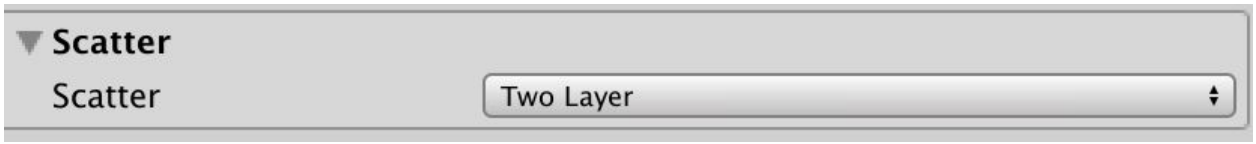
MicroSplat

Scatter Module

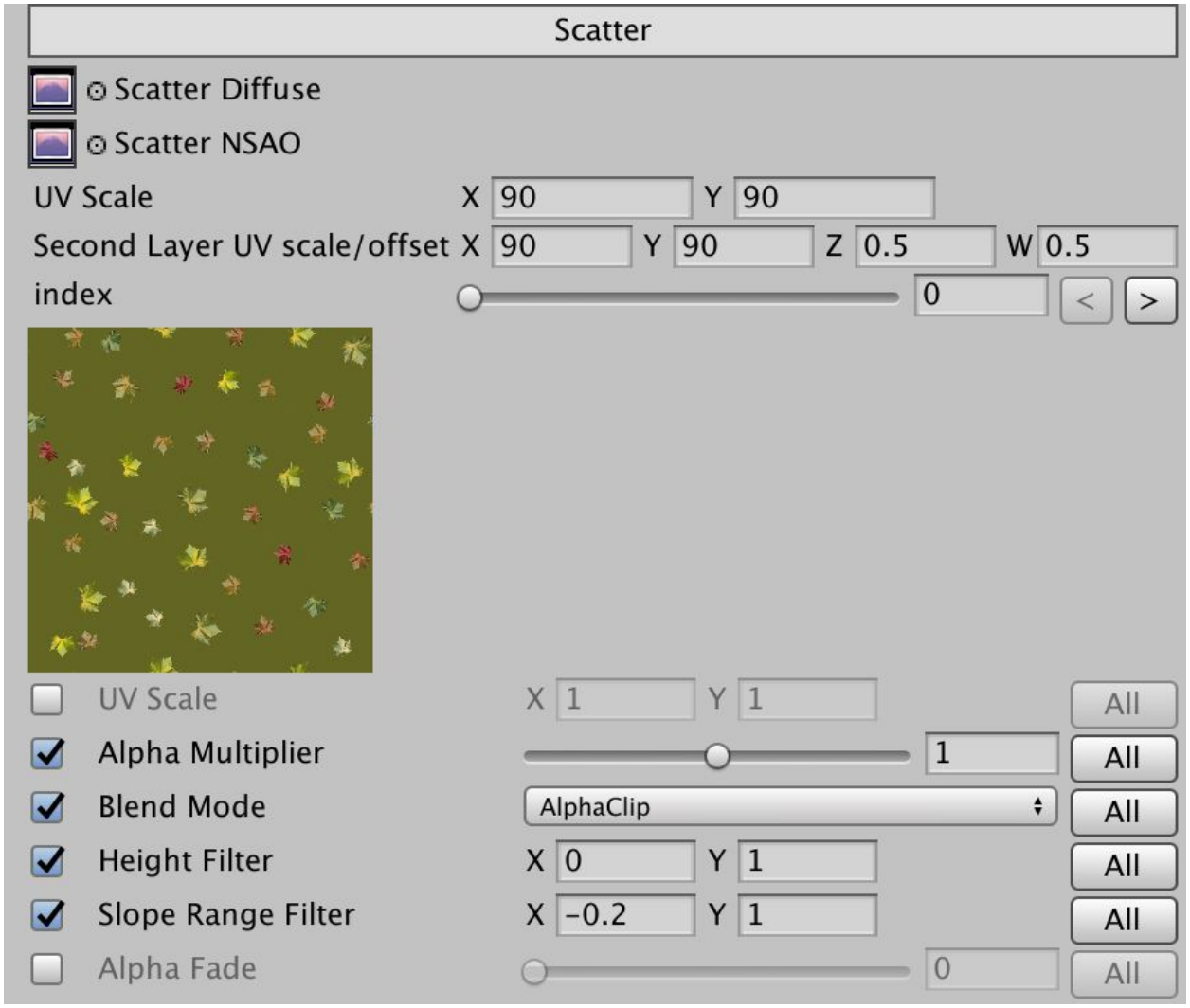
Overview

The Scatter module allows you to paint a layer of up to 32 additional textures onto your terrain. These textures can be overlaid using various blending modes, allowing you to add small details and contextual modifications to the terrain, such as moss on the tops of rocks, or scattered leaves. You can have up to two layers of scatter, allowing you to paint scatter elements over other scatter elements.

Getting Started



The Scatter system can be enabled by turning on the Scatter option in your shader generation section of the material. One or two layers are allowed. One enabled, a new section is added to the material.

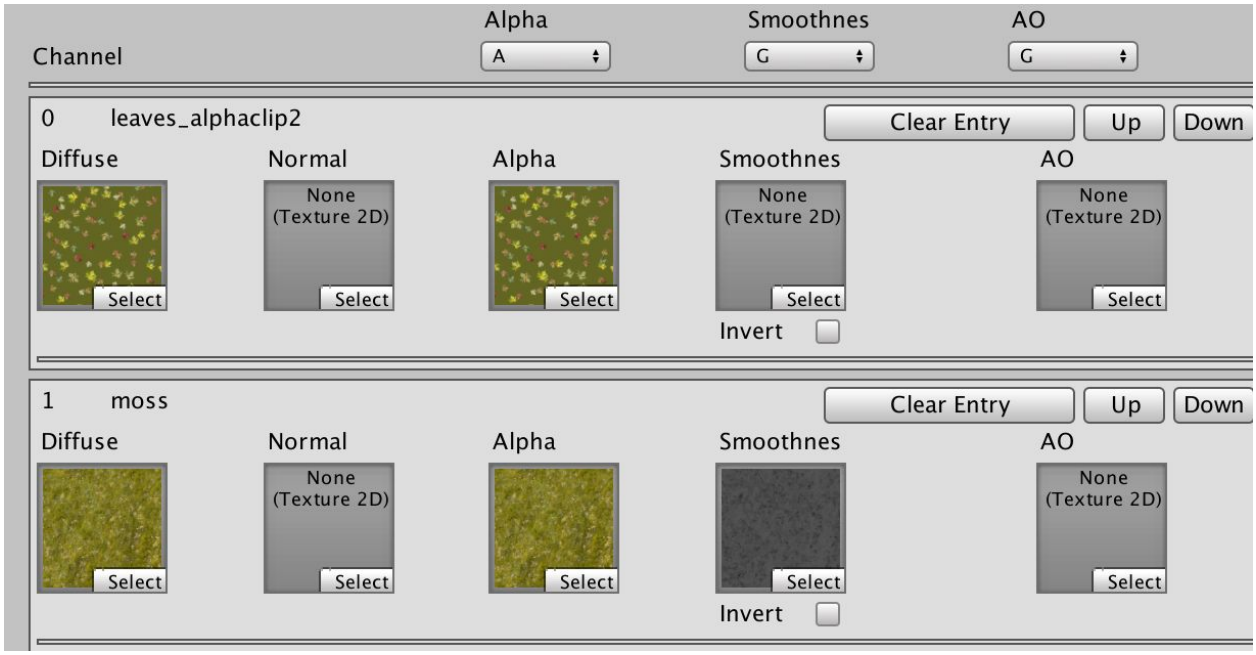


The Scatter section lets you assign texture arrays for the scatter texture, as well as a global UV scale. If the second layer is enabled, it gets its own UV scale and offset. The scatter section also has its own per-texture properties section. This is because it uses a separate set of texture arrays for the scatter textures.

Creating the Scatter Arrays

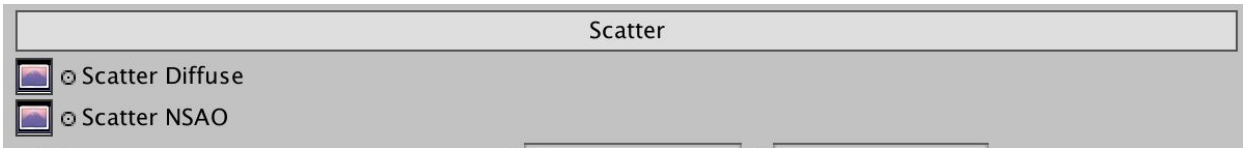
To create arrays to store scatter textures, go into the MicroSplatData directory for your terrain, right click, and select Create/MicroSplat/Texture Array Config from the menu. Name the Texture Array Config something sensible, like “ScatterConfig”.

Set the Texturing Mode at the top of the Texture Array Config to “Scatter”. Next add textures as you normally would, though notice that you have a slot for an alpha channel instead of the height map.

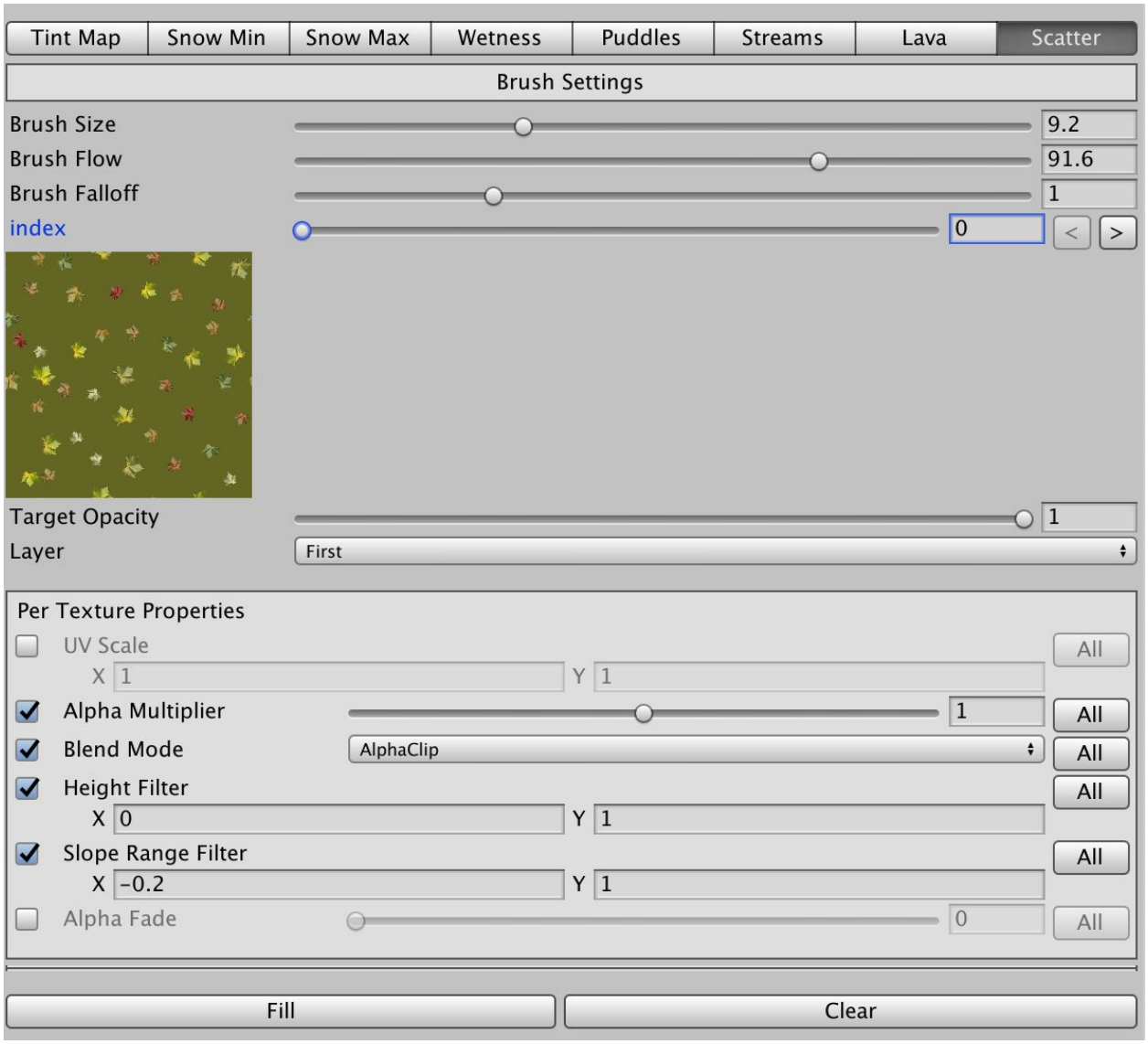


Note the Alpha channel in the example above is set to pull the data from the Alpha channel of the texture. Make sure you are pulling the data from the correct channels of your source texture.

Once you add your textures and press Update, two new Texture Arrays will be created in your project. These must be assigned to your material in the scatter section:



Now you can open the Terrain FX Painter from the Window/MicroSplat/Terrain FX Painter menu. Select your terrain(s) and go to the scatter tab.



Here you can select the texture you want to paint and the target opacity to paint. If the second layer is turned on, then you can select which layer to paint on.

Note that as a convenience, you can adjust the per texture controls for the Splatter system directly from the paint interface.

Scatter Per-Texture Properties

The per texture properties for scatter allow you to customize how the textures are combined. UV Scale obviously controls the scale of the scatter texture, and the alpha multiplier can be used to adjust the strength of the effect.

Height and Slope filters allow you to filter where the effect appears.

	In this image, height filter is enabled and set to 0.5 and 1. This makes it so the moss only appears on the top of the height map when painted. If the filter is revered (1 and 0.5), then moss would only appear at the lower heights on the texture.

The per texture Blend Mode allows you to control how the texture is blended with the terrain. The modes are:

- Alpha
    - The data is alpha blended with the terrain. At 100%, none of the terrain texture will show through
- Alpha Clip

- Alpha Clip mode allows you to filter elements of the texture based on their alpha value. As an example, this can be used to control which of the leaves in a texture appear based on the target opacity in the painter. Painting lower opacity will place less leaves, while higher opacity values will place more leaves. An example of how to set this up is below.
- Overlay
    - In this mode, the albedo is overlay blended and the normal is blended.
- Lighter Color
    - In this mode, the albedo uses a lighter color blending mode, in which the lightest color wins. The other PBR components are blended the same way as overlay mode.

Finally, a per texture property called “Alpha Fade" is available. This allows you to fade out the effect based on the mip map used. When set to a value of 0, no fade is applied. When set to a value of 1, the effect will be faded by the time the mip map chosen is one pixel in size. To understand why this is useful, imagine that you reduce the a texture with alpha’s spots on it to 1 pixel in size. You no longer have spots, just an average color and alpha value for that data. This can cause the overall color of the texture to appear to be different in the distance than you would expect, so using the alpha fade value you can gently fade out the small leaves and other details based on the mip used.

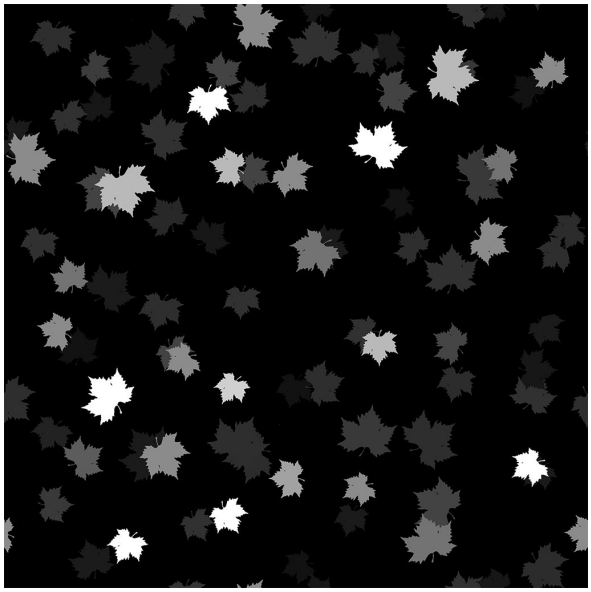
Alpha Clip Textures

When creating textures for alpha clip mode, lower alpha sections of the texture are clipped when the opacity of the painting is low.

On the right is the alpha channel of the scatter texture in the examples. Notice that each leaf has a different alpha value. As the opacity increases and passes the alpha value in the texture, more leaves will appear. This lets you control the density of leaves with your brush strokes.

Note that the alpha channel should be created without anti-aliasing for best results.

A neat trick in Photoshop is to adjust alpha's for each leaf, then use posterize to bring them all into fixed values. For instance, a posterize of 16 will only allow 16 evenly spaced alpha values. This helps the leaves stay constant even in areas where the opacity is being blended.



Notice also that the alpha areas of the texture are filled with a common color. Often this gets filled with black, which means the edges will get a black outline on them.

Tech info

The Scatter system uses the technique I developed for texturing in MegaSplat. It uses a custom splat map format, where an index is stored in the R channel (index / 64, so that it sits in a 0-1 space for an 8bit texture), and a weight for that texture is stored in the G channel. This allows a single custom splat map to store up all the possible texture choices, instead of needing one backing splat map for every 4 textures. When the second layer is enabled, the second index is stored in the A channel, and the weight is stored in the G channel.