MODULE: BIG WORLD

Overview

This module provides more advanced features to unlock the full power of Vista that allows you to create bigger environment at ease, including:

- Multi-biomes workflow: Place an unlimited biome in the scene and let them blend nicely together.
- Up to 4K textures for each biome: More pixels, more coverage, more detail.
- Extended node library: Landslide, crack, snow fall, water flow and more than that.

Version: 2023.1.0

Requirements: Vista 2023.1.0+

Multi-biomes workflow

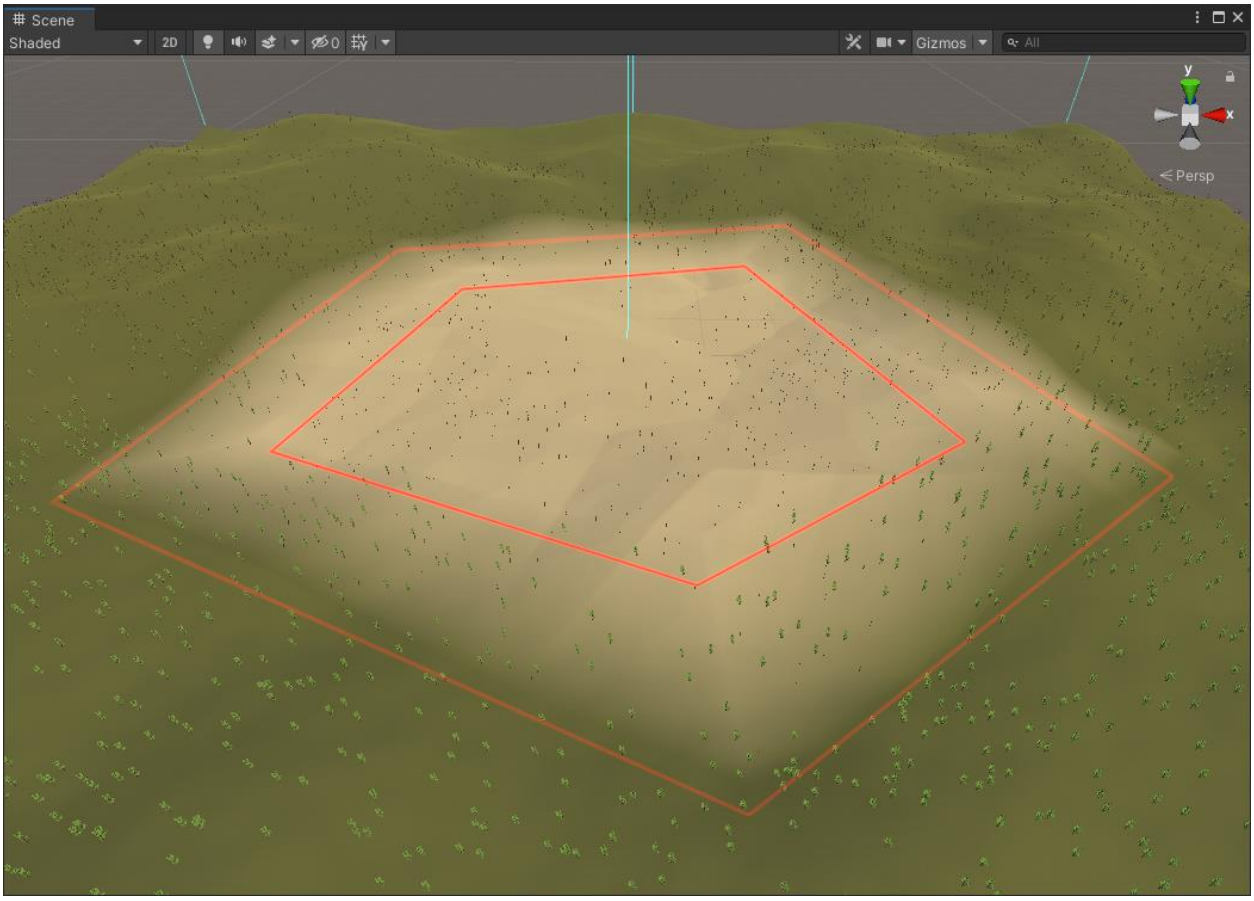
You can now create more than 1 biome anywhere in the scene, the process is similar to this section. If those biomes overlap, they will be blended together with a very nice transition.

Biomes blending

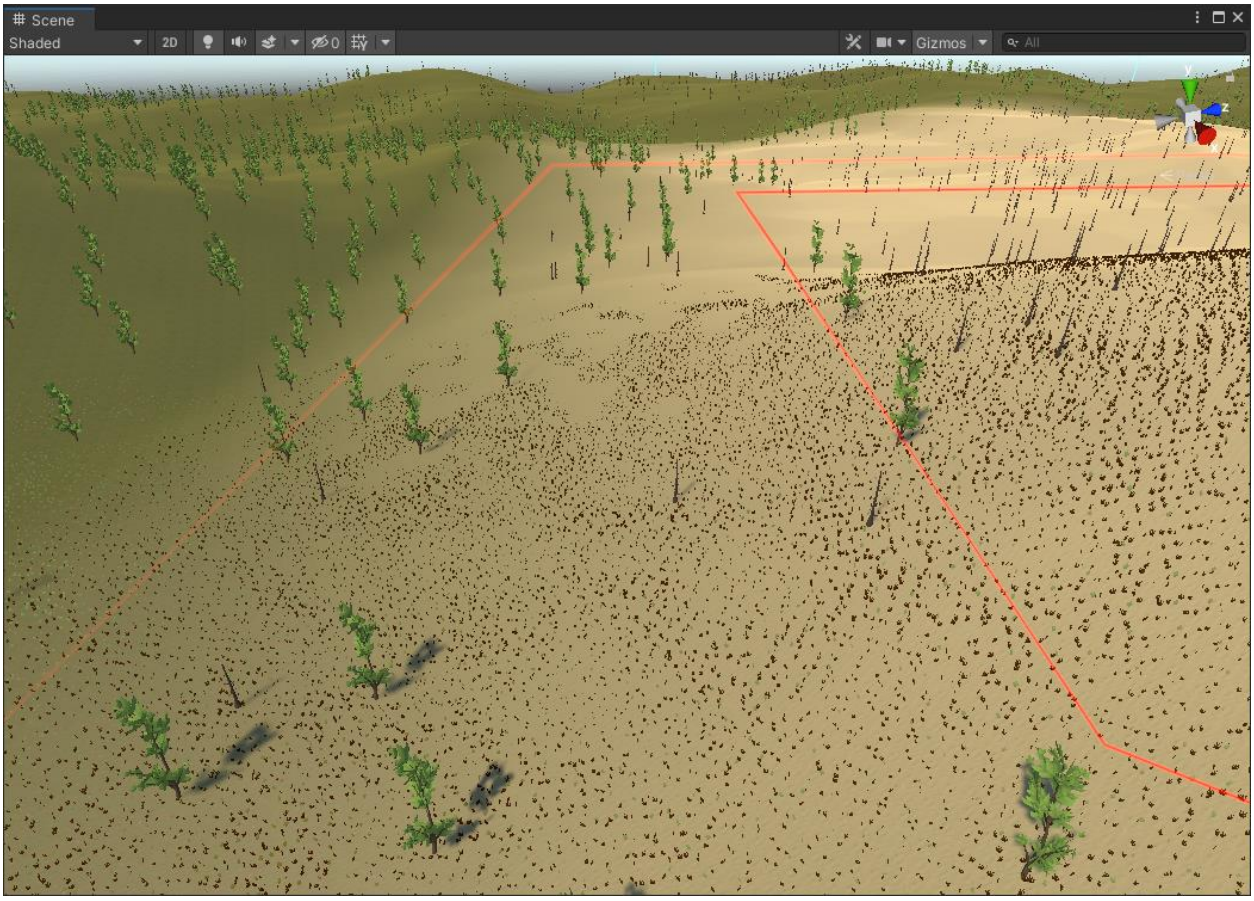
Overview

Vista can blend multiple biomes together with a nice transition between them. Biomes belonging to a VM instance are sorted by their order, later biomes will be “blended” on top of the previous ones using biome mask.

Here’s an example of biome blending:



In the image above, you can see that terrain geometry and texture are gradually changing from the grassy to the desert one.

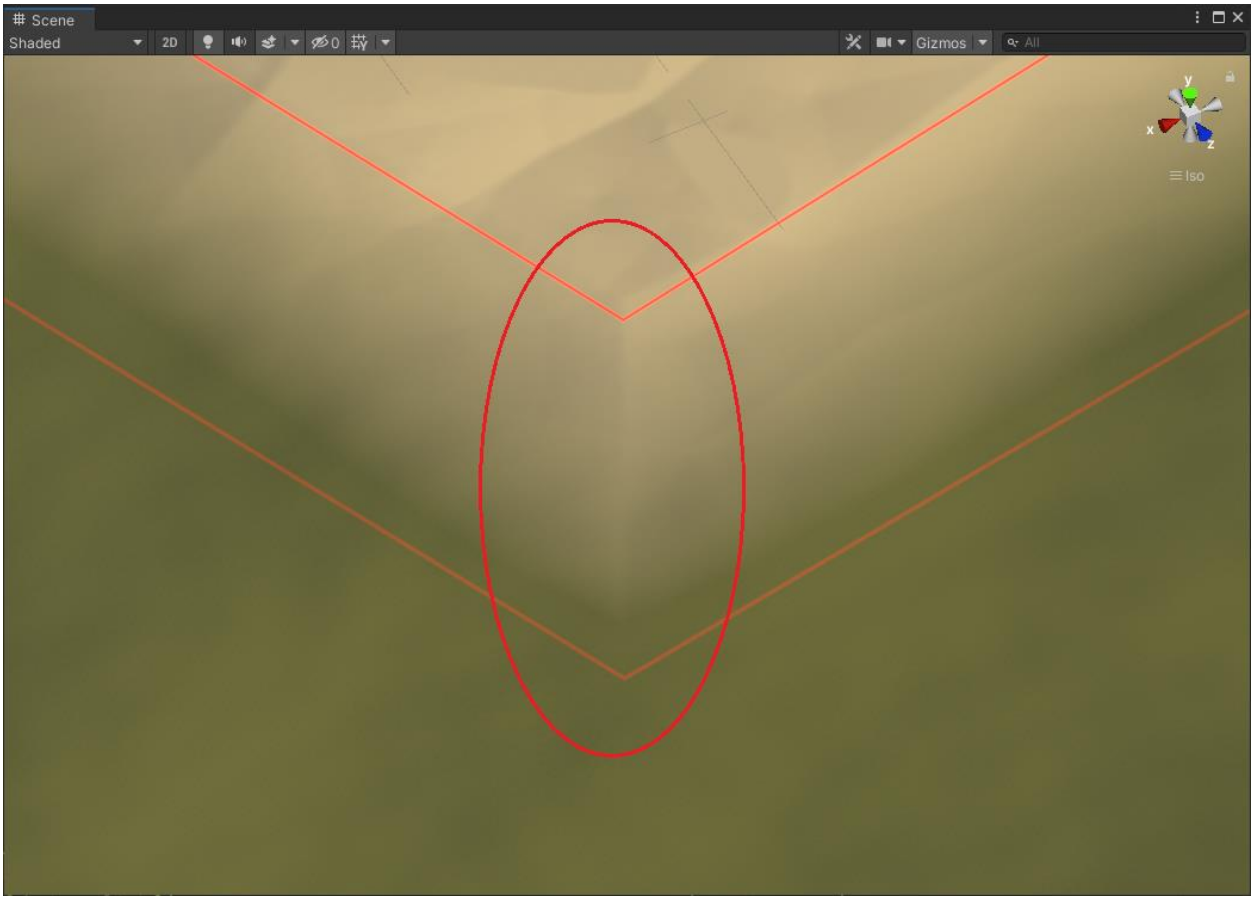


Green trees are thinned out and then completely disappear when it goes from grassy to desert biome.

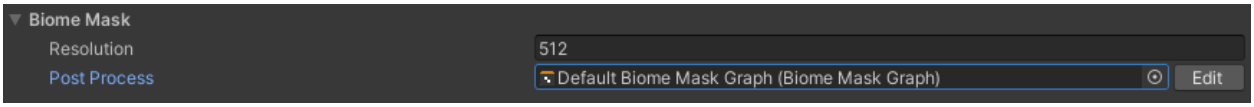
Grass and detail objects also get blended.

Better transition

Biomes are blended using a biome mask, an internal texture generated when you edit the biome anchors. Initially, the biome mask texture can contains some hard edged areas due to its polygonal nature:

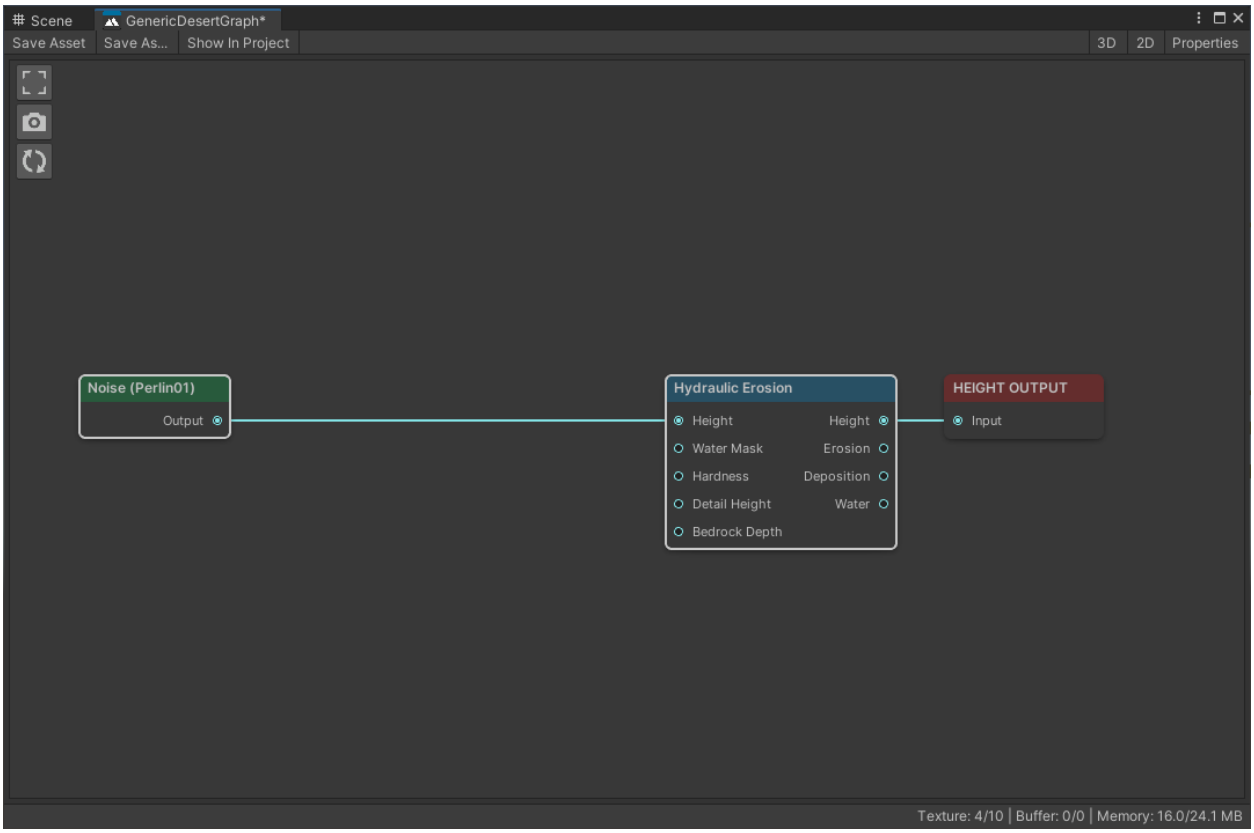


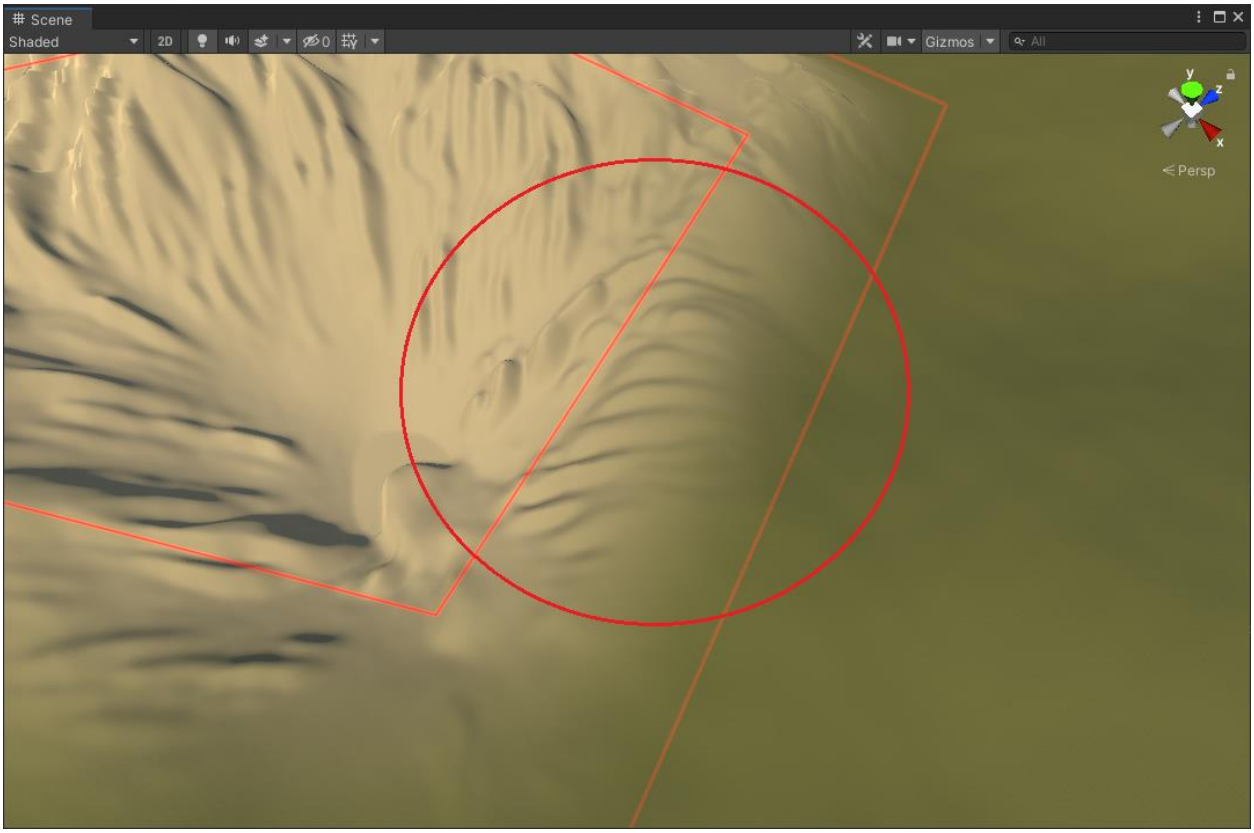
Luckily, Vista also provides the Biome Mask Graph that lets you polish the mask. Apply the graph to the biome, we have a way better transition:



Advanced transition

Sometime retouching the biome mask is not enough for a good transition, consider the example below:

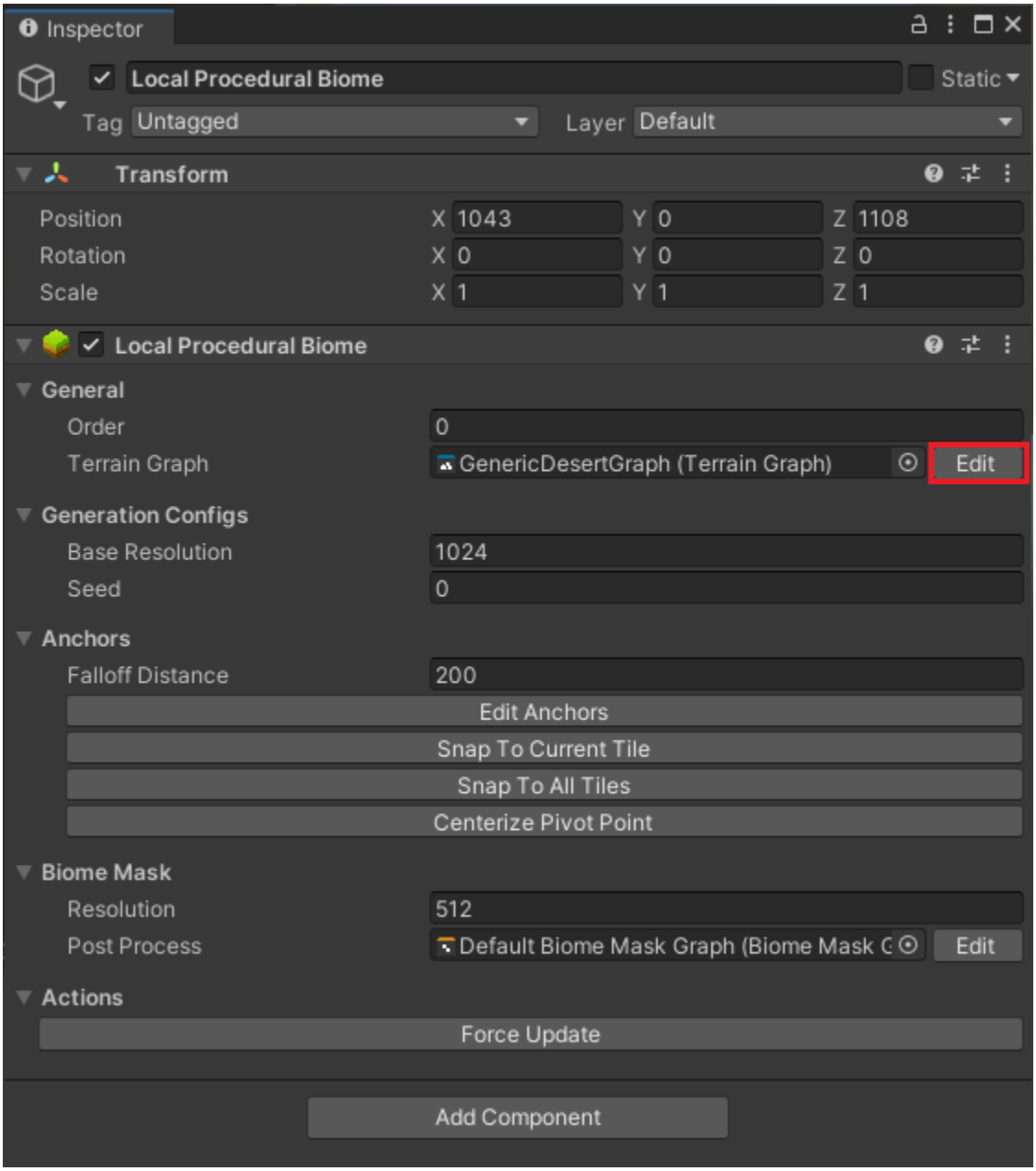

Scene
GenericDesertGraph*
Save Asset
Save As...
Show In Project
3D
2D
Properties
Noise (Perlin01)
Output
Hydraulic Erosion
Height
Water Mask
Hardness
Detail Height
Bedrock Depth
Height
Erosion
Deposition
Water
HEIGHT OUTPUT
Input
Texture: 4/10 | Buffer: 0/0 | Memory: 16.0/24.1 MB


Scene
Shaded
2D
Gizmos
All
Persp

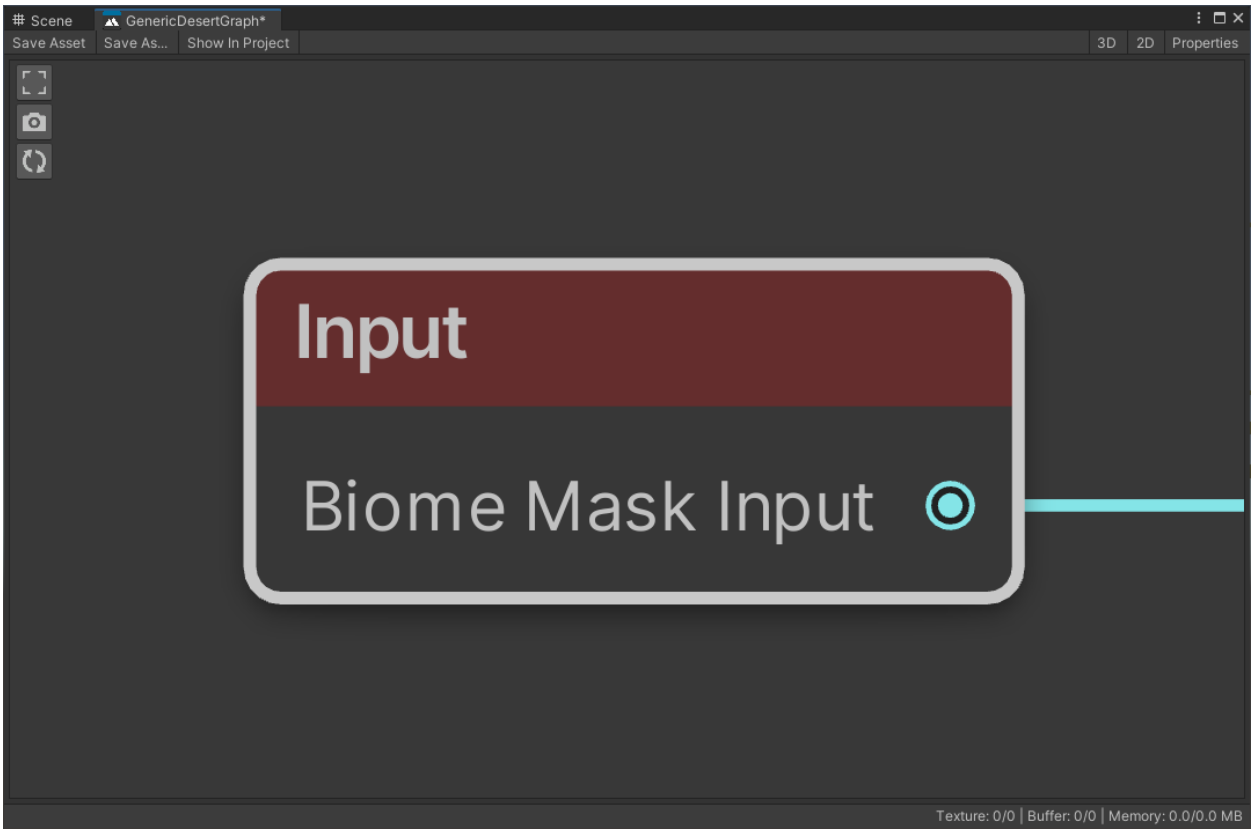
You can see that the erosion looks unnatural, like water is flowing uphill.

A way we can get around this is to take advantage of the biome mask directly in the terrain graph beforehand.

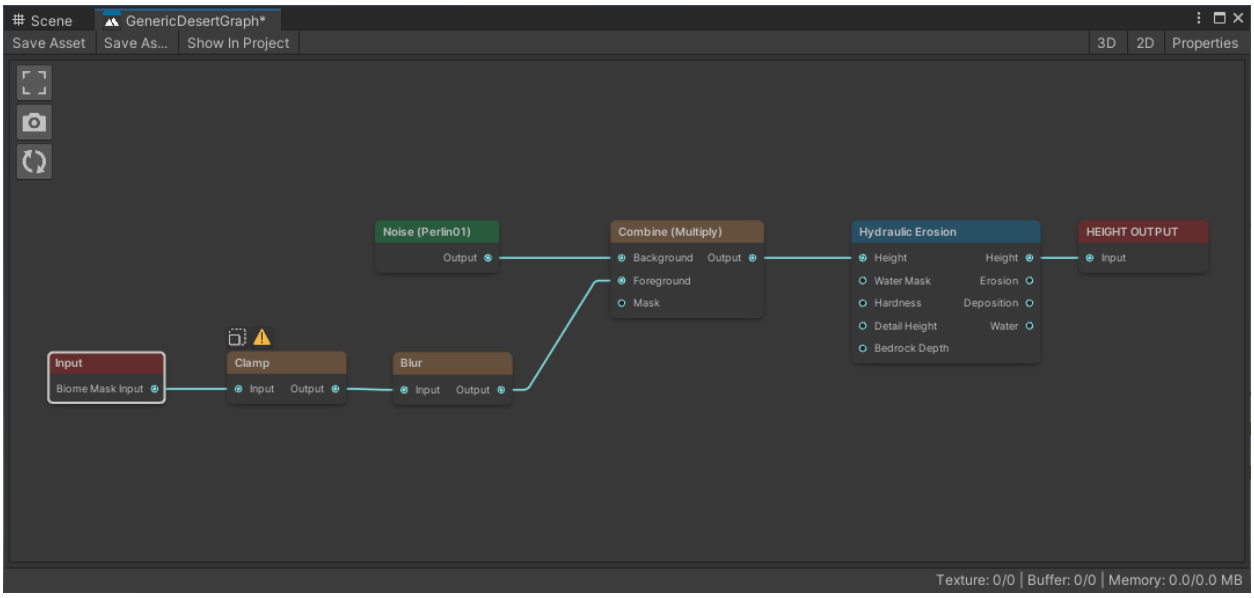
To do this, select the biome instance and click on the Edit button next to the terrain graph slot. It will bring up the graph editor with the biome mask fed as input.



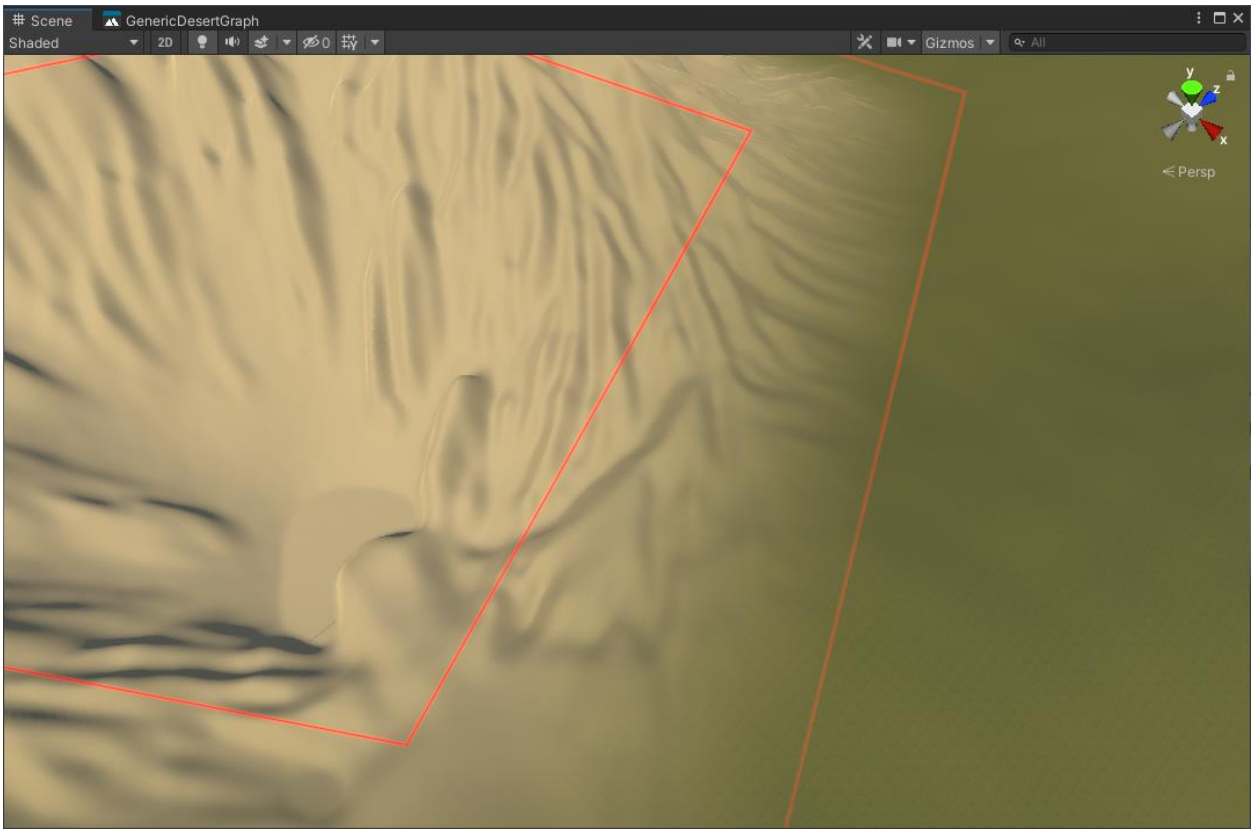
To refer to the biome mask texture, add an Graph Input node, and use "**Biome Mask Input**" (exact name without quotes) as input name. Instead of typing, you can select it from the name selector.



Since the biome mask is provided as raw with no post process, we need to do some quick effect such as blur:



Save the graph and this is what we get, way better:



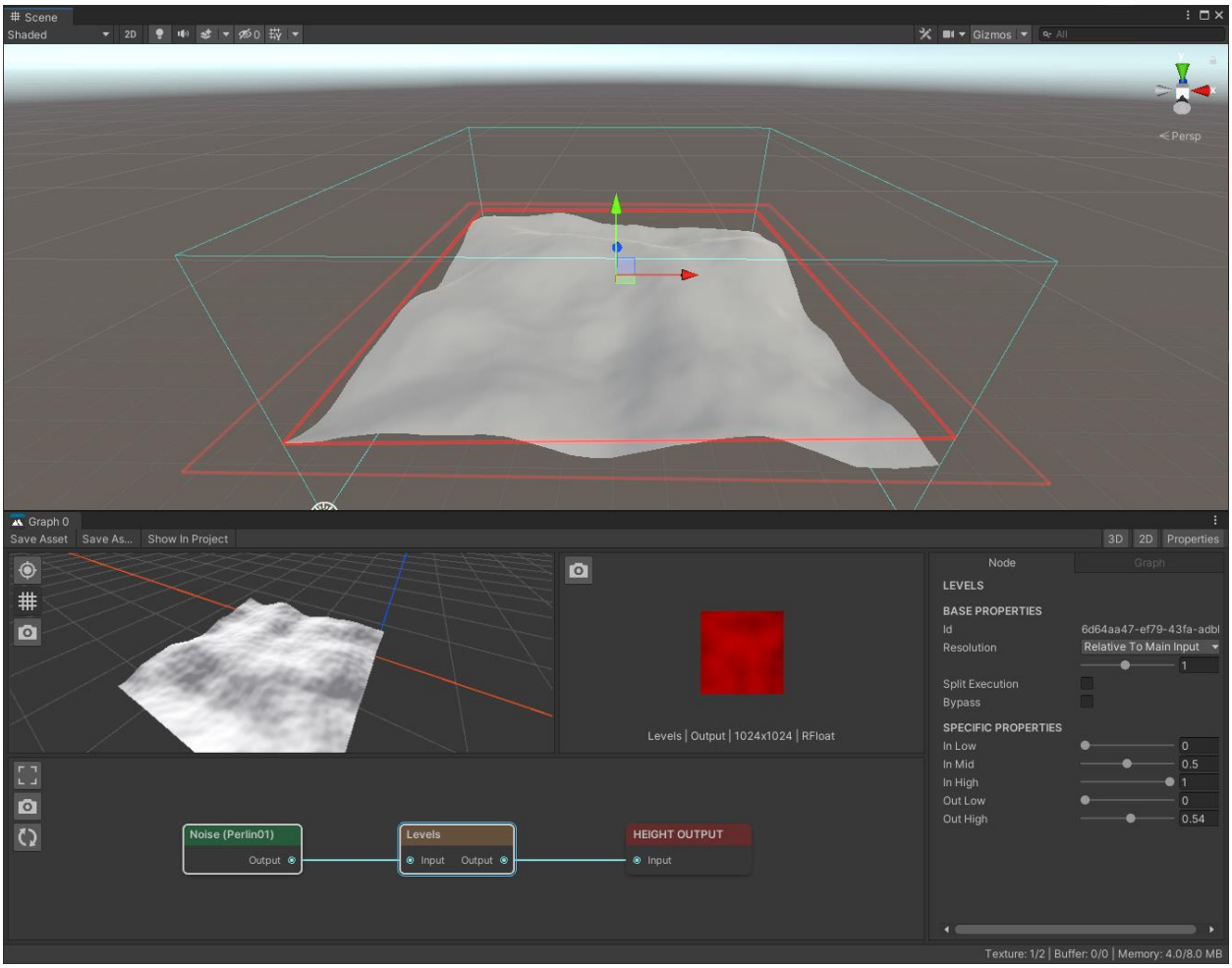
Blend modes

The biome allows you to select which blend mode to use on a specific data type. Please prefer this section for detailed specification.

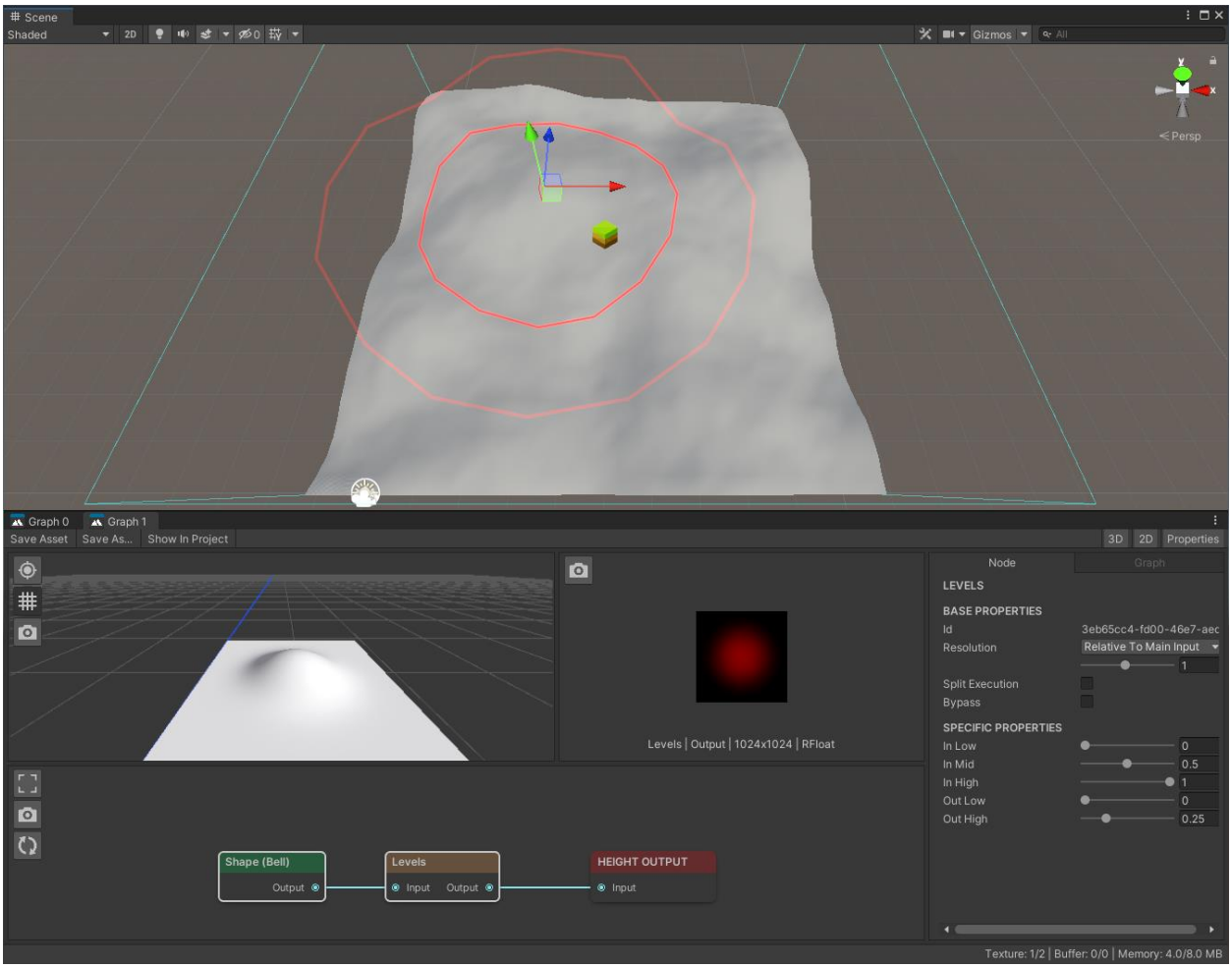
Below are some example of how to use blend mode in specific cases:

Raise or lower the terrains at a region:

First, create a “base” biome that output base geometry using the Graph 0 graph as below:

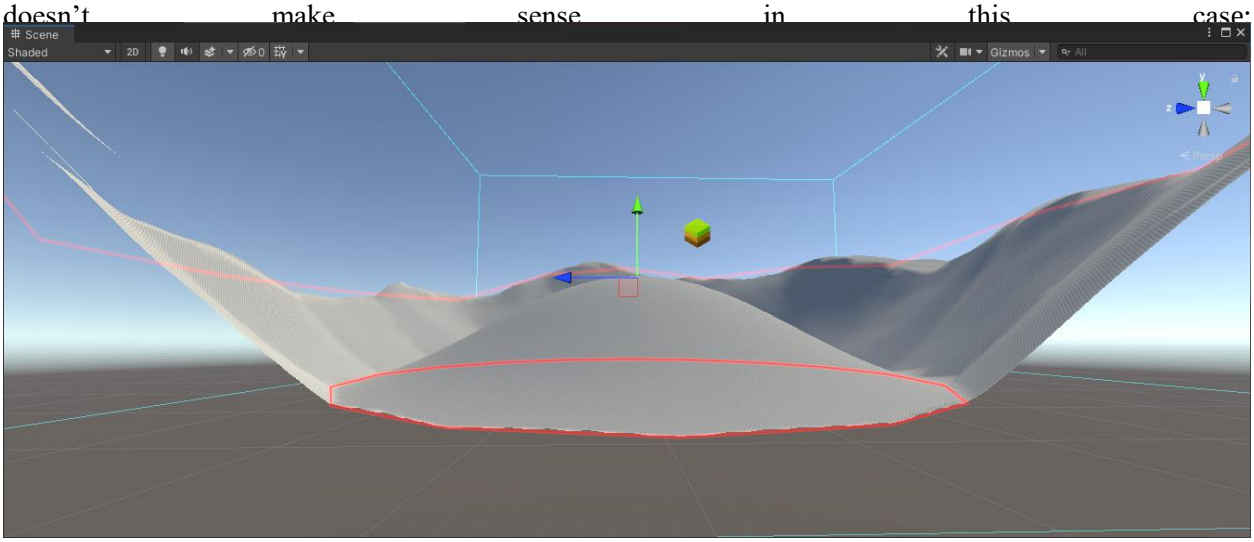


Next, create another biome with circle shape covers a part of the terrain, using the Graph 1 graph like this:



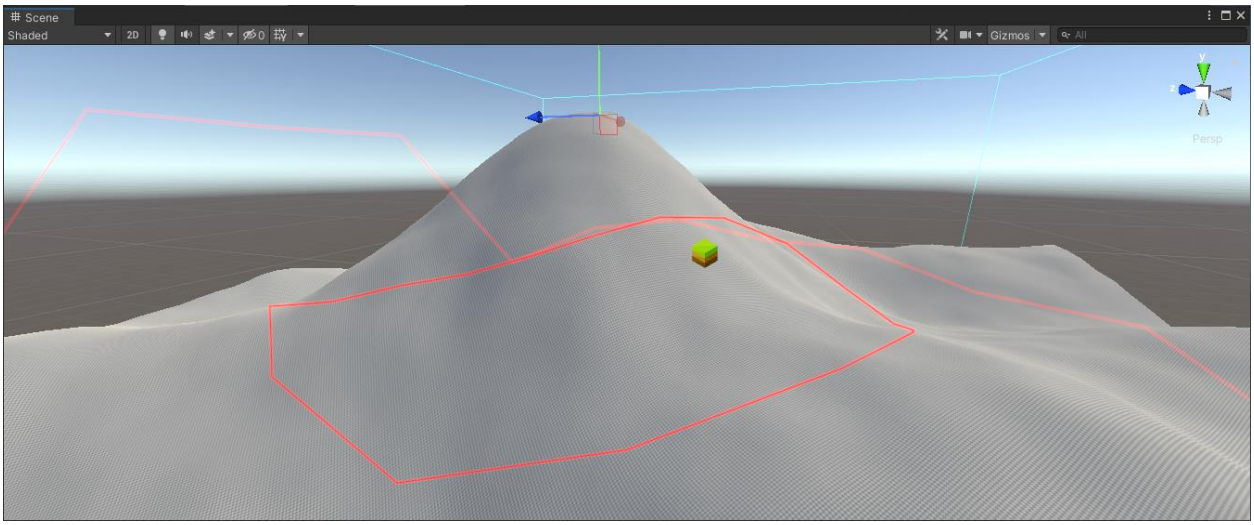
The second biome will just output a bell shape with its value remapped to [0, 0.25], as we will later add/subtract the bell shape to the base terrain.

By default, height map blend mode will be set to Linear, which gradually change from one to another, that doesn't make sense in this case:

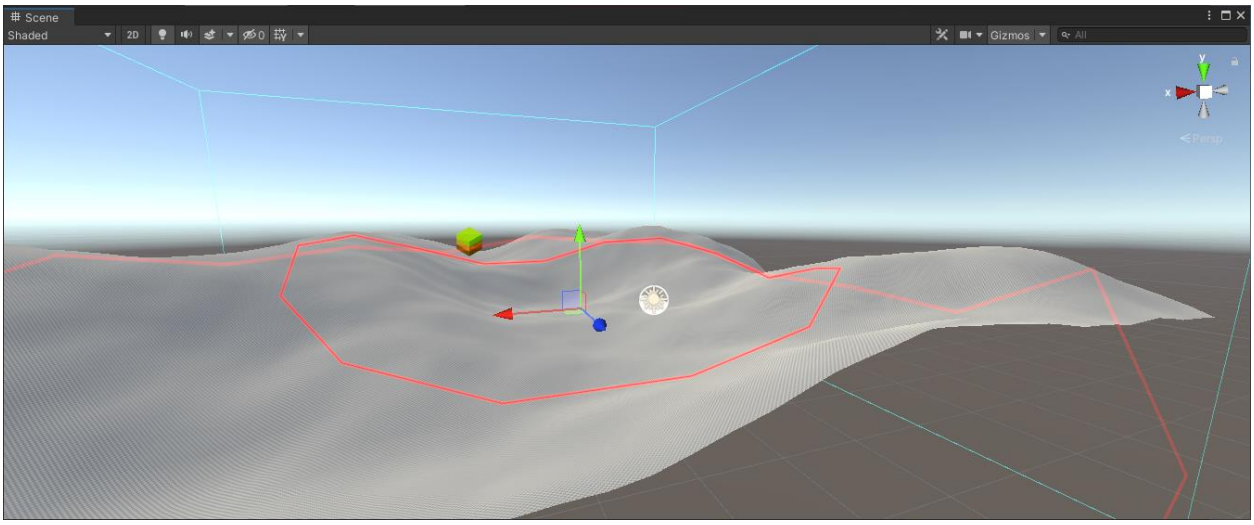


You need to set Height Map blend mode to Addictive or Subtractive for the **second biome**, the result will look like this:

In addictive mode, the terrain raised up:

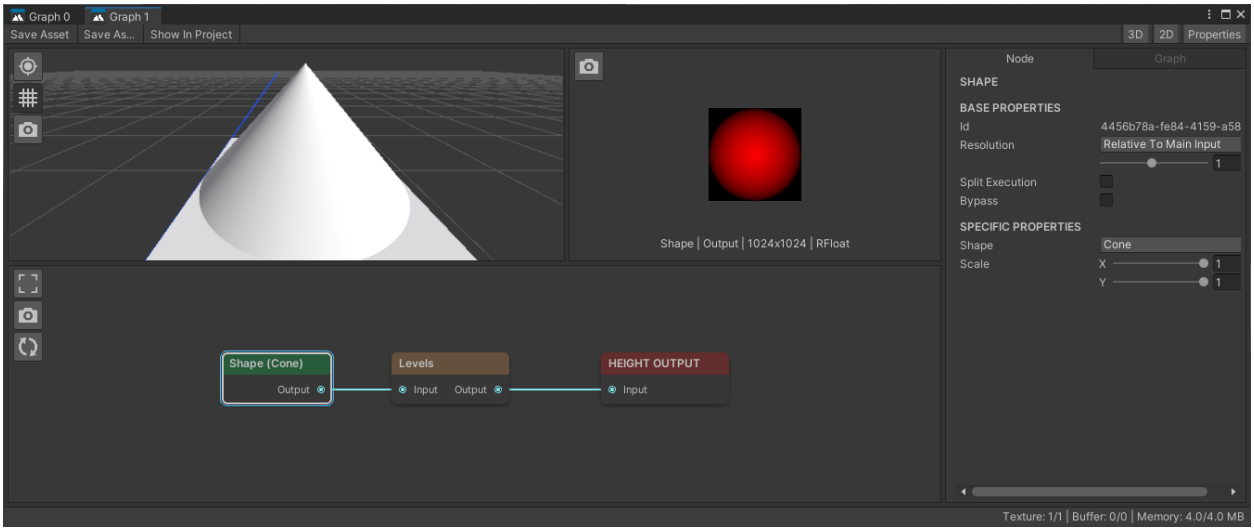


In subtractive mode, the terrain lowered down:

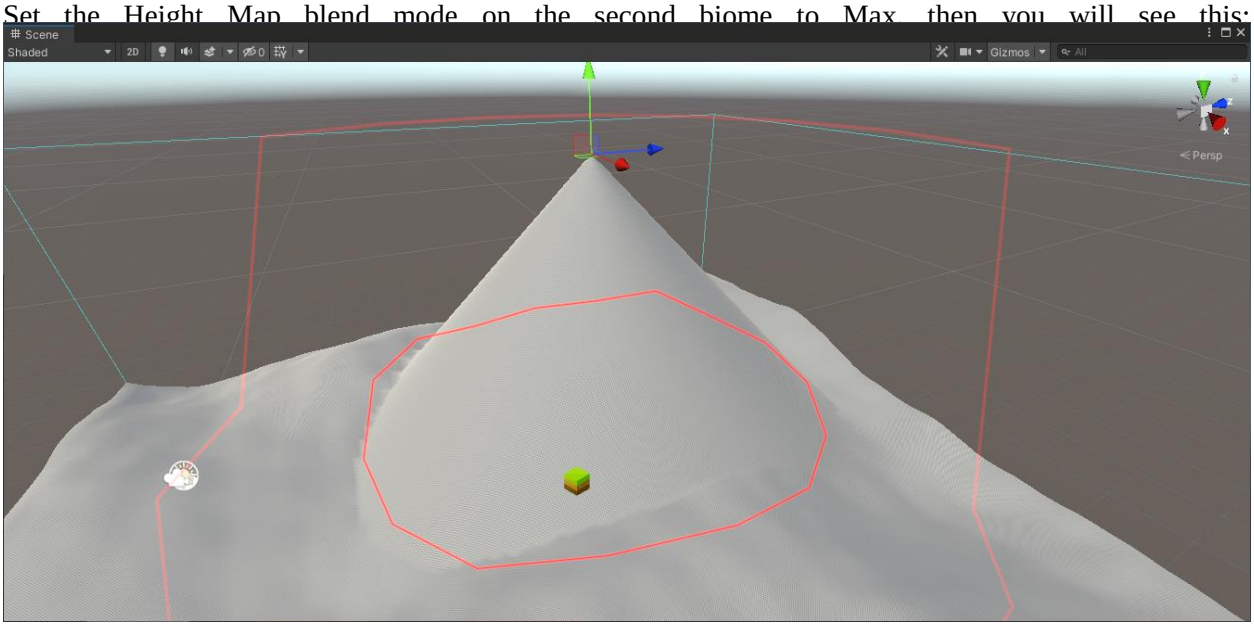


Placing a mountain

Tweak the Graph 1 graph to output a Cone instead of a Bell to see the effect better, also remap it to [0,1]



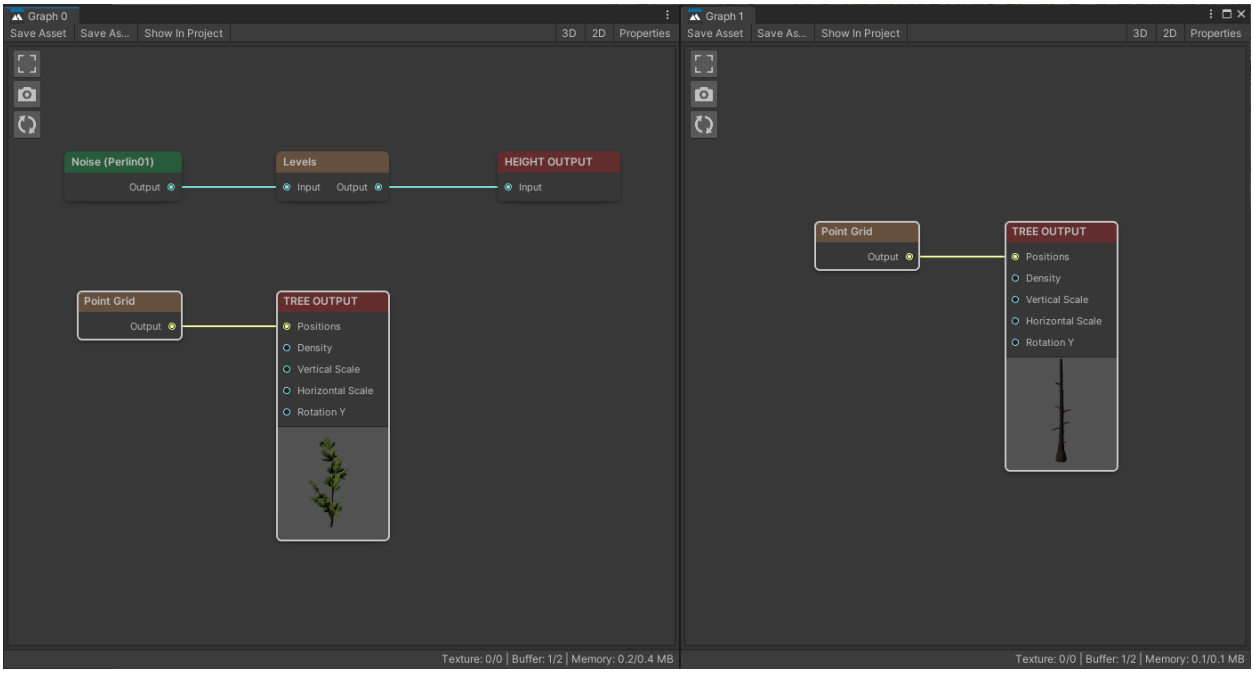
Set the Height Map blend mode on the second biome to Max, then you will see this:



Different from Addictive mode, the Max mode will choose the higher value of the base & the cone, which is suitable for interesting effects such as mountains with sharp transitions.

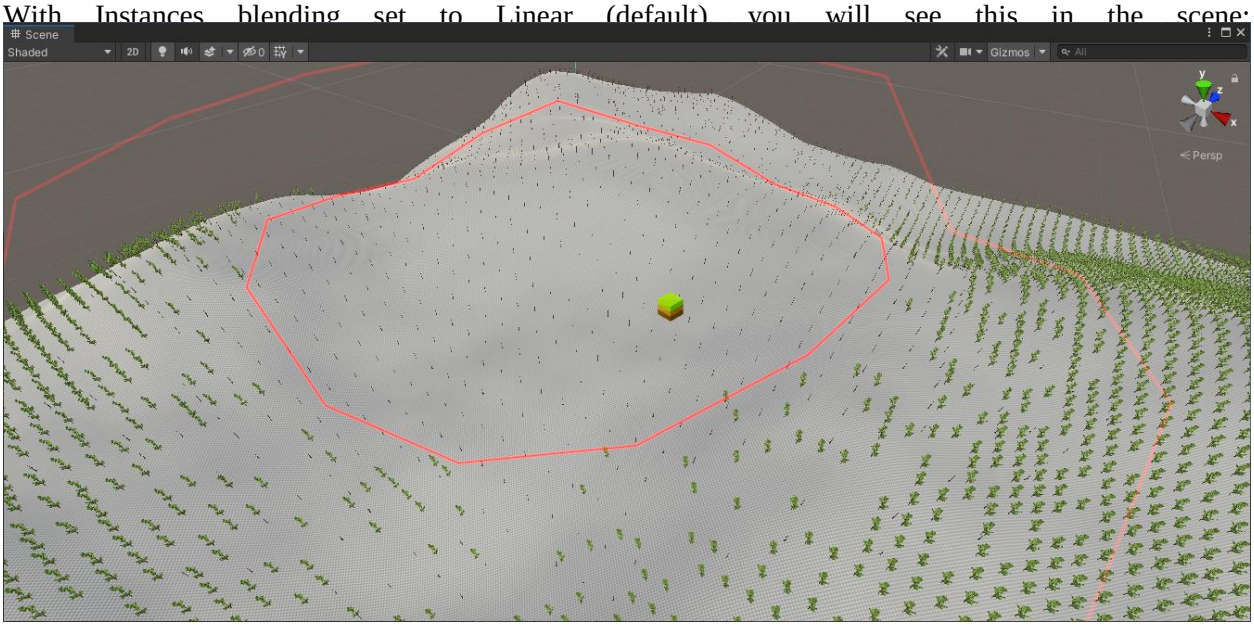
Grow additional tree species at a region

Modify the 2 graph to output some tree like this:



Also remove the Height Output Node for the Graph 1, so it's easier to see what's going on.

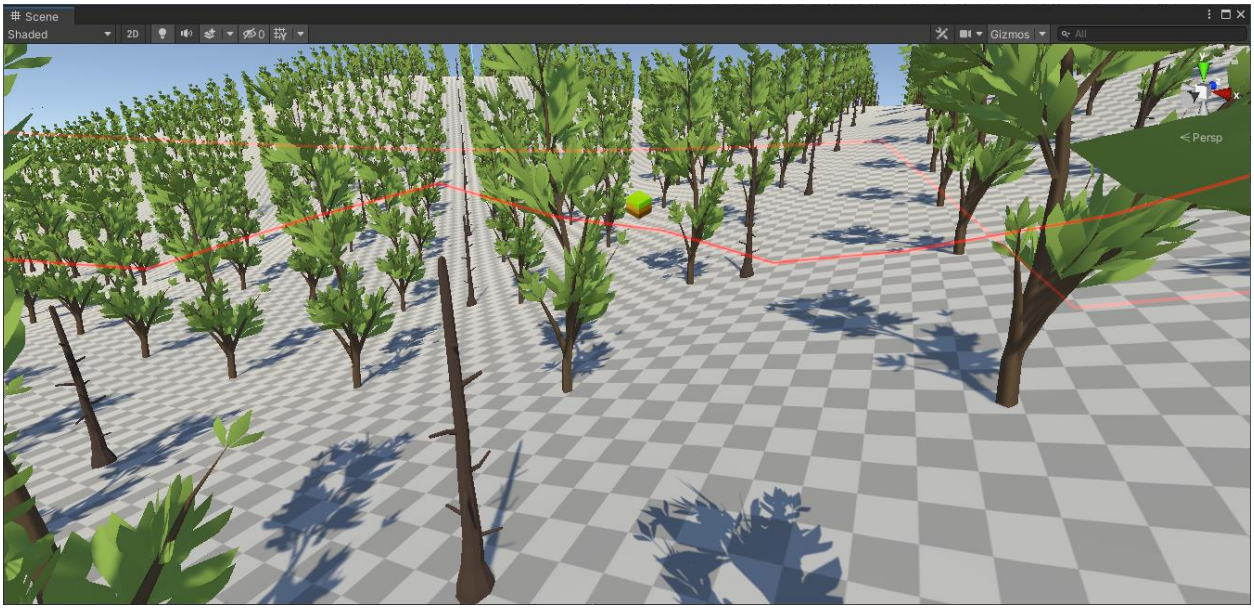
With Instances blending set to Linear (default) you will see this in the scene:



Trees from the below biome (green trees) cannot grow inside the region of the second biome.

In this example, we want to grow some dead trees at that location while keeping the existing trees there. To do so, set the Instance blend mode to Addictive for the **second biome**.

Then the two type of trees will coexist in the same region:



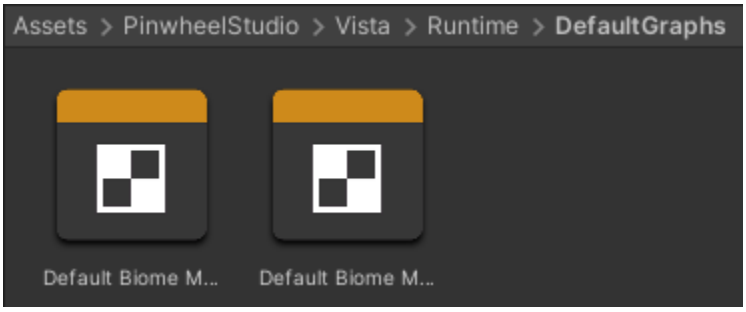
Grow additional grass species at a location

The idea is the same as the tree example above, just set Detail Density blend mode to Addictive for the second biome.

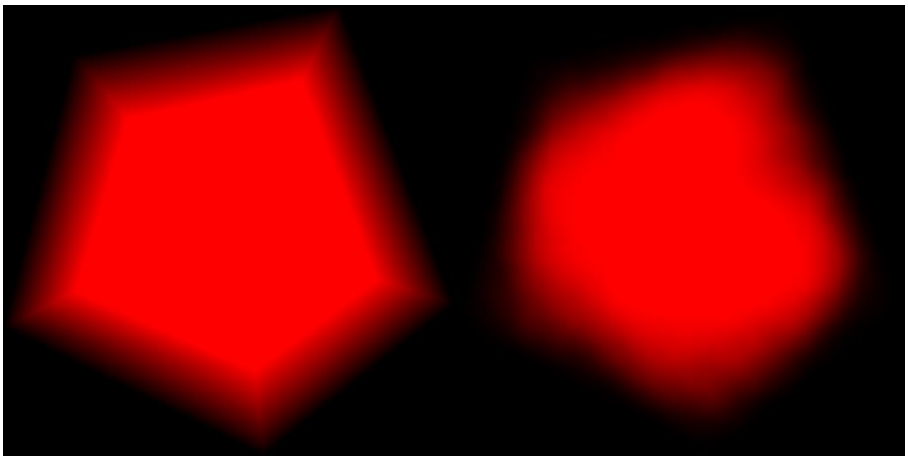
Biome Mask Graph

Biome mask graph is an asset containing rules for mask post processing, it is simpler compared to the terrain graph with less nodes, but quite enough for a fast retouching.

To create a biome mask graph, right click on the Project window, then select **Create>Vista>Biome Mask Graph**.



We provide a **Default Biome Mask Graph** asset for you to get started, located under **…/Vista/Runtime/DefaultGraphs** directory. The default graph will do some smooth and noise blend effect on your biome mask.



To edit the graph, double click on the graph asset. However, it's better to use the "Edit" button in your biome's Inspector to take advantage of contextual inputs.

Additional nodes

The following nodes are added to your library:

- Crack
- Default Value
- Flatten At
- Geometry Mask
- Gradient Map
- Landslide
- Layered Noise
- Slide
- Snow Fall
- Splatter
- Thermal Erosion
- Water Flow
- More in the future

For a detailed explanation of each node, please take a look at this section.