

Importing GIS shape files to GMS: Objective to import coverages rather than manually creating them. We will import Boundary and Recharge coverages. Could do the same with points, such as wells or observation points.

1. Create a MODFLOW model (Conceptual model, boundary, wells, and a Recharge coverage):
 - a. Right click on the explorer panel, Choose New Conceptual model; name the model Run_1
 - b. Right click on the model and choose new coverage; change name to Boundary; select specified head from Sources/Sinks ...
 - c. Right click on the model and choose new coverage; change name to wells. Select wells and refine points from Sources/Sinks ...
 - d. Right click on the model and choose new coverage; change name to Recharge. Select Recharge rate from list of Areal Properties.
 - e. Right click on the model and choose new coverage; change name to Layer. Select Horizontal K and Vertical K from list of Areal Properties.
2. Open shape file *boundary_poly.shp*, using shapefiles as the filter.
3. Choose Boundary coverage
4. Select GIS module
5. Under GIS select shapes → Feature Objects
6. Select Yes, Next
7. Next, and Finish
8. Repeat starting with opening *Oahu-Recharge_Polys.shp* and map to Recharge coverage. Map RCHRAT to Recharge Rate.
9. Repeat starting with opening *wells.shp* and map name, flow rate, screen, refine, etc.
10. Repeat starting with opening *layer1_polys.shp* and map horizontal and vertical conductivity.
11. You can continue with a model if you want.

Importing digital elevation maps to GMS: Objective to create MODFLOW layer elevations rather than manually entering data. We will also learn how to use the data calculator.

1. Open the file *mvccanyon.dem*. Use the filter DEM/Grid files. Choose mvccanyon as the name for the scatter points.
2. Switch to the 2-D scatter points.
3. Use scatter points → TIN under scatter points option and name the TIN GS.
4. Examine and manipulate the TIN view
5. Create a new model (new conceptual model, new coverage, etc.)
6. Create the model boundary and grid.
7. Choose Build Polygons under feature objects.
8. Start a MODFLOW new simulation.
9. Interpolate the scatter points to the top of the layer: from the scatter points module, select interpolation, interpolate → MODFLOW layers. Do not forget to map the correct information.

10. In 2-D scatter points, use Data, Data calculator to estimate the bottom of the layer at a depth equal to ground surface minus half of that (type $a-0.25*a$ in the space labeled expression, and type bottom in the space labeled results.)
11. Use interpolation to define the bottom of the aquifer as you did in step 9.