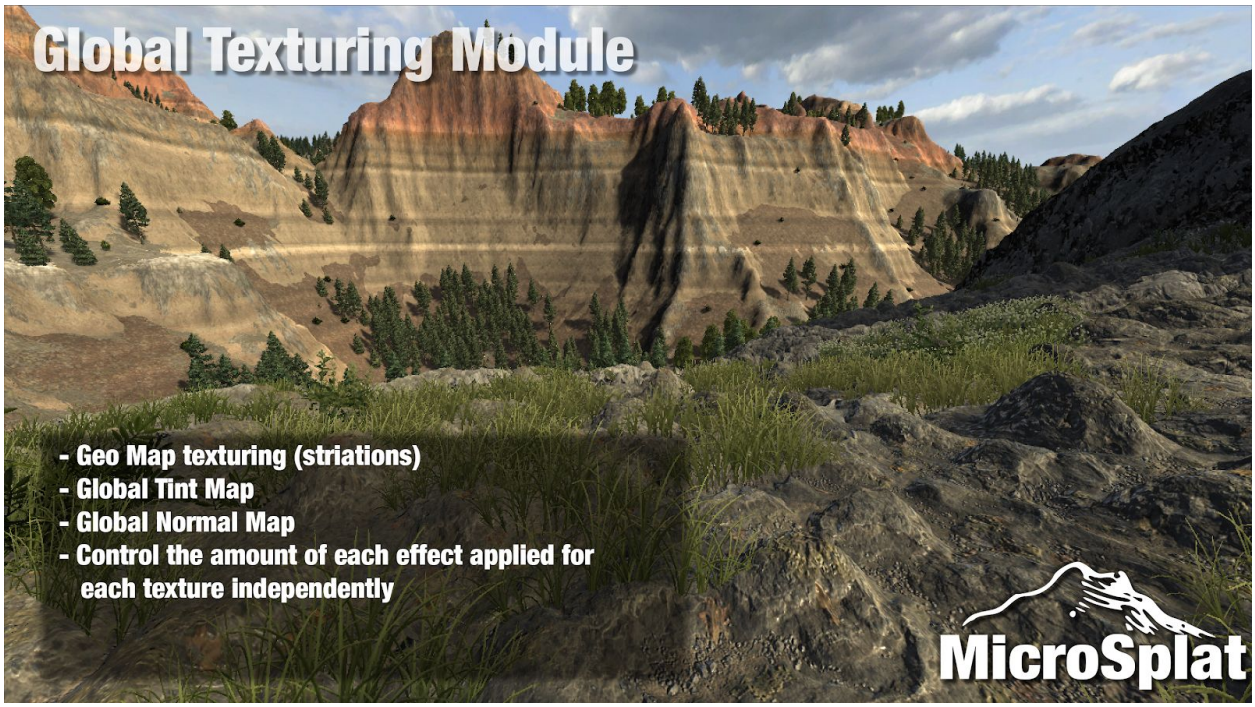
MicroSplat

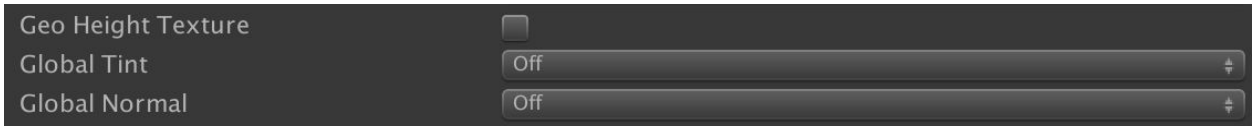
Global Texturing Documentation



Overview

The Global Texturing module adds several features which allow you to quickly shape the overall look of your terrain.

Shader Features

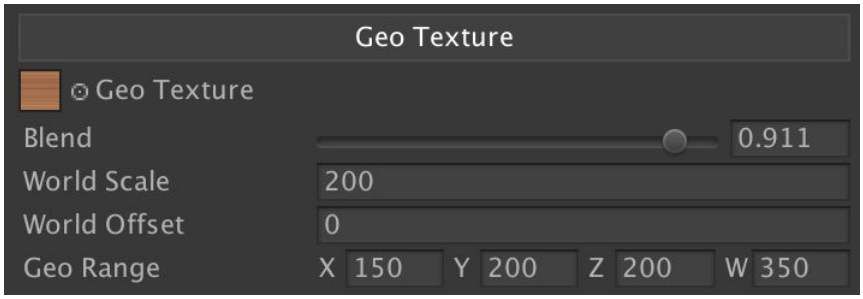


The Global Texturing module adds several features to the MicroSplat framework, the Geo Height Texture, which is a small gradient texture useful for creating striations and other horizontal patterns in the terrain, and the global mapping options,, which allow you to create a tint, normal, specular or emissive map for the entire terrain.

Geo Height Texture

The geo height texture feature applies a vertical tint map to the terrain. It is commonly used to create the type of rock striations found in the screenshot above. It has three modes, Off, Albedo, and Albedo Normal, which allows you to supply a normal map as well as a tint map.

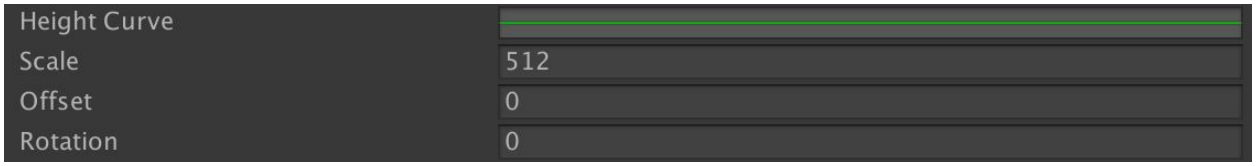
Once enabled, two additional options are avilable. GeoRange, which allows you to fade the geo texture across the height of the terrain, and Geo Curve, which allows you to warp the texture up and down along the terrain using a curve.



In the Geo Texture properties section, you can supply a small vertical gradient texture to the Geo Texture property. This is applied with a Multiply2x blend mode, which means a grey value will have no effect on the terrain, and values above or below will brighten or darken that area respectively. Alpha is respected in this texture, so you can control the amount of the effect via the alpha channel as well as via additional properties below. Additionally, a per-texture option is available, allowing you to control how much the effect is applied to each texture. This can be very useful to filter the effect off of surfaces that should not be colorized. The other properties are:

- Blend
    - How much of the effect to apply
- World Space
    - How many meters the image is stretched over
- World Offset
    - Where they begining of the texture is in world space
- GeoRange
    - X
        - Height in the world at which the effect begins to fade in
    - Y
        - Height in the world in which the effect is fully faded in
    - Z
        - Height in the world in which the effect begins to fade out

- W
    - Height in the world in which the effect has fully faded out



When Geo Curve is enabled, extra properties will be shown:

- Height Curve
    - This is a curve which pushes the geo texture up or down across it's mapping on the terrain.
- Scale
    - This maps the size of the curve over the terrain in world unity. At a value of 512, the curve will repeat every 512 units in the world.
- Offset
    - Offset the curve in world units
- Rotation
    - Allows you to rotate the curve around the Y axis
- Geo Height Contrast
    - This is only shown if the per-texture height filter is active, but controls the contrast on the height filter

Geo Height Filter

In the per-texture properties section, you can turn on Geo Height Filter. This enabled a slider from -1 to 1 which controls which part of the height map get the geo texture for each texture. If you adjust this for the rock and grass texture (index 2) in the demo scene, values between 0-1 will filter out the rocks (highest in the height map) such that they do not receive the

geo texture, and values between -1 and 0 will filter out the grass, such that only the rocks receive the geo texture. Once this is enabled, there is also another per-texture strength control which allows you to adjust how strong the filter is- allowing some, but not all, of the tint to come through in the filtered areas.

Global Tint

The Global Tint map can apply an overall color to the terrain. Some landscape generation systems can create a global color map for you, giving your terrain an overall colorization which is much more diverse than your textures would allow by themselves.

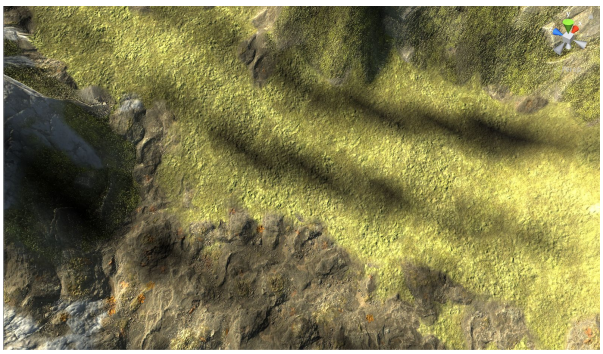
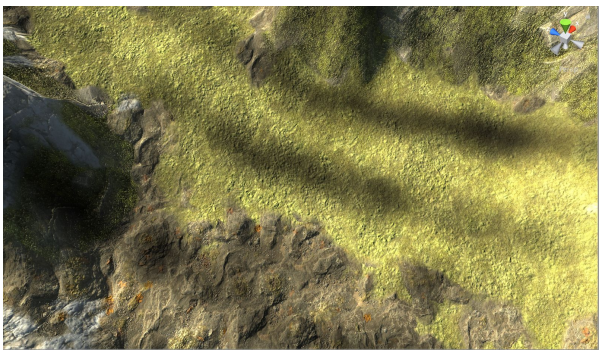
The Global Tint map can also be used to apply color variation to the scene, as you can filter how much of the effect is applied to each texture. For instance, you might desaturate your grass textures and use the global color map to tint the grass texture various shades of green and brown, providing an overall wider palette of colors.

The Global Tint map has four modes:

- Multiply2x
    - The tint map is applied to the terrain such grey has no effect, and colors lighter or darker than grey lighten and darken the terrain respectively.
- Overlay
    - The tint map is blended the same as Photoshop's Overlay blend mode
- LighterColor
    - The tint map is blended the same as Photoshop's Lighter Color blend mode. This is a more recent blend mode that tends to preserve the average color of the texture a bit better.
- Cross Fade
    - The terrain will blend between the splat mapping and this texture as a cross fade

Linear vs. Quadratic blending

Once a global map is enabled, an enumeration to switch between Linear and Quadratic blending is shown below it. Linear blending uses the standard bilinear blending on the GPU to sample the texture. However, since global maps are often fairly low res compared to the splat maps, bilinear blending can often produce blocky artifacts or aliased lines when details are small. When Quadratic is chosen, 4 texture samples are taken and a biquadratic blend is used instead, which is similar to interpreting the information as if it was a catmul rom spline. The difference is shown below:

	
Linear	Quadratic

Global Noise UV

Another way to break up the low res nature of global textures is to distort the UV coordinates with a bit of noise. Note that the parameters are shared with the Control UV noise, if that is enabled, so that they get the same offsets, and colors are coordinated between the global texture and painted splat maps regardless of the UV distortion.

Global Normal

The Global Normal is similar to the global tint map, except that it modifies the existing normal. This can be used to add subtle variation to the lighting across the world, or cross fade blend to a global normal.

Other maps are available for Emissive, Specular and a SAOM (Smoothness, AO, Metallic packed into RGB) maps, all working the same as the other maps.

Properties

Global Tint and Global Normal each get a set of properties to control their blending:

- Blend
    - How much of the map to blend in
- Begin Fade
    - Distance to begin fading the global texture
- Opacity At Begin
    - Opacity at the begin fade point
- End Fade
    - Distance at which cross fade is done
- Opacity At End
    - Opacity for distances greater than the end distance

Note that these properties are available in all modes. If you don't want to change the amount of the effect based on distance, just set the opacity values to 1. For blending satellite imagery, you might want to keep a small percentage of the texture blended in up close, and keep

a small amount of the splat maps blended in far away. Setting opacity to 0.2 and 0.8 would accomplish this, for instance.

Splat Fade Distance

When Splat Fade Distance is enabled, splat maps will be faded out in the distance, with a cross fade between the splat mapped textures and a single texture from your texture array. When Branch Samples is set to Aggressive, all calculations and cost of performing splat mapping in the distance is removed. This can save hundreds of samples in cases where your crossfading to satellite images or other global textures.