VOLUMETRIC FOG & MIST

Kronnect

Contents

Introduction

Thanks for purchasing!

Volumetric Fog & Mist is an advanced full-screen post-image effect for Unity that adds realistic fog, mist, dust and clouds effects to your scenes.

This asset is highly optimized but due to the nature of its algorithm it's not suitable for mobile devices. For mobile devices, use Dynamic Fog & Mist, also included in the package. You can add both assets to your project and enable the most appropiate for the running platform (see Dynamic Fog & Mist section at the end of this document).

Demo Scenes

Just load any demo scene included and click "Play". You will be able to move around using WASD or cursor keys. Press spacebar to jump, F to change fog style and T to toggle on/off the fog.

The Fog Of War demo scene allows you to "Cut" the fog as you pass through it (press "C" to enable fog cutting mode).

You can delete the Demo folder entirely or ignore it when importing the asset into your project.

Quick Start

1. Add the VolumetricFog script to your main camera in your scene.

2. Choose one of the preset and that's all!

You can of course customize any of its parameters to match your game mood and requirements.

Special Features

Fog Volumes

You can define special zones (fog volumes) where fog alpha will automatically change. Create a fog volume from the menu GameObject / Create Other / Fog Volume. Position the fog volume over the desired area, edit the collider bounds and set the desired fog alpha and transition duration in the inspector.

By default, Fog Volumes will react to any collider that contains the camera to which the fog image effect is attached (for first person controllers this is the default behaviour). But you can also assign a different collider so they will also work with third person controllers.

Check out Demo Scene #7 “MountainClimb” for an example of Fog Volumes.

Elevated Fog & Clouds

You can make the fog start above Camera position to simulate floating smoke or even clouds! Try it assigning a value above the Camera Y position to Base Height property in the inspector.

Check out Demo Scene #7 “MountainClimb” for an example of how to enable a dynamic cloud layer that reacts when player climbs a mountain.

Automatic fog light alignment with Sun

A light game object existing in the scene can act as the Sun and be assigned to Volumetric. You’ll find a property in the inspector, called Sun, where you can drag and drop the desired light in your scene.

After assigning a light as the Sun, the fog will react to the sun light direction, intensity and color automatically. Click “Unassign” to break the link and allow to freely customize light direction, intensity and color.

Void Areas

Another great feature included in the asset is the **void area**. This option is useful if you want a clear area around a world space position. For example, in 3rd Person View games, you may want a clear area around the character.

This option is similar to the Distance Fog feature (using Distance > 0) but Distance Fog Works having into account the distance from the Camera. So Distance parameter is useful for 1st Person View and Void Areas for 3rd Person View.

Void areas can be **spherical or boxed**. To make a spherical void area just move the radius slider to the left. To make it boxed, set the width and depth sliders.

Also, you can assign your character game object to the property field in this section, so the center of the void will follow it automatically.

Fog Area

Void Areas can be inverted, so fog will only appear inside the bounding sphere defined by the fog area. The demo scene #6 “HighClouds” shows an example.

To enable a fog area:

- Set the XZ position with Void Area position setting and the Y coordinate using the baseline height parameter.
- Choose a radius and a falloff (in void area section)

Fog of War

You can also set any number of void areas just calling **SetFogOfWarAlpha** method of the Volumetric script. Just pass the world space position, the radius and the desired new alpha for the fog. Just make sure the center and size of the fog of war (configured in the inspector) are properly set (by default the fog of war is centered on 0,0,0 with a size of 1024x1024).

Call **ResetForOfWar** to reset the cleared areas back to normal.

Point Light support

Up to 6 point lights can be selected to illuminate the fog with different colors, ranges and intensities.

This feature can be used to achieve many visual effects, from fog gradients, glow or bloom, definitely enhancing the ambiance of your scenes.

At night, if you have the fog synced with a Sun game object, the fog will be dark. You can use this feature to illuminate the surrounding area of the characters.

Note that point light are simulated in the shader, so it’s not neccesary to have real point lights in the scene. But if you have them, you can simply assign them to the slots in the Point Light section or make the asset choose them for you automatically using the slider and checking “Track Point Lights”.

Light Scattering

Light scattering is the physical phenomena that makes the light reflect/refract when it crosses different densities, adding shafts of light across the scene from the light source. Volumetric Fog & Mist includes a light scattering option, which approximates that effect in screen space (that means that it only works when the light source is in front of you).

To enable this option, you need to assign a light source to the Sun property and check the Enable toggle in the inspector. Then customize the effect with the different parameters in that section.

Please note that light scattering will increase the workload on the GPU, so you may have a configuration parameter in your game to enable it in addition to the fog.

Enhanced compatibility

Enhanced Sprite Compatibility

Standard Unity sprite shaders are not compatible with Image Effects as they are not rendered as 3D objects and don't write to ZBuffer on real world positions. That forces Image Effects to be rendered before the transparent queue so at least sprites (as particles) are not covered by the Image Effect. This cause that sprites look floating over the scene as the fog makes them clearly separated from rest of the scene.

To avoid the problem described above, Volumetric Fog & Mist includes two custom sprite shaders found in Resources/Extras folder. You will find two materials with names SpriteFogDiffuse and SpriteFogUnlit, which you may just assign to your Sprite Renderers to make Sprite fully compatible with the Image Effects.

Compatibility with Time of Day

If you use Time of Day asset, you may assign the Sun game object found under Sky Dome to the Sun field in the Volumetric Fog & Mist inspector. That will sync the direction and color of the Sun light with the fog.

Compatibility with Gaia

Volumetric Fog & Mist is also available from Gaia's Extension Manager. You will find a list of convenient buttons that configures and select the different presets of Volumetric Fog & Mist in just one click.

Compatibility with Horizon(ON)

Volumetric Fog & Mist has been tested with recent versions of Horizon(ON). It will only work with the real terrain though, so you will probably need to reduce the max distance factor and combine Volumetric Fog & MIst with the fog effect provided by Horizon(ON) for the long distance.

Performance Tips

Volumetric Fog uses an extremely optimized ray-marching algorithm to provide “volumetric sense” fog in front of your player. This great effect comes at a performace price that makes Volumetric Fog & Mist not suitable for mobile devices (at least mobile devices to date).

However we have added a few optimization parameters to provide you with more control regarding the performance vs quality:

- **Max Distance**: reduce the max distance property to a value that matches your scene/requirements so no extra fog is calculated in vain.

- **Downsampling**: increase this value to improve performance. A high value will produce visible artifacts around objects. A x2 value usually works well. A x4 value works better with elevated/cloud fog. You can enable the “Edge improvement” option to reduce fog bleeding/pixelization around geometry borders.

- **Stepping**: controls the step of the ray-marching algorithm. Reduce this value to improve performance.

- **Stepping near**: additional factor for the ray-marching step applied only to close distances. Increase to improve the fog effect when stepping is reduced.

- **Sky Haze**: reduce to 0 to improve performance.

- **Distance** (starting Distance in Fog Geometry group): reduce to 0 to improve performance.

Optional features that you may check they’re either on (because you want them) or off (because you don’t want them and want to make sure they are really disabled):

- **Point Lights**: reduce the number of point lights that can illuminate the fog (Point Light section). Make sure the range for non-used slots is zero.

- **Light Scattering**: uncheck the Enable toggle to disable the effect and increase performance. Make sure that if you enable it, the effect is visible when facing towards Sun, otherwise you will be wasting lot GPU cycles!

- **Fog Void / Fog of War**: disable (either setting the fog void radius to zero) or disabling fog of war feature (toggle in its section) if you’re not using them to reduce GPU work.

Support

Please visit kronnect.com for questions, support and more info.

Common Issues

When I import Volumetric Fog & Mist I see some errores in the console related to Standard Assets.

Volumetric Fog & Mist includes a copy of the Standard Assets inside the Demo folder. Depending on your Unity version, this copy of Standard Assets corresponds to 5.1.1 or 5.3.1 Unity versions. If you already have the Standard Assets imported in your project you will receive errors due to duplication of files. The errors will go away when you delete the duplicated files. You may delete the Standard Assets folder inside Volumetric Fog & Mist Demos folder.

I have exceded the maximum number of allowed shader keywords. What can I do?

Volumetric Fog & Mist shader uses the following keywords, defined in VolumetricFog.shader file:

#pragma multi_compile __ FOG_DISTANCE_ON
Used when you set Starting Distance > 0.

#pragma multi_compile __ FOG_VOID_ON FOG_BOX_VOID_ON FOG_VOID_INVERTED
Used when you enable Void Area or Fog Area (inverted).

#pragma multi_compile __ FOG_HAZE_ON
Used when you Sky Haze setting is > 0.

#pragma multi_compile __ FOG_OF_WAR_ON
Used when you enable Fog of War feature.

#pragma multi_compile __ FOG_POINT_LIGHT0 …
Used when the range setting of the optional point light setting is > 0.

#pragma multi_compile __ FOG_SCATTERING_ON
Used for light scattering (god rays, sun shafts).

Yoy have two options here to reduce the keywords:

A) I don't need that feature: just remove the corresponding #pragma line.
B) I need that feature: you may remove the #pragma line AND also remove all #if related statements in the shader so that code will always execute.

When I generate a build, it stucks or takes lot of time!

This is a known issue with Unity when compiling shaders with many keywords. You may want to reduce the shader complexity removing some keywords that you don't use – check the previous question to learn about the different keywords used by the shader. Just edit VolumetricFog.shader file and remove the line that contains #pragma multi_compile xxxx, where xxxx is the keyword / feature you don't need.

Dynamic Fog & Mist

You will find a copy of Dynamic Fog & Mist included in this package located in the Extras folder.

Dynamic Fog & Mist is somewhat less impressive visually than Volumetric Fog but it will provide better performance.

If you're not interested in using Dynamic Fog & MIst, remember to remove the Extra folder completely.

Volumetric Fog Change Log

V5.2 Current version

Improvements:
- New dithering algorithm that applies to sky haze which contributes to extra banding reduction
- Fog of War: new params to control delay and duration of automatic fog restore after setting alpha
- Improved included alternate sprites shaders (unlit & diffuse) to accept vertex colors.
- Ability to follow a character when using fog inverted mode.

Fixes:
- Fog would shift height under some circumstances

V5.1 Published on 2016.05.12

Fixes:
- Reduced banding at low density.
- Changed Dynamic Fog & Mist Advanced shader variant to use shader model 3.0

V5.0 Published on 2016.04.27

New Features:
- New "Edge Improve" option to reduce fog bleeding/pixelization over geometry edges when downsampling is increased.
- New “Dithering” option to reduce banding artifacts.

Improvements:
- Inverted areas (spherical and boxed) are now accurate and works from any view angle.
- Dynamic Fog & Mist (included in package) updated to V1.7

V4.2 Published on 2016.04.19

New Features:
- New demo scenes “High Clouds” and “MountainClimb”

Improvements:
- Improved area fog with better cloud scattering
- Can set custom colliders on Fog Volumes

Fixes:
- Fixed light scattering bug on DX platform when antialias is enabled

V4.1 Published on 2016.03.30

New Features:
- Light scattering option (a.k.a. god rays, sun shafts or volumetric scattering)

Improvements:
- Improved performance when fog density is low
- Reorganized inspector settings in foldable sections

Fixes:
- Fixed sky haze noise sampling
- Fixed point light sampling scale

V4.0 Published on 2016.03.14

New Features:
- Support for Point Light (up to 6 point lights) with auto tracking - another option for creating artistic effects. New Demo Scene.
- New Sprite materials & shaders (Sprite Fog Diffuse, Sprite Fog Unlit)
- Includes Dynamic Fog & Mist 1.5
- Can invert void areas

Improvements:
- Improved performance

Fixes:
- Fixes regarding Sun unassigment in inspector
- Integrated Dynamic Fog & Mist to avoid issues with shared resources

V3.3 Published on 2016.03.05

New Features:
- Enhanced compatibility with sprite renderer

V3.2 Published on 2016.02.19

New Features:
- New World Edge preset
- Compatibility with Gaia via Extension Manager
- Compatibility with Time of Day (assign Sun game object to Sun property in inspector)
- Ability to render either in front or behind transparent objects with a single click (inspector)

Improvements
- Ability to assign a gameobject (character) to make the void area follow it automatically
- Ability to set the baseline of the fog automatically with Camera height.
- Button in inspector to unassign the Sun
- Improved preset auto configuration, now detects water level
- Improved falloff for distance fog when views from top or bottom
- Improved fog algorithm

Fixes:
- Compatibility with Render Texture (Demo Scene 3 included, check video below)
- Fixed issues with different height base lines

V3.1 Published on 2016.02.09
- Fog of War.

V3.0 Published on 2016.01.25
- Downsampling option to improve performance. Best results when fog is used as cloud layer.

V2.2 Published on 2016.01.22
- Support for boxed void areas

V2.1 Published on 2016.01.08
- Automatic light alignment with defined Sun

V2.0 Published on 2016.01.04
- Support for void areas
- Support for elevated fog & clouds

V1.2 – Published on 2015.12.22
- Improved support for transparent objects

V1.1 - Published on 2015.12.03

Complementary Assets

Don’t miss these other assets to enhance your game experience. Visit kronnect.com to learn more about these and other amazing assets!

Beautify

Beautify is a full-screen image processing effect that **improves the image quality in real time producing incredibly crisp and vivid scenes**.

Beautify uses smart algorithms in a single pass, resulting in a very fast image effect, **suitable for both desktop and mobile platforms**.

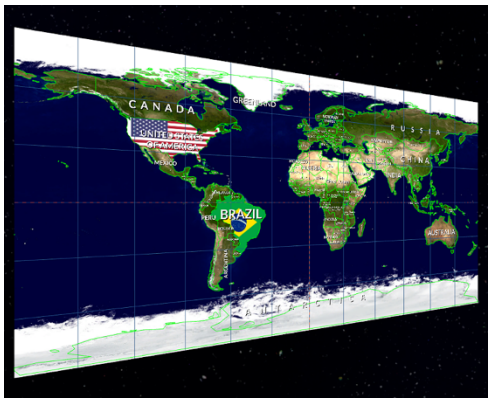
http://kronnect.me/unity/w3/portfolio-asset-beautify.html

Compass Navigator Pro

Compass Navigator Pro adds a “Skyrim”-like compass bar to your UI, including smooth fade in/out, various bar designs, +11 icons in two variations (+22 icons) and nice features.

http://kronnect.me/unity/w3/portfolio-asset-compass-navigator-pro.html

World Political Map Series & World Map Strategy Kit

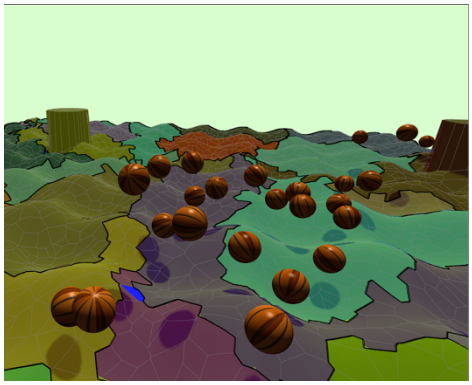


World Political Map Series is a collection of advanced mapping assets for Unity. Used by many companies and agencies across the world to visualize data, resources, interact with the user, etc.

World Political Strategy Kit is a complete framework for building AAA strategy games, including cool 3D PBS dynamic viewport for map, hexagonal grid, path-finding, real elevation, and much more.

http://kronnect.me/unity/w3/portfolio-asset-world-map-strategy-kit.html

Terrain Grid System



Terrain Grid System is an advanced grid generator and territory/cell highlighter/fader for both **Terrain and 2D grids**.

http://kronnect.me/unity/w3/portfolio-asset-wpm-terrain-grid-system.html