JK Volumetric Clouds for Unity

User Manual

JK Volumetric Cloud is an asset used to add cloudy skies into the Unity Editor. Standard Unity procedural skybox shader is used for the color of the sky and the sun. Only the clouds themselves are rendered by the asset itself.

Clouds can be generated in three different qualities (high, medium and low). These settings modify the resolution clouds are rendered in.

Two types of clouds can be displayed – cumulus stratus. The position of and type and thickness of the cloud is described by the cloud map. This can be either a custom cloud map provided by the user or generated by the program. Generated cloud map dynamically evolves over time and the user can control its changes.

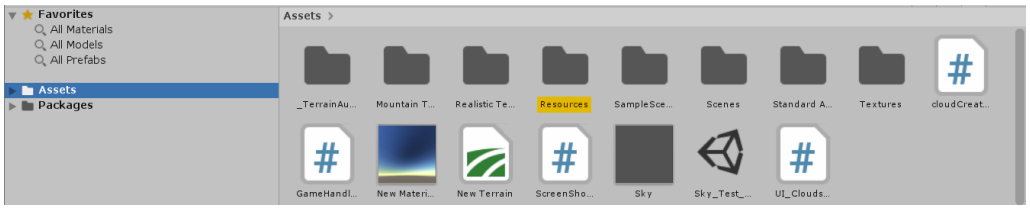
Clouds react to the color and direction of the sunlight.

Contents

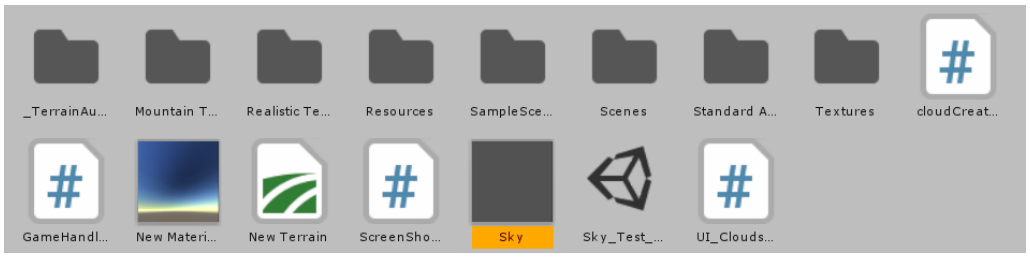
Installation

Setting up the JK Volumetric Clouds in Unity is straightforward.

1. Download the asset from the Unity Asset Store
2. Place Clouds folder into *Assets/Resources* folder. Sky.prefab and cloudCreator.cs can be placed anywhere in the project (ideally somewhere into the Assets folder)



3. Drag the Sky.prefab into your Hierarchy window or directly into the scene.



4. Clouds should appear in the sky

Issues and Usage

Cloud rendering in the asset can only be used in certain types of projects.

Flying Through Clouds

Flying through clouds is not possible. Clouds can only be viewed from the ground.

Wind Speed

Only one-sixteenth of the clouds update each frame. This makes the rendering much faster but causes issues with clouds moving too fast.

Because of this problem do not use a wind speed higher than 20.

Walking and Running Speed

Only one-sixteenth of the clouds are updated each frame. This causes problems if the clouds move too fast relative to the player.

Do not use walking or running speed higher than 20.

Custom Cloud Map

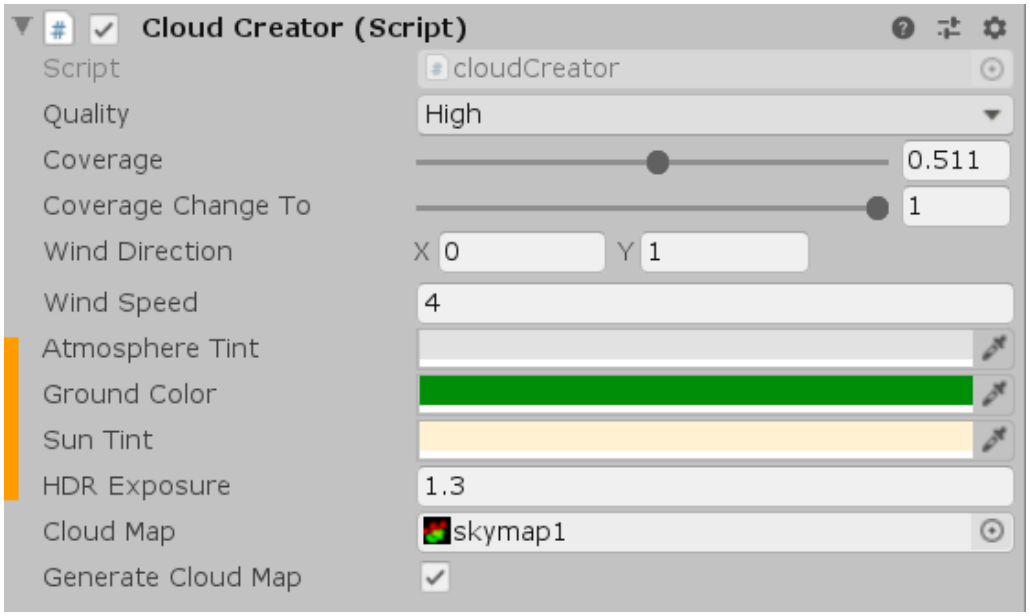
Avoid sharp transitions between areas with higher and lower amounts of clouds (make them blurred).

Basic Settings

Unity Procedural Skybox variables

These variables do modify the sky beneath the clouds.

They work the same way they do in the standard Unity Procedural Skybox.



(Unity Procedural Skybox variables highlighted)

Atmosphere Tint

Atmosphere Tint describes the color of the particles in the atmosphere. They modify the color of the sky. Using gray particles gives blue sky, giving them a specific hue will shift the sky towards that color. Lighter particles give a lighter sky tone.

Ground Color

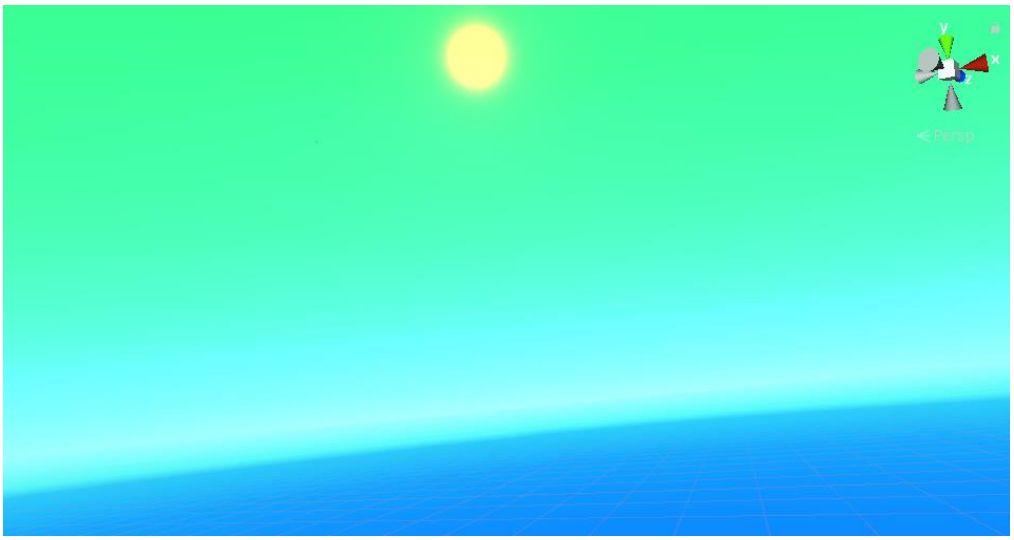
Ground Color is displayed in the bottom half of the skybox sphere.

Sun Tint

Sun Tint modifies the color of the Sun dot in the sky.

HDR Exposure

HDR Exposure modifies both the color of the clouds and the sky underneath them. The output color is multiplied by the value of this variable. Higher values, therefore mean both lighter sky and clouds.



(Modified Atmosphere Tint, Ground Color, Sun Tint, and HDR Exposure)

Sun

There are no Sun settings in the JK Volumetric Clouds asset. The brightest directional light in the scene is taken as the Sun for the clouds.

Clouds are modified by the direction, color, and strength of the Sun.

Direction

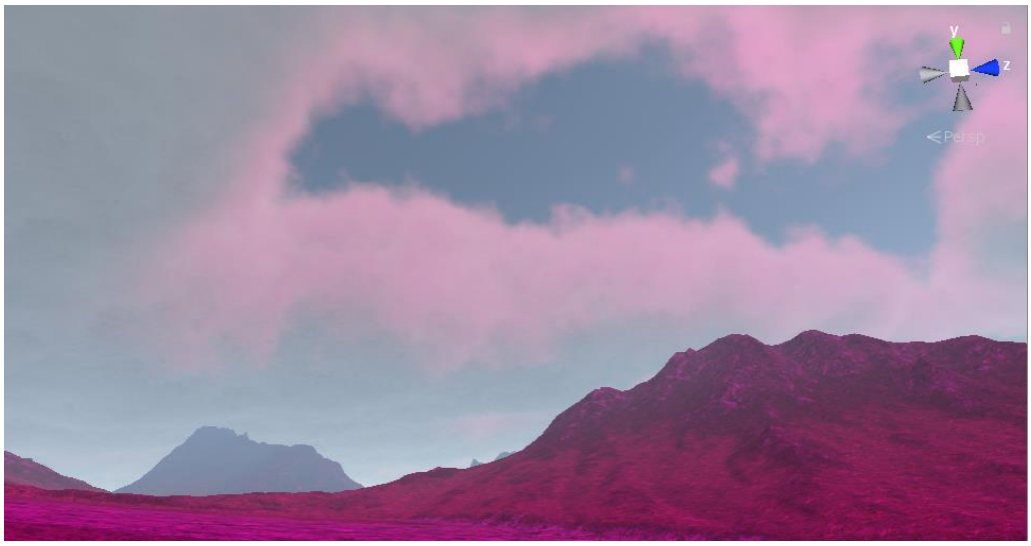
Direction influences self-shadowing. When you change the direction of the Sun, you can see the darker parts of the clouds move away from the Sun.

The light coming in a sharp angle also has lower intensity. This makes the evening and night clouds darker than their noon counterparts.

(Clouds appear darker in the evening)

Color

The color of the incoming light changes the color of the brightly lit parts of the clouds. It doesn't have an effect on the color of the sky or the Sun dot (use Sky Atmosphere Tint and Sun Tint instead).



(Clouds in the purple light)

Intensity

Intensity changes the strength of the light and therefore makes clouds darker or lighter. This value shouldn't be changed too much, because it does not affect the underlying sky color.

(Clouds with too high light intensity)

Ambient Light

Clouds do not receive light only from the Sun, but also from their surroundings (mostly the sky). Ambient Light is used to describe all the light coming from directions other than the Sun.

In the asset, there are two properties used for this Ambient Color Top and Color Bottom. The first describes the ambient light at the to of the clouds (higher altitudes) and the second one at the bottom.

For the daily sky, a blueish-grey is used – light comes mostly from the rest of the sky.

In the evening ambient can be shifted to orange or red.

In the night use dim blueish light.

(night clouds, color created by ambient light)

Quality

The quality setting modifies the resolution of the rendered clouds.

Lower quality clouds are quicker to render, but they contain less detail.

Custom Cloud Map

Cloud maps are textures used to modify the amount and type of clouds in different parts of the sky.

The program can use both user-defined cloud maps, or a dynamically generated one.

A custom map can help the user define specific cloud shapes and use both cumulus and stratus cloud types. The generated cloud map uses only cumulus clouds, on the other hand, it can dynamically change over time.

Drawing a Cloud Map

The cloud map is an image, that can be produced in a graphics program of your choice. Texture channels are used to define the amount and type of clouds, the higher value means a higher amount of thicker clouds.

Red

Red is used for areas with the cumulus clouds. These are thick bulky clouds.

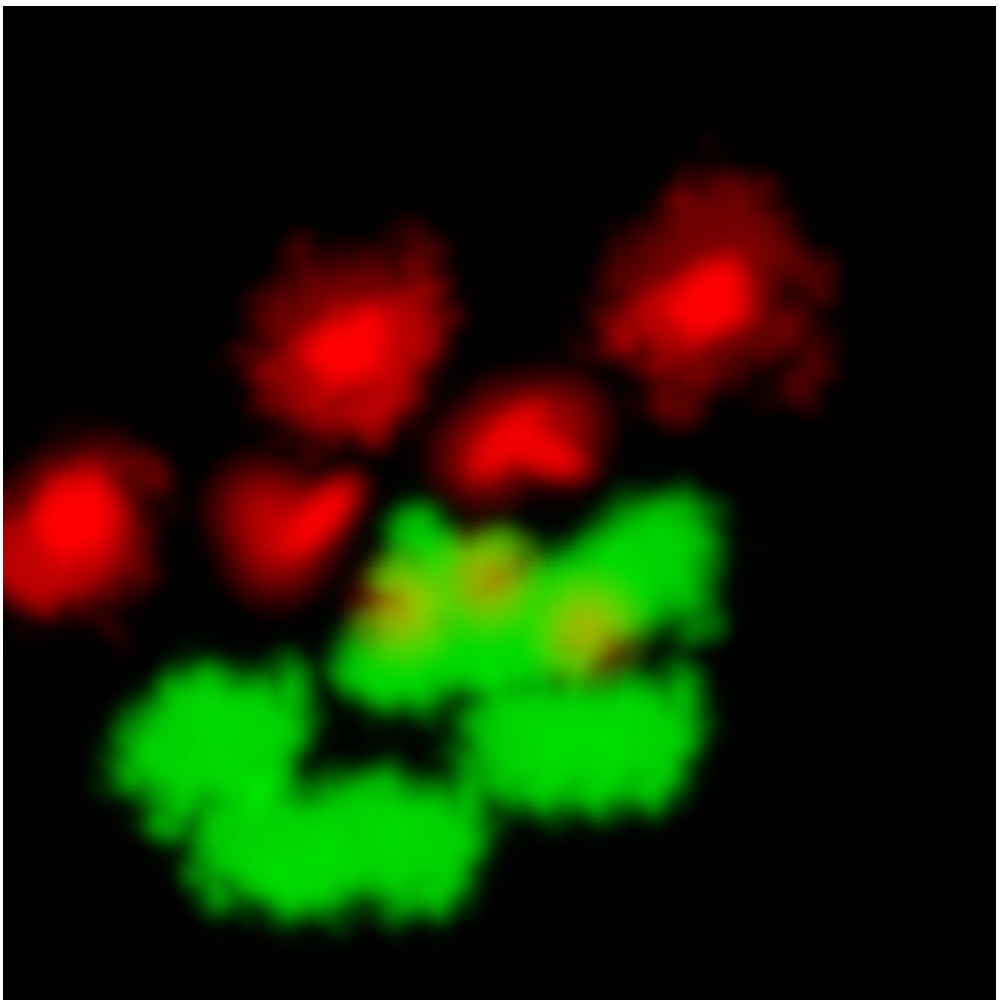
Green

Green is used to add stratus clouds. These are thinner clouds with more fragmented clouds.

Tips for Drawing the Cloud Map

The transitions between the different amount of clouds shouldn’t be too sharp, but there should be cloud shapes visible in the cloud map.

Colors like RGB(125, 0, 0) should be used only for transitions between areas with or without clouds. Most of the image should be either black or have high channel values, for example, RGB(255, 0, 0).



(Example of a custom cloud map)

Using a Custom Cloud Map

Using a custom cloud map in your scene is straightforward. First, import the image with the cloud map into your Unity project.

When the importing of the texture is finished, drag it into the Sky asset field Cloud Map and uncheck the Generate Cloud Map checkbox.

Once this is done, the clouds specified by the cloud map should appear.

(Example of clouds generated from a custom cloud map)

Generated Cloud Map

Apart from the custom drawn textures, the program can generate its own cloud map. Moreover, this cloud map dynamically evolves over time based on the user setting wind speed, wind direction and the amount of newly appearing clouds.

Basic Setup

To start generating a cloud map make sure the Generate Cloud Map checkbox is checked.

When the checkbox is checked you can modify the amount of clouds on the sky by modifying the Coverage property.

(sky with high coverage)

Animating the cloud map

Cloud map can also be animated. Three properties are used to do this. All of them can be changed at runtime simulating more complicated weather.

Wind Direction

Wind Direction gives the program the direction the clouds should move.

Wind Speed

Tells us the speed clouds should move in the directions specified in the Wind Direction property.

The clouds are optimized, so only one-sixteenth of the pixels are rendered each frame. This causes problems when the clouds move too quickly. Do not set the speed of the clouds higher than 20 except for debugging purposes.

Coverage Change To

Coverage can be changed over time. This can be done by setting the Coverage Change To property in the Sky.prefab.

Newly appearing clouds will be generated with the coverage set by this property.

It takes time until the clouds with this density move above the player (to the center of the cloud map). The length of this time depends on the wind speed. With the speed of 20, this change takes around 10 minutes.