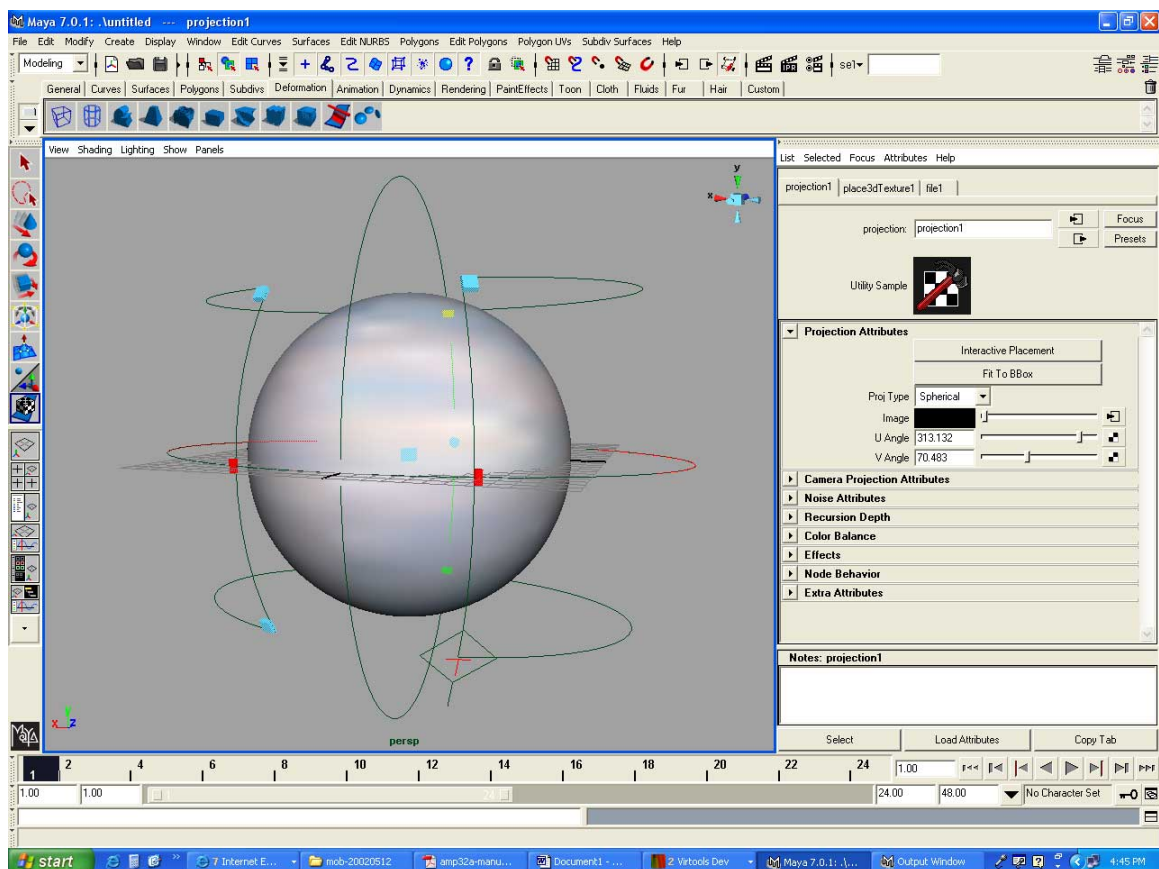


# Air, Water, Land

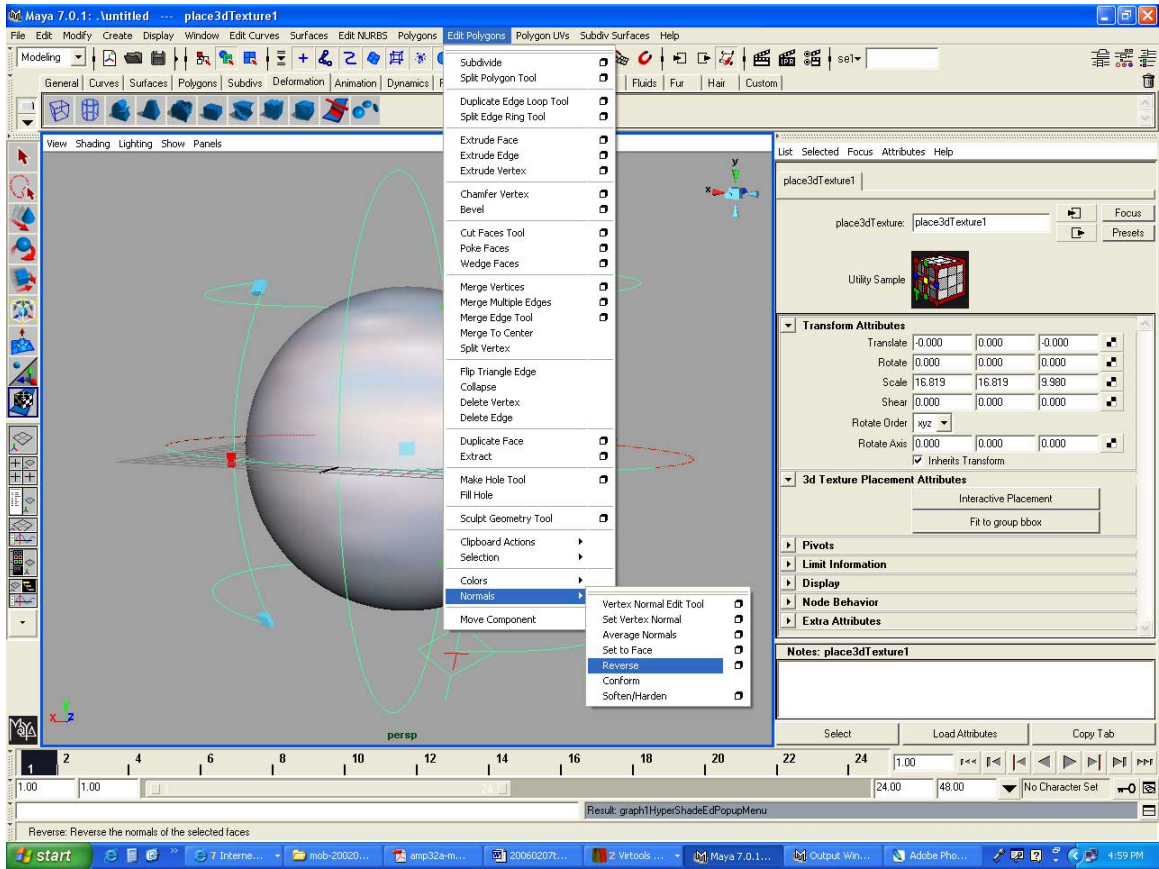
So we already covered land in the last lecture, so let's take a look at air and water.

## The Sky Sphere

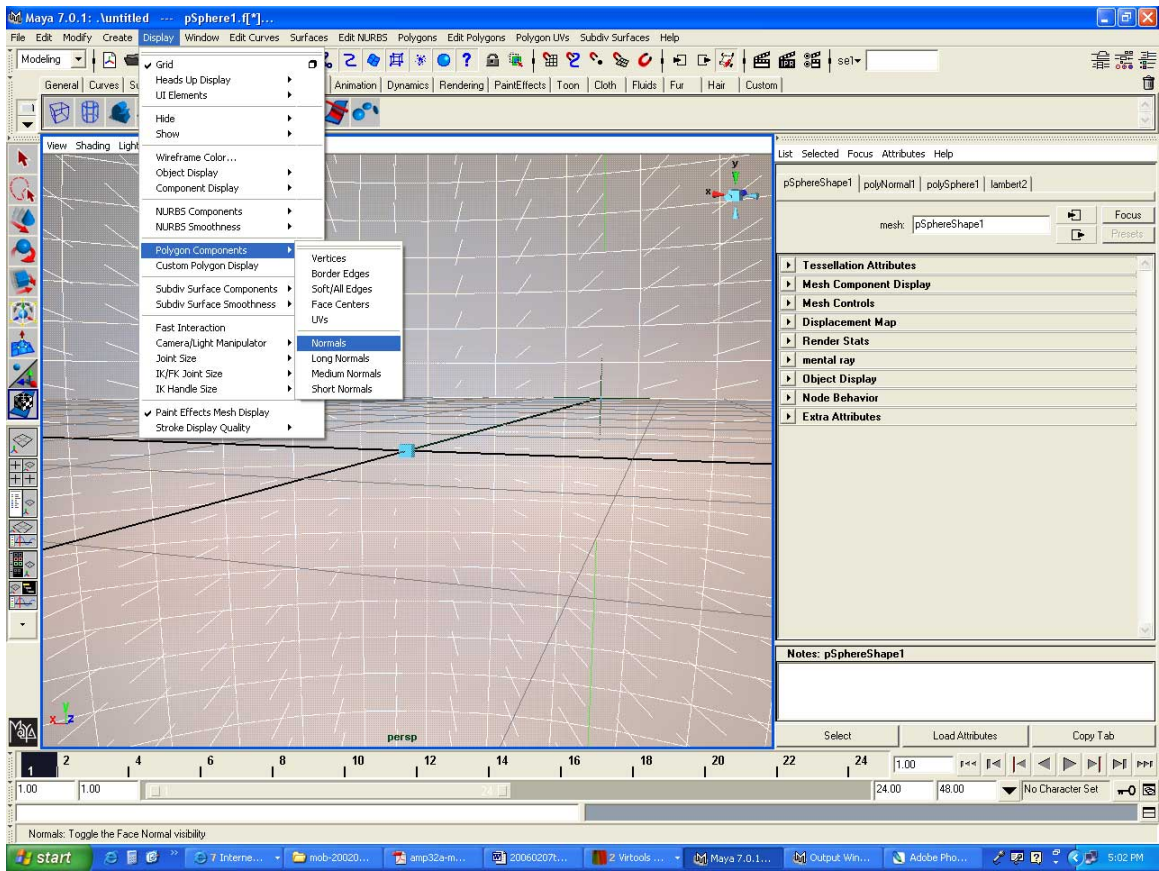
Start with a fairly large, pretty smooth polygonal sphere. I used Radius = 25 with 50 x 50 divisions. Add a new Lambert material, and create a render node with a file attached as a spherical [oddly enough, sometimes planar looks nice, so you can try that too] projection. Select an appropriate sky texture, and hit the Fit to Bbox button on the Projection1 node in the Channel Box. Then fiddle with the Place3DTexture manipulator until the texture looks nice on your sphere.



Convert your material to a file texture [shift select the sphere in the work area and the material in Hypershade, and hit Edit->Convert to file texture, making sure you create a .jpg of a reasonable size [see previous textures tutorial for more information on this procedure]. Then be sure to REVERSE your NORMALS as we will be looking at our lovely sky from the inside of this sphere. Do this by selecting the sphere and hitting Edit Polygons -> Normals ->Reverse.



If you want to make sure this happens, Hit Display ->Polygon Components ->Normals, and you should see something similar to what's depicted in the work area below if you Dolly to the center of the sphere.

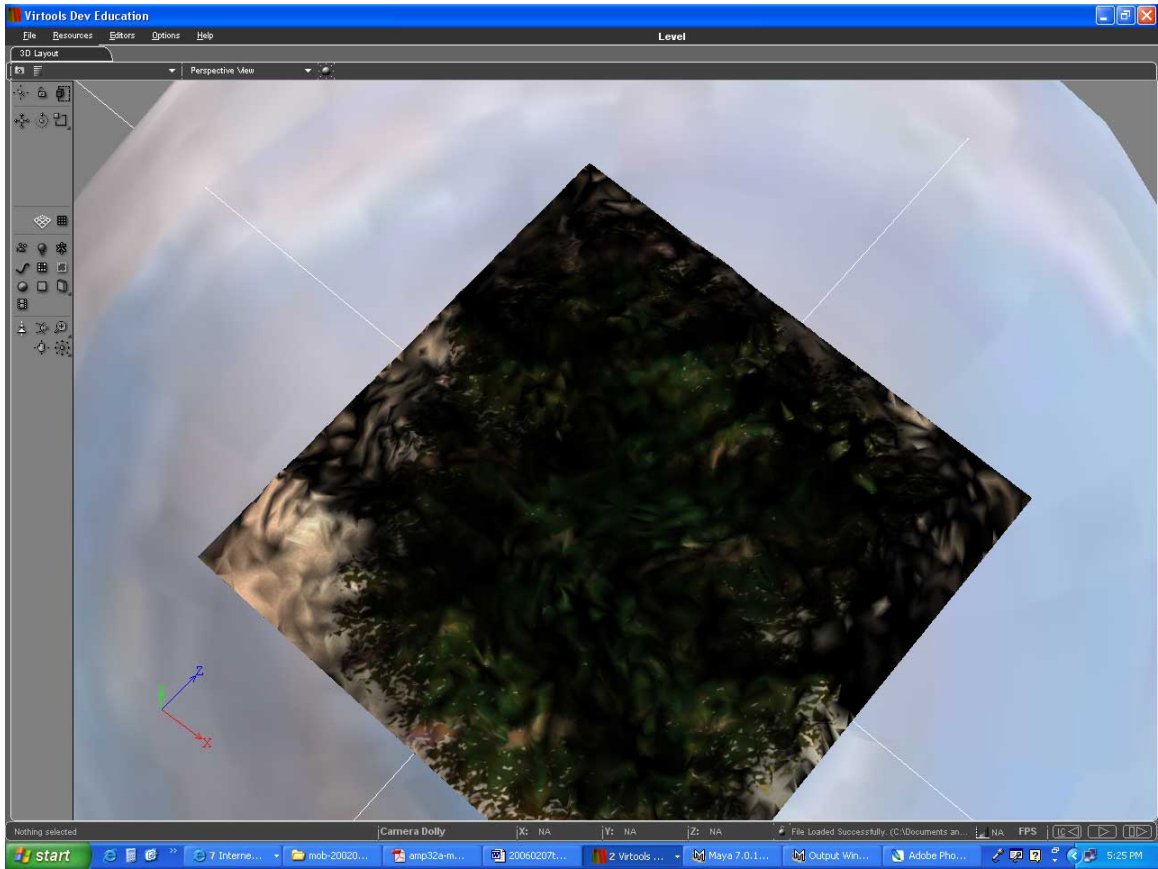


If your sphere looks like a head of short hair, you have not flipped your normals.

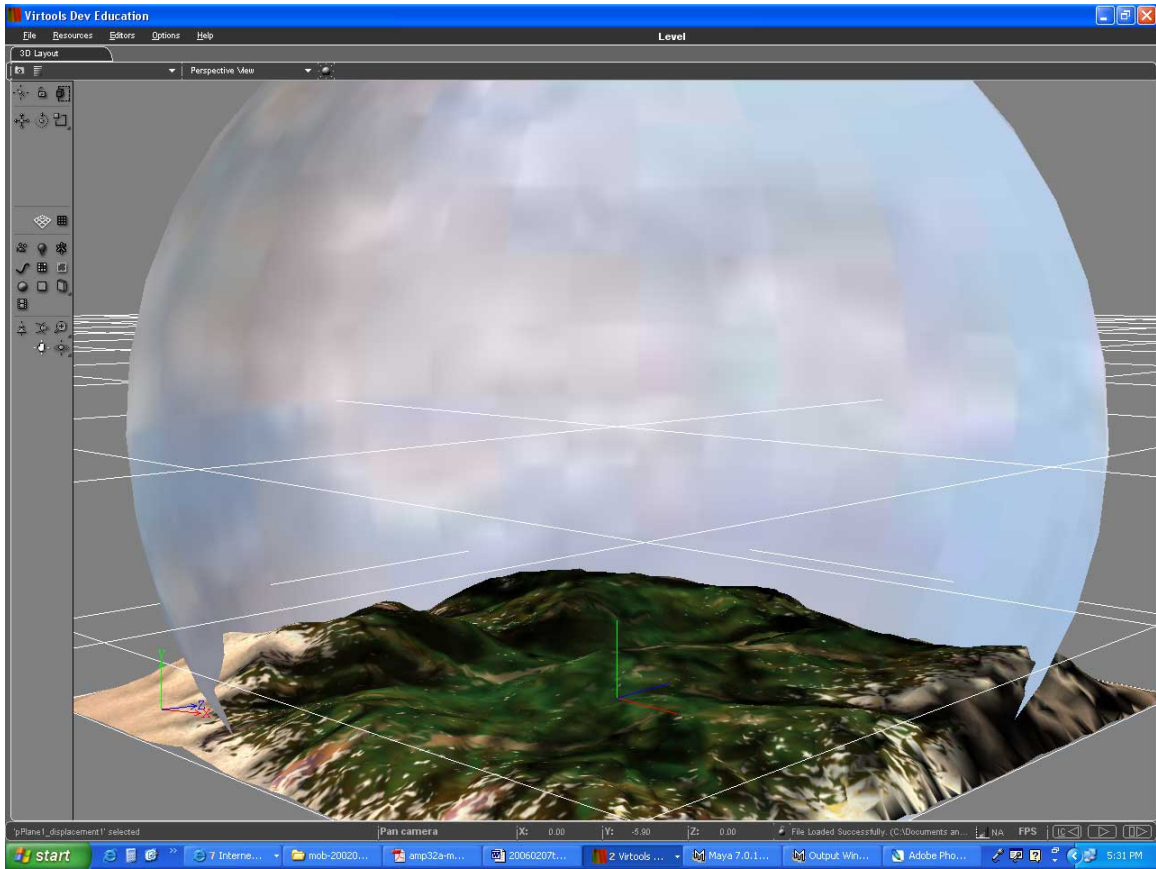
Then export to Virtools, set up a couple lights and make sure that your sky sphere is behaving as expected.

## Land

If you then import the "land" we created during class, you should see something like this:



So let's move our terrain so it's level with the bottom quarter or so of our sphere, and then scale it so that it's boundaries fall just outside.

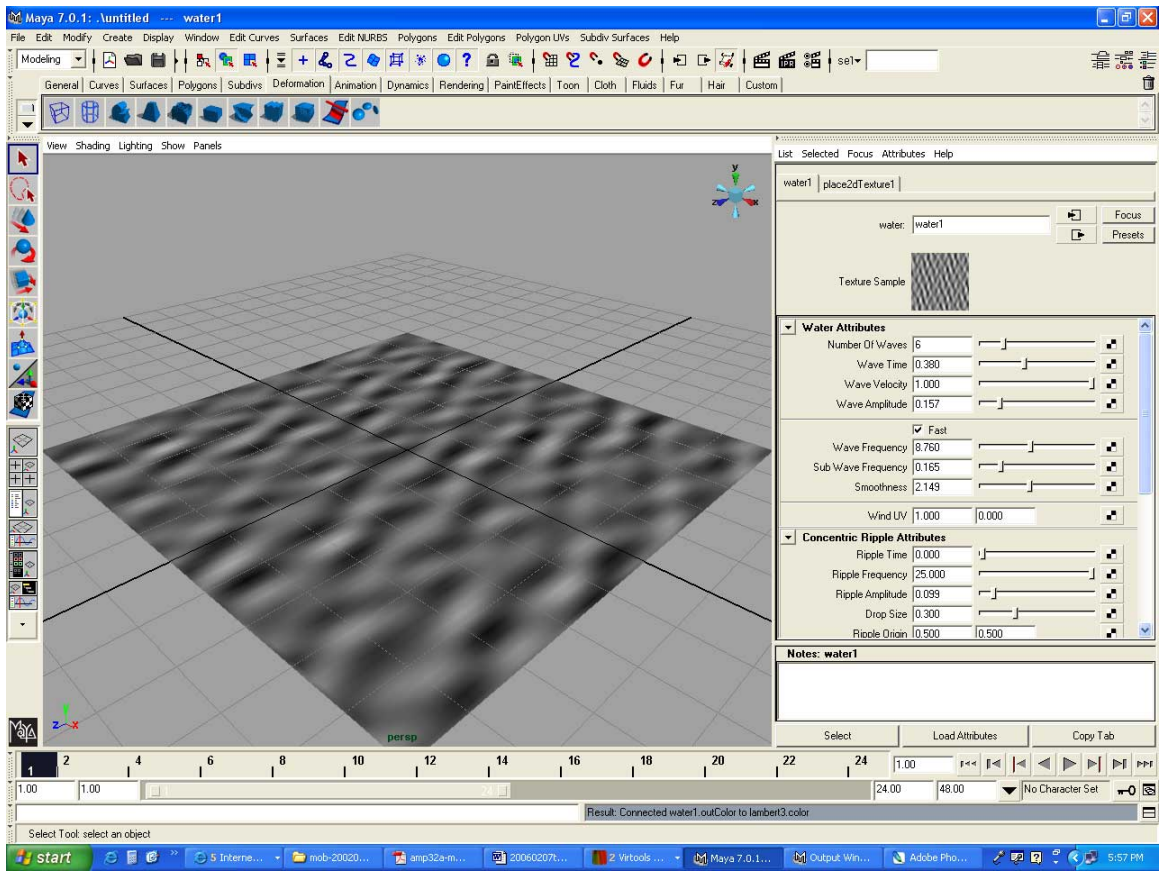


Then, put your camera inside and pan around to make sure it looks how you want it to. [We'll get into issues like horizon fog etc... later in the class.]

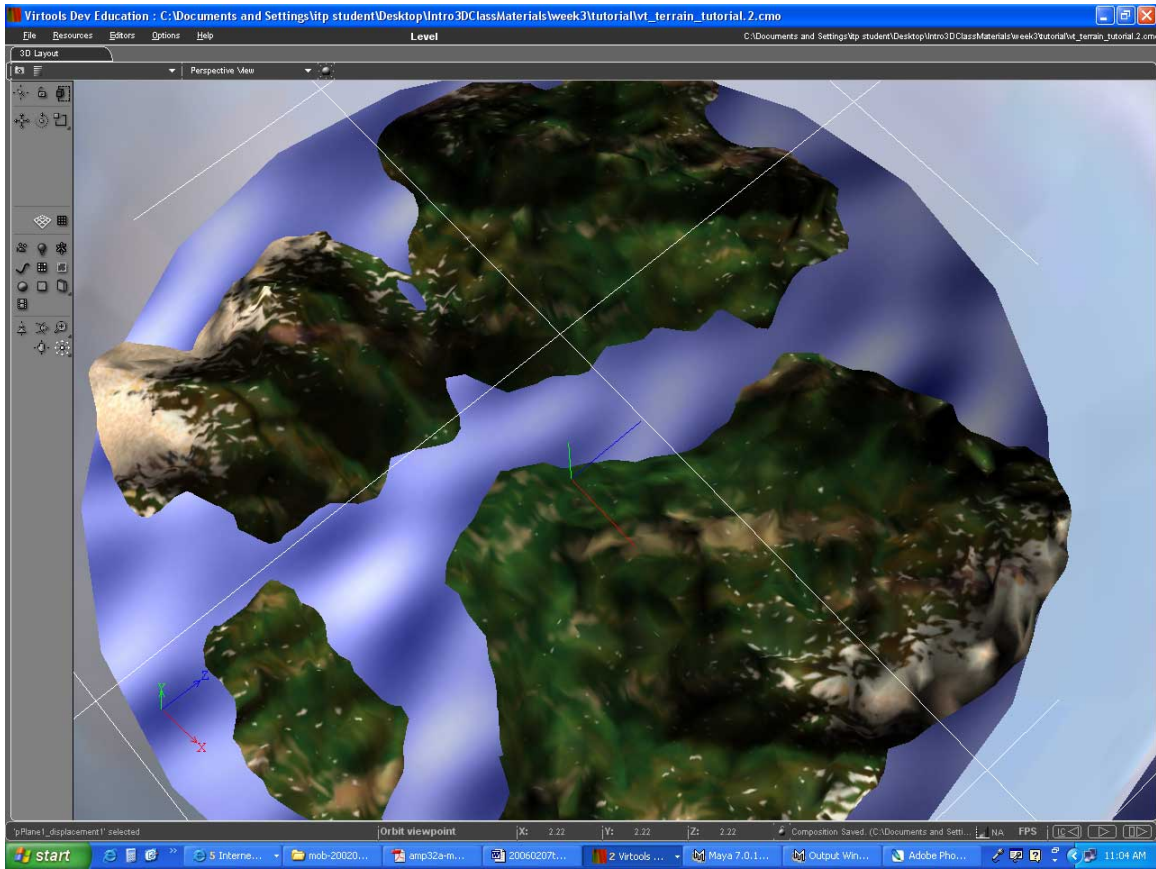
## Water

Let's say the inhabitants of our little world are egregious sinners, and we need to flood it to punish them.

There are lots of ways to do water in Virtools. Let's begin with one of the simplest. Start with a plane in Maya with plenty of geometry. I used: 10 x 10 with 100 x 100 subdivisions. Create a material with a procedural texture meant to simulate waves. I recommend either "water," or "noise." Adjust the parameters including color so it looks how you want it to. Mine ended up like this [I'm using black and white to highlight the contrast, really blue would be appropriate]:

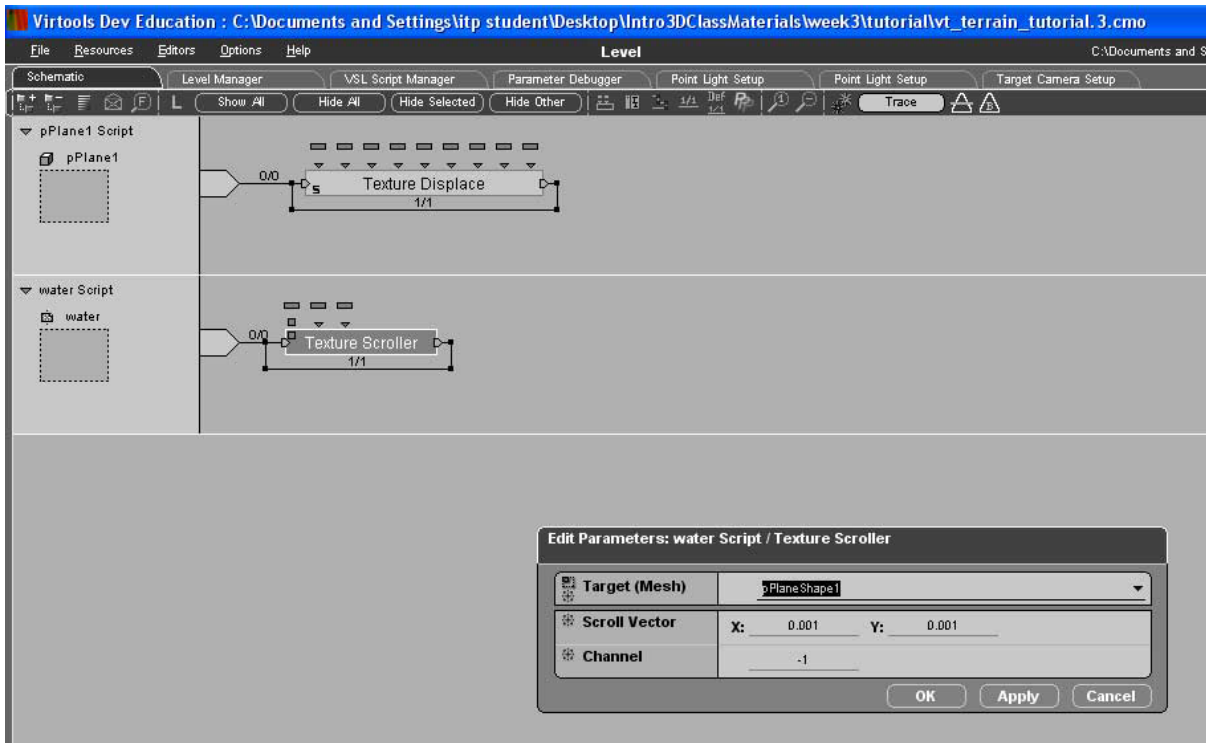


Convert this into a file texture, and export to Virtools. Move your plane along the y axis to position it properly & scale so that it covers the appropriate part of your terrain, submerging part of the land..



Now we're going to make animated waves for our water.

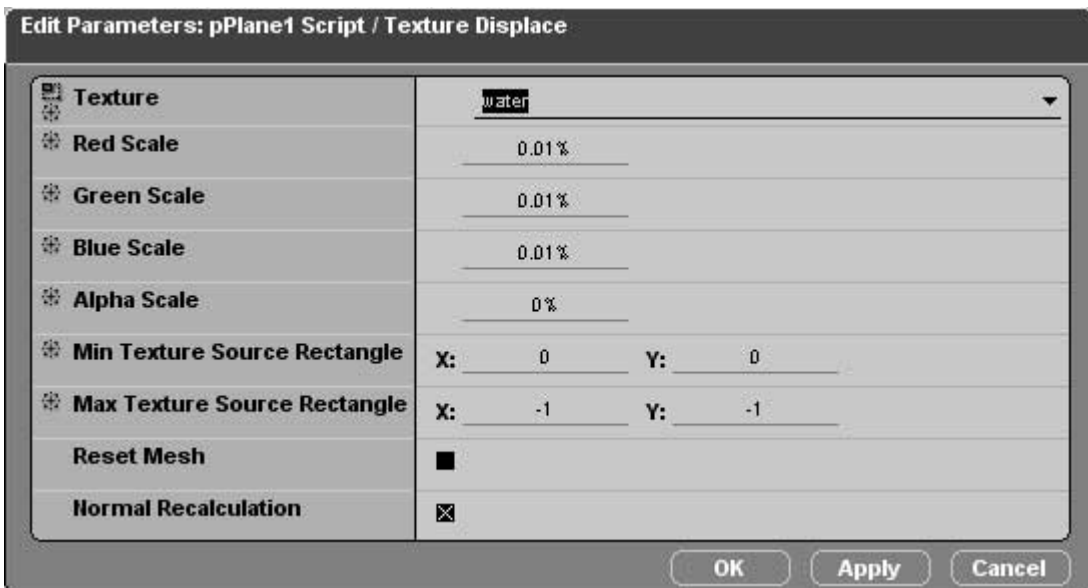
- 1) Begin by **SETTING INITIAL CONDITIONS** on the **MESH** for your water.
- 2) Create a script for your water texture by right clicking on it in the level manager and selecting "Create Script."
- 3) Switch over to the Schematic view by clicking on the tab marker "Schematic." From the Building Block Manager (top right) select from the category Materials / Textures -> Animation -> Texture Scroller. Drop this onto your texture script, connect its leftmost "In" pin to the script start arrow. Then connect its "Out" pin back to its "in" pin to cause the script to loop every frame.
- 4) Finally, set the script's parameters according to the illustration below (double click on it to bring up the parameters dialog) :



Hit play and watch your texture scroll. Adjust the parameters according to your desires. For the time being, don't worry about the texture wrapping borders.

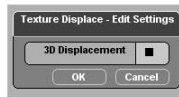
Now let's make the wave texture actually displace the water mesh.

- 1) In the Level Manager, find the 3D object that corresponds to your water plane. Create a script for it.
- 2) From the Building Block Manager, drag the Mesh Modifications ->Local Deformation ->Texture Displace building block into your script.
- 3) Hook it up the same way you did your Texture Scroller as shown above.
- 4) Edit its parameters according to the image below:



Note: 1) that your mesh will be very sensitive to the color scales, and these should always be set very low initially and scaled up as needed. 2) that the result of this operation almost always moves your entire mesh up a certain amount along its local y vector, so you should adjust its initial position accordingly (and reset its initial condition).

- 5) The final thing you need to do is to edit the building block's "Settings" which are different from its parameters. Generally speaking, parameters are data a building block uses in its operation; settings change the *way* a building block operates. Not all building blocks have settings, but it frequently makes sense to check them as you start to refine a BB's operation. You can access the settings by right clicking on the BB and selecting "Edit Settings" or the "s" key. In this case you need to UNCHECK the 3D transformations setting:



- 6) Now play your scene and get lost in the tranquil motion of your virtual waves.