HW1, Part D:

This photo is a screenshot capture of the video game Legend of Zelda, The Wind Waker. Just from a single glance, one can easily tell that this is a simple but aesthetically pleasing art style. In the photo, you can see Link controlling the sailboat through the ocean, which appears to wide and expansive. Based on the lighting and shadows of the photo, the sun's light is off to the upper right. The skybox/environmental map also composes of a cloudy sky with a far off horizon. But I think the most interesting visual effect in the game is the movement of the ocean.

In the game, I like how the ocean is a constantly moving thing. The effect does not vary with the changing of the camera. It swells, rises, and falls ever so slightly as the player remains in place. You can also tell in the far distance of the photo that the ocean is an uneven body of water at times. The white foam on top also moves and interacts with each other in different ways, colliding and forming together. As the player moves the boat across the ocean,you can see the little waves and splashes of water at the head of the boat and foam trails behind it. And, although not shown in the photo, the ocean also reacts to the weather. In sunny weather, the ocean gently swells up and down, and in stormy and grey weather, the ocean undulates and oscillates a lot more.

If I were to guess as to how this visual and interactive effect of the water was done, I believe that the ocean it is a mix of updating the mesh, altering a texture, and changing the color of the pixels depending of the water. Because I am a 3D modeler (and thus am familiar with several modeling techniques), I believe that the ocean is actually a giant plane mesh with an optimal amount of vertices. In order to do swells and undulation, certain parts of the mesh update to

move up and down in sine or cosine like patterns. To do the white foam patterns on top, the ocean has a shader applied to it with a foamy texture. The foamy texture is animated and goes through several calculations in order to do the realistic interactions. Finally, the color of the pixels change based on the weather and day. The blue pixel colors of the ocean become brighter as the sun rises, and they become darker as the sun sets into night time. A fully sunny and cloudy day would show the ocean as its brightest blue, and stormy weather would grey the ocean out.

In all, the expanse and believable effect of the ocean in LoZ- TWW makes the game feel large and open. It looks aesthetically pleasing and reacts in similar ways to how earth's oceans do.