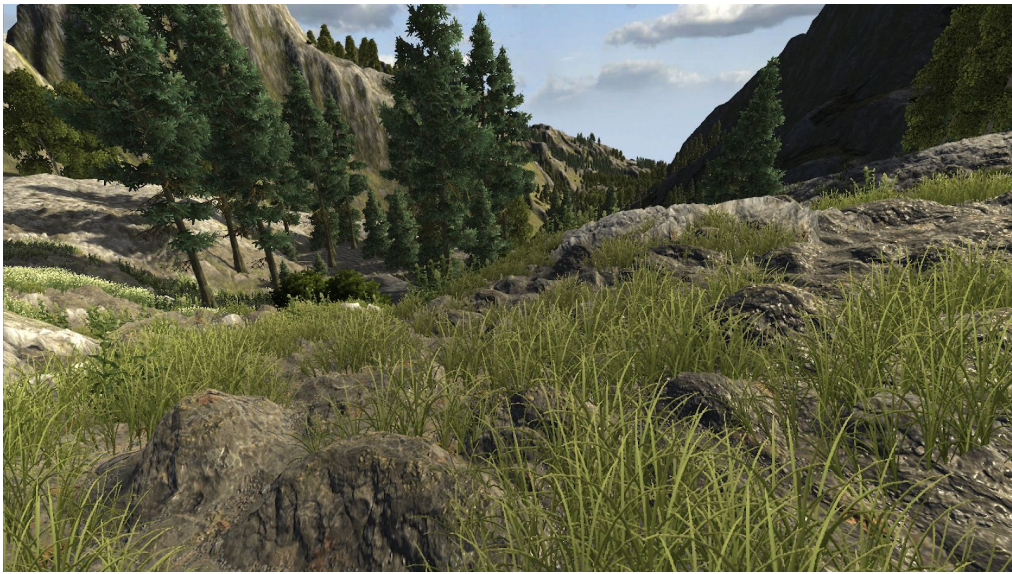


MicroSplat

Procedural Texturing Documentation



Overview

The procedural texturing module of MicroSplat allows you to texture your terrain based on rules. The texturing is executed in the actual terrain shader, so no splat map textures or painting is needed.


Shader Features

Procedural Texture	<input checked="" type="checkbox"/>
Use Biome Mask	None
Noise Space	World
Cavity Map	<input checked="" type="checkbox"/>
Erosion Map	<input checked="" type="checkbox"/>

Enable the Procedural Texture option in the Shader Generation section of the material. An option to enable the Biome Mask is available- this is an RGBA texture that can be used to mask out layers. In SplatMap mode, the RGBA channels of the texture correspond to weights of four biomes. In ExclusionMap mode, you can get 16 biomes by masking colors like 1,1,0,0 as a unique biome filter.

Noise Space lets you use either world space or UV space to compute noise values. Cavity and Erosion Map allow you to pregenerate a special map containing cavity and erosion information, which can be used to filter terrain texture weights. These two options require a precomputed map, which can be computed by MicroSplat, or supplied by a third party program.

Properties

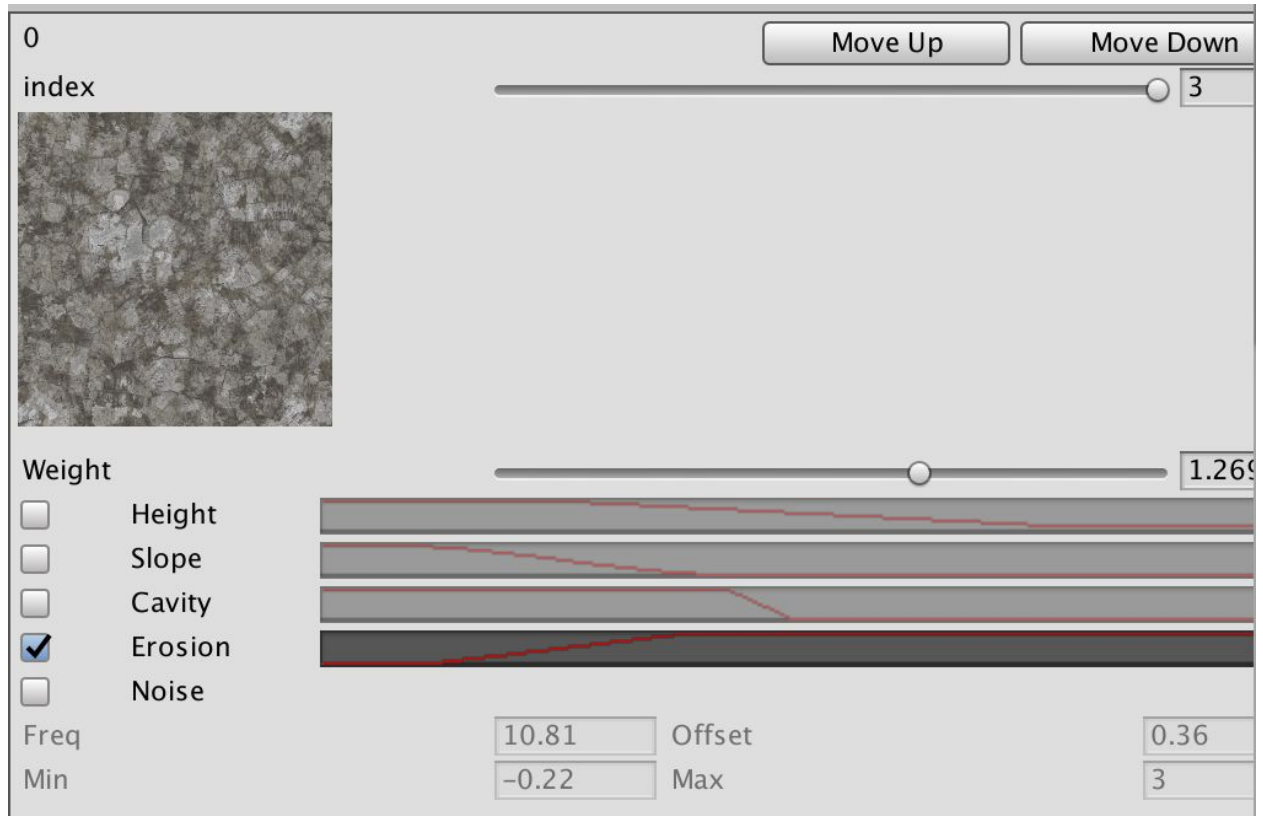
 Noise Texture	
World Height Range	X <input type="text" value="0"/> Y <input type="text" value="500"/>
Layer Count	<input type="text" value="3"/>

Once enabled, a Procedural Texturing section will be added to the material settings. At the top are the following options:

- Noise Texture. The noise texture allows you to rough up your ruleset with noise. One noise texture is used across the whole system for speed.

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- World Height Range. Height based rules need to know the range of the terrain, so you can enter your minimum and maximum world height for your terrain(s) here
- Layer Count. This controls how many rules you have in your system. Each rule is processed a bit like a photoshop layer, where layers on top have priority over layers below them.



Each layer has an interface like the one pictured above. At the top, you can choose the index of the texture you are going to apply. Remember, layers are ordered like photoshop layers, so it is suggested to have the last layer be the “background” layer, with higher layers deciding where they should have weight. You can move a layer up or down with the button

The layers properties include:

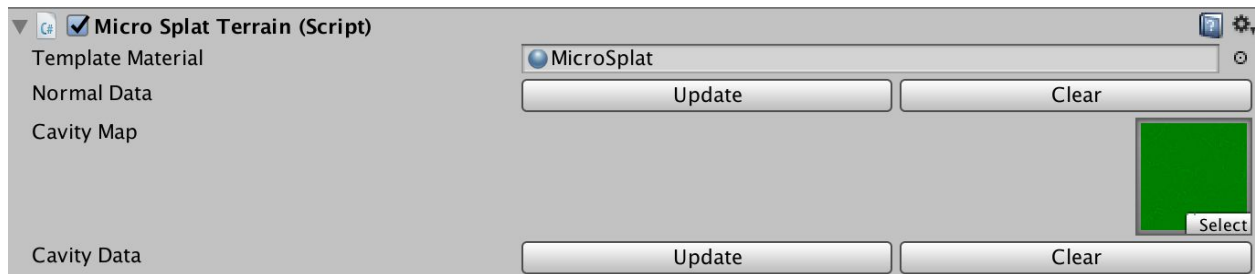
- **Weight.** This is the overall opacity of the layer.
- **Height Curve.** When enabled, you can use a curve to determine how much weight the layer should have at what heights. Remember to set the height range. Weight is defined on the vertical axis, height is on the horizontal.
- **Slope Curve.** When enabled, lets you define a curve to determine which slopes the layer should appear on. Weight is defined on the vertical axis, while angle is defined on the horizontal axis. The angle goes from 0-1, with 0 being down and 1 being up.
- **Cavity.** When enabled, lets you define a curve to apply weight based off of the cavity map.
- **Erosion.** When enabled, lets you define a curve to apply weight based off erosion data.
- **Noise.** Noise modifies the weight of the layer. You can use the frequency and offset to scale or move the noise, while the min and max parameters remap the noise output. You can use the remapping to make the noise faint (0.0 to 0.2), increase contrast (0 to 5), or even be subtractive (-1 to 0).

Biome Mask

When the biome mask is enabled, you can supply a texture to filter each rule by biome. In Splat Map mode the texture is an RGBA texture, allowing for four biomes areas. Each rule has 4 values which determine the weight for that rule set on that biome. For instance, if you set the value for a rule to 1, 0, 0, 0, then the rule's weight will only be applied where there is red in the biome mask. Essentially, these values are multiplied together to produce a weight.

In exclusion mode, values like 1,1,0,0 can be used allowing for 16 possible biomes.

Cavity Map



Procedural texturing based on height and slope can be performed without any additional data. However, when Cavity Map or Erosion Map are enabled, a precomputed map is required as generating this data in the shader can be costly. Many landscape programs can output these extra maps, but MicroSplat has a generation system included. Once enabled, simply select the MicroSplatTerrain component and press 'Generate' on the Cavity Data line. Once a map is generated, should the terrain change, you can press update to regenerate the map.

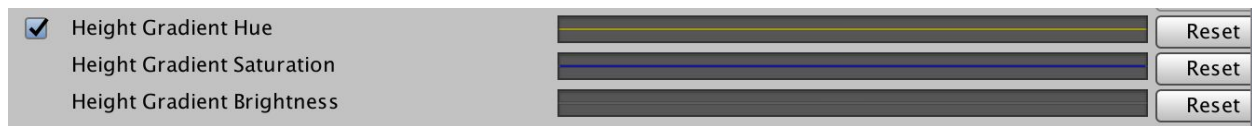
You may also provide your own map. Cavity is read from the G channel of the texture, and Erosion is read from the A channel. Note you do not have to use a cavity and flow map, you could use whatever map you want and filter weights based on that texture data.

Gradient Heights



This module also adds a special per texture property for Gradient Heights. You can find this in the per-texture property section. Once enabled, each texture can have a gradient tint based on the height of the terrain. In this case, the grass is being made more lush at the bottom, and darker at the top. Note that this feature does not require you to procedurally texture your terrain, and works fine with traditional splat mapping.

Gradient HSB



The gradient HSB controls are similar to the gradient tint, but allow you to adjust the Hue, Saturation and Brightness of a texture over the height of the terrain. This can allow for a great deal of control over your terrain's coloring, for instance making grass get brown and desaturated as you get to the top of the hills, etc. Like the gradient height tint, this is also available when using traditional splat mapping.

Workflow Advice

If you are familiar with Photoshop layers, then the way weights work in this system will make a lot of sense. Create several layers, set their weights to 0, and set the last ones weight to 1. Select something universal for this last texture.

Then go through the other layers, choosing textures for them, and raising their weights to 1. Then enable noise of a filter curve and adjust the parameters to get the texture to appear where you want it.

Baking

Computing splat maps at runtime adds significant cost to the shader, so if you don't need the terrain to dynamically be textured at runtime, you can bake out the result to traditional splat maps. To do so, select the MicroSplatTerrain component and press "Bake Procedural To Terrain" under the "Procedural Baking" rollout. You can then turn off procedural texturing. Note

that the texturing will not be exactly the same, because previously it was being computed on each pixel being drawn, and now it is being drawn at the splat map resolution.