**Running Your Second, Third, and Fourth Tuflow Models.**

After you have run the first VanillaC4 model in Tuflow using a 10 m grid, follow the workflow on how to look at the results and evaluate the model outcome.

The next step is to make a 3 m grid, then 1 m grid, then 1 m grid. Run each of these.

For the 3 m grid, it’s really simple.

* Copy/paste the 002 .tcf, .bat, and .tgc files and re-name the copies to be 003.
* Go into the .tgc file for 003 and change the grid cell size to 3. SAVE FILE
* Edit the .bat file to change 002 to 003. SAVE FILE
* Edit the .tcf file as follows (then SAVE FILE):
  + point to the 003 .tgc file.
  + Change the time step to a lower value for a 3 m grid using the simple formula in the comment in the time step line. 3\*0.25 = 0.75 s.
  + Change 002 to 003 in the results and check folder lines.
* That should do it. Now run the 003 bat file.

Note that in the mods for 003, we kept the very large source area for inflow. That was ok for a quick process and to keep your learning focused on midifying the text files. However, it is usually best to update the SA polygon in GIS down to just the size needed each time. We’ll do this next.

For the 1 m grid, do this:

* repeat all the steps above for the 3 m grid, but now make the files as 004 and set the grid cell size to 1.
* Go into GIS, copy/paste the SA .shp file, rename it with a new suffix like “\_1m.shp”, and now edit the SA polygon/rectangle in that. Instead of having it be ~ 11 m long down the length of the river, reduce it down to just over 1 m. Remember, you can use the topo points to help you scale the rectangle down. You can use the “modify feature” tool in ArcGIS to do this. Then SAVE your edits.
* Go into the 004 .tcf file and be sure to update the file name for the SA file to the new name. Use the open relative file trick to make sure it works.
* That’s it. Run the model.

If you want to try running a 0.5 m grid, then that will be too big to run in DEMO mode. To run that you’ll have to visit with one of my graduate students (Arielle Gervasi, Kenny Larrieu, or Sierra Phillips) in Veihmeyer room 239 or 219. They have the USB hardware dongles to run the model. Please turn on the HPC and GPU lines in the .tcf file, per workflow sections 4.4, 4.5, and 4.6

After you run these models, follow the directions in the assignment for tutorial 1.

Changing from VanillaC4 to InPhase and OutPhase C4.

After you run the different model resolutions, the next challenge is to go back to the 1 m grid and make a new variant in which you swap out the topography. VanillaC4 was a straight canal basically. In the 0\_datainputs folder you’ll find the folders with these other DEMs.

To make this work, here is what you have to do:

1. Copy/paste the .asc grid file for a new topo into the model/grid folder. You can put all of them in there at any time, you do not have to wait.
2. Follow the instructions for the 004 run, but keep incrementing your run numbers 006, 007, etc. This time set the grid size to 1 m and in the .tgc file point the topography file to whichever Dem you want to use.
3. You’ll need to check the code, BC, SA, and PO files, because now the river banks are undulating. Most likely, you have to copy/paste those files to make new versions with new names and update them to make sense with the new topographies. You’ll need one set for inphase and one for outphase.
4. After you run these, look at the results and make sure everything is sensible or maybe some of the GIS files need further revision.

Follow the instructions for tutorial 2 on what to do.

WANT MORE PRACTICE?

On your own, feel free to try some other tests.

Try raising and lowering the Manning’s n value to see how much hydraulic schange per each 0.01 increment in n. Try

Try changing the eddy viscosity parameters from 0.5 and 0.005 to higher numbers. You can take the 0.5 down some but don’t put 0.005 lower.

Try using Manning’s equation to estimate the bankfull discharge and change the discharge to that value. 121.46 m3/s is too high. You can also try different discharges and WSEs to see how those affect model performance.