Education evenings 2018

Practical introduction to groundwater modelling

Computer exercises
04 01 Grid design

1

Purpose

In this exercise, we will

- ✓ modify the default grid manually,
- ✓ specify the grid design using objects,
- ✓ change the active part of the grid,
- ✓ and increase vertical discretization of the default Layer Groups,

in order to get acquainted with some of the ModelMuse grid design possibilities.

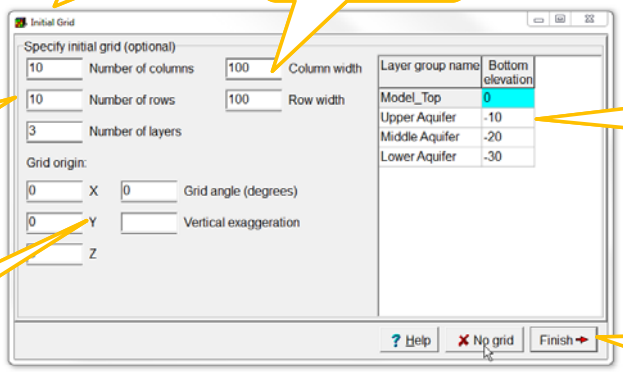
2

Set initial grid

1. Start ModelMuse, create a new MODFLOW model and set the projection to "NA".

2. We are now at the initial grid window

5. the horizontal cell dimensions



3. where we can specify the number of cells in each direction

6. and the layer group names and bottom elevations.

4. the grid origin, angle and vertical exaggeration

7. Accept the defaults and click Finish.

3

Modify the grid manually

1. The grid toolbar provides different tools to do so.

8. Drag to rotate grid

2. Delete grid lines

7. Set spacing of selected elements

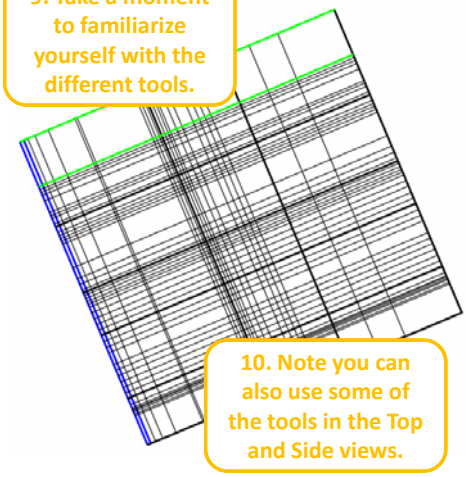
3. Drag grid lines

4. Add vertical grid line

6. Subdivide grid cells

5. Add horizontal grid line

9. Take a moment to familiarize yourself with the different tools.



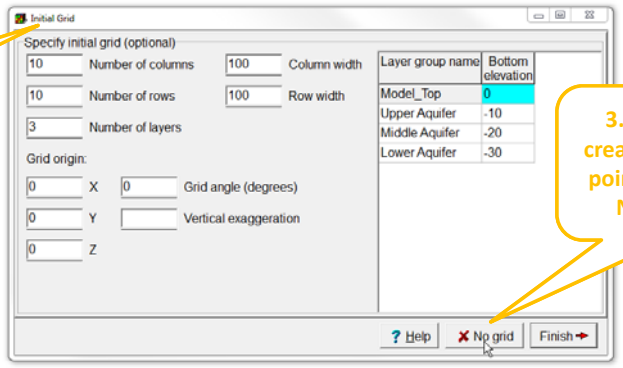
10. Note you can also use some of the tools in the Top and Side views.

4

Skip creating a grid

1. Start ModelMuse again, create a new MODFLOW model and set the projection to "NA".

2. We have used the initial grid window before



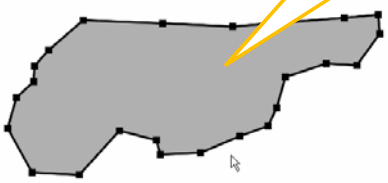
3. Therefore skip creating a grid at this point by clicking the No grid button

5

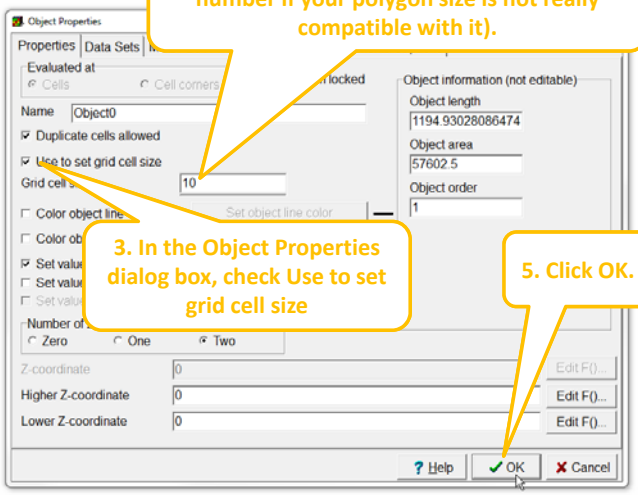
Use object to set grid cell size

1. Select Create polygon object, and

2. Draw a polygon like this.



4. And set it to 10 (or another reasonable number if your polygon size is not really compatible with it).

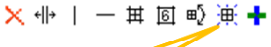


3. In the Object Properties dialog box, check Use to set grid cell size

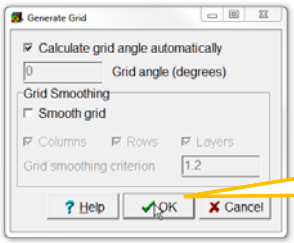
5. Click OK.

6

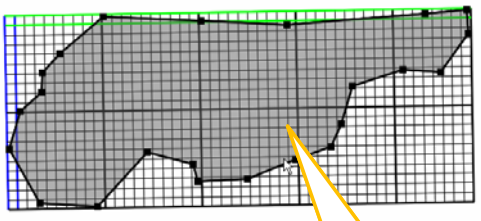
Generate grid



1. Click the Generate grid button



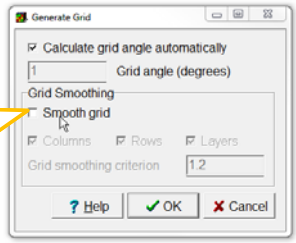
2. Leave the default options, and press OK.



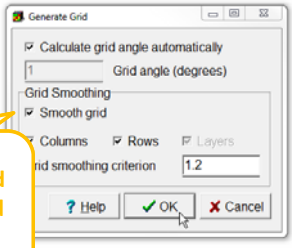
3. This is what you should get.

7

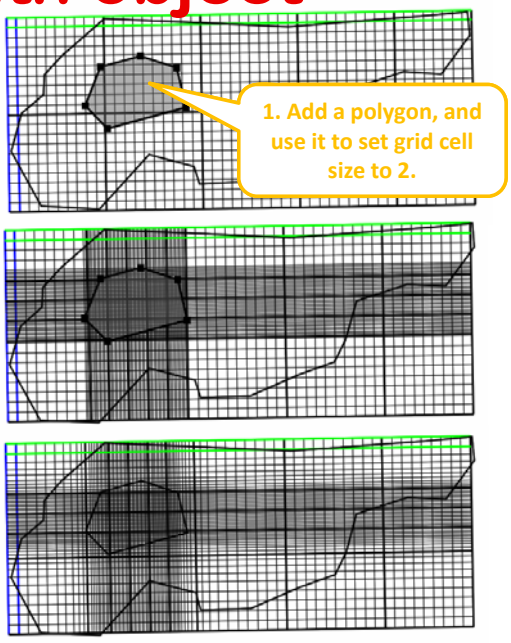
Refine grid with object



2. Generate the grid again without the Smooth grid option.



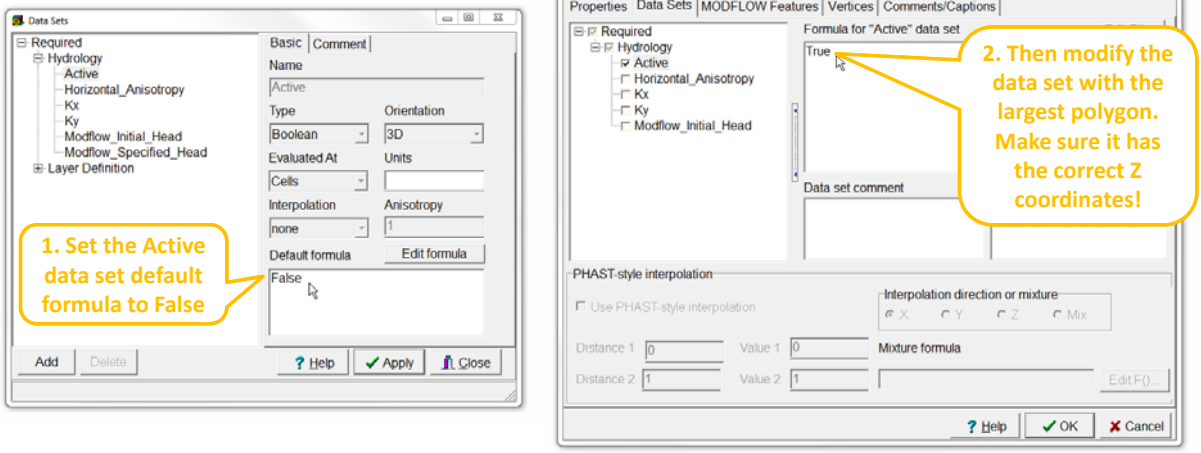
3. Then press undo and generate the grid with the Smooth grid option to see the difference.



1. Add a polygon, and use it to set grid cell size to 2.

8

Set active part of grid with object



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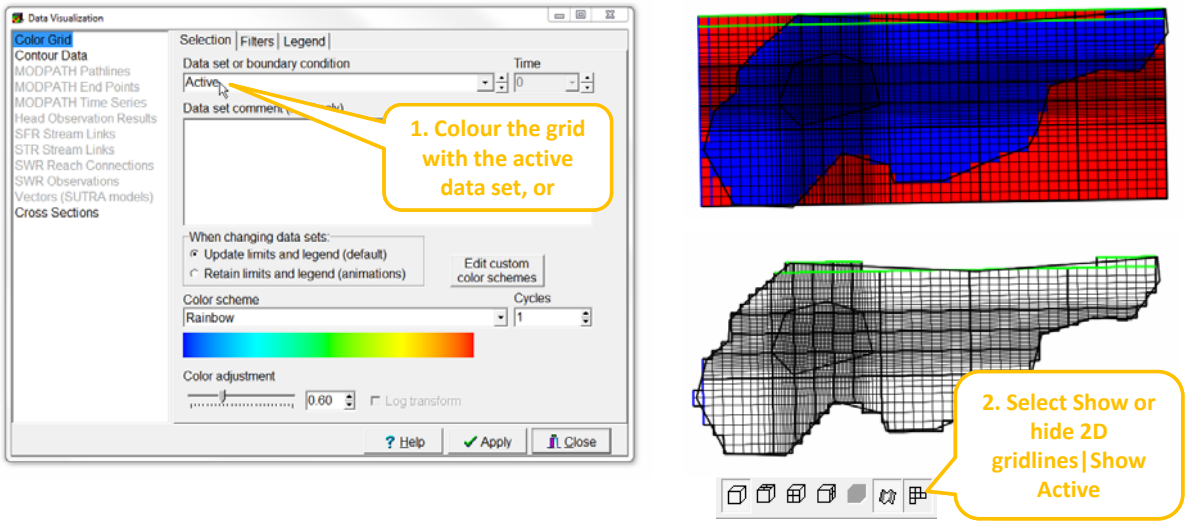
Visualize active part of grid



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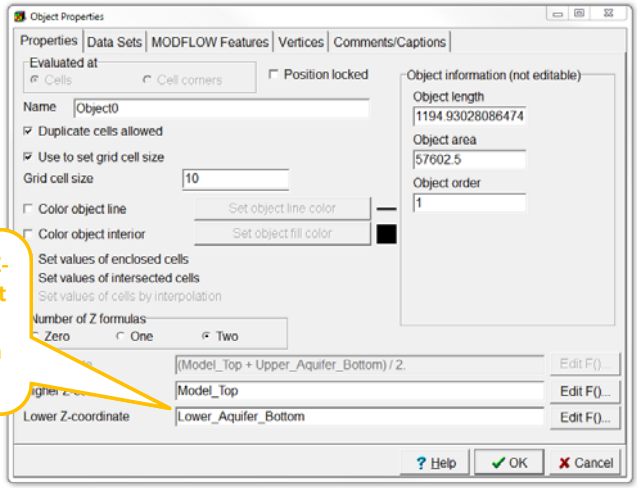
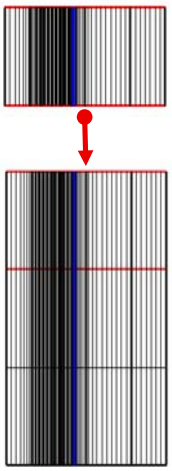
Activate Middle and Lower Aquifers again

1. Check if the second and third layer are active.

2. If not, set the Lower Z-coordinate of the largest polygon to Lower_Aquifer_Bottom to fix this.





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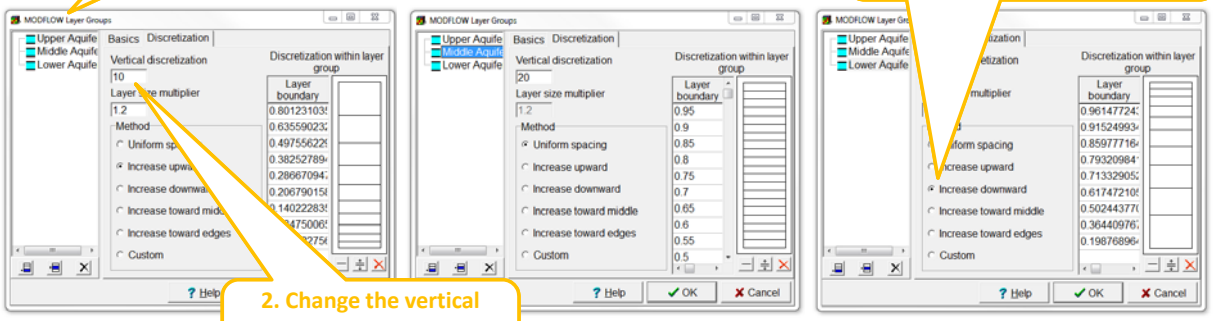
Refine layer discretization

1. Select Model | MODFLOW Layer Groups,

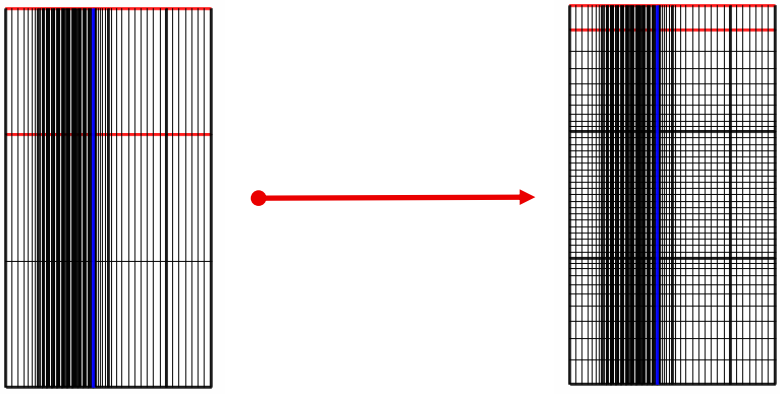
2. Change the vertical discretization to 10, 20, and 10 respectively,

3. And set the Method to Increase upward, Uniform spacing and Increase downward.



12

This is what you should get



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Questions? Found an error?
Please contact B. Rogiers at brogiers@sckcen.be.