TerraWorld© Quick Guide

Contents

TERRAWORLD© QUICK GUIDE 1

INTRODUCTION 4

FEATURES 4

GETTING STARTED 5

PREREQUISITES 5
INSTALLING 5
EXTERNAL RESOURCES 6

TERRAWORLD USER INTERFACE 7

TABS 7
FOOTER 9
GRAPH GENERICS 10
Clear Button 11
Add Nodes Section 12
Node Settings Section 13

AREA TAB 14

SEARCH FIELD 15
Search Results Window 16
Interactive Map 17
Interactive Map Window 18
TEMPLATES 22
GRAPHS 23

HEIGHTMAP TAB 24

HEIGHTMAP MASTER NODE 25
PROCESSORS 26
Heightmap Source 26

Smoothen Terrain *27*
Water Erosion *28*
Terrace Filter *29*
Thermal Erosion *30*
Hydraulic Erosion *31*
Terrain Deformer *32*
MASK 33
Flow Way Filter *33*
Slope Filter *34*
Area Mixer *35*

COLORMAP TAB 36

COLORMAP MASTER NODE 37
TERRAIN LAYERS MASTER NODE 38
PROCESSORS 39
Satellite Image *39*
Terrain Global Layer *40*
Terrain Detail Layer *41*
MASK 42
Color Filter *42*
Area Mixer *43*

BIOMES TAB 44

MASK 45
Biome Filter *45*
Area Mixer *46*
SCATTER 47
Terrain Tree Scatter *47*
Object Scatter *48*
Instance Scatter *49*
TERRAMESH 50
Water Generator *50*
Mesh Generator *51*

TERRAIN RENDERING TAB 52

TERRAIN RENDERING MODE 53
TESSELLATION 54
HEIGHTMAP BLENDING 55
COLORMAP BLENDING 56
PROCEDURAL SNOW 57
TERRAIN LAYERS 58

VFX TAB 59

DAY NIGHT CYCLE 60
CLOUDS 61
ATMOSPHERIC SCATTERING 62
WIND 63
HORIZON FOG 64
SNOW 65

Water 66
Post Processing 67
Advanced Settings 68
GLOBAL SETTINGS TAB 69
World Creation Mode 70
Data Cache 71
Preview Quality 72
Splatmaps 73
Terrain 74
Background Terrain 75
Scene View 76
Debug Log 77

Introduction

TerraWorld© is a Unity plugin to create close to reality environments using real-world data from ESRI, NASA & OpenStreetMap along with built-in algorithms for procedural generation and placement of 3D assets in scene.

It's a fully automatic level designer system working on top of a graph based system where users define settings in graph modules acting as connected nodes each handling specific operation to finally create or place assets on top of terrain in scene.

The current system consists of various sections in order to handle all settings for world creation. The whole settings can be saved into a preset file which is easily shareable between TerraWorld© users.

Features

- Node-based user interface easily shareable between TerraWorld users
- Creates detailed terrain surfaces using real-world elevation and satellite imagery
- Heightmap filters such as Erosion and Terrace to generate realistic terrain surfaces
- Outputs slope and flowmap masks from heightmap
- Analyzing satellite images using filters such as "Color Filter" and use generated masks to create terrain layers used for terrain texturing
- Outputs specific area features such as water, trees, grass and etc. from online landcover data and pass generated masks to "Mesh Generator" or "Scatter" nodes in order to create 3D models where needed and populate assets in scene.
- Customized terrain shader which adds high-end features such as DX11 Tessellation, Height and Colormap Blending, Procedural Snow and Stochastic Texturing for terrain rendering.
- Biome Templates which are pre-made graphs to cover various biome types in nature such as Forests, Grasslands, Deserts and Tundra environments.
- Customized Standard Shader which supports Procedural Snow, Wind, Double Sided Rendering and Height-based Tessellation features.
- Users can create new graphs or edit and customize existing ones to setup desired environment elements in scene.
- Day Night cycle with automatic dynamic lighting adoption through the entire scene
- Billboard Clouds Rendering with semi-volumetric representation
- Atmospheric Scattering to cover Volumetric Lighting and Aerial Perspective Fog
- Wind Simulation to support vertex animation in materials
- Horizon Fog to fill in the gaps at scene horizon level and blend world bounds with sky
- Procedural Snow coverage for the entire scene
- Customized Water Shader with flowmapping support on surface
- Compatible with Unity's built-in Post Processing solution

- Scatter objects and GPU Instances based on user-defined or analyzed environment elements such as slope, color, biome type and etc. in the scene with built-in high performance rendering.
- Water area extraction from real-world landcover sources and automatic generation of lake and river surfaces.
- Generated copies of terrain surface at specific areas based on user-defined rules or analyzed environment elements such as slope, color, biome type and etc.
- Automatic Cache system to work in offline mode
- Different Scene View modes to take the editor camera to specific hot spots.
- Includes massive collection of hand-edited resources to start with creating desired landscapes.
- In-Editor terrain preview before world generation.

Getting Started

These instructions will get you a copy of the project up and running on your local machine.

Download provided unity package from TerraUnity's webstore or Unity's AssetStore and import into Unity.

Prerequisites

- Unity 2018.3 and up is required

Installing

When the package is imported in project for the first time, you need to do the following instructions to remove the errors and get TerraWorld running.

1. From Unity's menu go to Edit => Project Settings
2. Go to Player settings
3. Select "Other Settings" section
4. Set Color Space to Linear
5. Set Scripting Runtime Version to .Net 4.x
6. Set API Compatibility Level to .Net 4.x
7. Enable "Allow Unsafe Code"
8. From Unity's menu go to Window => Package Manager
9. Find Post Processing Stack package from the list and install the latest version
10. Load TerraWorld from Unity's menu and go to Tools => TerraUnity => TerraWorld

In order to load TerraWorld plugin, go to:

Tools = > TerraUnity => TerraWorld

In order to load Help file, go to:

Tools = > TerraUnity => Help

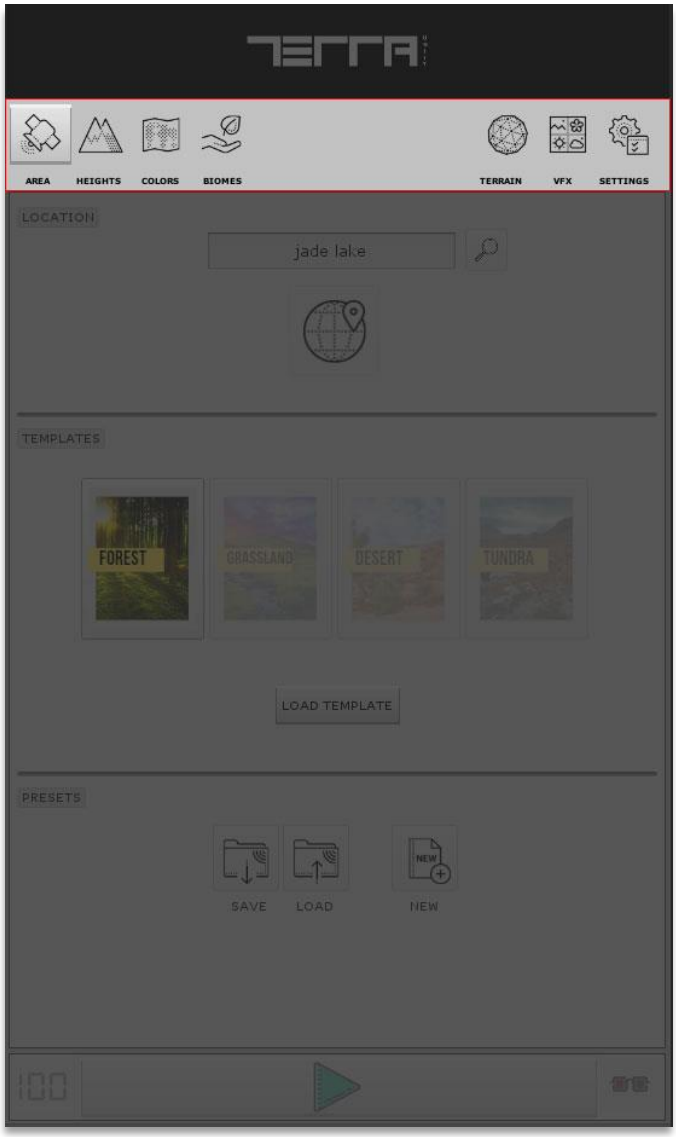
In order to access social links for TerraUnity, go to:

Tools = > TerraUnity => Contact Us

External Resources

- Environment assets from Unity's " Book of the Dead" demo
- Environment assets from Unity's " Fontainebleau" demo
- Some Free stuff from the Unity AssetStore
- TerraUnity Art Team's terrain textures (copyrighted content)
- TerraUnity's custom graphics & rendering assets (copyrighted content)

TerraWorld User Interface



Tabs

Users can select between available tabs to create or edit graphs and settings for world generation.

The current system includes tabs of “Area”, “Heightmap”, “Colormap”, “Biomes”, “Terrain Rendering”, “VFX” & “Global Settings”.

Area Selection
This is where users define the area for world generation through a user-friendly interactive 2D map window. You can also toggle on a 3D preview map in scene to get an overview of the final environment.

Heightmap
This is the graph where users define heightmap and surface properties through various nodes of filters, masks and operators. The filters take input height data and process using realistic erosion, terrace and deformation filters and analyze surface to output slope, flow, curvature & aspect maps to be used by other nodes.

Colormap
All operations of satellite imagery analysis and terrain texturing is being done through this graph. The system uses advanced image processing algorithms to create a realistic colormap by analyzing satellite image pixels and surface analysis along with blending of detail textures based on obtained landcover.

Biomes
All environment elements which needs to be created or populated in the world can be handled through this graph. This graph includes specific biome extractors to detect landcover zones and use Scatter and MeshGen modules to place user-defined 3D models in scene and create procedural models where needed.

Terrain Rendering

This is where you define the type of terrain material and its features based on target platform. The Modern Rendering feature in this section uses TerraWorld©'s custom terrain shader which supports:

- DX11 Tessellation & Phong Smoothing
- Height Blending of detail textures for sharp looking texture blending
- Colormap Blending for far/close blending of created colormap (derived from satellite image) with detail textures from camera position
- Procedural Snow with full controls over strength, opacity and angle distribution
- Procedural Puddles to scatter puddles along flat areas of terrain
- Stochastic texturing to remove tiling artifacts due to high frequency details in textures
- Per layer Material Properties of Color, AO (Ambient Occlusion), Metallic & Smoothness.

VFX

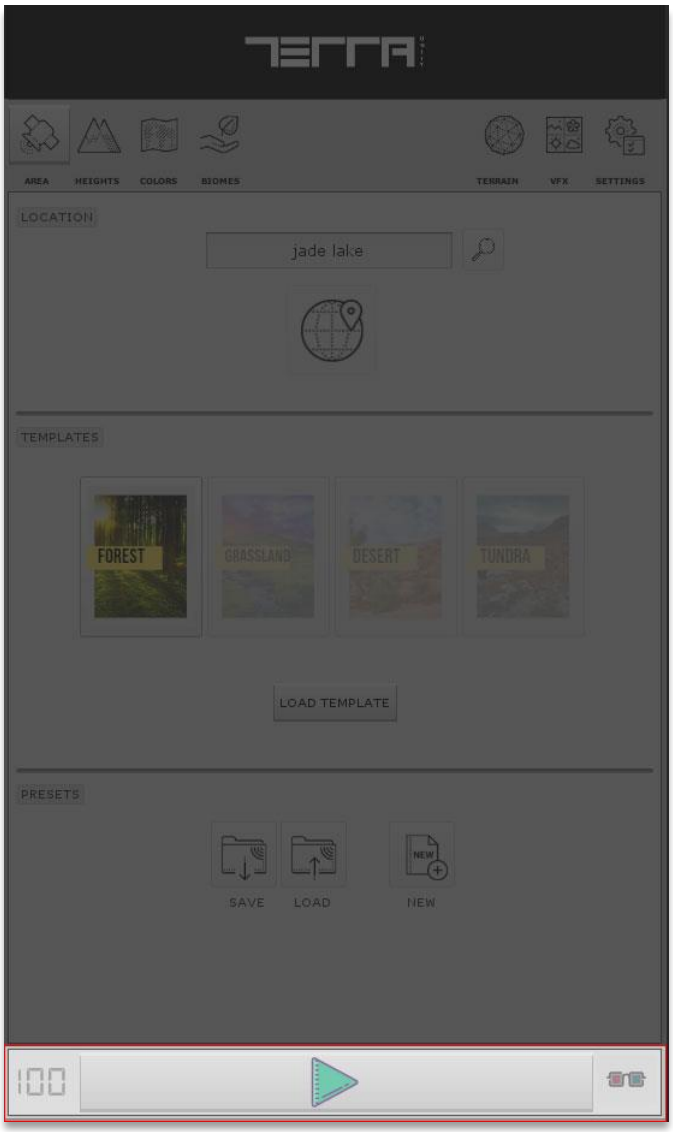
In this section we set all visual properties of the scene to define features such as day/night cycle, clouds rendering, atmospheric scattering, volumetric lighting and fog, season setup, real-time reflections and post processing. This gives users the ability to setup their desired mood and atmosphere in scenes.

General Settings

This section handles core general settings of the TerraWorld© system in order to toggle on/off specific features used in background operations and also UI.

Footer

Progress Bar: Loading progress for the generating world.
Generate Button: Generates a world in the scene based on current graph.
3D Button: Previews a 3D terrain in the center of the scene to give an overview of the generating world.

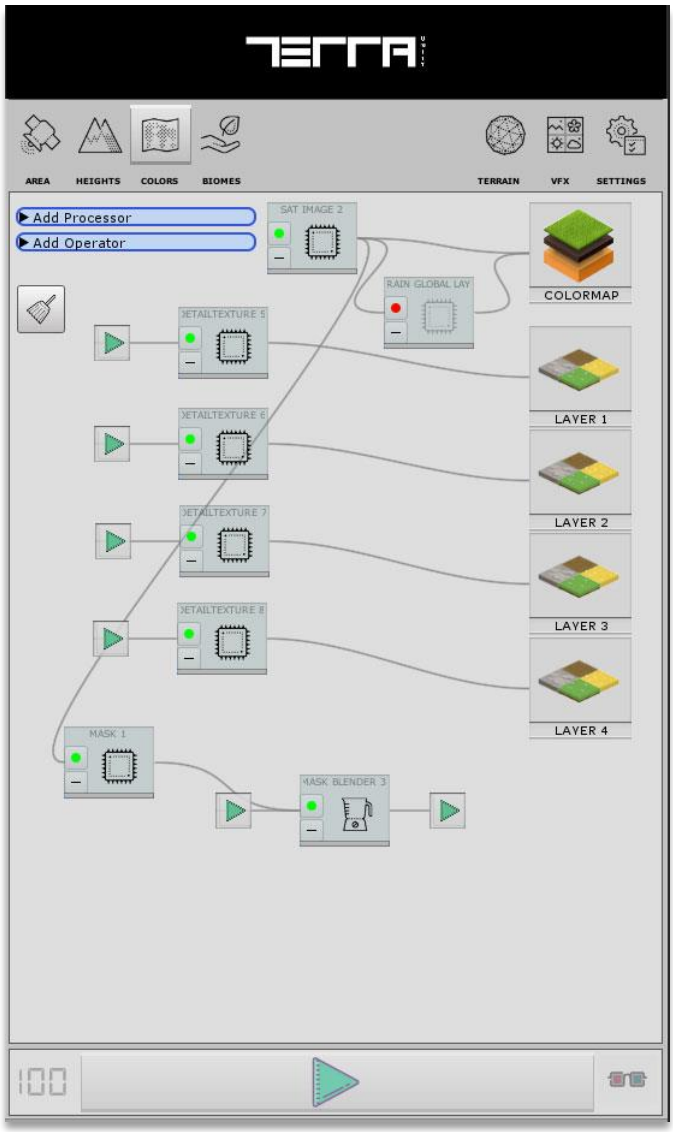


Graph Generics

3 tabs of “Heightmap”, “Colormap” & “Biomes” represent a graph-based UI which you add/remove/edit modules from the list of pre-built nodes each responsible for specific operation.

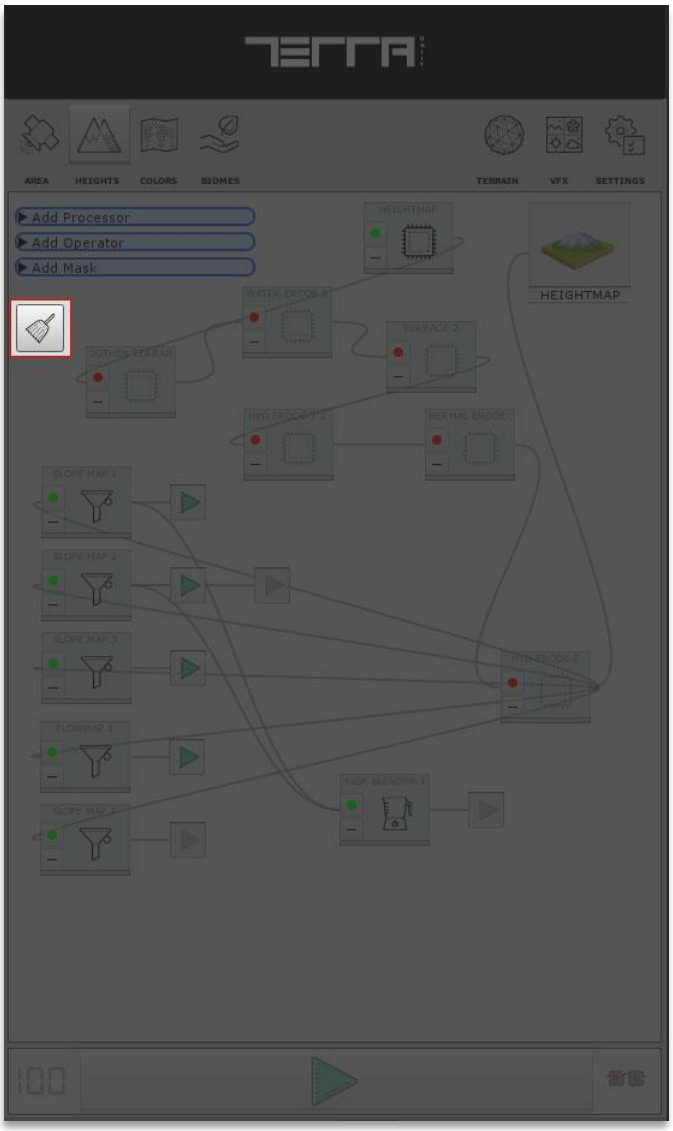
TerraWorld© comes with node types of “Processor”, “Mask”, “Extractor”, “Scatter” & “TerraMesh”.

Each node can be enabled/disabled without needing to be added or removed from the graph and also can be deleted from the graph.



Clear Button

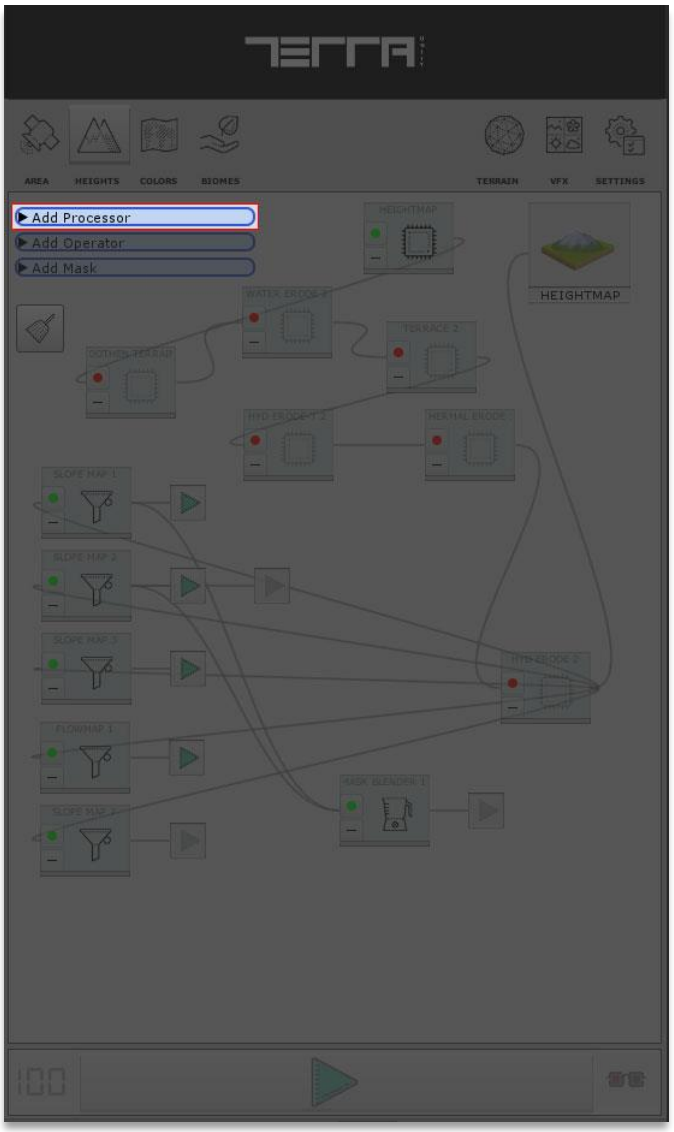
Pressing the Clear button will clear all nodes in the current graph



Add Nodes Section

Processors are type of nodes which alter input data based on specific operation and output the same data type.

From the “Add Processor” dropdown menu user can add a Processor node from the list.



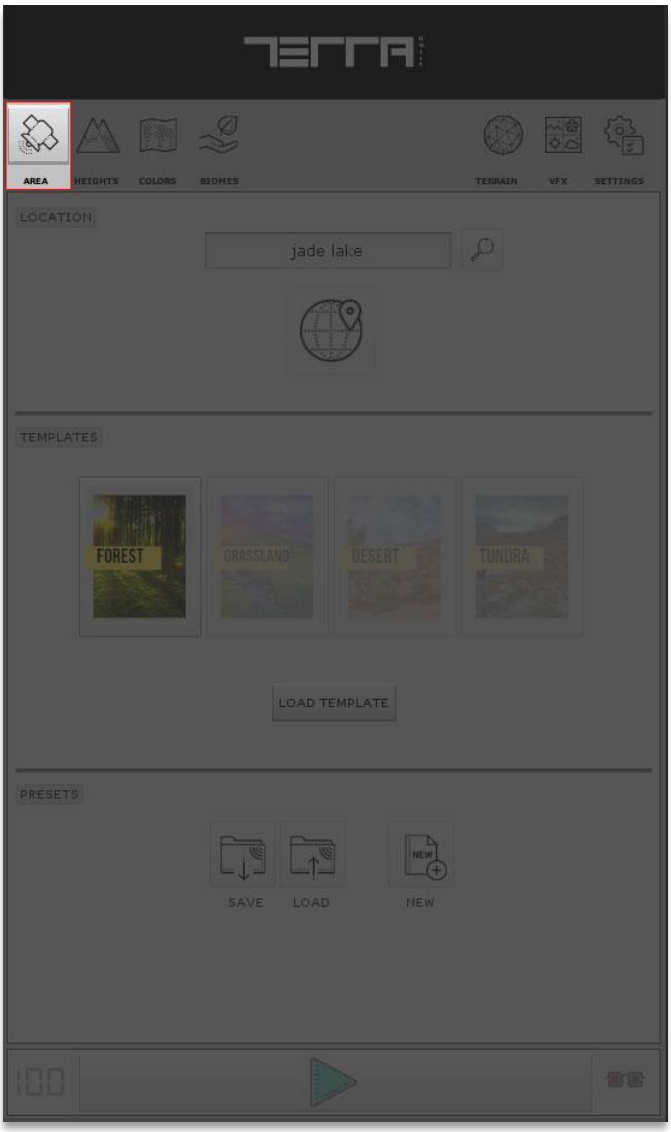
Node Settings Section

All node settings will be displayed here for the users to set current node's parameters.

This section will be appeared by selecting a node on the graph.

Area TAB

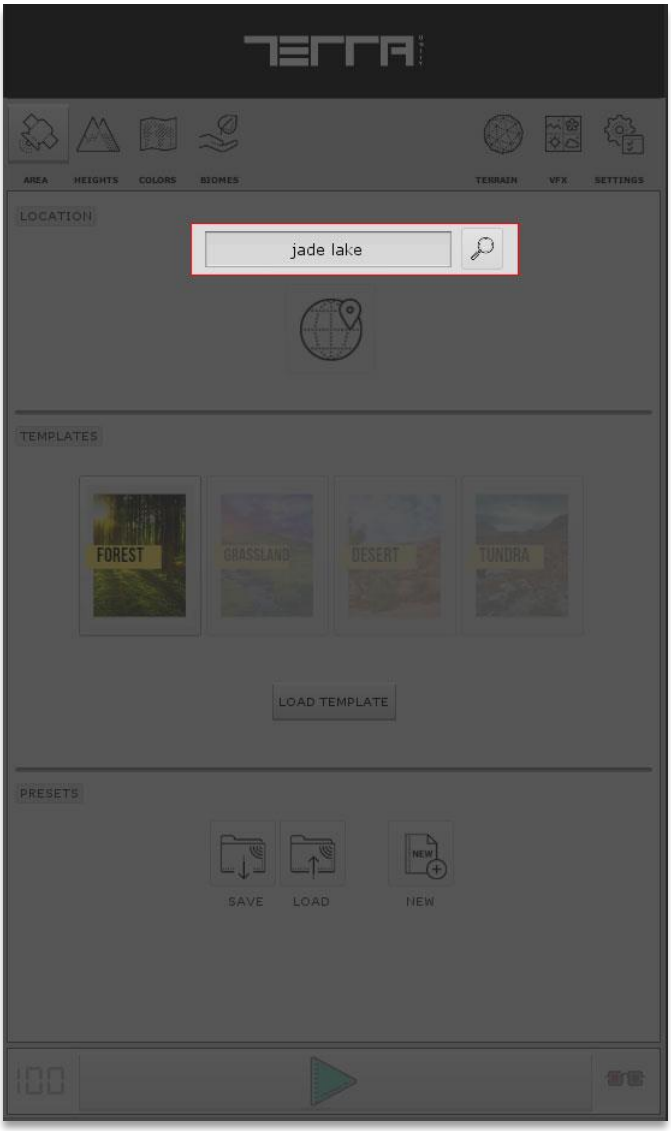
This is where you define world location and area size along with selecting Biome type and manage graphs to save/load customized graphs or load pre-made graphs that comes with TerraWorld©.



Search Field

Type in a location name or address anywhere on Earth.

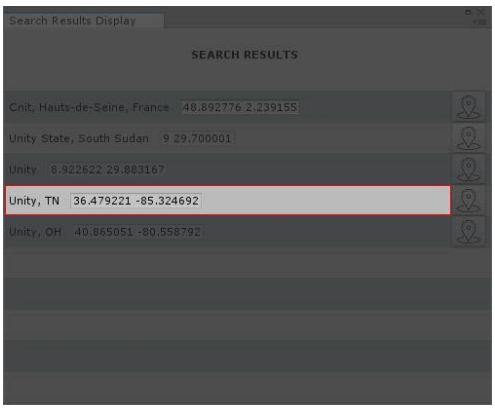
Pressing Search button will bring up a results window where you can set the center location for generating world.

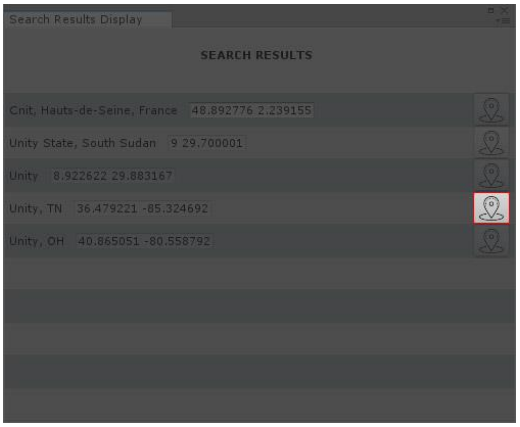


Search Results Window: When Search button is pressed, the search results window will pop up.

List of query results with location names and point coordinates in Decimal Degrees (Left Image).

Pin button to set center point of the world origin (Right Image).

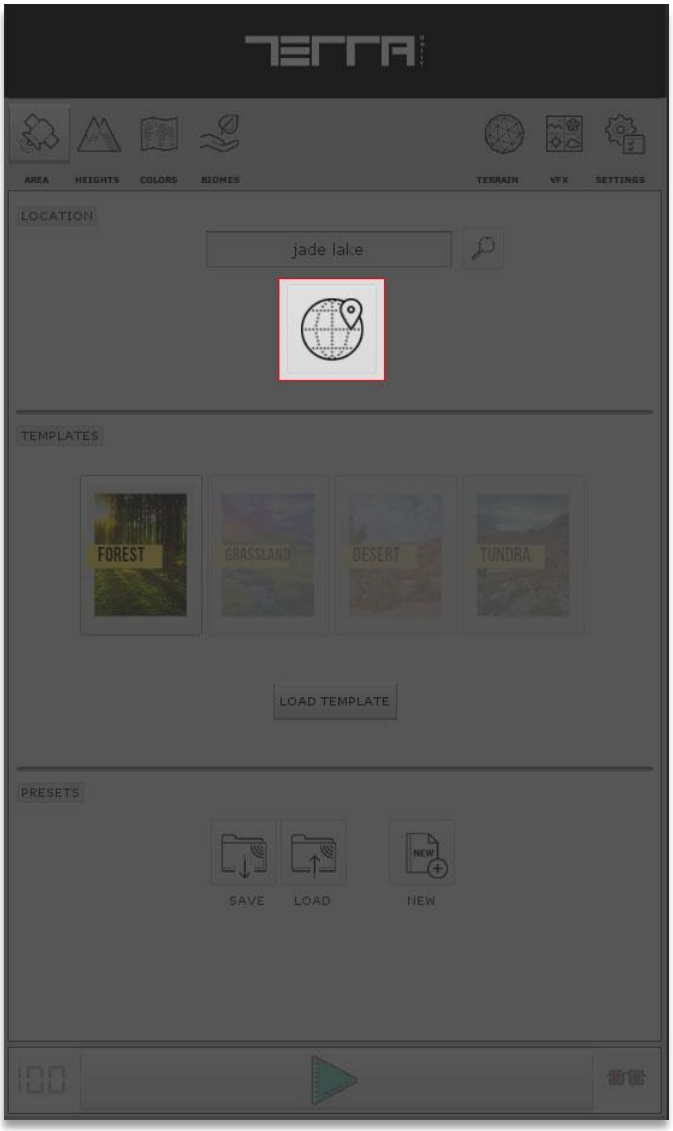




Interactive Map

Pressing the Placemark button will open up a new window displaying an interactive map to select area of interest through a **2D** map.

The Interactive Map window will be loaded with latest used parameters.



Interactive Map Window

The Interactive Map is a dockable window which gives users the ability to navigate the entire Earth through a Satellite Image or LandCover style 2D map.

Show HUD: Enable/Disable window UI controls

Lock Area: Enabling this option will lock area bounds even if user changes map location

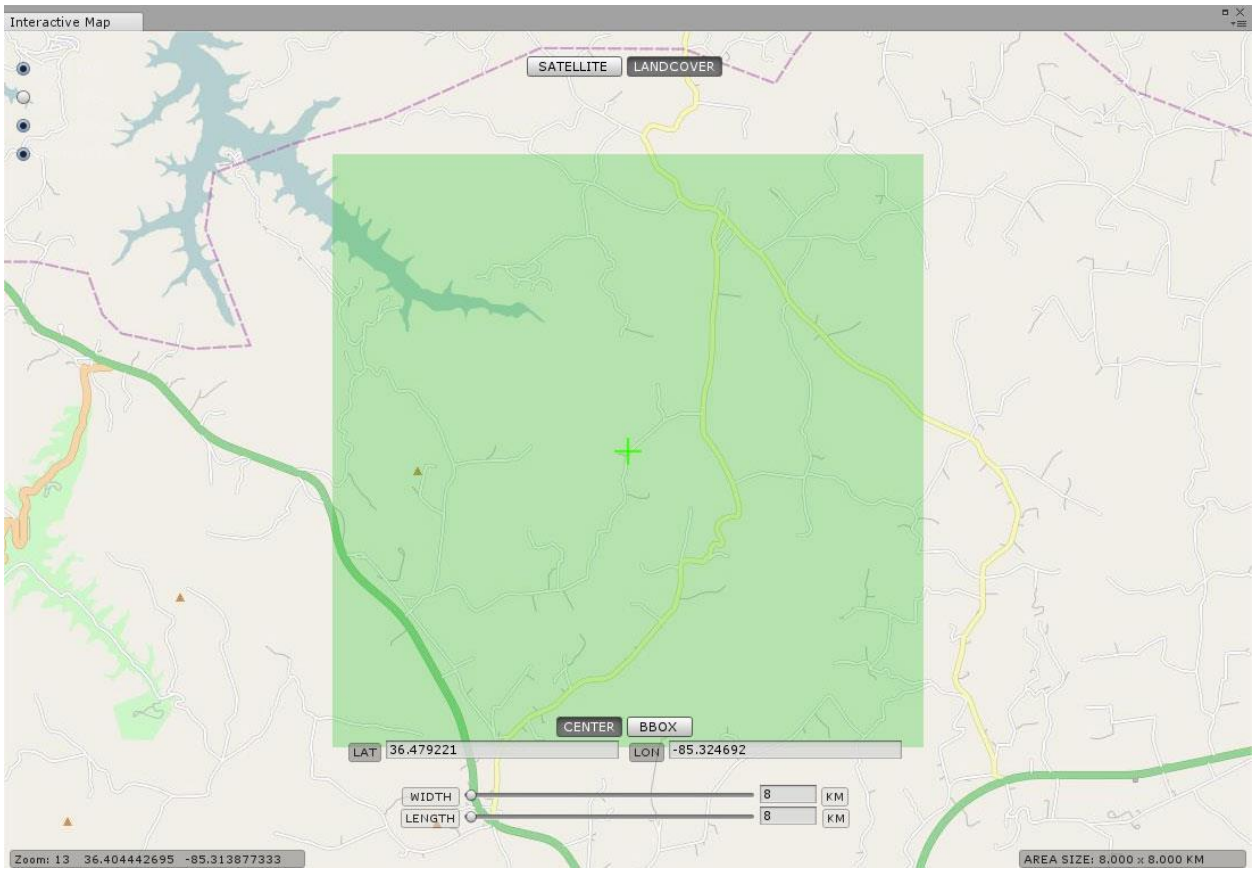
Show Bounds: Turns the area selection graphic on or off

Show Cross: Enable/Disable center cross graphic

Map Styles

Satellite: The base map preview style will be in aerial photo style

Landcover: The base map preview style will be in OSM Landcover style (Following Image)



Area Selection Mode

World area in TerraWorld© is defined using 2 modes of “Center” & “BBox”

Center: Set center point’s Latitude & Longitude coordinates in Decimal Degrees format and specify Width & Length of the area in kilometers.

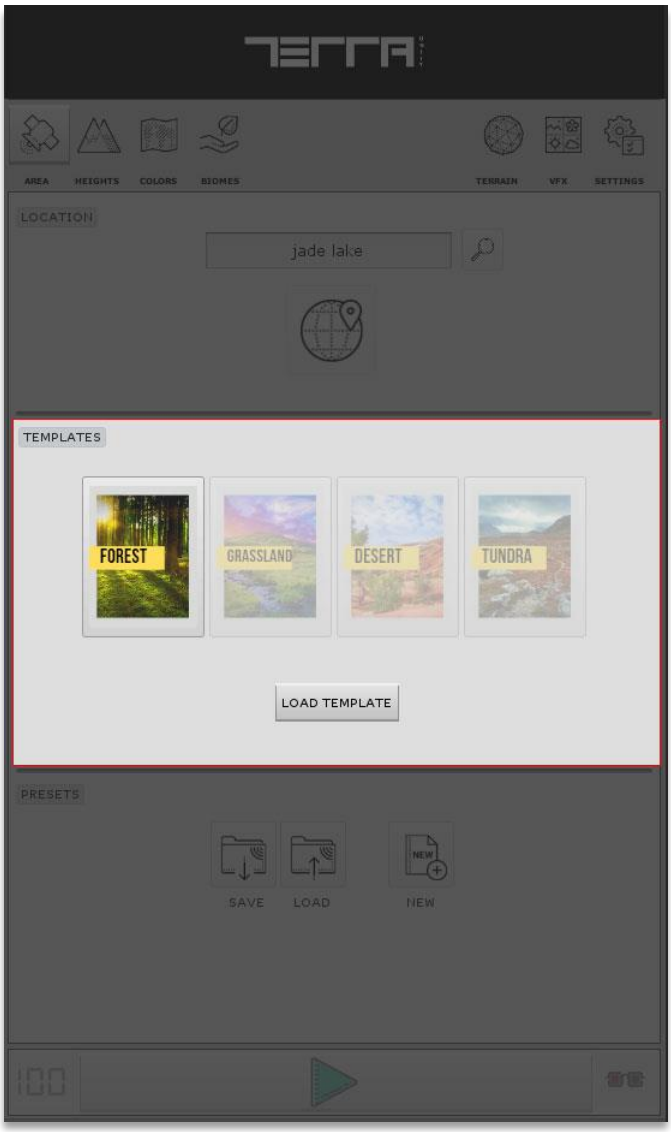
BBox: Insert arbitrary Top, Left, Bottom & Right coordinates in Decimal Degrees format to specify the area.

Templates

TerraWorld© includes some pre-designed graphs called templates.

Users can select any of these templates as a base and make own changes.

Note: Loading any of the Templates will overwrite all options except Area Selection and General Settings tab



Graphs

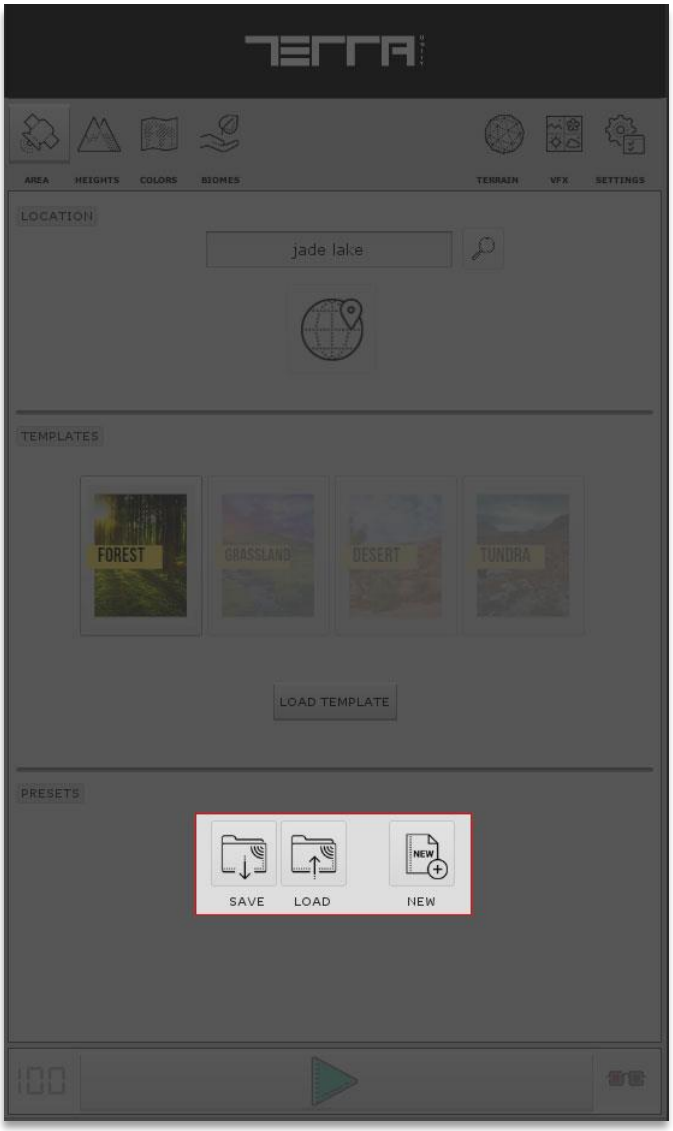
TerraWorld© is a graph-based system and users can create scenes from real-world data by defining node settings.

User can select the graph preset from the pre-defined graphs built-in in TerraWorld© or create new ones from scratch along with saving or loading previously generated ones.

New:
Create and empty graph in TerraWorld© and then user can modify or design his/her own graph.

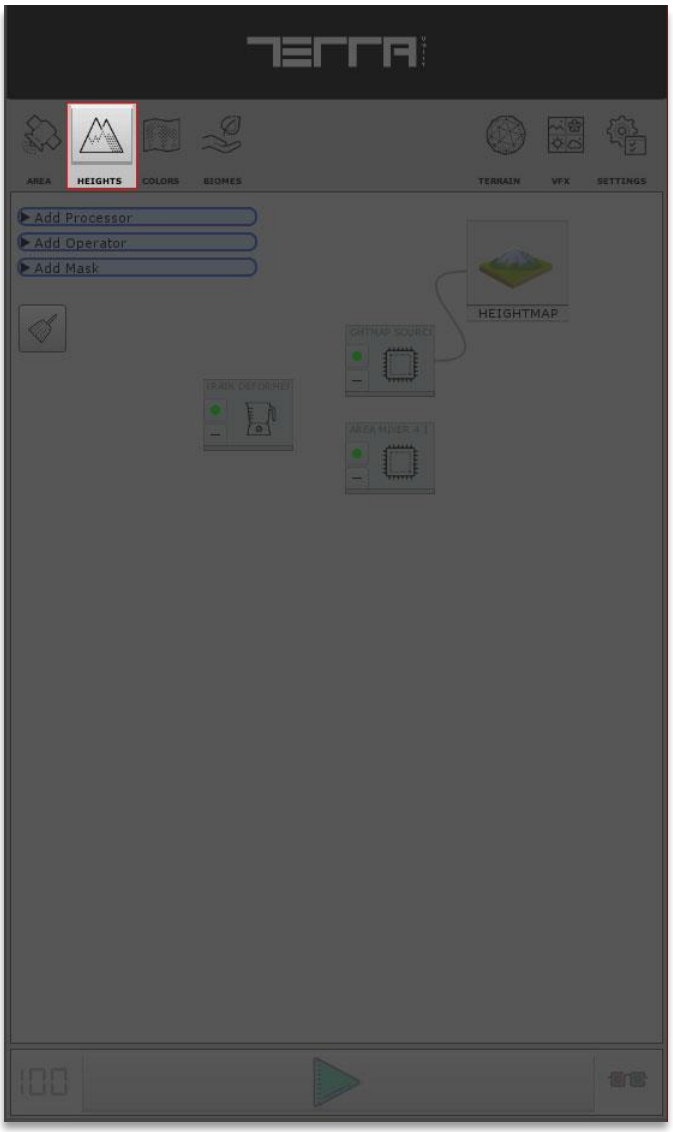
Save:
Saves current graph settings in UI into a file for later usage or world sharing between TerraWorld© users.

Load:
Loads previously generated graphs in TerraWorld©.



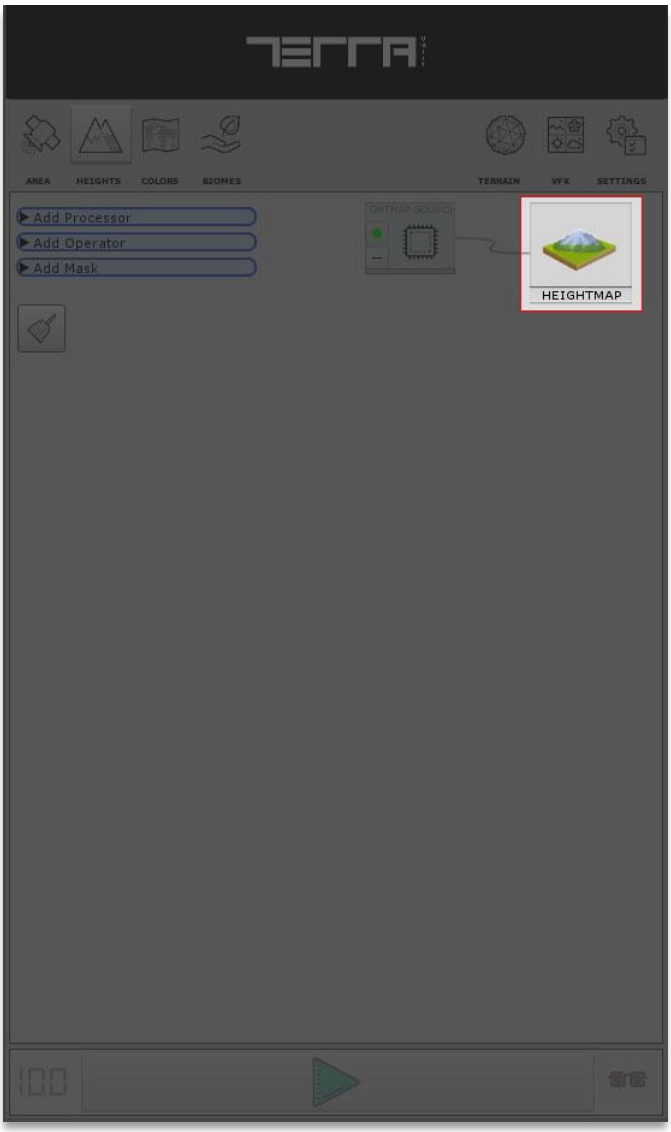
HEIGHTMAP TAB

Here you can add/remove/edit modules that operate on heightmaps to finally create terrain surface in world or use data in other nodes.



HEIGHTMAP MASTER NODE

Receives the last heightmap node in graph tree and applies to terrain surface.



PROCESSORS

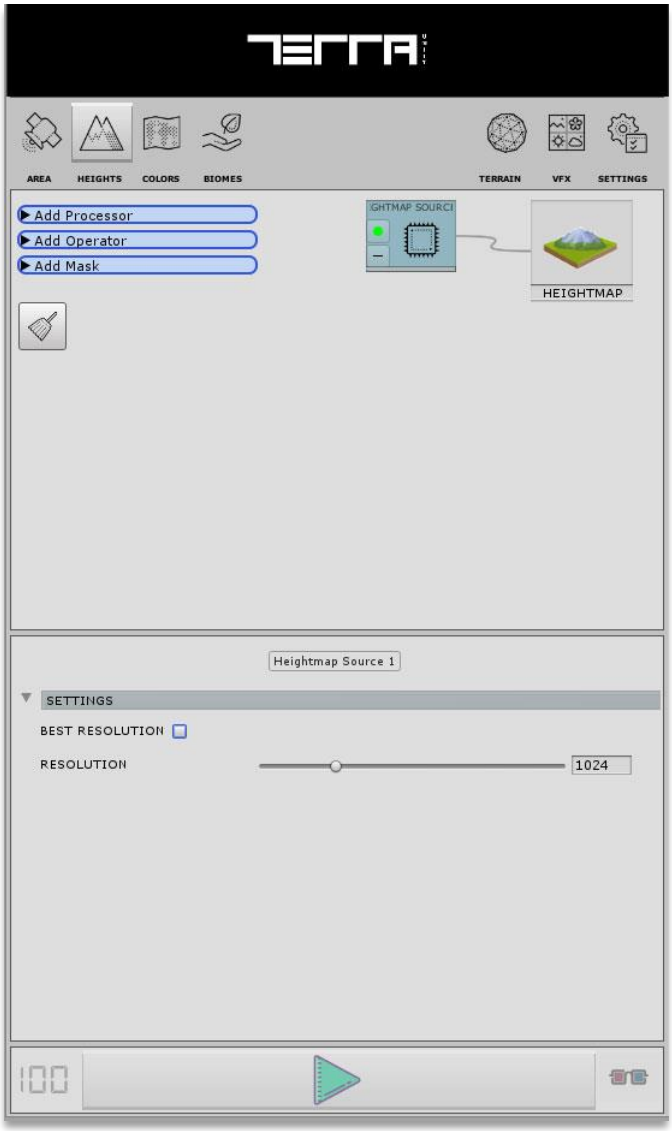
Processors are type of nodes which alter input data based on specific operation and output the same data type.

Example: “Smoothen Terrain” processor node in heightmap graph takes a processed heightmap from previous node and smoothen out the surface and then pass the result to the next node.

Heightmap Source

Provides the heighmap data for the selected area.

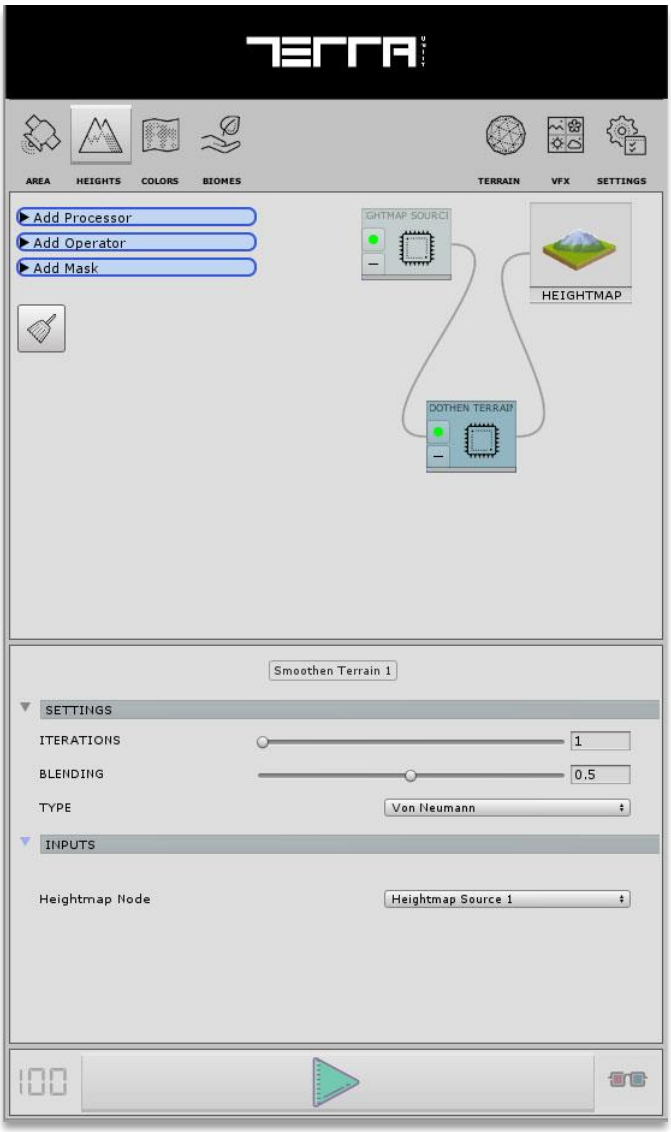
Best Resolution: Automatically detects the best resolution from the data server and retrieves data from source.
Resolution: If “Best Resolution” option is unchecked; users can define an arbitrary resolution value for the heightmap source.



Smoothen Terrain

Smoothen Terrain node, inputs heightmap to remove unwanted jagged edges and terraces on surface usually occurred by resample operation's banding artifacts.

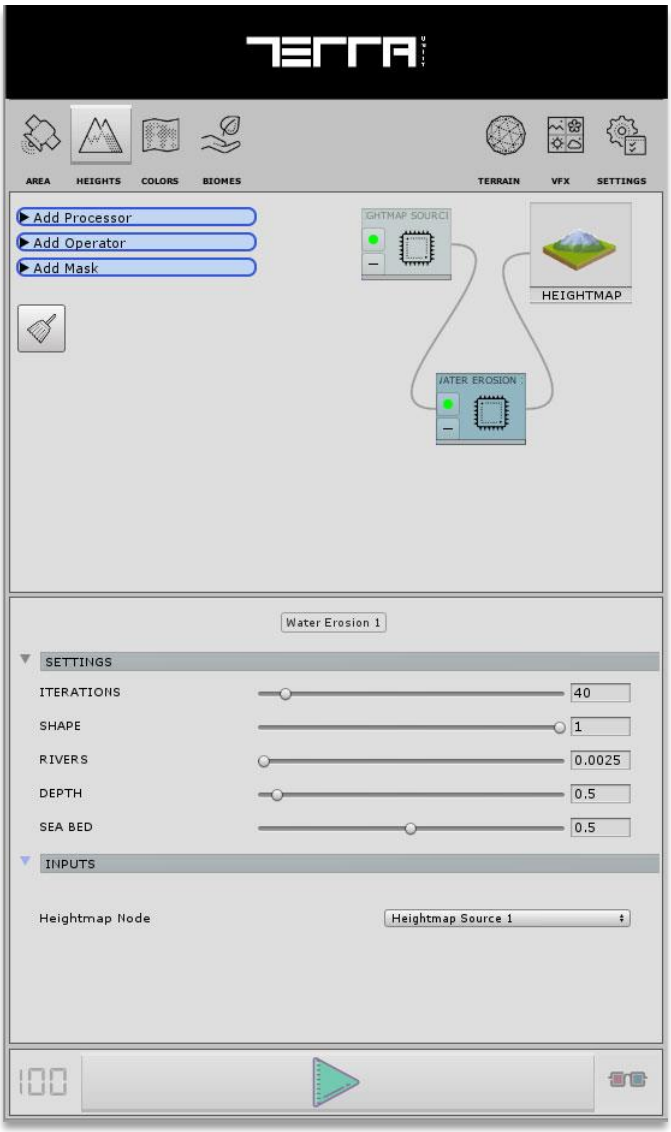
Iterations: Number of iterations Smoothing operation will be applied on heightmap
Blending: Blending between the new smoothed & old heightmap shape
Type: Type of the Smooth operation



Water Erosion

“Water Erosion” node, simulate the water erosion effects on the input heightmap

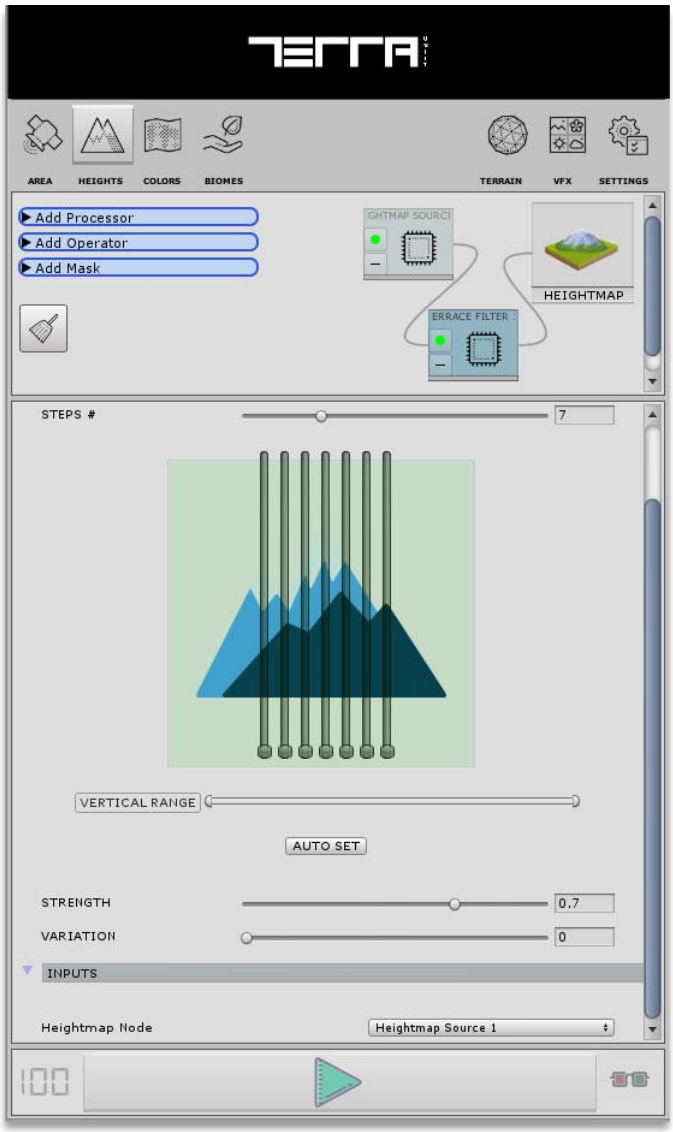
Iterations: Number of iterations that “Water Erosion Node” will be applied on heightmap
Shape: Shape for the Water Erosion simulation
Rivers: Rivers for the Water Erosion simulation
Depth: Depth for the Water Erosion simulation
Sea Bed: Sea-bed carving amount for the Water Erosion simulation



Terrace Filter

“Terrace Filter” will apply terrace simulation on the input heightmap

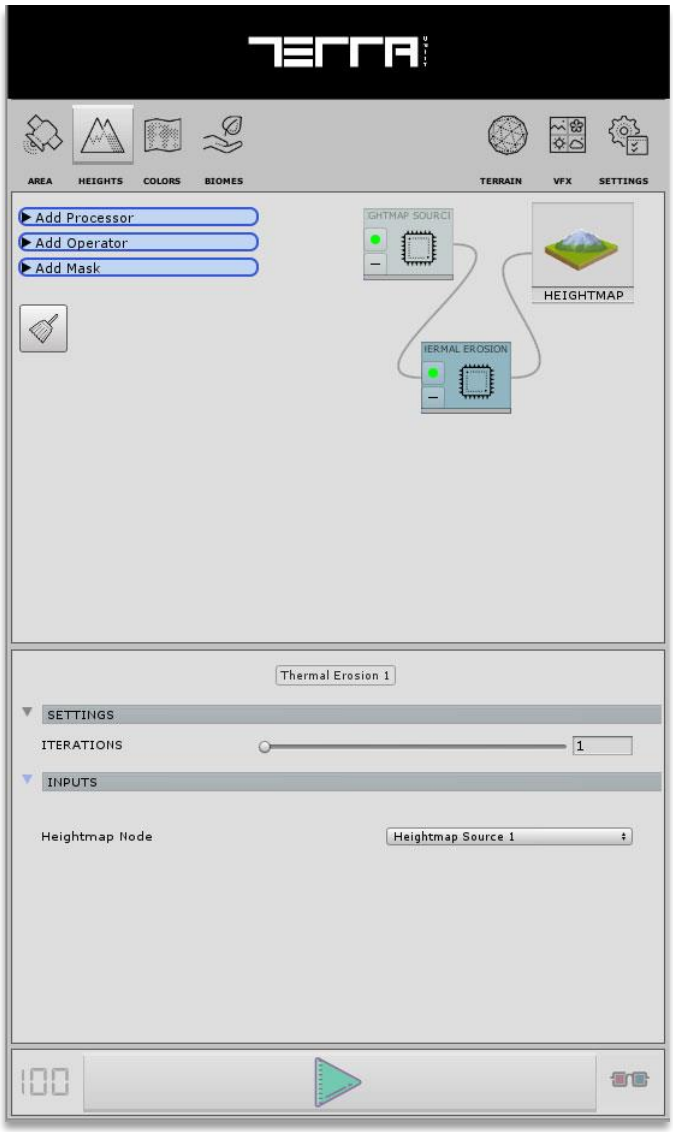
Steps: Number of terrace steps on the surface
Strength: Strength of the terrace effect on surface
Variation: Position variation of the terrace steps in vertical axis



Thermal Erosion

“Thermal Erosion” node will apply thermal erosion simulation on the input heightmap

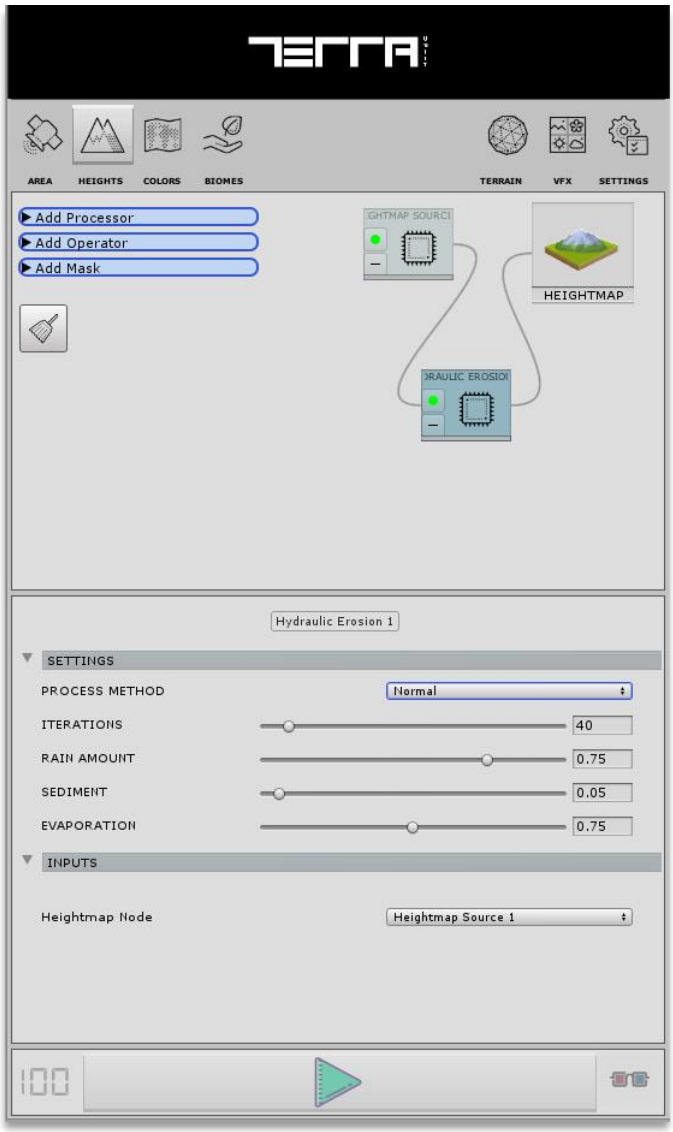
Iterations: Number of iterations thermal erosion operation will be applied on heightmap



Hydraulic Erosion

Hydraulic Erosion occurs when the motion of water against a rock surface produces mechanical weathering. Most generally, it is the ability of moving water (flowing or waves) to dislodge and transport rock particles.

TerraWorld© uses two different methods for simulating the Hydraulic Erosion on the terrain.



Process Method - Ultimate: Hydraulic Erosion simulation on the input heightmap

> Iterations: Number of iterations Hydraulic Erosion operation will be applied on heightmap

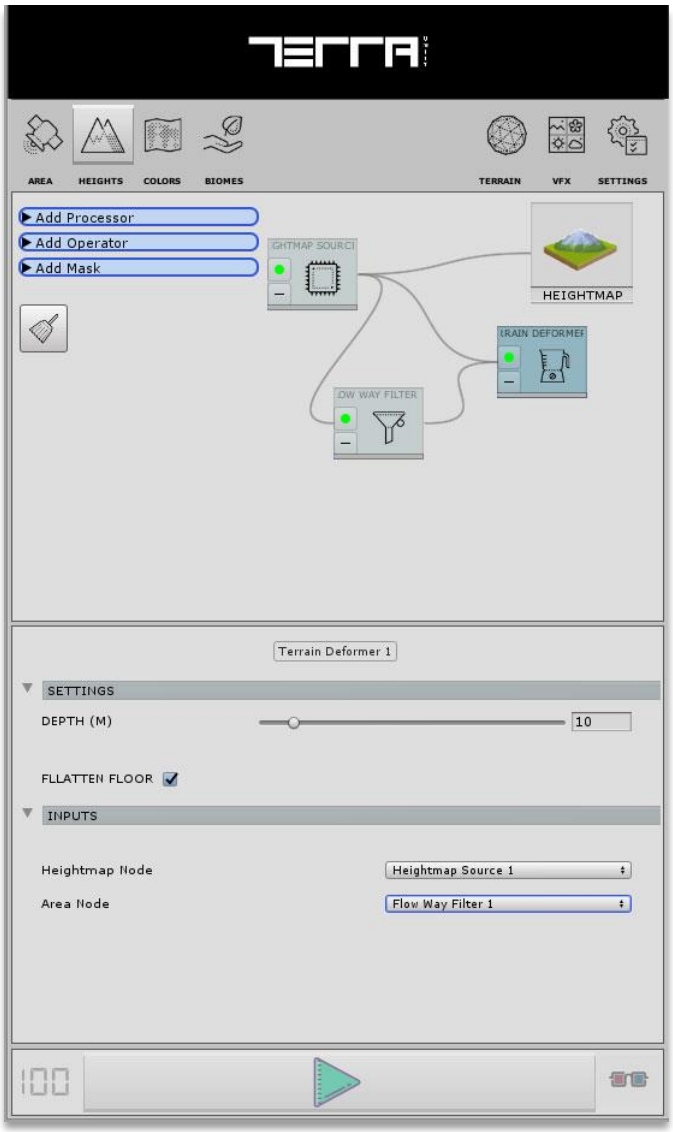
Process Method – Normal: Hydraulic Erosion simulation type 2 on the input heightmap

> Iterations: Number of iterations Hydraulic Erosion operation will be applied on heightmap
> Rain Amount: Rain amount for the Hydraulic Erosion simulation
> Sediment: Sediment strength for the Hydraulic Erosion simulation
> Evaporation: Evaporation strength for the Hydraulic Erosion simulation

Terrain Deformer

Terrain deformer takes a mask and deforms terrain surface based on input mask.

Depth: Depth in meters to dig through the surface
Flatten Floor: Flatten the floor of the deformed areas



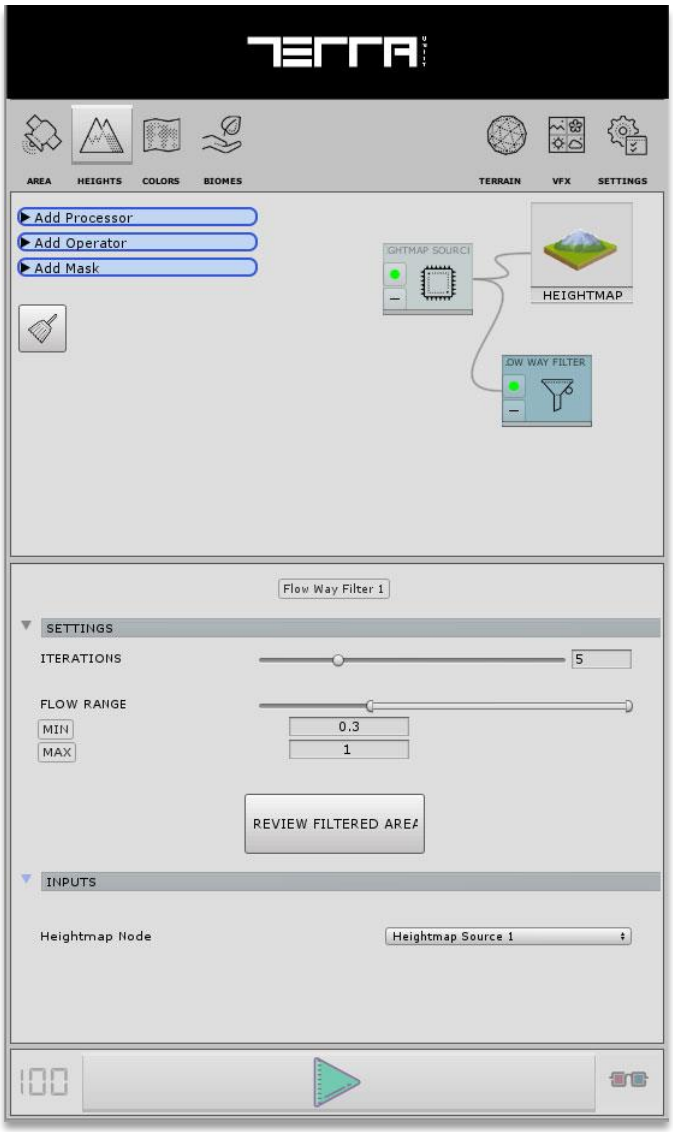
MASK

Mask nodes will filter or mask work areas by defined filters.

Flow Way Filter

Creates a flow mask from the input heightmap which extracts rivers and water ways along the surface heights

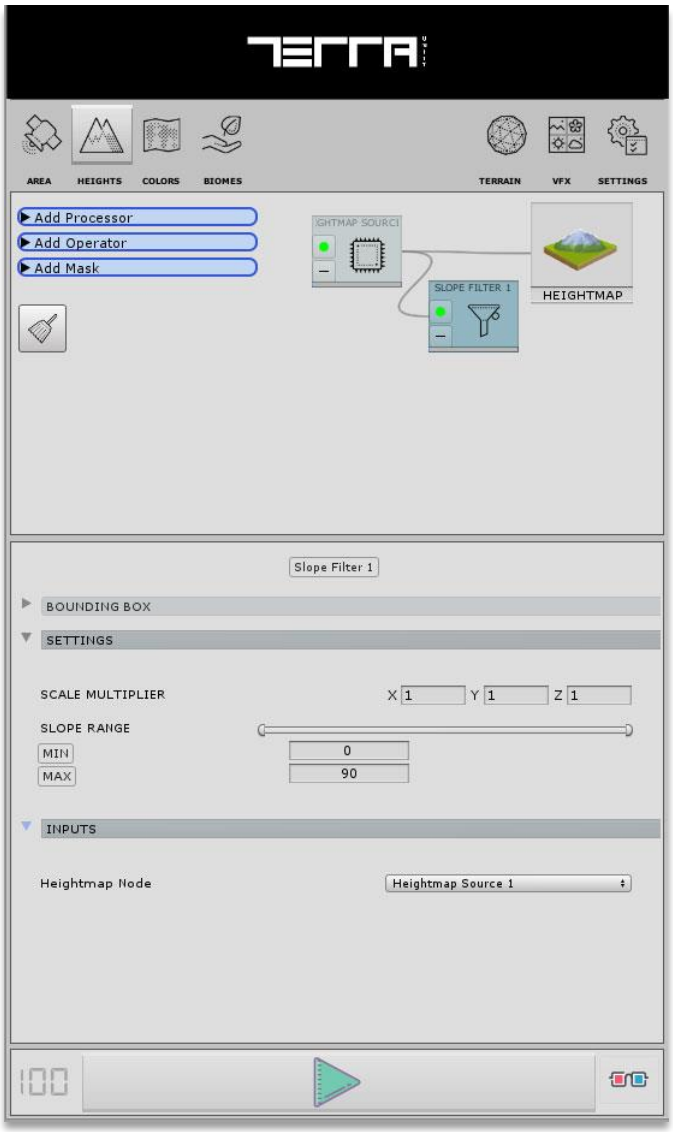
Iterations: Number of iterations flow way filter operation will be applied on heightmap
Flow Range: Filter flow rate in normalized scope



Slope Filter

Creates a slope mask from the input heightmap which is normalized between 0 to 90 degrees in vertical axis

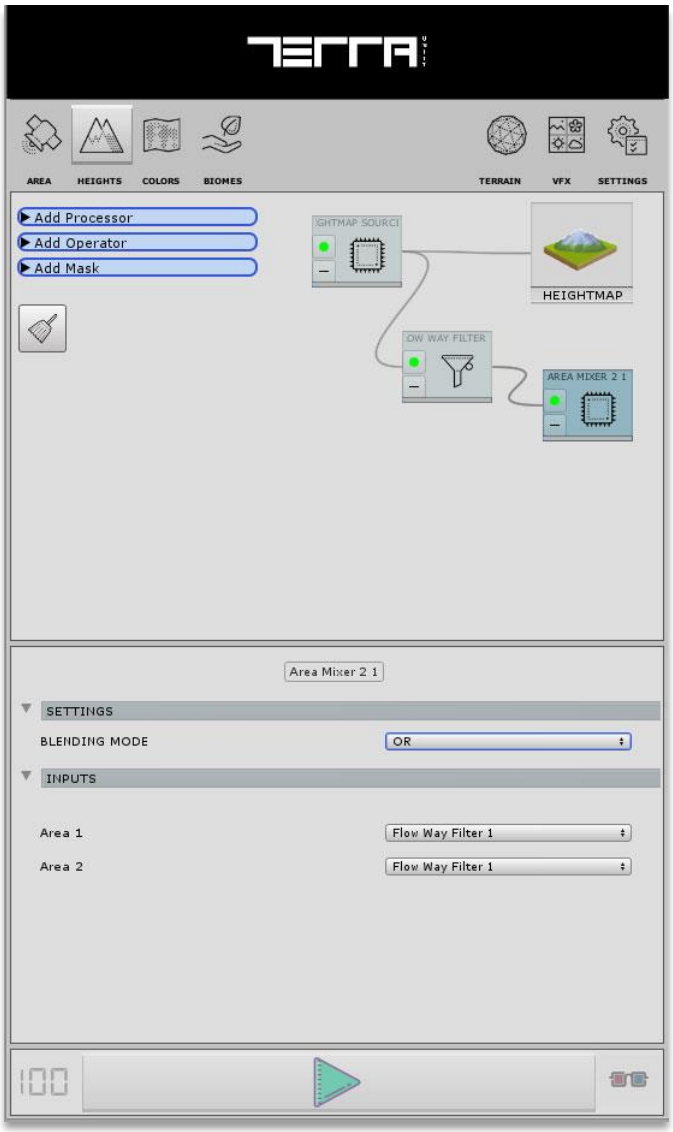
Bounding Box: For selecting effective areas
Slope Range: Minimum & maximum slope in degrees compared to horizon level for filtering area.



Area Mixer

Merges 2 area masks by logical operators.

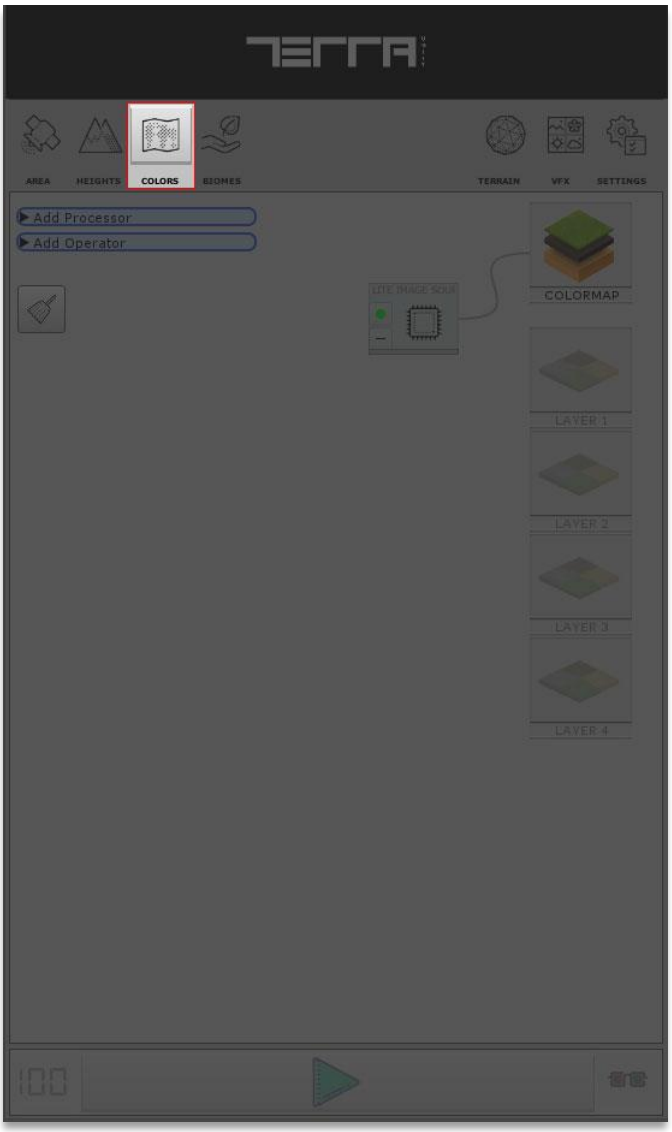
Blending Mode: Select blending mode to merge masks



COLORMAP TAB

All operations of satellite imagery analysis and terrain texturing is being done through this graph.

The system uses advanced image processing algorithms to create a realistic colormap by analyzing satellite image pixels and surface analysis along with blending of detail textures based on obtained landcover.



COLORMAP MASTER NODE

This node takes all terrain global layer nodes and merge them as the terrain colormap.

Colormap is a global image which covers the whole area which is useful for far viewing distances and because of its limitation (especially in image resolution) usually used for low level details.

TerraWorld© can use processed image base on real world satellite image as a colormap and blend it with user defined “Detail Textures”. Camera will render the satellite image as a cover image - if it has a “far distance look” at terrain - and will smoothly replace the ”Detailed Textures” while camera is getting close to the surface.

Note: In Legacy Terrain Rendering mode, the colormap master node will be applied on the RED channel of splat map as the first terrain layer.

TERRAIN LAYERS MASTER NODE

Takes a terrain detail layer node and applies it as terrain layer for detailed texturing on splat map channels.

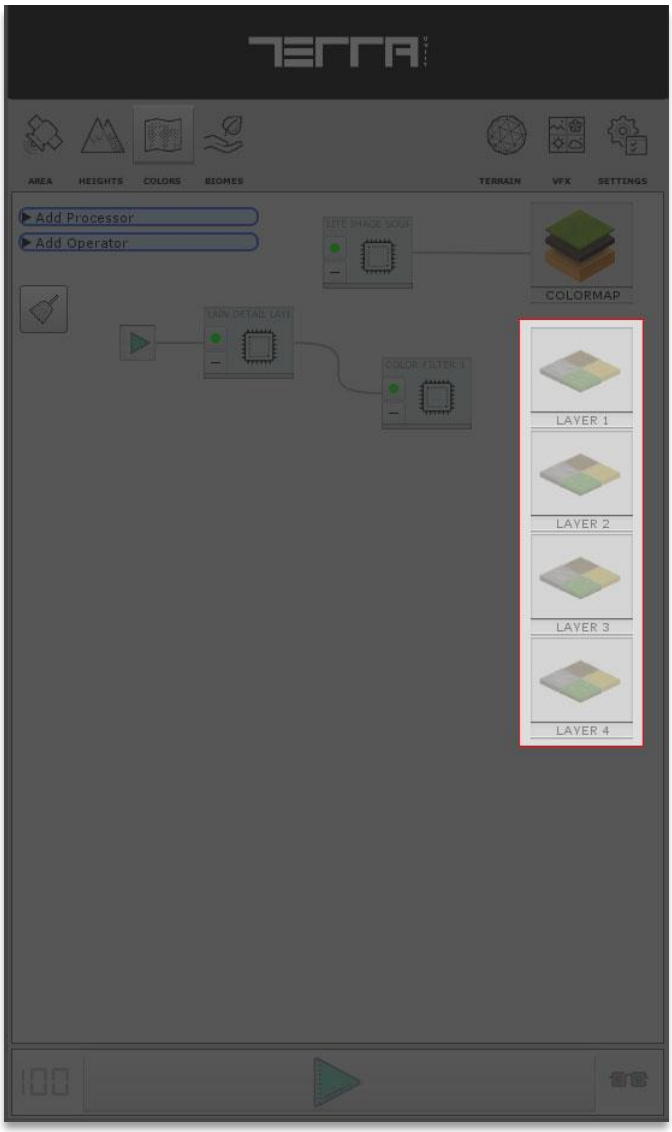
Terrain layers are high resolution textures used for detail texturing and are useful for near viewing distances. Because of the high resolution, they are used for ground level details but on the other hand they can use a huge amount of system resources.

TerraWorld© can use processed image base on real world satellite image as a colormap and blend it with user defined “Detail Textures”. Camera will render the satellite image as a cover image - if it has a “far distance look” at terrain - and will smoothly replace the” Detailed Textures” while camera is getting close to the surface.

TerraWorld© is limited to four detail texture layers in “High-End” rendering mode but there is no limitation for “Legacy” rendering mode in terrain layers.

Note: in Legacy Terrain Rendering mode, Colormap Blending is not supported.

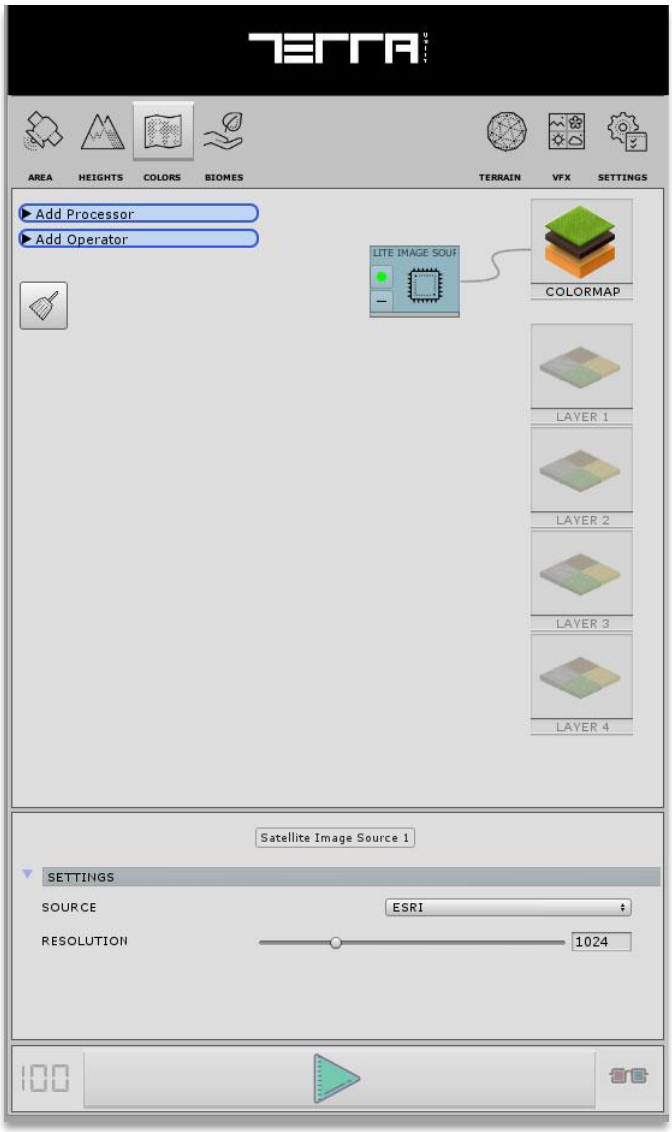
Note: Each terrain layer will be applied on a different splatmap channel.



PROCESSORS

Processors are type of nodes which alter input data based on specific operation and output the same data type.

Example: “Smoothen Terrain” processor node in heightmap graph takes a processed heightmap from previous node and smoothen out the surface and then pass the result to the next node.



Satellite Image

Provides the satellite image of the selected area.

Source: Select imagery source from various mapping providers
Resolution: Select satellite image resolution for the entire world

Terrain Global Layer

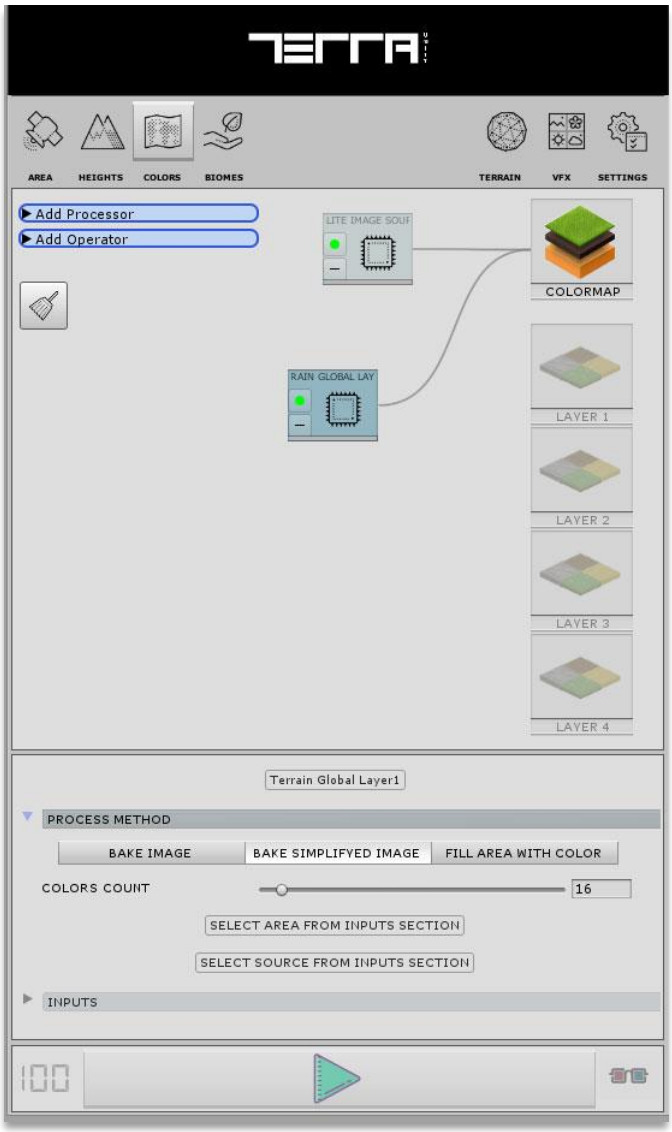
Takes an image and an input mask to filter out pixels and add up to the final colormap.

Terrain global node uses 3 methods to process and prepare an image to bake it on the final colormap

- BAKE IMAGE: This method cuts out the selected area and bakes it to final colormap.
- BAKE SIMPLIFIED IMAGE: This method will extract the most used color in selected area and then simplifies the image by detected colors.

  Color Count: Simplify image to most used colors
  Fill Color: Fill masked area with this color on colormap

- FILL AREA WITH COLOR: This method will fill the masked areas by selected color and bakes it to the final colormap



Terrain Detail Layer

Creates a detail texture layer in terrain data for splatmap texturing.

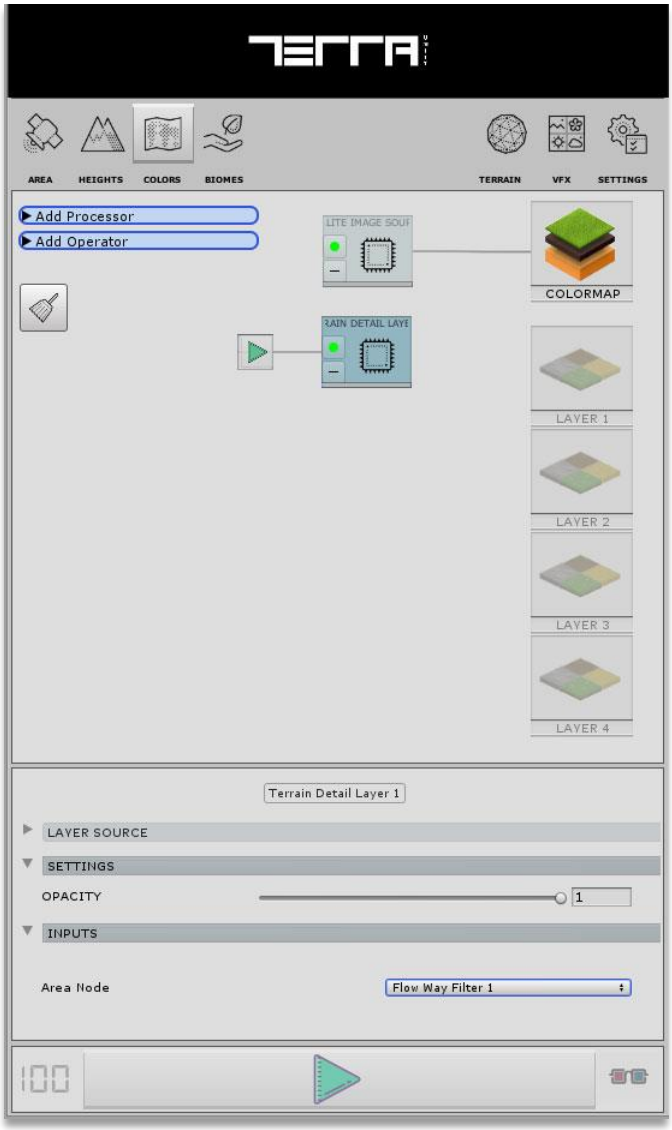
This node takes a mask (e.g. Slope range from heightmap graph) as input and creates splat layer based on the mask. Splat areas will be filled with the inserted terrain layer asset.

Opacity: Opacity of the terrain layer

In TerraWorld©, users can assign a terrain layer (Detail Texture Layer) by using the 2 following methods:

- Using existing terrain layer
  - Terrain Layer: Select Terrain Layer for rendering

- Creating new terrain layer
  - Diffuse Map: Diffuse texture for the layer
  - Normal Map: Normalmap texture for the layer
  - Normal Strength: Normal map strength on the surface
  - Mask Map: Mask map texture for the layer
  - Tiling: Tiling for the inserted texture on material
  - Offset: Tiling Offset for the inserted texture on material
  - Specular: Specular color on the surface
  - Metallic: Metallic strength on the surface
  - Smoothness: Smoothness strength on the surface



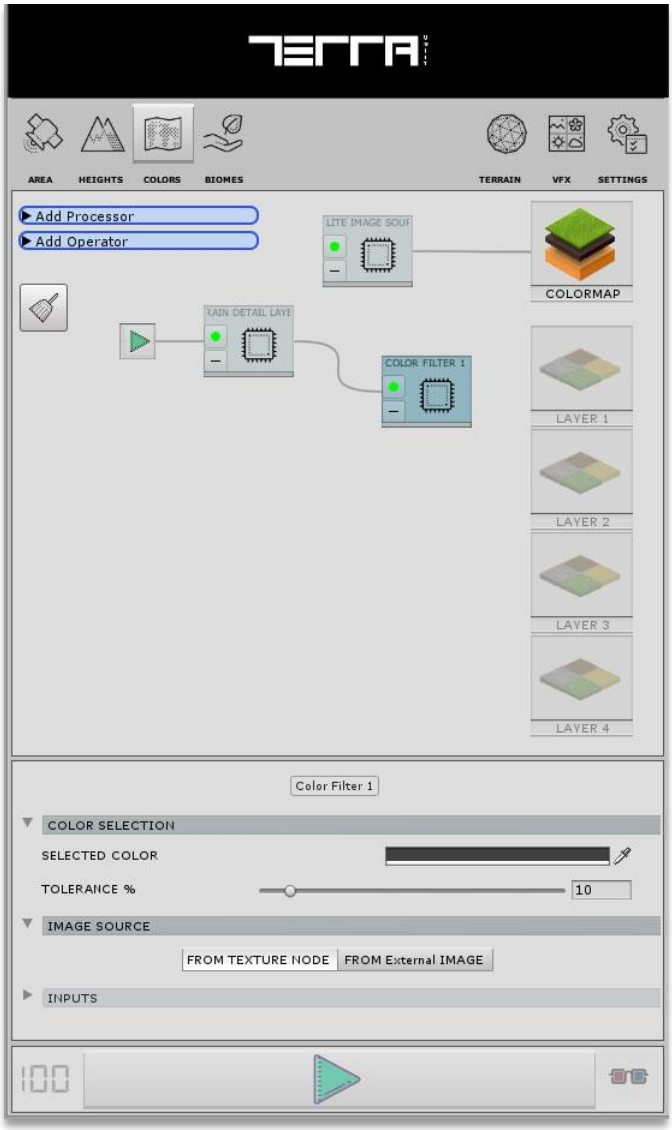
MASK

Mask nodes will filter or mask work areas by defined filters.

Color Filter

Takes an external image/texture asset and generates mask based on user-defined color in the image pixels.

Selected Color: A mask will be generated for the system using the selected color
Tolerance: Tolerance range for the selected color in color space
External Image: Use external source image instead of the input node's image

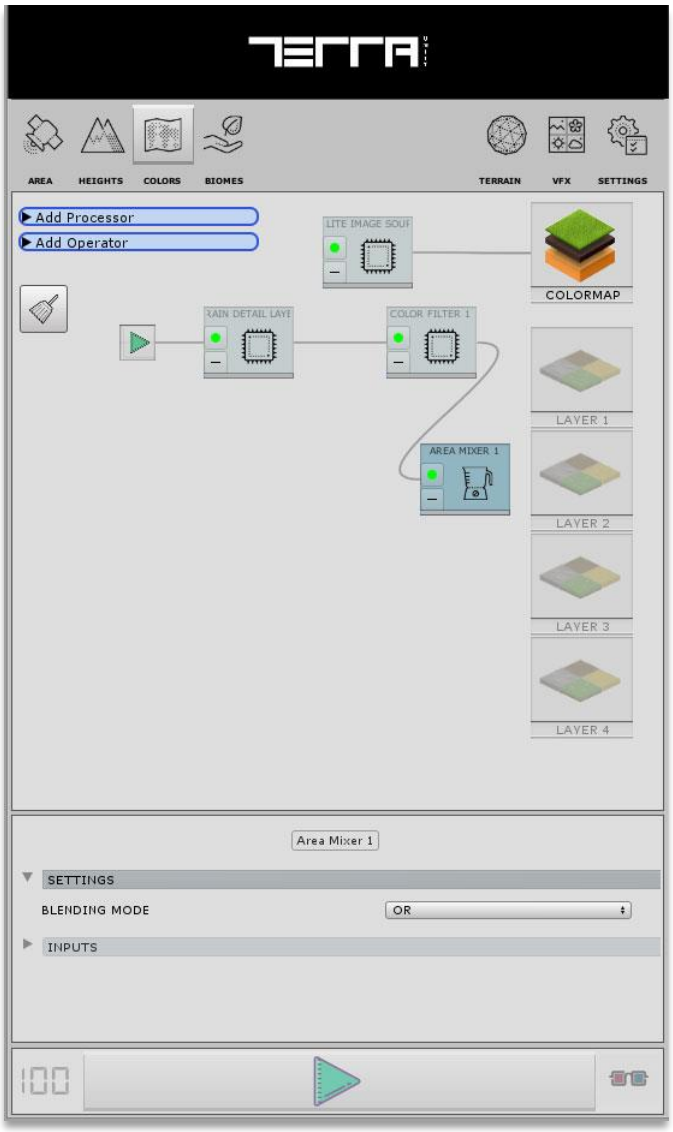


Area Mixer

Blends 2 masks with each other based on selected logical operator

Blending Mode: Select mode to blend masks.

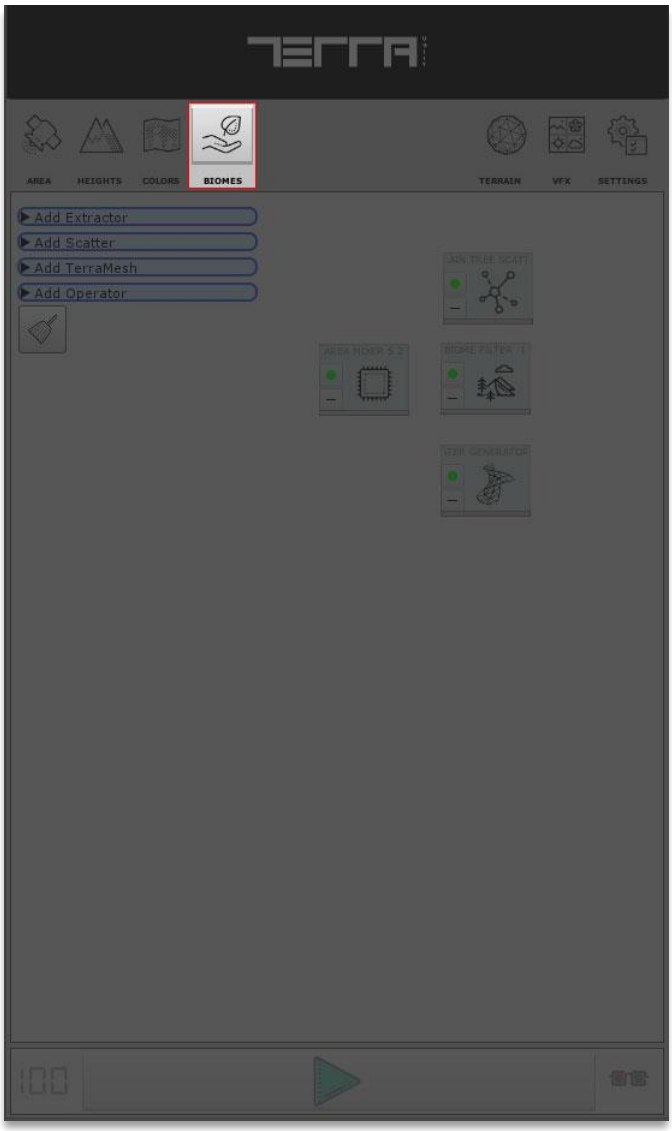
Logical Operators:



BIOMES TAB

In Biomes graph, user can do following actions:

- Filtering area based on biomes and land cover data
- Scatter objects & GPU instances on the terrain
- Generate lakes & rivers
- Generate a copy of terrain surface at specific locations or specific rules



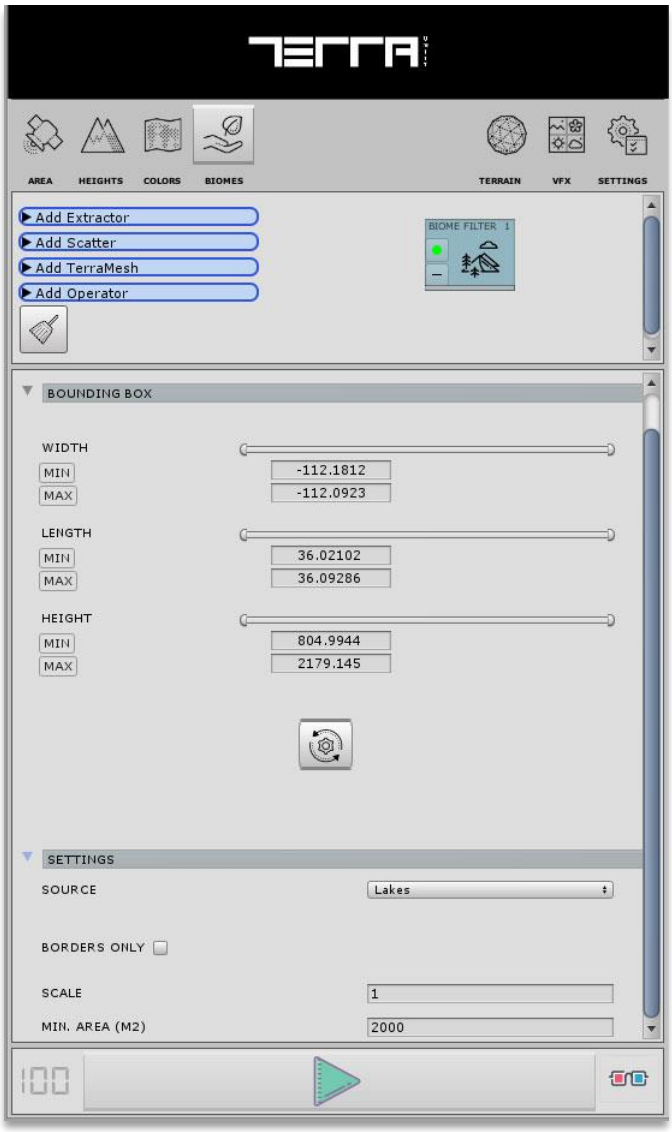
MASK

Masks nodes will filter or mask work areas by defined filters.

Biome Filter

Connects to Landcover data source and outputs biome feature areas.

Bounding Box: Defining active area
Source: Select Elevation source from various mapping providers
Rivers Width (M): Default rivers' width in meters (M)
Borders Only: Extract only edges of the detected masked area
Edge Size (M): Area damping along the borders in meters
Scale: Scale of the whole shape of the mask
MIN. Area (M2): Ignore areas with less than specified Min. size in square meters (M2)

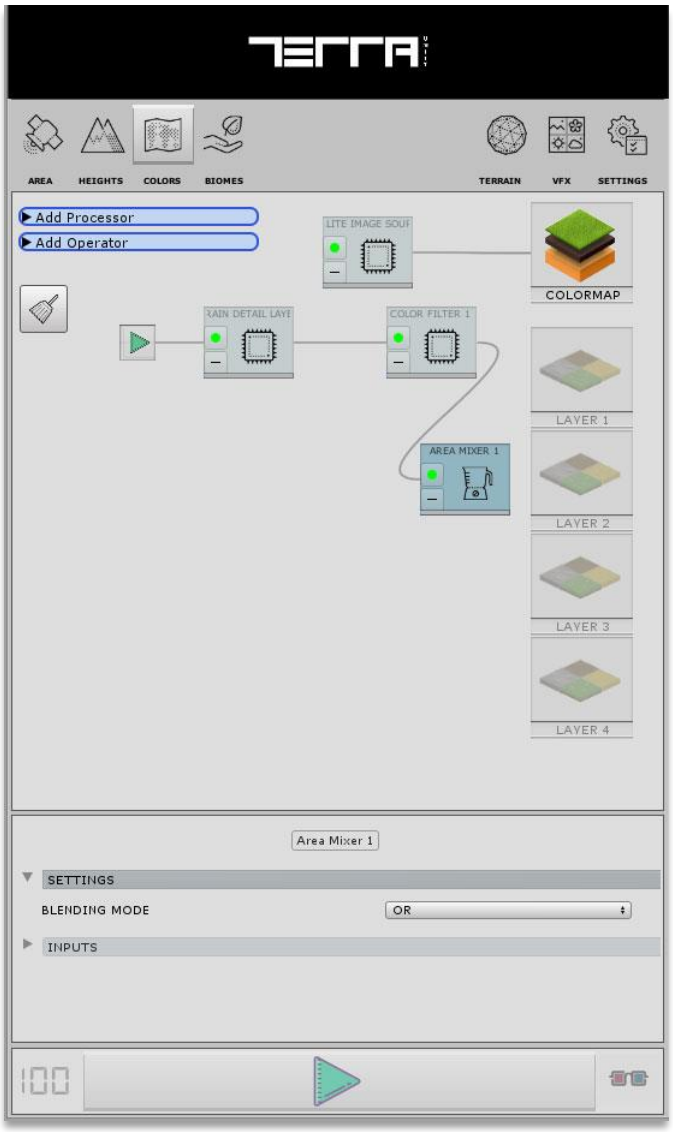


Area Mixer

Blends 2 masks with each other based on selected logical operator

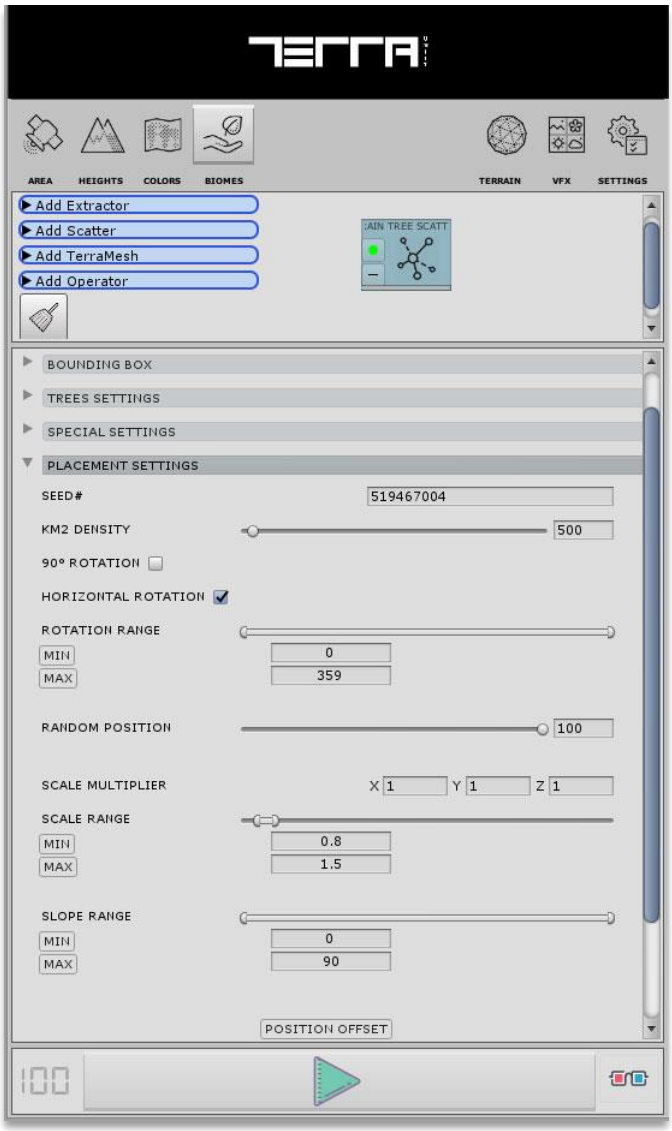
Blending Mode: Select mode to blend masks.

Logical Operators:



SCATTER

Scatters inserted models in the scene based on various placement settings.



Terrain Tree Scatter

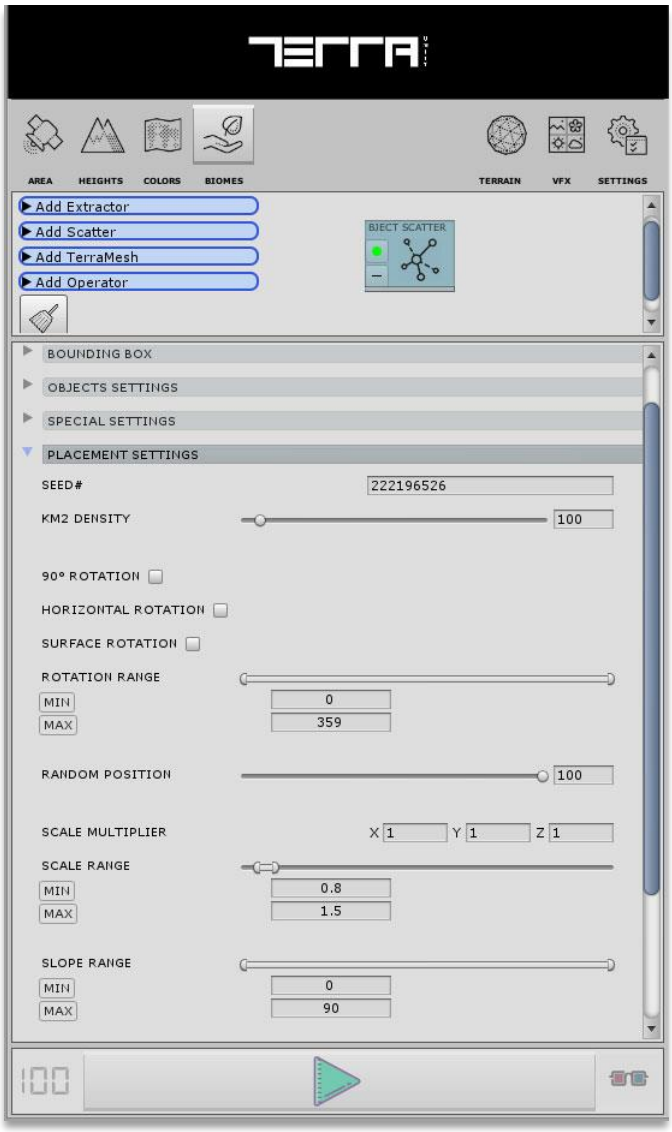
Scatters vegetation models in the scene based on various placement settings and applies them to the terrain data.

Bounding Box: Defining active area
Prefab: Prefab used for the tree model
Seed#: Seed number for unique procedural values
KM2 Density: Instance count per square kilometer for placement
90° Rotation: Rotation is only performed in 90 degree multiplies 0°, 90°, 180° & 270°
Horizontal Rotation: Rotation is locked in horizontal rotation axis (Y) only
Rotation Range: Minimum & Maximum rotation in degrees for object
Random Position: Percentage of the random position for instance
Scale Multiplier: The multiplier value for the original object scale
Scale Range: Minimum & Maximum random scale variation
Slope Range: Minimum & Maximum slope in degrees compared to horizon level for object placement
Offset: Placement offset of the object in 3 dimensions
Layer Name: Parent Layer name of the current object's layer in hierarchy view
Layer Mask: Object placement will be applied on selected layer(s)

Note : Terrain Tree Scatter node uses Unity's standard Terrain Tree system for scattering objects & instances

Object Scatter

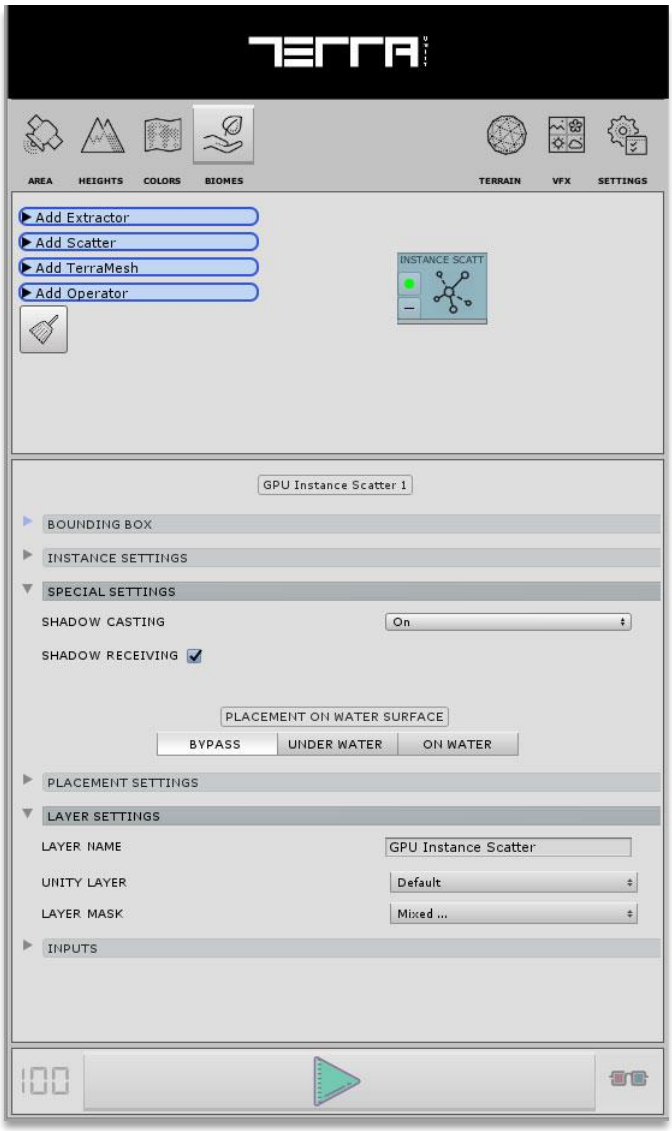
Scatters game objects in the scene based on various placement settings. Object scatter is designed to scatter prefabs in scene.



Bounding Box: Defining active area
Placement on water: Object scatter can ignore water surfaces or place above or below water surfaces
Seed#: Seed number for unique procedural values
KM2 Density: Instance count per square kilometer for placement
90° Rotation: Rotation is only performed in 90 degree multiplies 0°, 90°, 180° & 270°
Horizontal Rotation: Rotation is locked in horizontal rotation axis (Y) only
Rotation Range: Minimum & Maximum rotation in degrees for object
Random Position: Percentage of the random position for instance
Scale Multiplier: The multiplier value for the original object scale
Scale Range: Minimum & Maximum random scale variation
Slope Range: Minimum & Maximum slope in degrees compared to horizon level for object placement
Offset: Placement offset of the object in 3 dimensions
Layer Name: Parent Layer name of the current object's layer in hierarchy view
Unity Layer: Select object's Unity layer
Layer Mask: Object placement will be applied on selected layer(s)

Instance Scatter

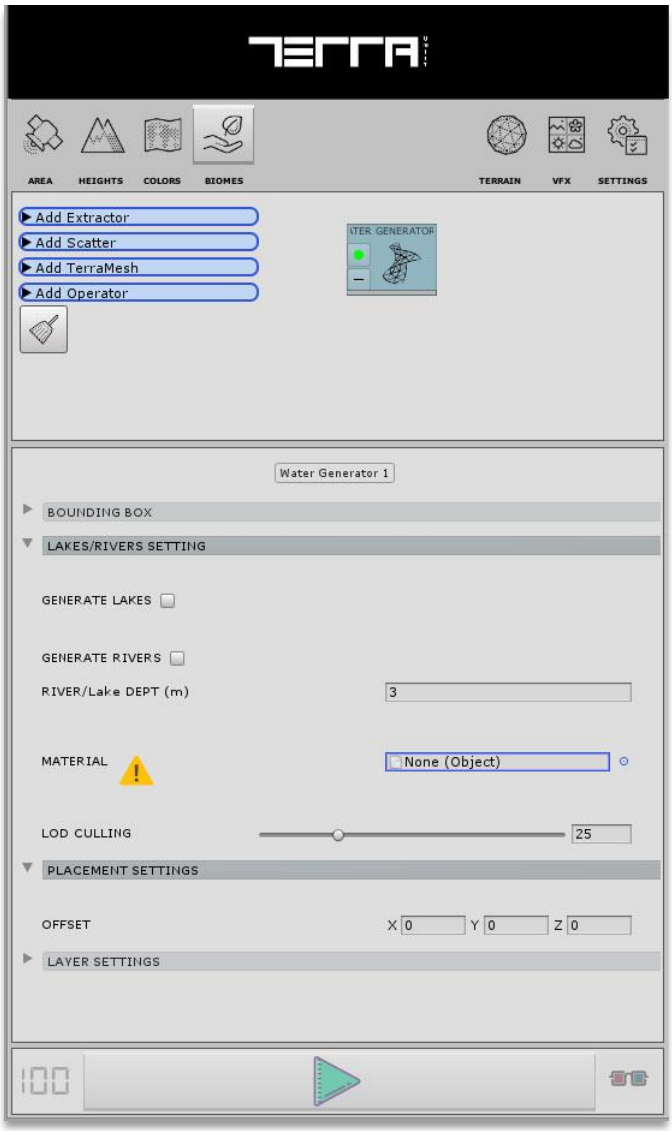
Scatters GPU instances in the scene based on various placement settings. Instances do not have collider and do not support physics, but they are very light in rendering and millions of instances can be placed in a scene.



Bounding Box: For selecting effective areas
Prefab: Prefab used for GPU instance object
Shadow Casting: Shadow Casting mode for each instance
Shadow Receiving: Receive shadows on model or not?
Seed: Seed number for unique procedural values
Placement Distance (M): Placement distance in meters between instances
Instance Count: Instance count for each patch
90° Rotation: Rotation is only performed in 90 degree multiplies 0°, 90°, 180° & 270°
Horizontal Rotation: Rotation is locked in horizontal rotation axis (Y) only
Surface Rotation: Rotation is calculated from the underlying surface angle
Rotation Range: Minimum & Maximum rotation in degrees for object
Random Position: Percentage of the random position for instance
Scale: Original scale of the instance
Scale Range: Minimum & Maximum random scale variation
Slope Range: Minimum & Maximum slope in degrees compared to horizon level for object placement
Position Offset: Placement offset of the object in 3 dimensions
Rotation Offset: Rotation offset of the object in 3 dimensions
Layer Name: Parent Layer name of the current object's layer in hierarchy view
Unity Layer: Select object's Unity layer
Layer Mask: Object placement will be applied on selected layer(s)

TERRAMESH

Generates 3D Mesh for lakes, rivers and terrain surfaces in filtered areas.



Water Generator

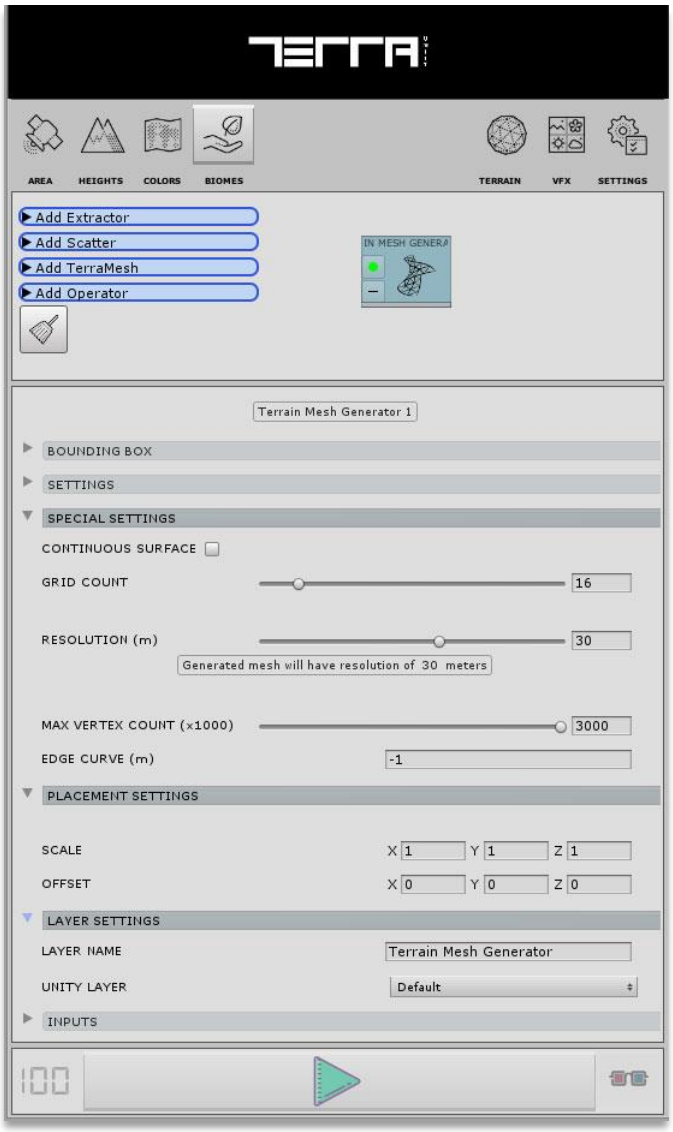
Generates lake and water surfaces in the area

Generate Lakes: Generate lakes in the world
MIN. Area (M2): Bypass generation of lakes with specified minimum area size in square meters (M2)
Generate Rivers: Generate rivers in the world
River Width (M): Set default width for rivers in meters
River/Lake Depth (m): Set default depth for rivers/lakes in meters
Material: Material used for this object
LOD Culling: Minimum object's screen size percentage where it culls from rendering
Offset: Placement offset of the object in 3 dimensions
Layer Name: Layer name of the current object's layer

Mesh Generator

Generates a copy of terrain surface based on user-defined rules.

Material: Material used for this object
LOD Culling: Object's screen size percentage where it culls from rendering
Collider: Does object contribute to collision detection!
Physics: Enable or disable Rigidbody component on the object to perform physics calculations
Continuous Surface: Generate mesh as a single object
Grid Count: Divide surface into a grid of mesh chunks
Resolution (M): Distance between mesh vertices in meters
MAX Vertex Count (x1000): Maximum vertex count value multiplied by 1000 which is allowed for each mesh grid
Edge Curve (M): Curve amount along the edges of the mesh vertices in meters
Scale: Original scale of the object
Offset: Placement offset of the object in 3 dimensions
Layer Name: Layer name of the current object's layer
Unity Layer: Select object's Unity layer

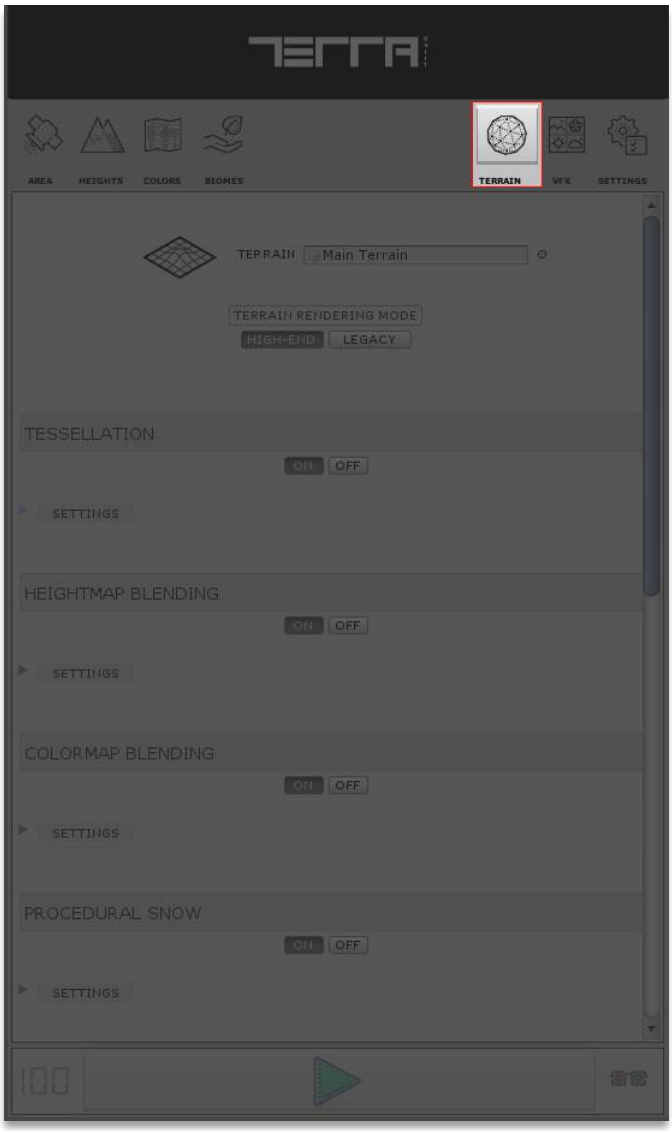


Terrain Rendering TAB

In this tab users define all settings related to terrain material.

If user is on Unity's Standard Rendering Pipeline, "High-End" terrain rendering will be activated for advanced terrain shader features.

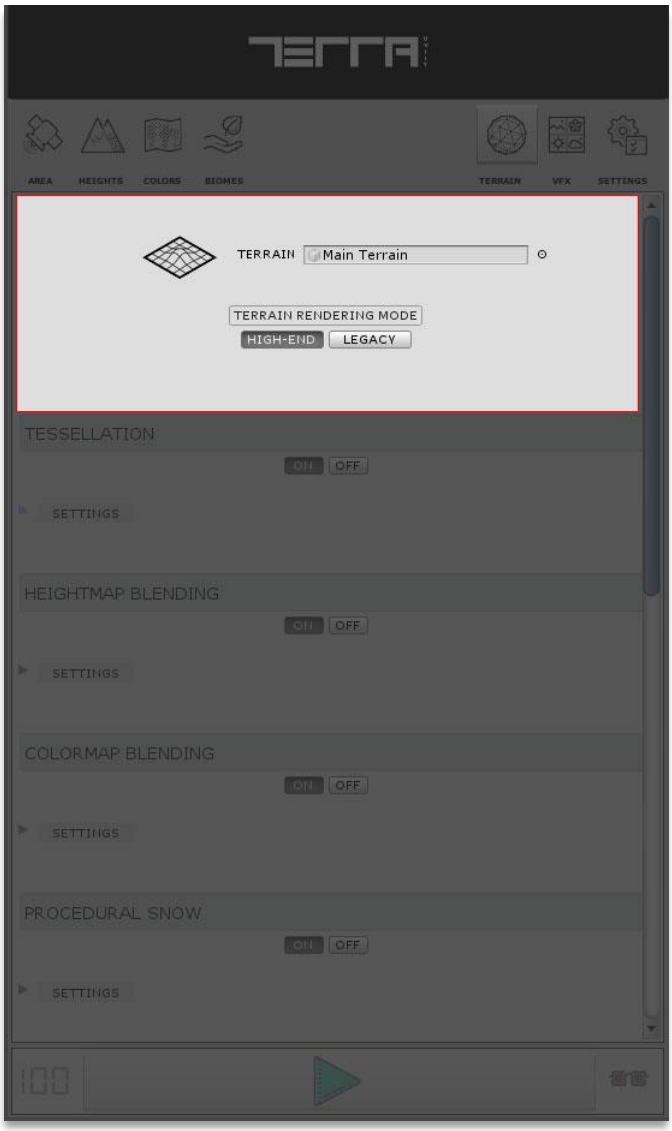
Note: TerraWorld's custom terrain shader is not supported on SRPs such as HDRP & URP (aka LWRP) yet.



Terrain Rendering Mode

Select between High-End & Legacy (Unity's built-in Standard terrain shader).

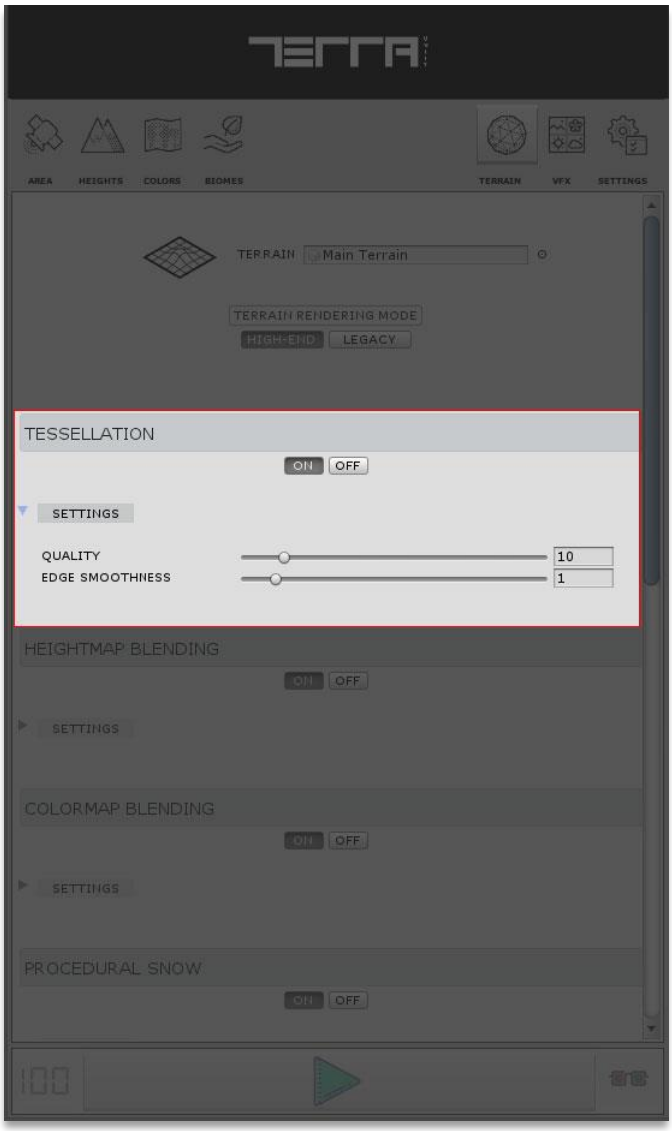
When High-End mode is selected, TerraWorld's custom terrain shader will be assigned to the terrain and advanced features will be unlocked for terrain rendering.



Tessellation

Activate DX11 Tessellation on surface

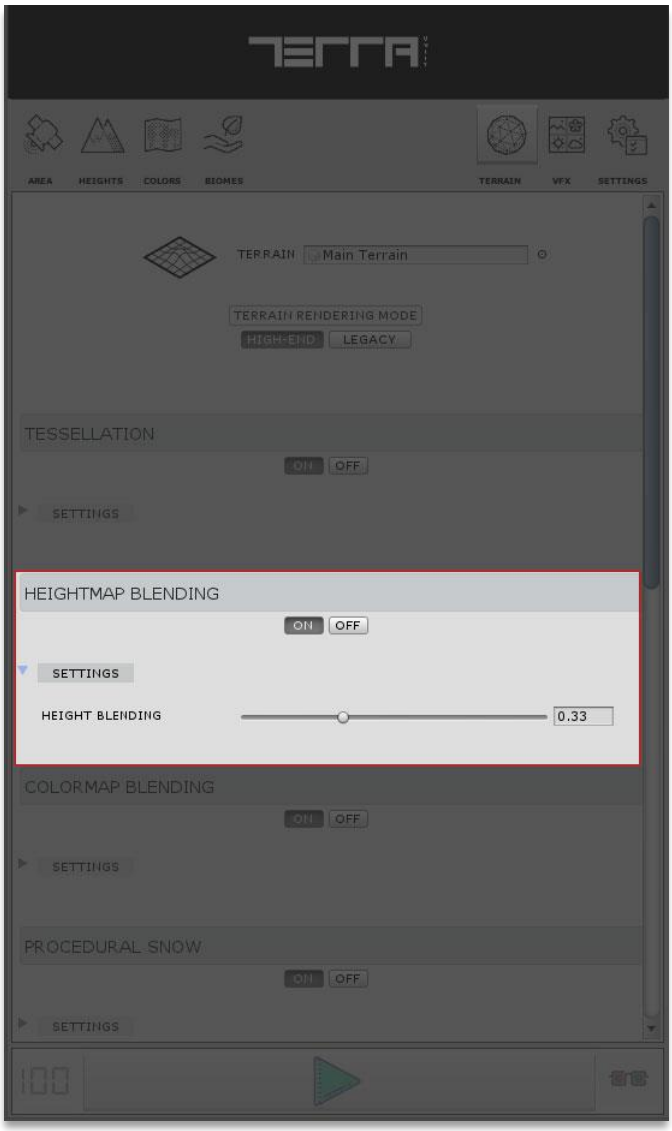
Quality: Tessellation quality on surface
Edge Smoothness: Phong smoothness on surface edges



Heightmap Blending

Activate Heightmap Blending on surface

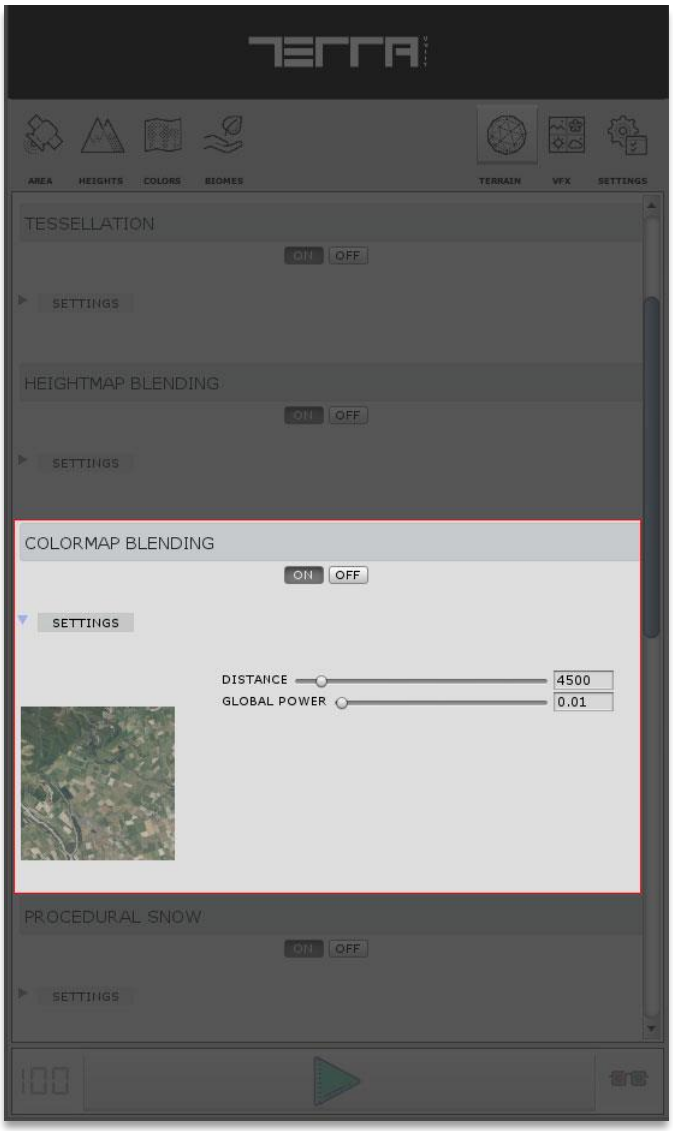
Height Blending: Heightmap Blending range between terrain layers



Colormap Blending

Activate Colormap Blending on surface

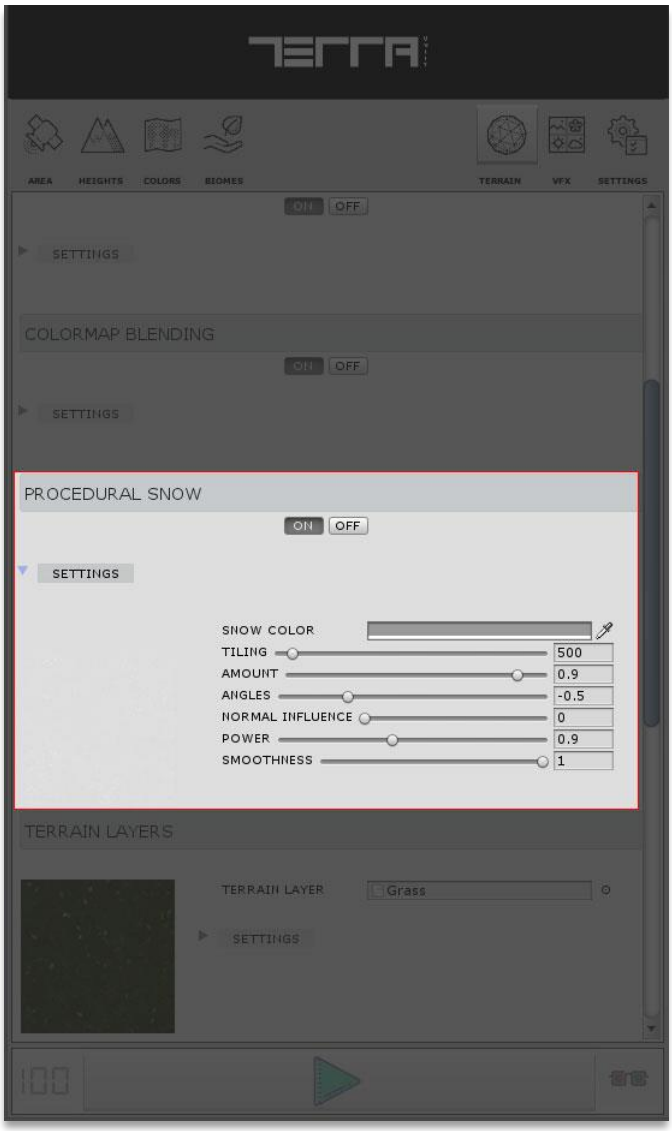
Distance: Blending distance between Colormap & detail textures
Global Power: Global blending power between Colormap & detail textures



Procedural Snow

Activate Procedural Snow on surface

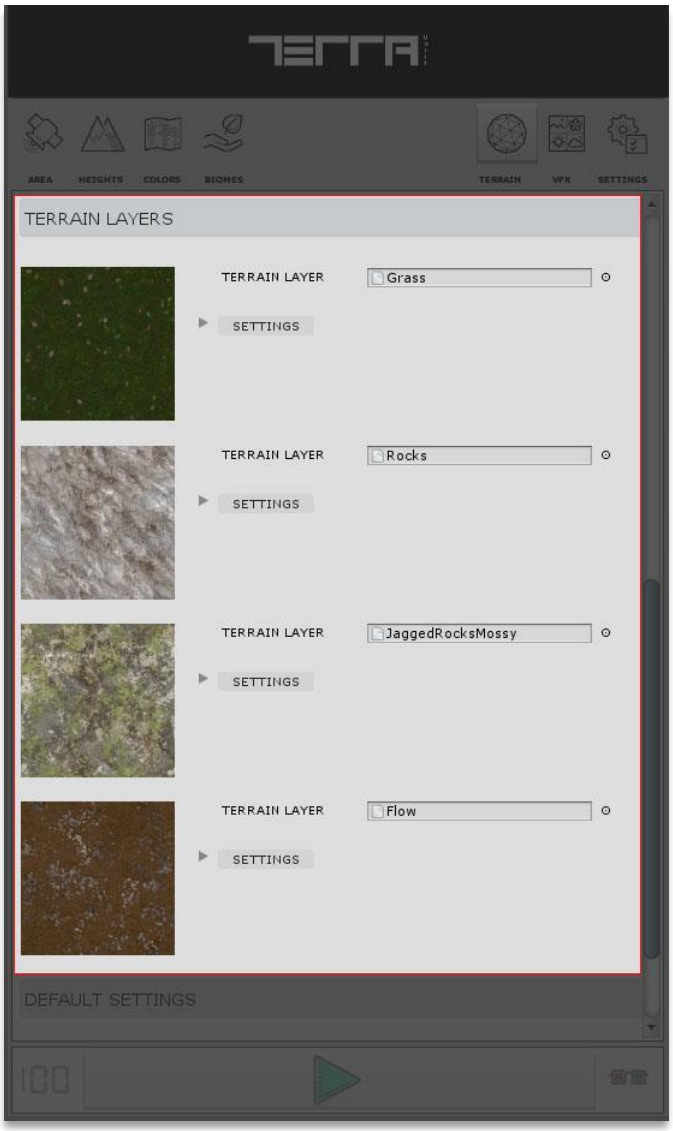
Snow Color: Snow color on terrain surface
Tiling: Texture tiling for snow rendering
Amount: Amount value for snow rendering
Angles: Angles distribution for snow rendering
Normal Influence: Detail textures normalmap influence for snow rendering
Power: Power value for snow rendering
Smoothness: Smoothness value for snow rendering



Terrain Layers

Terrain Data's terrain layers as detail textures

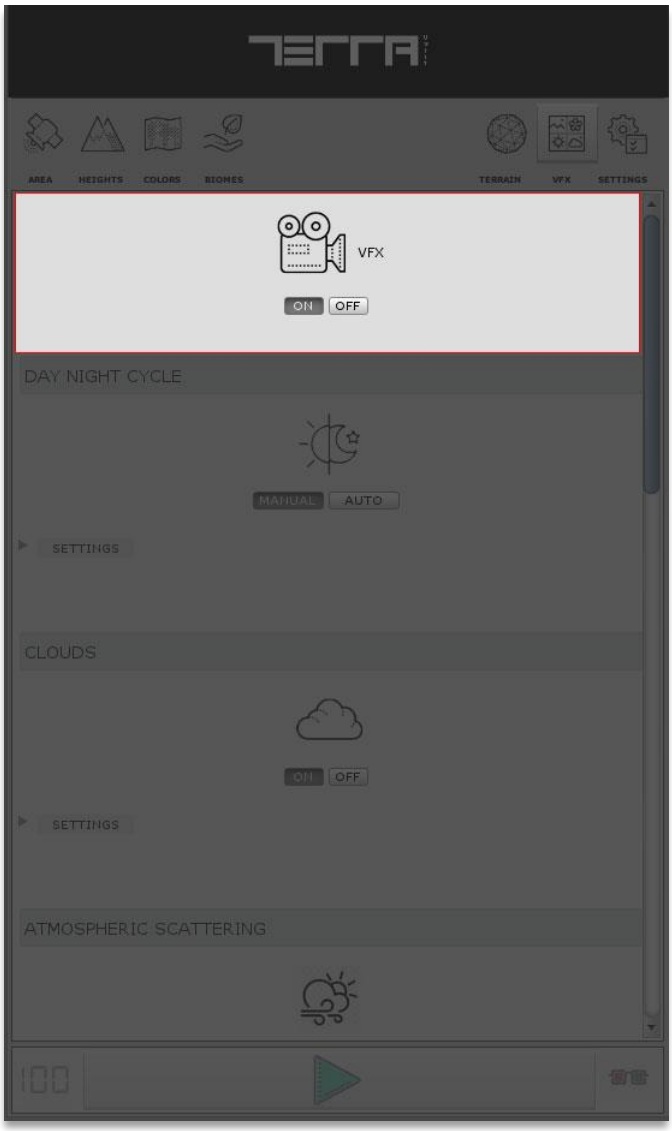
Terrain Layer: Reference to the TerrainLayer asset
Displacement: Tessellation displacement taken from layer heightmap on surface
Height Offset: Layer height offset on surface
Tiling Remover: Tiling Remover intensity
Tiling Noise: Tiling Remover noise
Color: Layer color on terrain surface
AO: Ambient Occlusion value for texture layer rendering



VFX TAB

In this section users set all visual properties of the scene to define features such as day/night cycle, clouds rendering, atmospheric scattering, volumetric lighting and fog, season setup, real-time reflections and post processing. This gives users the ability to setup their desired mood and atmosphere in scenes.

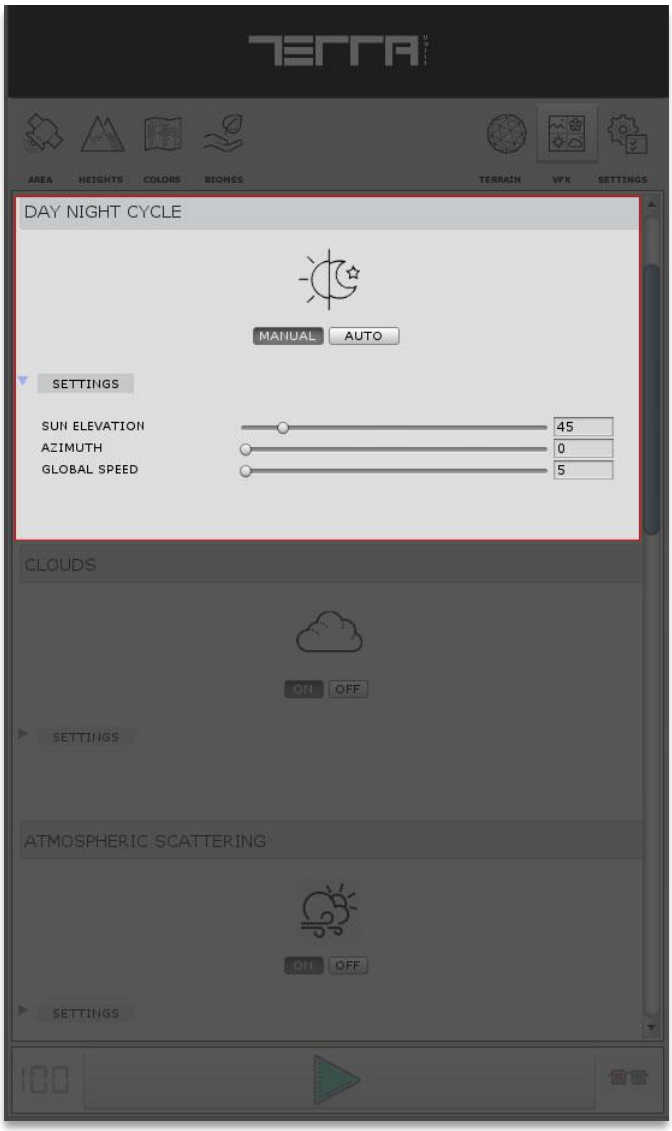
User can turn on/off VFX to achieve high-end graphics!



Day Night Cycle

Set time of day settings.

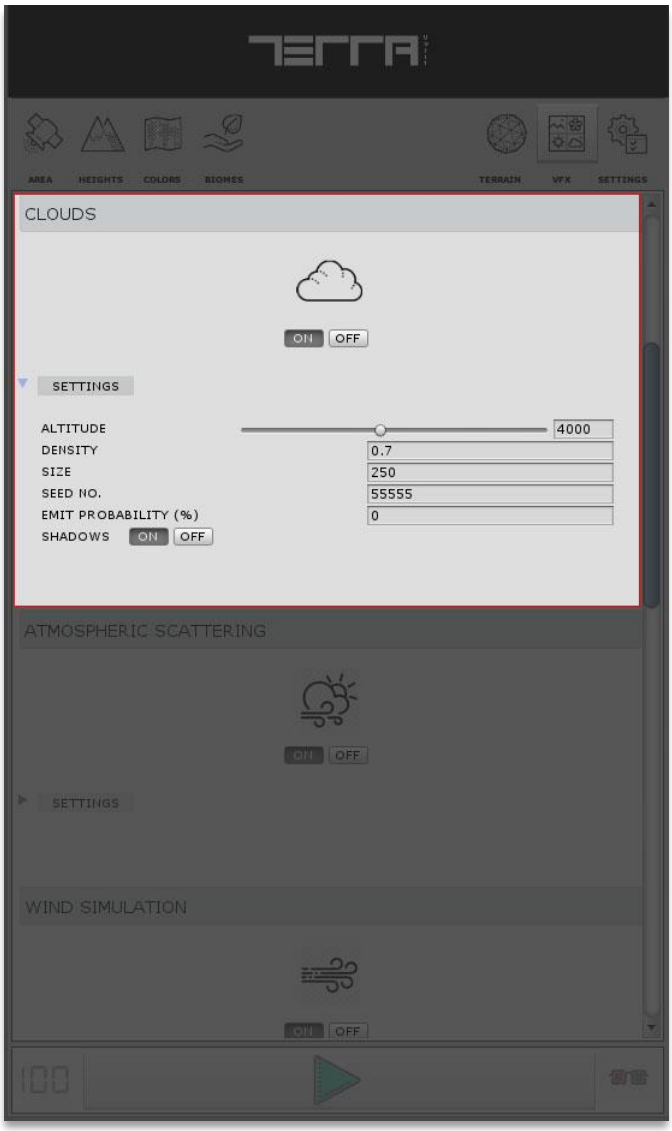
Manual / Auto: Switch on or off day/night cycle
Sun Elevation: Elevation of the Sun in the world
Azimuth: Azimuth of the Sun in the world
Global Speed: Global speed for the day/night cycle



Clouds

Switch clouds on or off

Altitude: Clouds altitude in the 3D space
Density: Density of the clouds in the area
Size: Size of cloud instances
Seed No.: Seed No. for the clouds randomization
Emit Probability (%): The percentage of snow/rain emit probability from the clouds
Shadows: Turn on/off clouds shadow casting!

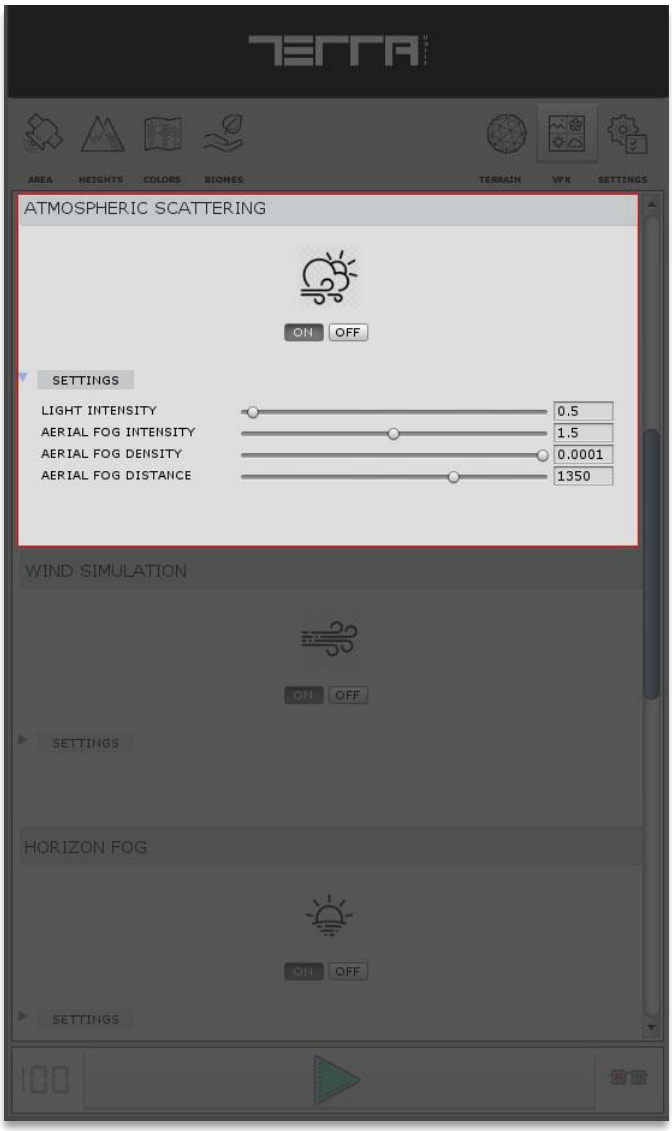


Atmospheric Scattering

Switch atmospheric scattering on or off

Note: Atmospheric scattering is only enabled when there are 4 shadow cascades enabled!

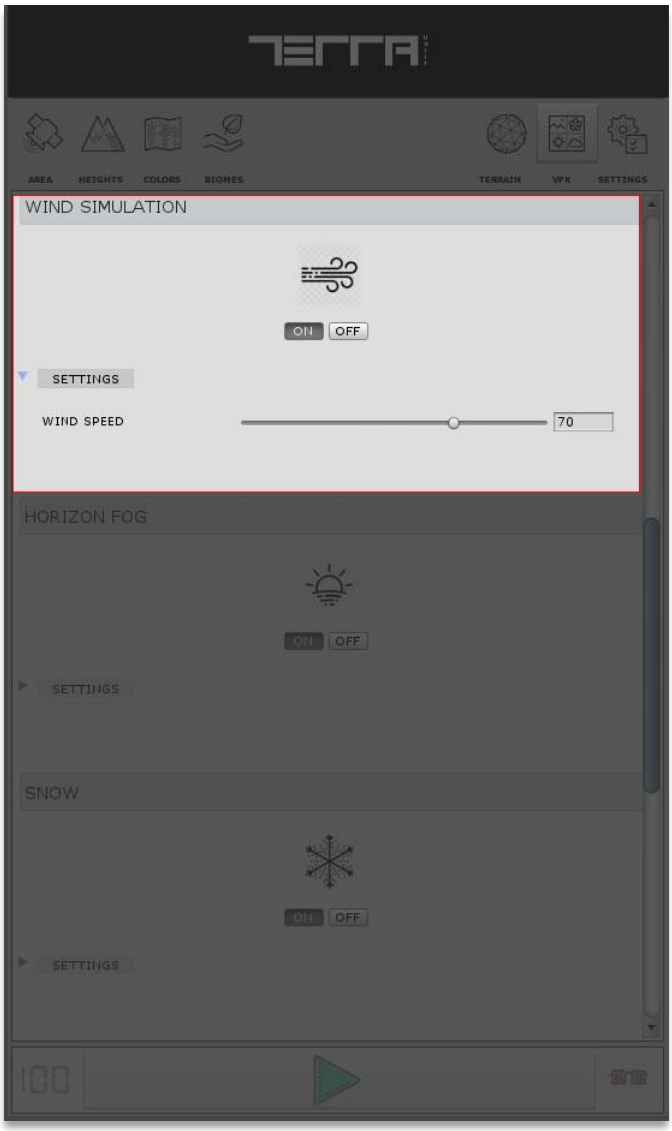
Light Intensity: Volumetric light intensity
Aerial Fog Intensity: Atmospheric aerial fog intensity
Aerial Fog Density: Atmospheric aerial fog density
Aerial Fog Distance: Atmospheric aerial fog distance



Wind

Switch wind simulation on or off

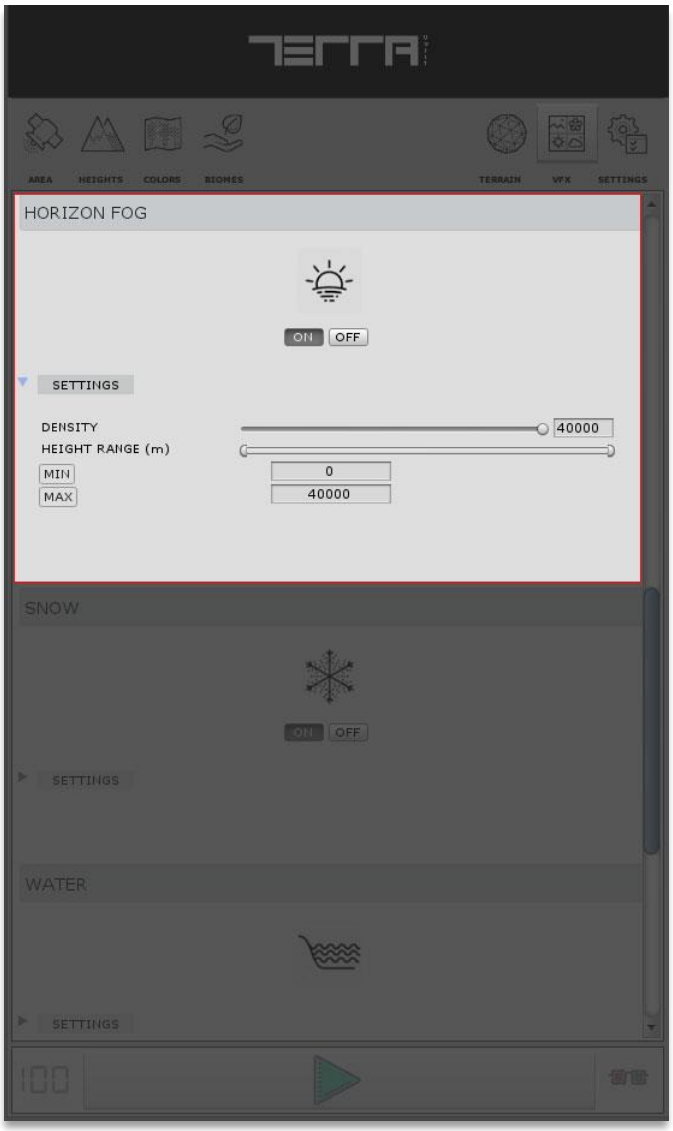
Wind Speed: Wind Speed for the volumetric fog



Horizon Fog

Switch Horizon Fog on or off

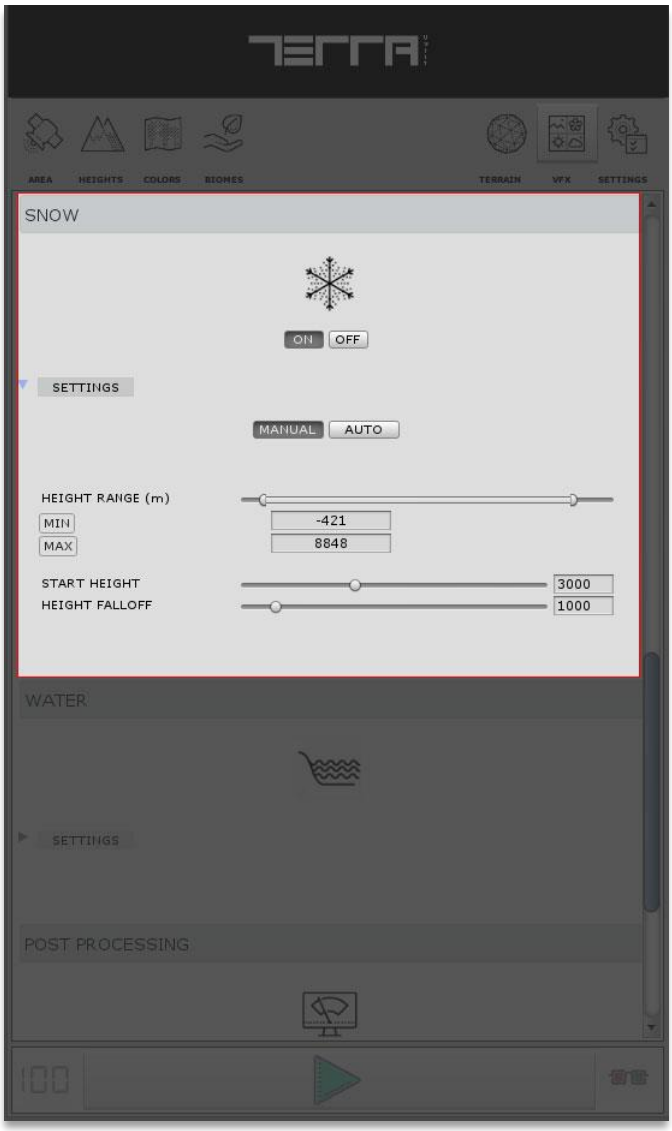
Density: Horizon Fog Density
Height Range (M): Minimum & Maximum starting height of horizon fog



Snow

Toggle Snow rendering in scene

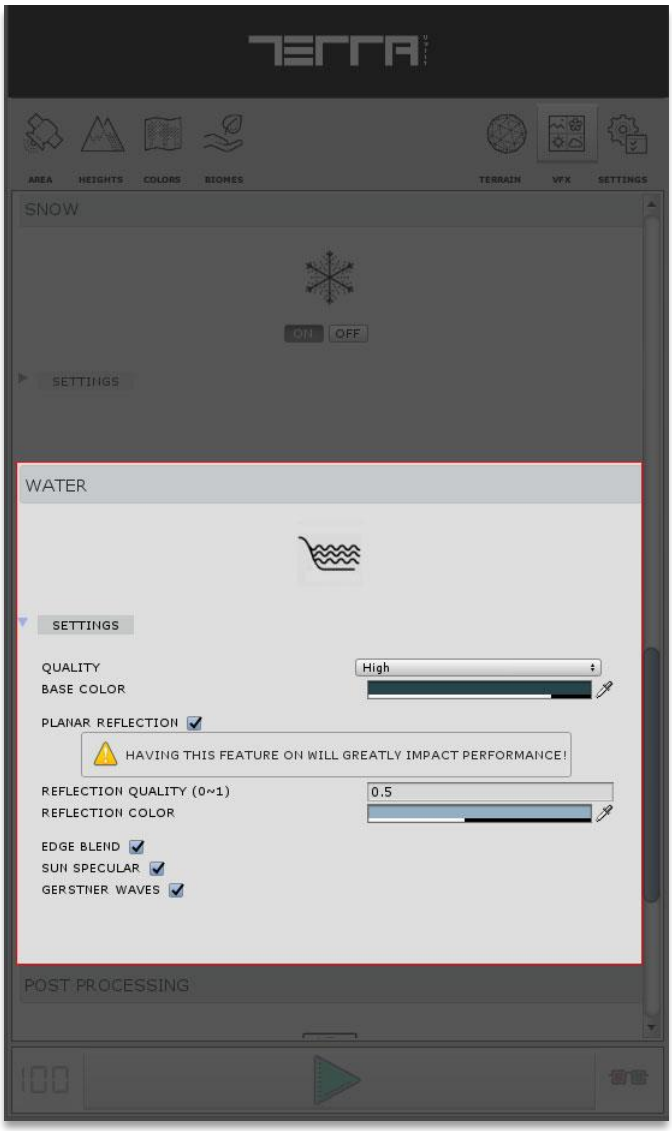
Height Range(M): Minimum & Maximum starting height of snow in meters
Change Speed: Speed of weather change
Start Height: Staring height of the snow on surface
Height Falloff: Height Falloff for the starting point of the snow on surface



Water

Water rendering settings

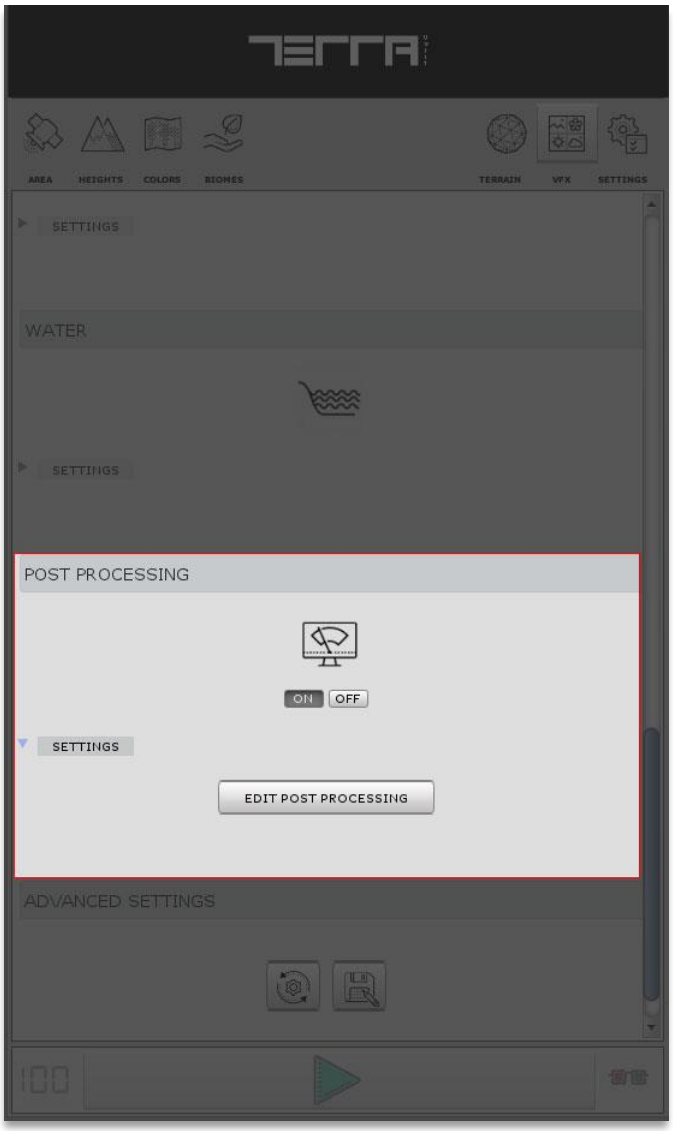
Quality: Quality of water rendering and features
Base Color: Base water color
Planar Reflection: Switch planar reflection to simulate real-time reflections on surface
Reflection Quality (0~1): Quality of the reflection on water surface
Reflection Color: Reflection color and depth on water surface
Edge Blend: Blending of water surface at the edges to simulate foam and transparency at the edges
Sun Specular: Simulate sun specular lighting on surface
Gerstner Waves: Switch Gerstner waves on water surface which displaces water mesh vertices to simulate waves



Post Processing

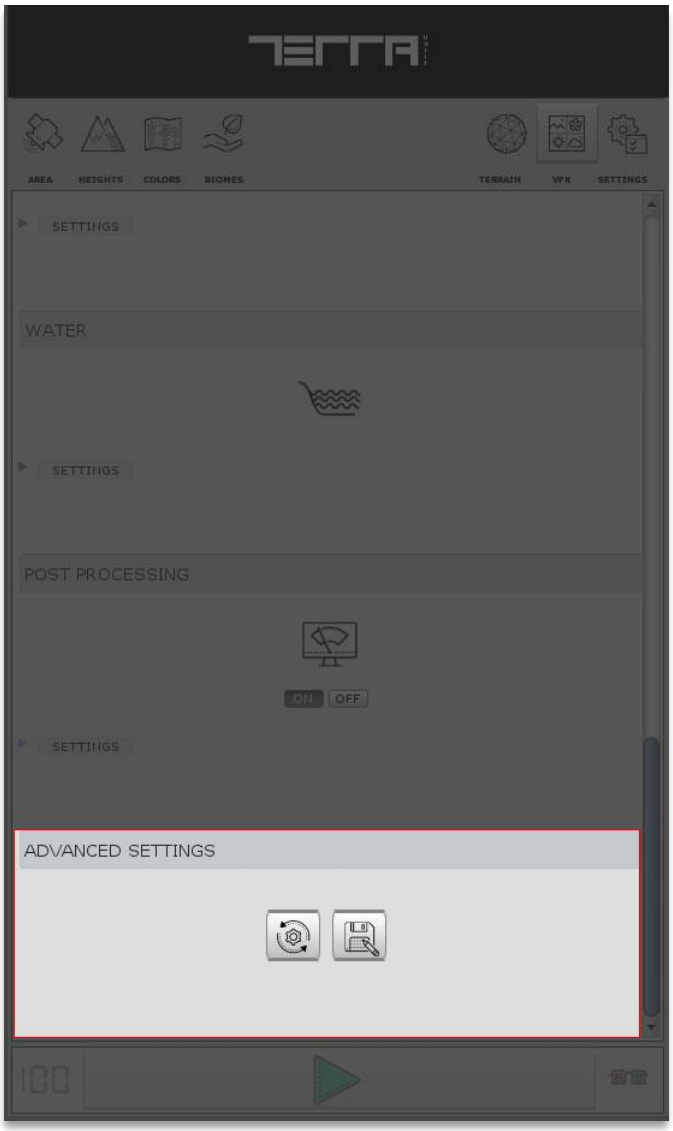
The post processing stack comes with a collection of effects and image filters you can apply to your cameras to improve the visuals of your games.

Edit Post Processing: Edit post processing settings. Pressing this button will take you to the Post Processing asset file in order to edit and customize settings.



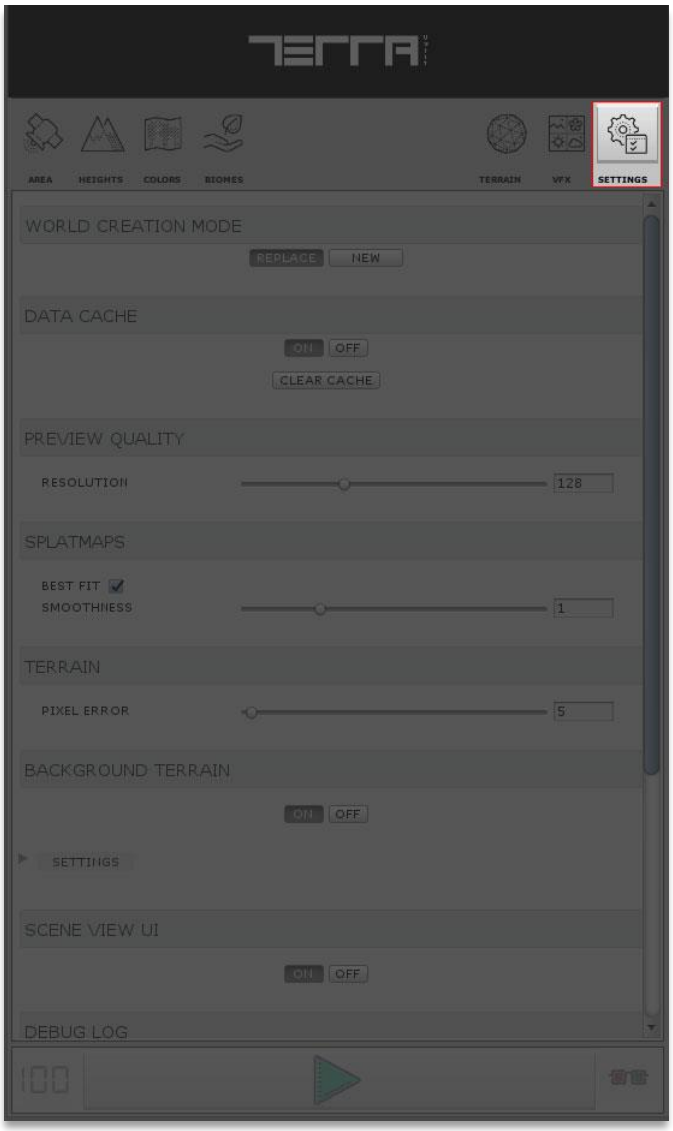
Advanced Settings

Reset to default settings or edit all runtime VFX parameters living in scene hierarchy.



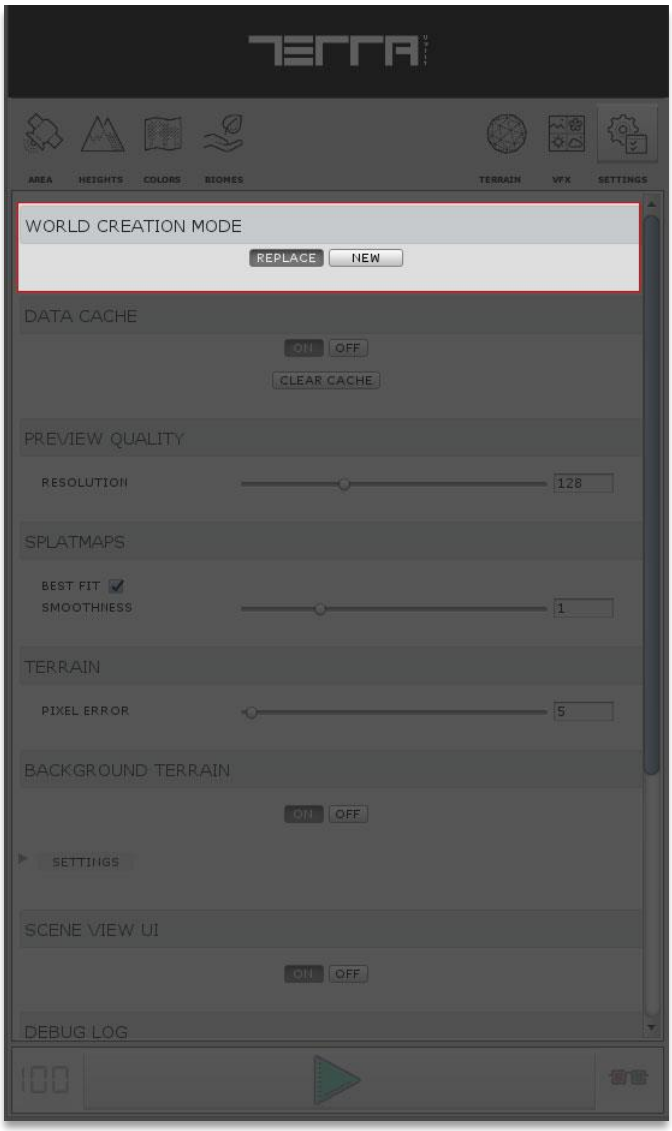
Global Settings TAB

Here you can define global settings which will be shared between all graphs and TerraWorld system.



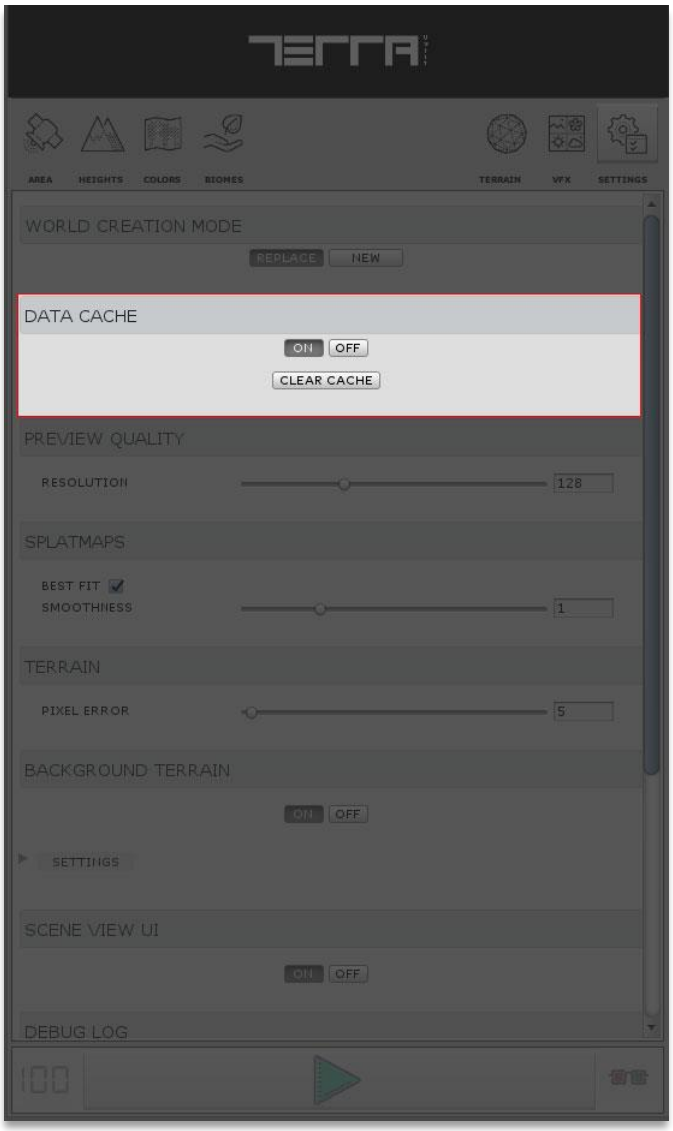
World Creation Mode

Select between New or Replace world modes. When in Replace mode, the existing world in scene will be destroyed and the new one will be replaced.



Data Cache

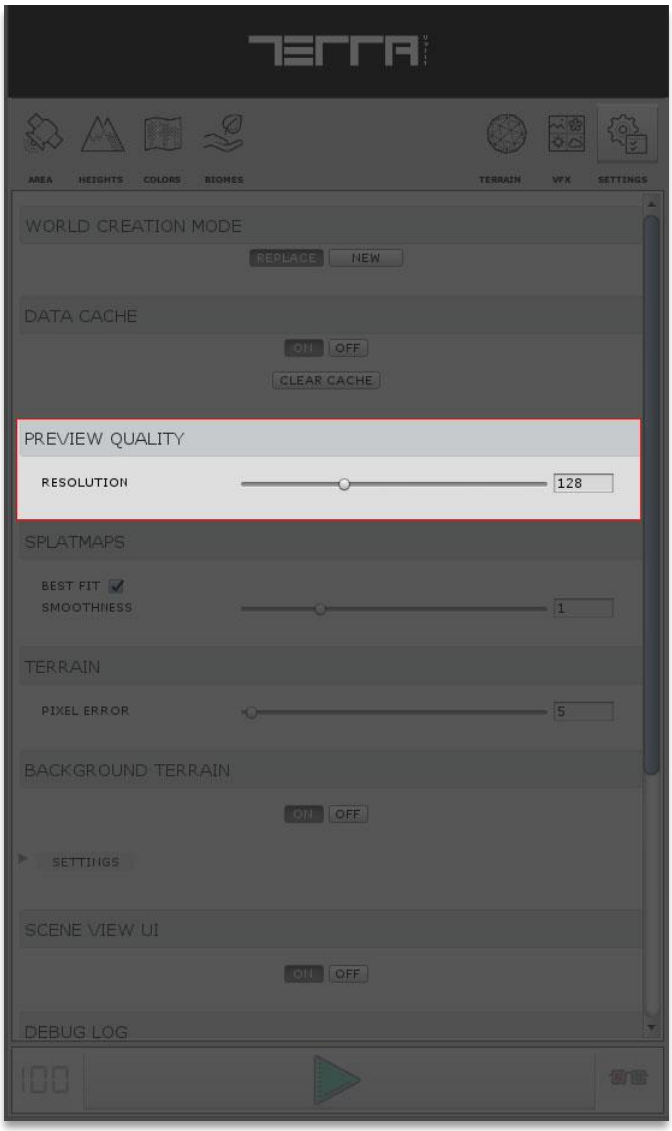
Data cache option will enable/disable cache system for data fetching from internet.



Preview Quality

The preview quality defines resolution of preview system requests both in UI and scene previews.

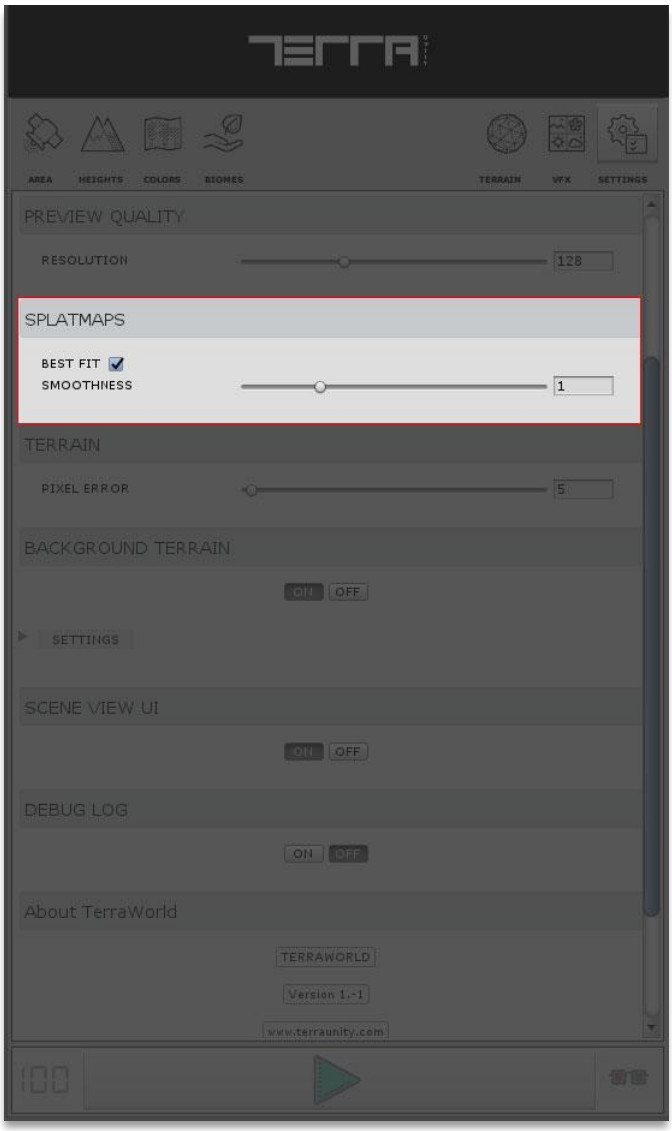
Resolution: Resolution for preview requests in scene and UI



Splatmaps

Splatmap settings used on terrains for texturing

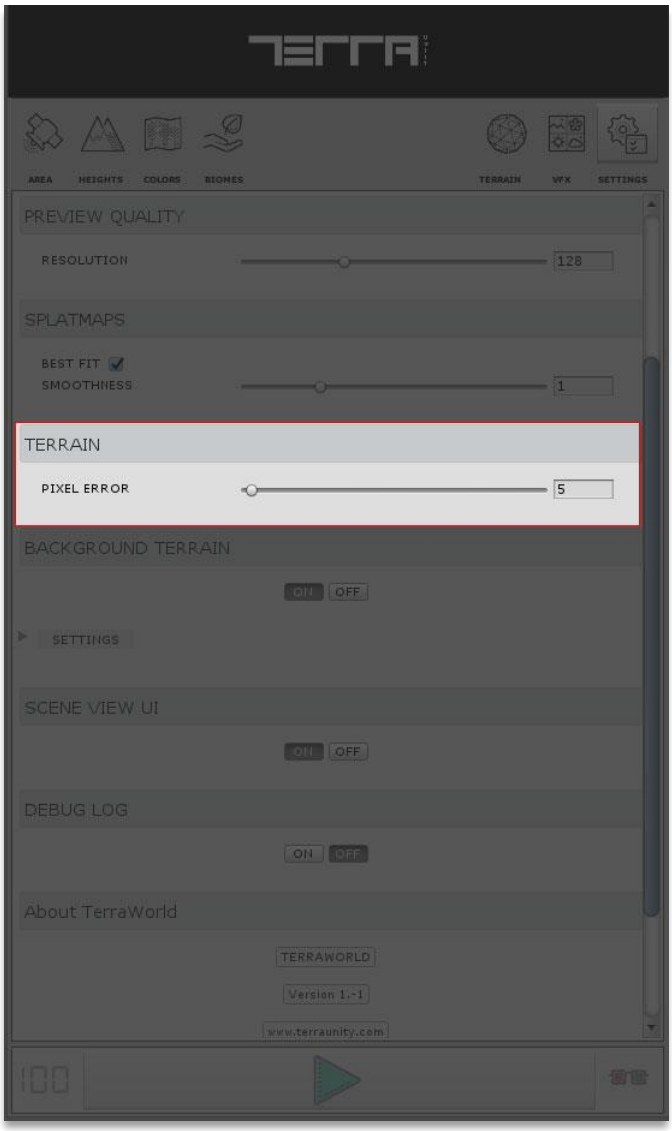
Best Fit: Automatically calculate splatmap resolution
Smoothness: Smoothness iterations for the splatmap channels blending



Terrain

Terrain surface quality applied on heightmap.

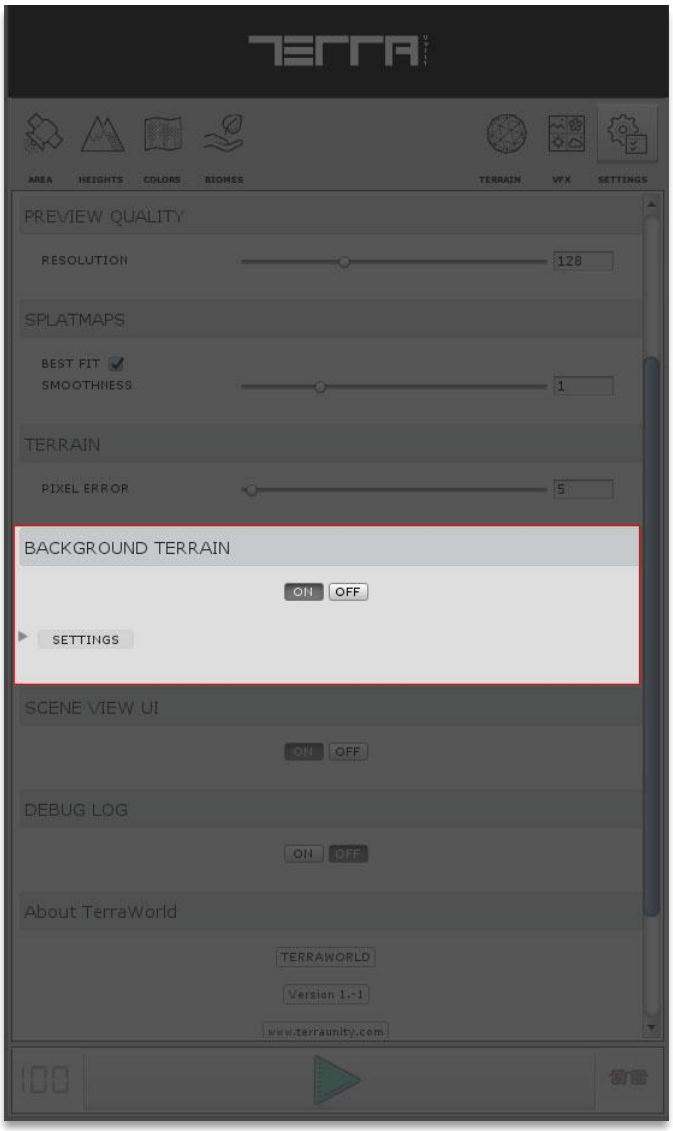
Pixel Error: Pixel Error value for the main terrain's surface quality



Background Terrain

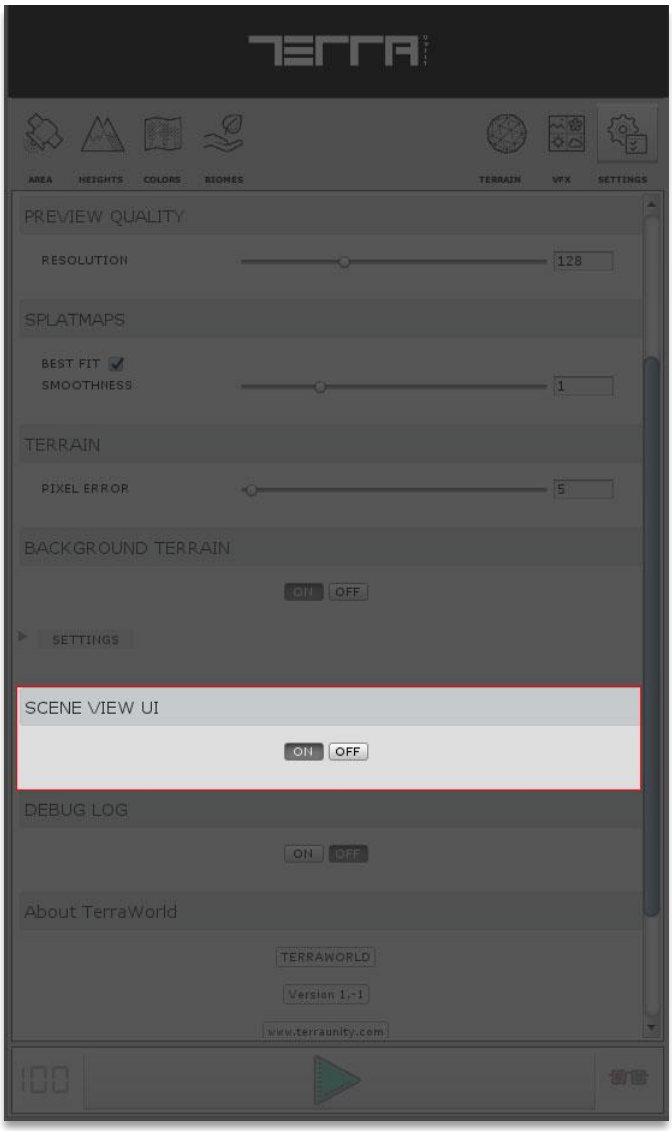
Background Terrain Settings.

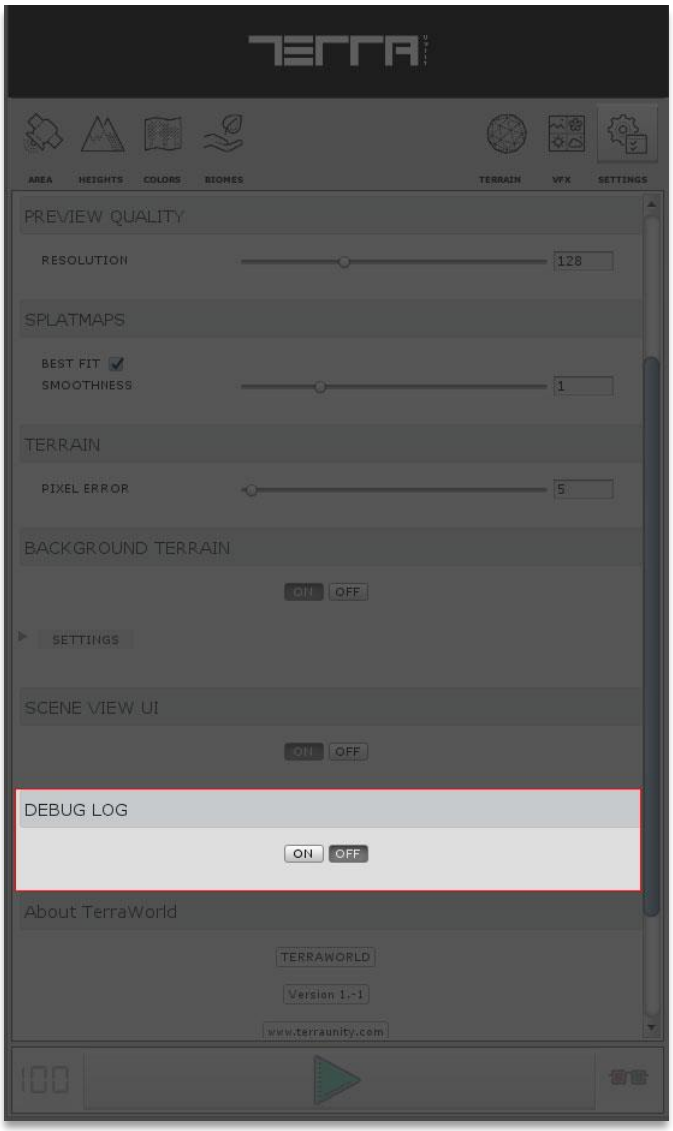
Area Multiplier: Background Terrain's area size is value multiplied with the original world size.
Heightmap Resolution: Select heightmap resolution for the background world
Image Resolution: Select satellite image resolution for the background world
Pixel Error: Pixel Error factor for the background terrain surface quality
Y Offset: Offset in meters for the background terrain's Y position
Snow Cover: Enable or disable snow cover on background terrain



Scene View

Turn on/off Scene View UI display displaying TerraWorld© related information in scene view.



Debug Log

Logs all generation steps into the console window.