Realistic Water

with blender

by S68
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Introduction

My 6th tutorial. I wonder why I keep counting. I recently developed a script to create landscapes (Blender World Forge - BWF, on my site) and I was creating landscapes and posting them. Some people start asking how the water was done, so I understood that maybe a tut on that would be useful.

Preparing The Meshes

You need a mesh for the land and a plane for the water.
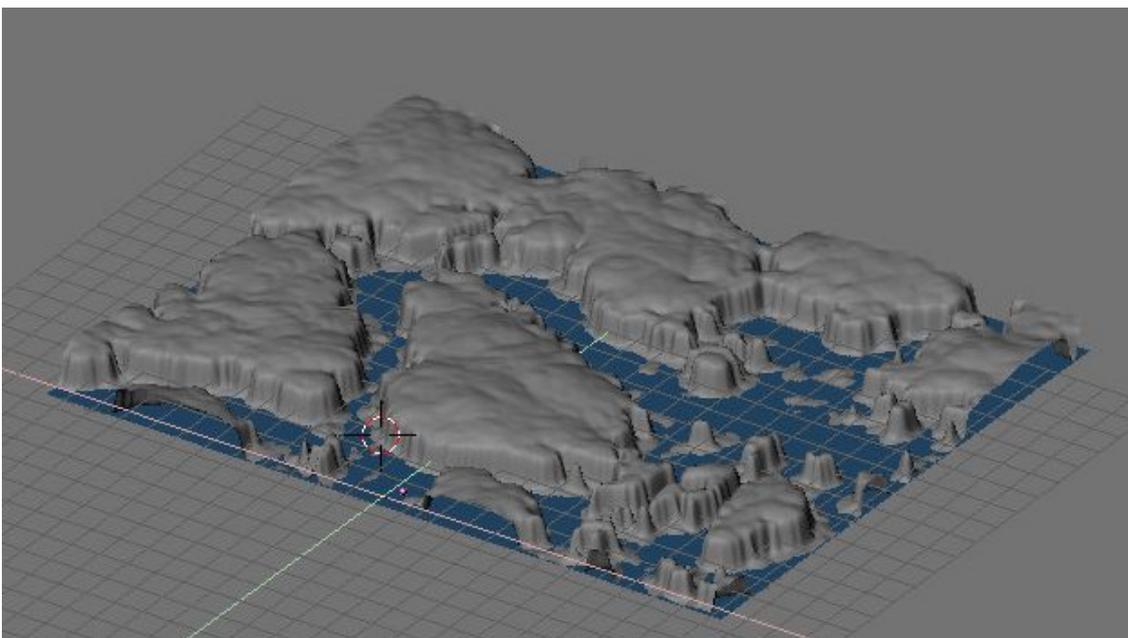
The figure above shows a BWF landscape, a blue plane, representing water has been placed at a convenient height.
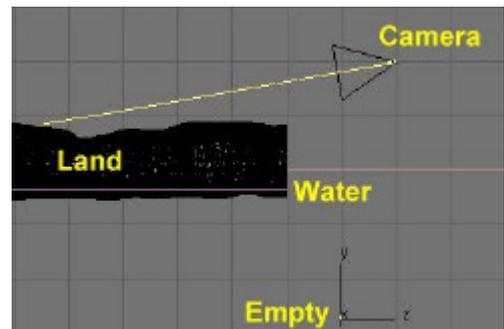
The key points are:

1. Reflections – blurred by waves
2. Transparency – With shallow areas clearer and deeper dark blue.

We will achieve both with a single hack:

Let's Part the Land

Reflections are achieved the standard way. You place an Empty specular to the camera with respect to the water surface plane.

The reflection is faked via an EnvMap which is *rendered from the empty viewpoint* This means that the empty should see the emerged land but not the submerged, or rather parts of the emerged land which deserves a reflection won't have it because they would be hidden, in the Empty's view, by the sea floor.

The first thing to do is to divide the dry land from the sea floor.

The easiest way to do this is to use my knife script (again on my site) to cut the land mesh with the sea plane as reference plane.

Beware that you might want to separate the land mesh in chunks no greater than 16000 vertices since the knife script quadruplicates them, and you will have problems if the resulting mesh is greater than 64000 vertices.

You can Remove doubles and re-join the meshes later, if desired, as for knife documentation.

You will then have two meshes, one of dry land, all above water line (black in figure) and one of sea floor, all below water line (pink in figure)
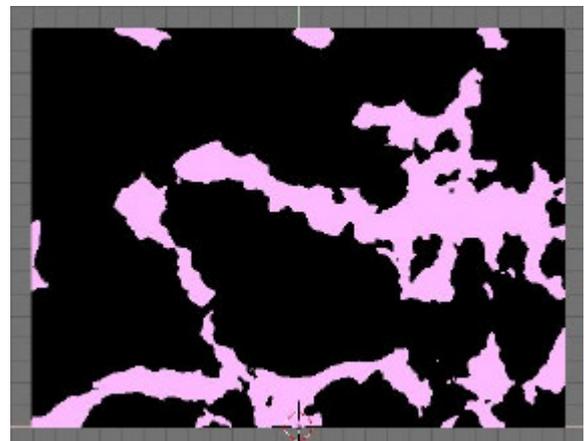
Give the same rocky material of your taste to both, but make the materials unique so that you can later tweak the sea floor.

Now move the sea floor on a layer of its own or on the layer of the water mesh. Be sure to make both these layers inactive in the EnvMap calculation.

The Water Surface

The water material needs many subtle settings.

The base material is here on the right. Note that it is NOT traceable.

Here I used a Oren-Nayar-Blinn material, but this is not really strictly needed.

What are necessary are three textures:

1. A large waves texture, a Blender Stucci texture, **Plastic**, with **NoiseSize = 0.35** and **Turbulence = 5.0**. Keep the noise **Soft** and apply it **Glob**ally as a **Nor** map of strength **0.25**

2. A small ripple texture, again a Blender Stucci texture, **Wall Out**, with **NoiseSize = 0.05** and **Turbulence = 5.0**. Keep the noise **Soft** and apply it **Glob**ally as a **Nor** map of strength **0.1**

3. The Reflection map itself. An EnvMap computed from the Empty, of desired size. Remember to use the **Refl** mapping, and have it affect both **Col** and **Cmir** channels, with a **0.5** strength.

The Ocean (Sea, Lake, River, Pond etc.) Floor

Now let's go back to the part of the land mesh lying below the water. It should have the same material you choose for above water. Now make it single user so that you can tweak it without changing the dry land.

First of all add a new texture channel.

For this channel choose Blender's 'Blend' procedural and make a nice colorband going from some nice dark colour (dark blue or dark green, as in this case) to a more clear colour, similar to the shore colour and than fade into an alpha=0 to show again the original material underneath.
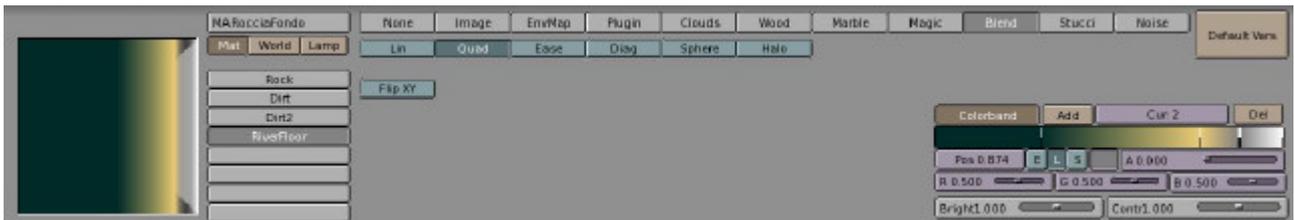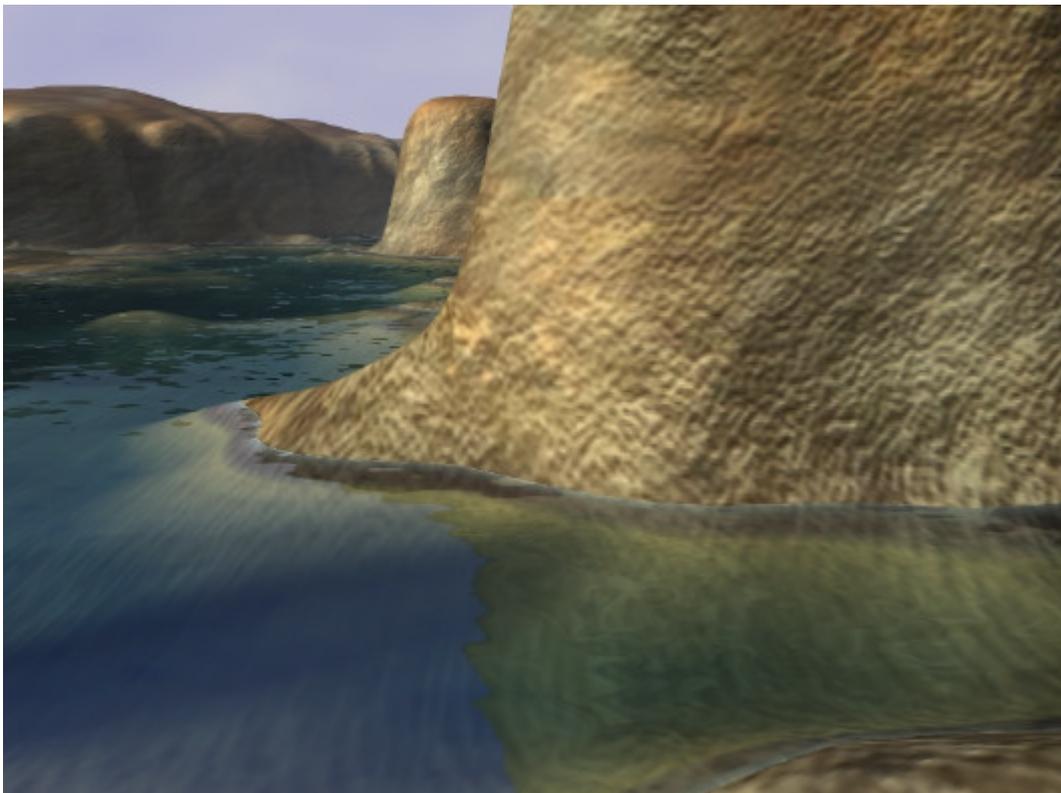

I found that a very thin white line at the very end of the colorband gives nicer results.

The result, if the colorband is properly applied, will be of dark areas where the mesh is lower, and the water deeper, and clear areas, up to white, where the mesh gets closer to the waterline.
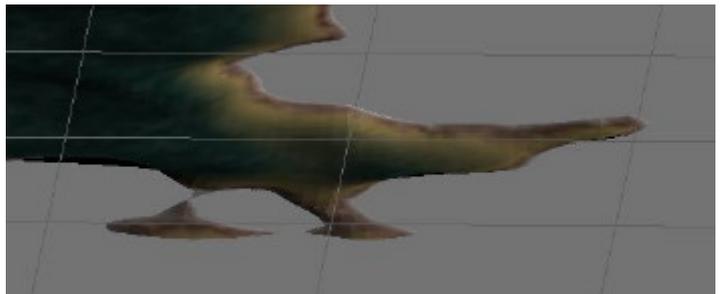
Here's what it should look like ✍

Have fun, Stefano