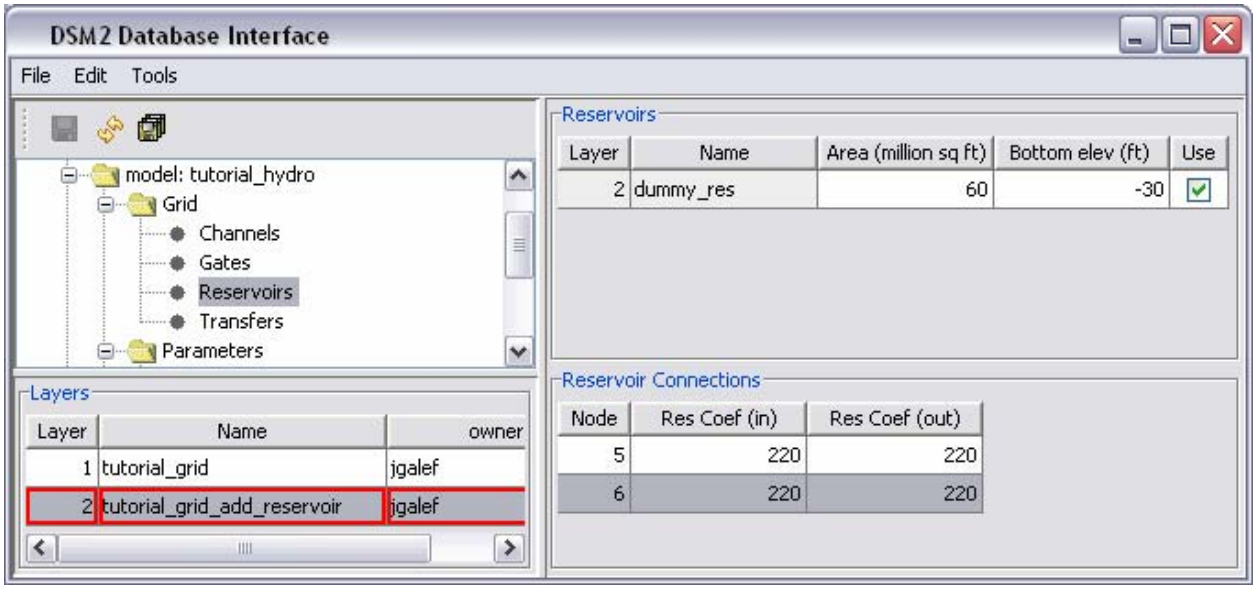
i) Node: *6*

ii) Res Coef (in): *220*

iii) Res Coef (out): *220*

h. Save the current settings.

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



j. Create a Reservoir Revision Layer:

1) In the *Layers panel*, right-click and select *New layer*.

2) Select *Yes* to confirm the refresh.

3) Name the new layer, *tutorial_grid_revision*, and add a description.

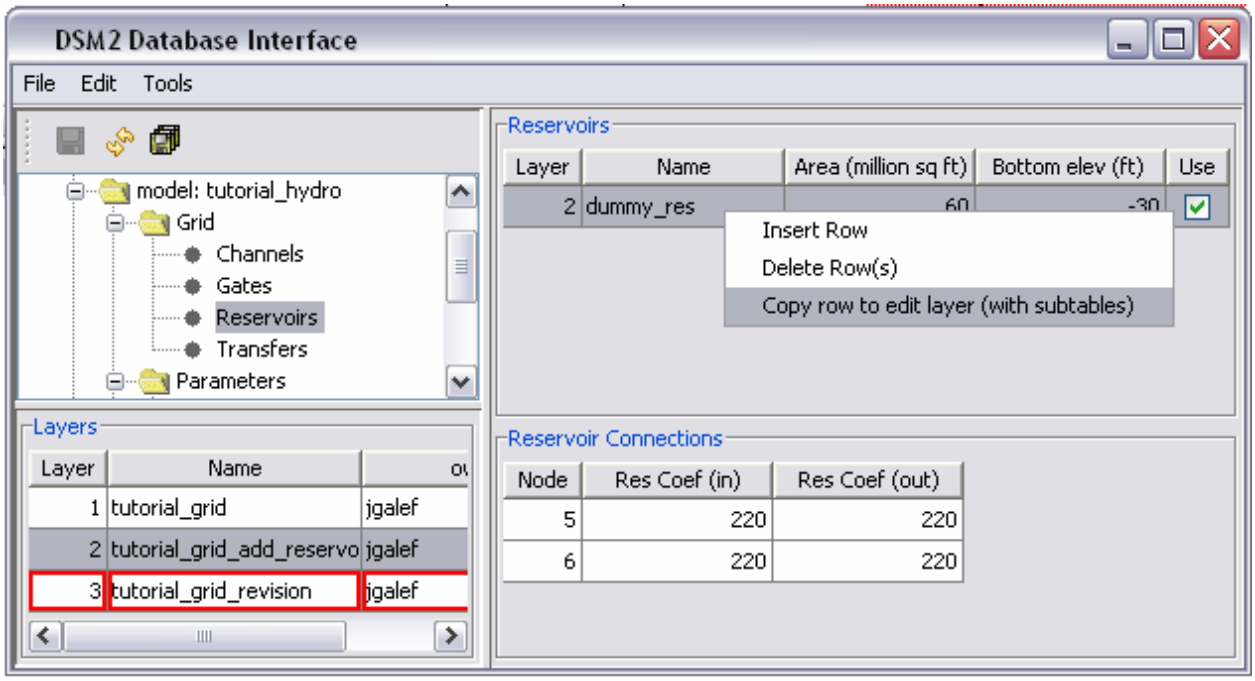
4) Enter *3* for the layer number.

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

l. In the *Select Layers* window, double-click the *tutorial_grid_revision* layer.

m. In the *Layers panel*, click on the *tutorial_grid_add_reservoir* layer.

n. In the *Reservoirs* table, right-click the layer and select *Copy row to edit layer with subtables*.



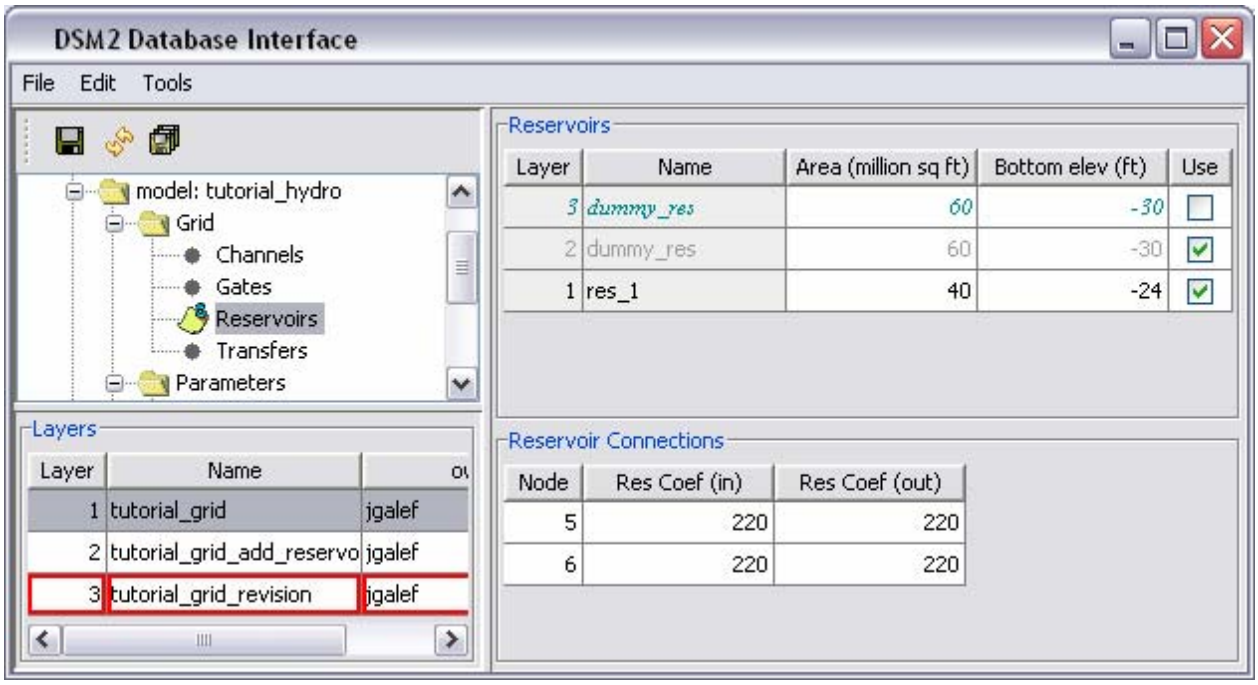
o. In the *Layers panel*, click on the *tutorial_grid_revison* layer.

p. In the *Reservoirs* table, double-click the *Use* field to get rid of the checkmark.

q. Save the current settings.

r. In the *Layers panel*, highlight all three layers.

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

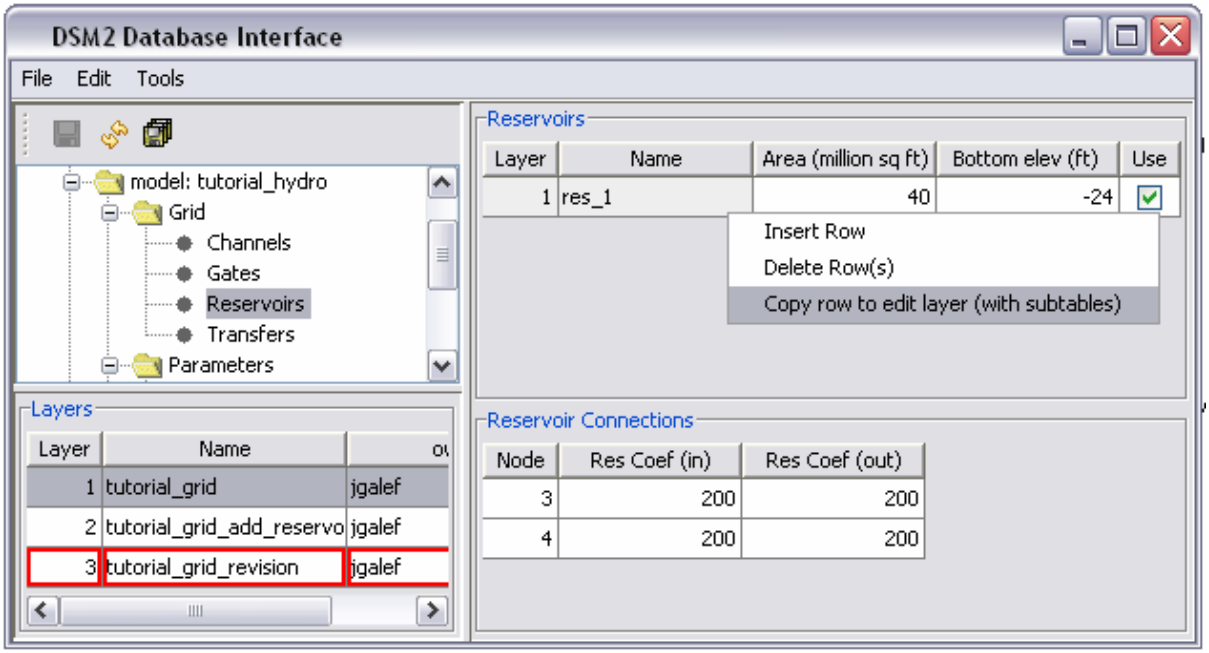


Note that *dummy_res* of Layer 2 has been grayed-out. This indicates that the new reservoir will no longer be used by the model.

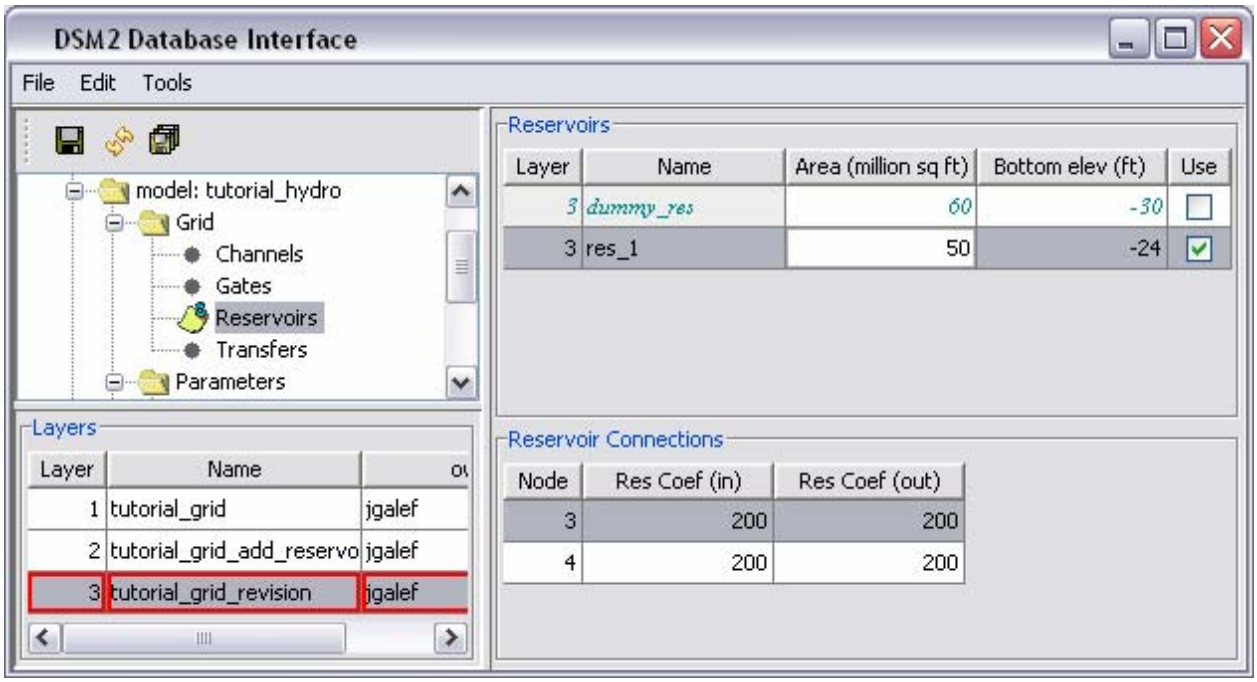
2. Altering the Properties of the Original Reservoir:

a. In the *Layers panel*, click on the *tutorial_grid* layer.

b. In the *Reservoirs table*, right-click the layer and select *Copy row to edit layer (with subtables)*.



c. In the *Reservoirs* table, for the new row in Layer 3, change the *Area (million sq ft)* field from *40* to *50*.



d. Save the current settings.

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

3. Changing the name of Channel 2004:

a. In the *Simulations Navigator*:

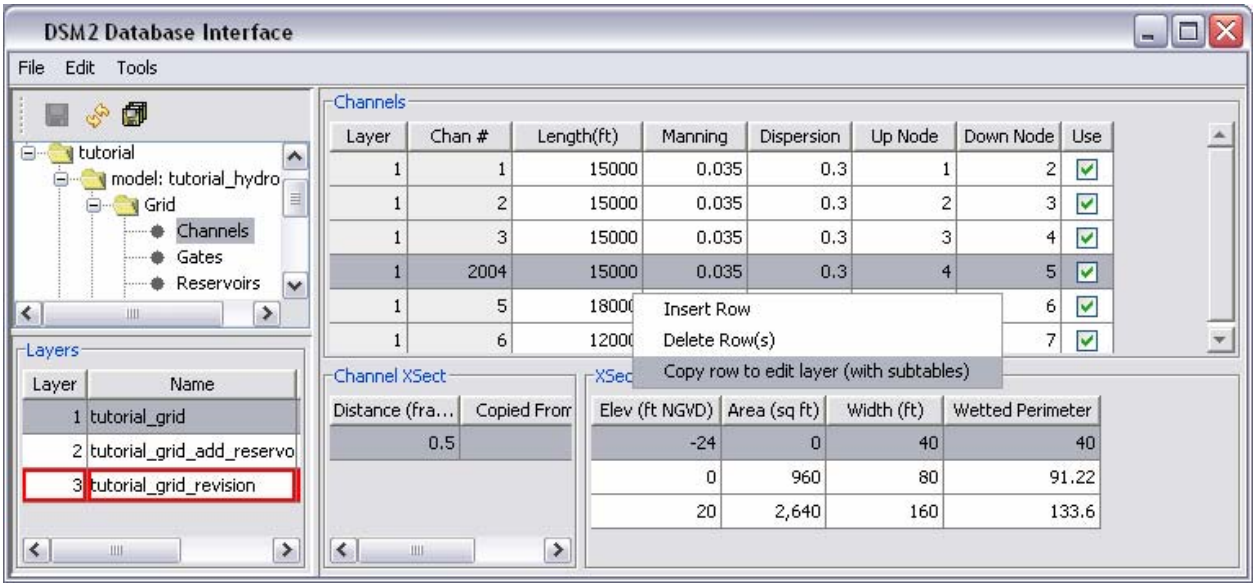
1) Remain in the *Grid* folder.
2) Double-click on *Channels*.

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

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

d. In the *Layers panel*, click on the *tutorial_grid* layer.

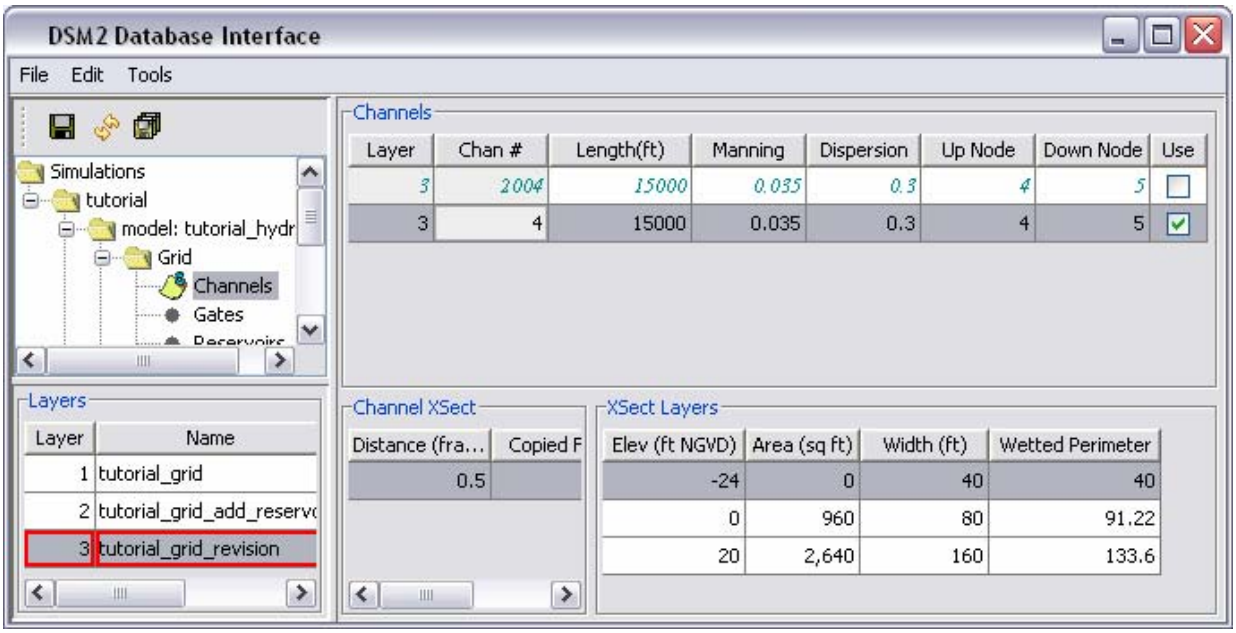
e. In the *Channels* table, right-click the layer with Channel 2004 and select *Copy row to edit layer (with subtables)*. Repeat this procedure.



f. In the *Layers panel*, click on the *tutorial_grid_revison* layer.

g. In the *Channels* table:

1) For the first row, double-click the *Use* field to get rid of the checkmark.
2) For the second row, change the *Chan #* field from *2004* to *4*.



h. Save the current settings.

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

4. Add the New *Channel 4* to the Output Layer:

a. In the *Simulations Navigator*:

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

2) Expand the *Output Time Series* folder.

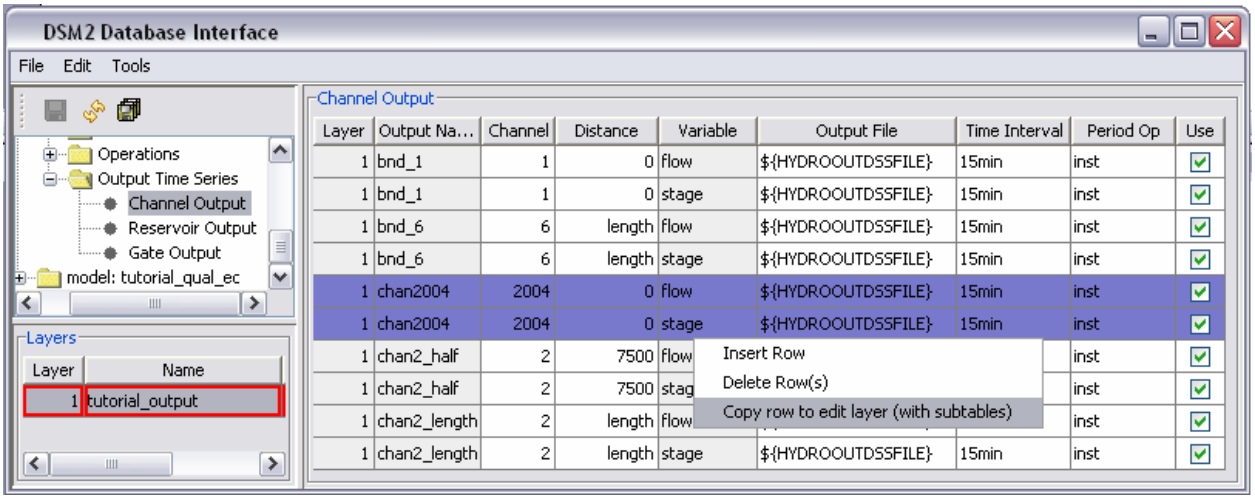
3) Double-click on *Channel Output*.

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

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

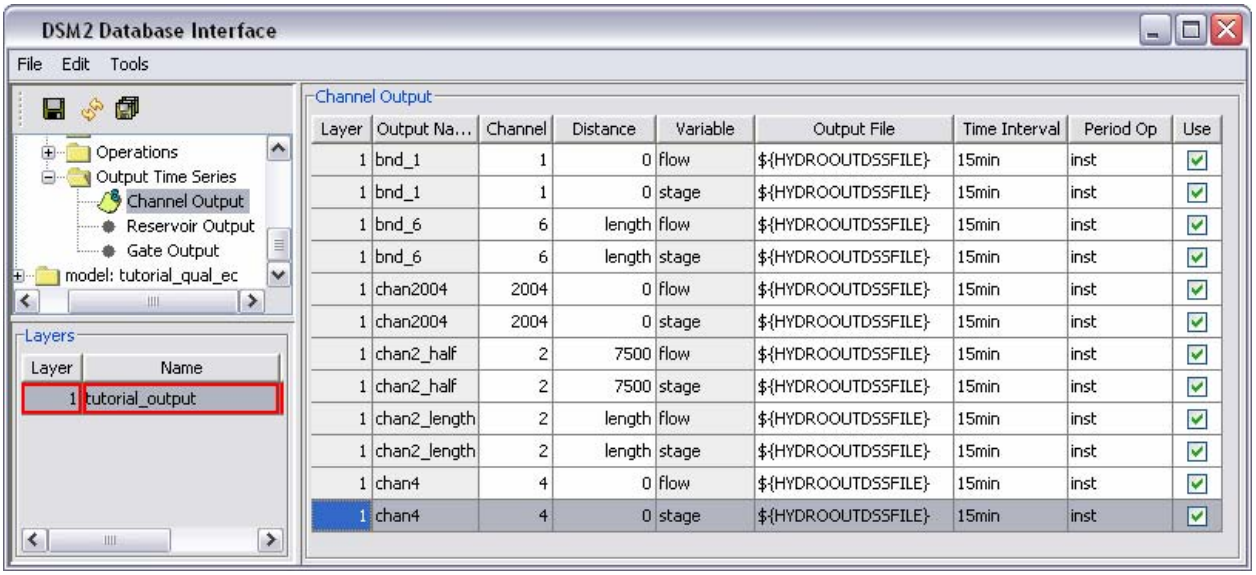
d. In the *Channel Output* table, hold down the *shift* key while clicking on the two rows associated with *Channel 2004*. Holding down *shift* allows for the selection of the entire row.

e. Right-click and select *Copy row to edit layer (with subtables)*.



f. Select *OK* to accept the Error Condition.

g. For the two new layers, change the Output Name field to *chan4*, and the *Channel field* to *4*.



The model will function properly despite the fact that the layers with *chan2004* are still present. The model will simply ignore these layers.

h. Save the current settings.

i. In the *Layers panel*, right-click and select *Unset edit layer*.

5. Add Initial Conditions for the New *Channel 4*:

a. In the *Simulations Navigator*:

1) Collapse the *Output Time Series* folder [optional].

2) Expand the *Initial Conditions* folder.

3) Double-click on *Channel IC*.

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

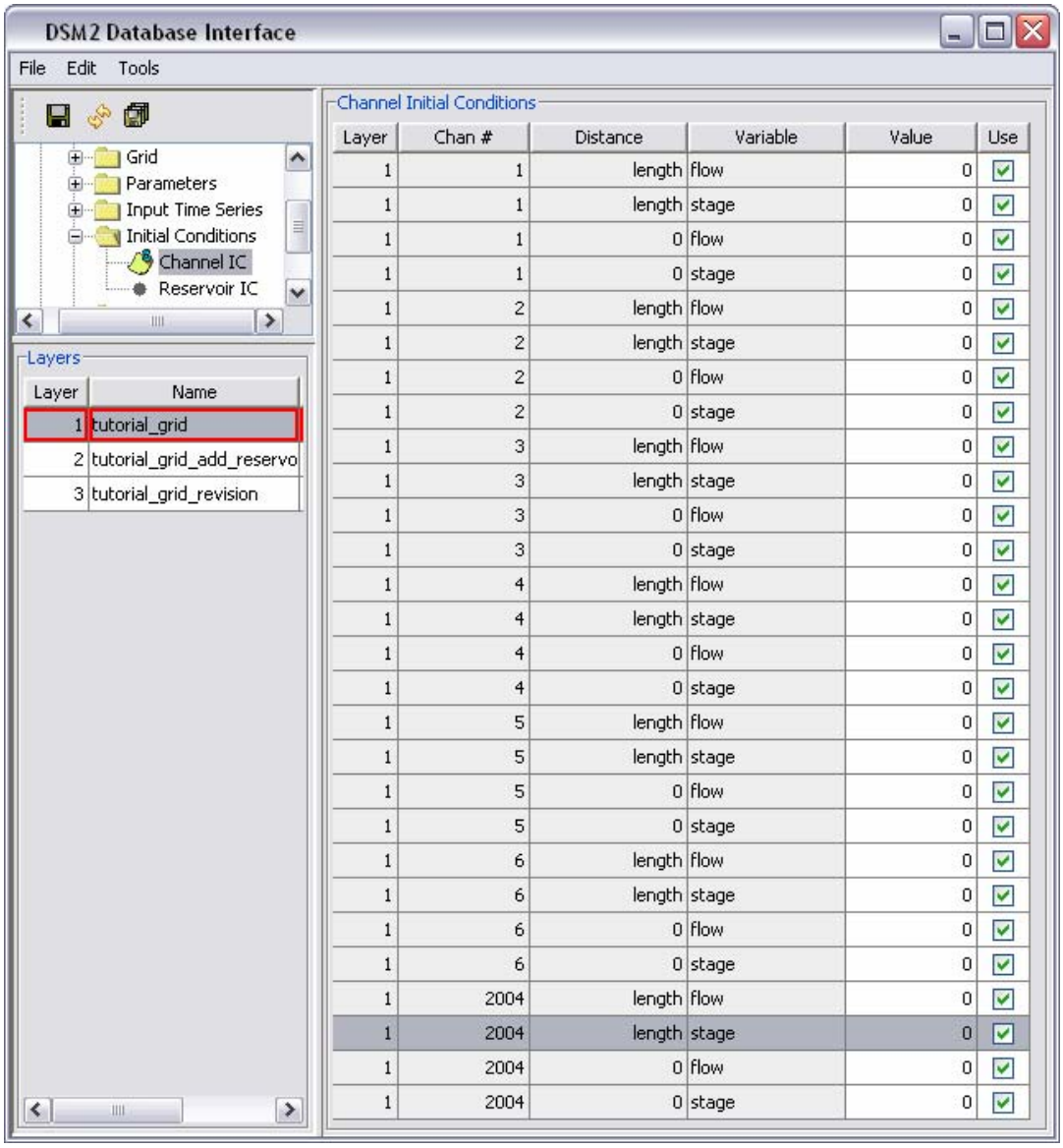
c. In the *Select Layers* window, double-click the *tutorial_grid*.

d. In the *Channel Initial Conditions* table, hold down the *shift* key while clicking on the four rows associated with *Channel 2004*.

e. Right-click and select *Copy row to edit layer (with subtables)*.

f. Select *OK* to accept the Error Condition.

g. For the four new layers, change the *Chan #* field from *2004* to *4*.



h. Save the current settings.

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

6. Running HYDRO and QUAL

a. In Windows Explorer, navigate to the directory: *dsm2_training**tutorial**simulations**simple*\.
b. Right-click on the directory, *t3_layering*, 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 *t3_layering* directory, and examine the results.