## PRE & POST PROCESSING GRAPHICAL USER INTERFACES (GUIs)

## Why a GUI?

Ease of input (graphical)
Intuitive input (visual)
Model features input as objects so grid can be changed without a human re-entering text in files
Import of data sets in various formats and/or use of functions to generate values

## What does a GUI do?

Renders a graphical picture of properties & boundary conditions
Facilitates investigation of the input information
Creates text files given your graphical depiction of the system and input of values to GUI menus
The GUI runs the model codes with those text files as input
Imports results from the output files of the model run and produces maps, charts, & graphs of results
Facilitates investigation os the results

**USGS GUIs** Out-dated: USGS MF-GUI (needs ArgusONE) NOW ModelMuse (1<sup>st</sup> released May 2009 updated often) Commonly Used Commercial GUIs Ground Water Vistas (GWV) Ground Water Modeling System (GMS) Visual MODFLOW Problems with commercial GUIs: \* Do not keep up with USGS developments \* Much to learn, less intuitive than you may think \* It is easy to miss modeling errors when using a GUI \* Difficult to get problems resolved (exception GWV is very responsive) \* Some use modified versions of MODFLOW with different binary output format \* Cannot import individual module files \* Those you share models with must own the same GUI **Benefits** 

\* Ease of visualizing and accomplishing input and output especially for large models

GUIs available in our lab:

ModelMuse MM There is an old version under wrdapp I suggest you download from the USGS software page And install it in a folder where you have access

The documentation is very useful and The videos are good tutorials: http://water.usgs.gov/nrp/gwsoftware/ModelMuse/ModelMuseVideos.html

Ground Water Vistas GWV (student version is free to anyone and fully functional for 50x50x4) GWV tutorial:

C:\Program Files\gwv5\manuals\gv5manual.pdf after opening that pdf, see the tutorial right after intro and concepts

Ground Water Modeling System (GMS) phasing out soon GMS tutorial: Start GMS and go to help Take quick tour and then start the tutorial (pdfs are in the doc directory)

The best way to learn to use a GUI is to follow the tutorial and mimic their steps while setting up a model you need for a project

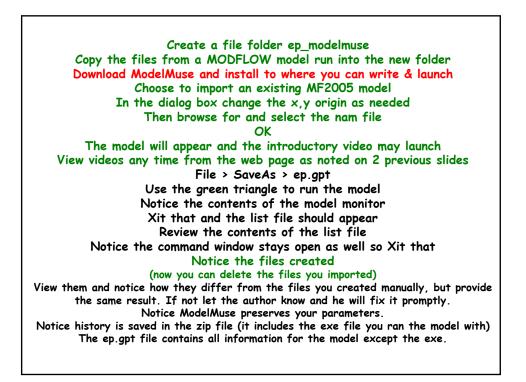
If you receive a model and do not have the GUI, sometimes you can import a model to a GUI Beware that importing often produces bugs because the GUI authors focus on building new models. DID YOU CONFIRM YOUR MODEL WAS CORRECT WHEN IMPORTED TO GWV?

Whenever Importing Files: REMOVE TABS ADD carriage returns at the end of files AVOID missing data from a file (eg blanks read as zeros in dos) May need to delete comments

If you work with ModelMuse or GWV they will respond promptly with a "fix" unless they have stated that they do not support a package that you are trying to import so carefully read their user manual/help Our focus is on learning about MODFLOW &associated Codes Not on learning a GUI which can be quite time consuming in itself

Having knowledge of the MODFLOW files and processes will make you a good GUI user

The following 2 slides guides you in opening the transient model we create in class in ModelMuse. Use this only if you decide it benefits you. It is not a required task.



Import results: File > Import > ModelResults Choose the fhd file which contains the heads in text format Notice a 3D color flood contour map of heads appears (to see head value place cursor over the grid and look at the lower right panel) Examine heads on various rows, columns, layers by rotating the 3D view in the lower right window compare SP1TS1 to SP4TS30 choose via colored checker board File > Import > ModelResults Choose the cbc file which contains flow info, select all of them Notice a color flood can be chosen for different flows, compare recharge for SP1TS1 compare to SP3TS1, look at other flows of interest (to see flow value place cursor over the grid and look at the lower right panel) Choose a different item to view using the colored checker board This time choose flow to the right face of the cells or flows to one of the boundary types Take a little time to investigate the model. If you were to build a model from scratch in ModelMuse you would use objects to define properties and they would be independent of the grid. Again our focus is on learning about MODFLOW and associated software specifically how to "find your way around" the codes, manuals, and files so we will not spend much time on the GUI, but we will import more complex models later in the course

