Storm Scene

First Draft

Project requirements:

- **General shaders and pipelines; basic shader programs with vertex and fragment shaders; renderer architecture, components and design; fundamental lighting algorithms.**
  - **Phong shading, multi-light shaders, custom geometry, uniform buffers, etc.**

  The demo, at present, is expected to use Phong shading, texturing, and vertex displacement algorithms for the water, clouds.

- **Post-processing shaders and pipelines; framebuffers and multi-pass algorithms; intermediate lighting algorithms and effects.**
  - **Bloom, antialiasing, other post-processing effects; pipeline management systems; etc.**

  Lightning should utilize bloom.

- **Screen-space effects; multiple render targets and intermediate framebuffer applications.**
  - **Deferred rendering, depth-of-field, motion blur, SSAO, etc.**

  The water will use screen-space reflections to reflect objects above the water.

- **Interpolation algorithms, curves and splines; intermediate shader programs with tessellation and geometry shaders.**
  - **Catmull-Rom, Bezier and Hermite curves; drawing and reparameterizing curves; level-of-detail; etc.**

  The displacement of the surface of the clouds and ocean will follow mathematical curves, (Gerstner waves?)possibly with other noise added to break up the shape.

- **Introductory animation programming concepts.**
  - **Forward kinematics and pose-to-pose keyframe animation; etc.**

  A “tentacle” sticking out of the water that interpolates through a few poses, using forward kinematics.

- Advanced topics.
  - Compute shaders; scene culling; custom utilities; etc.

  Create heavy rain effect, calculating particle positions using a compute shader