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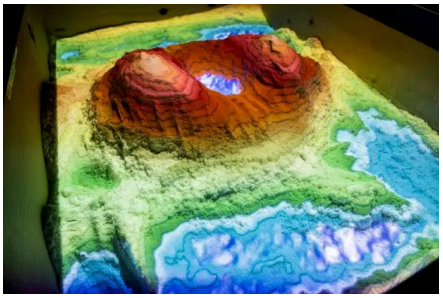
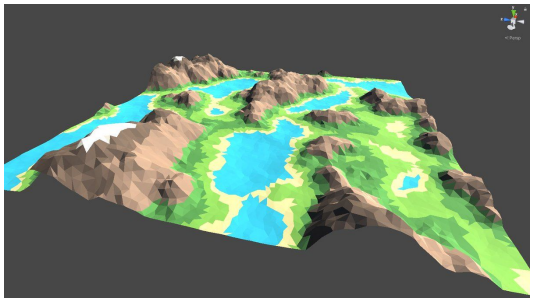
Final Project Proposal

3D Terrain

For my project I am seeking to create a 3D terrain shader with multiple levels relative to height. Some example levels could be water, sand, dirt, snow, etc. These general levels could just simply be colored or have a designated texture applied. Specifically, working with some of the concepts we have explored this term such as noise, height maps, frequency, amplitude allowing for both a unique and adjustable terrain. Following this, when considering the lighting and similar aspects I am seeking to target an idea similar to project 3 where the user has the ability to play around with some lighting positions and some ambient, specular, and diffuse values allowing the terrain to be seen in an interesting way.

Breaking this down further, I am seeking to make this work with the idea of a sandbox in mind. Such as, the terrain lives on a given quad where its fields such as amplitude, frequency, and height can be adjusted freely while the terrain maintains the rendering on the given quad. Some rough examples illustrating the general concept I am after can be seen below.





I can't say, without actually jumping to the implementation, how difficult this would be but some optional features which I believe could be applied include adding a slight effect of moving water on the terrain such as the boundaries between the water and next level adjusting/moving slightly to illustrate the effect of water in say a river or lake for example. Another addition could be giving the water a slightly reflected or refracted effect. A final idea could be bringing another object in the scene to mimic a sun where the user can adjust the lighting positions which in turn moves the sun accordingly for a better visualization. These are just some general ideas for the project although I am open to any suggestions or advice.

I believe this would be interesting and is actually something I have wanted to pursue with some future implementation being to bring this into Unity where this terrain can be intractable in a VR environment.