



# **DYNAMIC FOG & MIST 2**

## **Universal Rendering Pipeline Edition**

**Quick Start Guide**



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## Introduction

### **Thanks for purchasing!**

Dynamic Fog & Mist 2 is a light-weight performant fog effect for Unity that creates simple yet gorgeous landscape animated fog plus fog of war feature.

This version of Dynamic Fog & Mist has been created from scratch for Universal Rendering Pipeline. It won't work with other pipelines. Please use regular Dynamic Fog & Mist package for built-in pipeline.

## Requirements

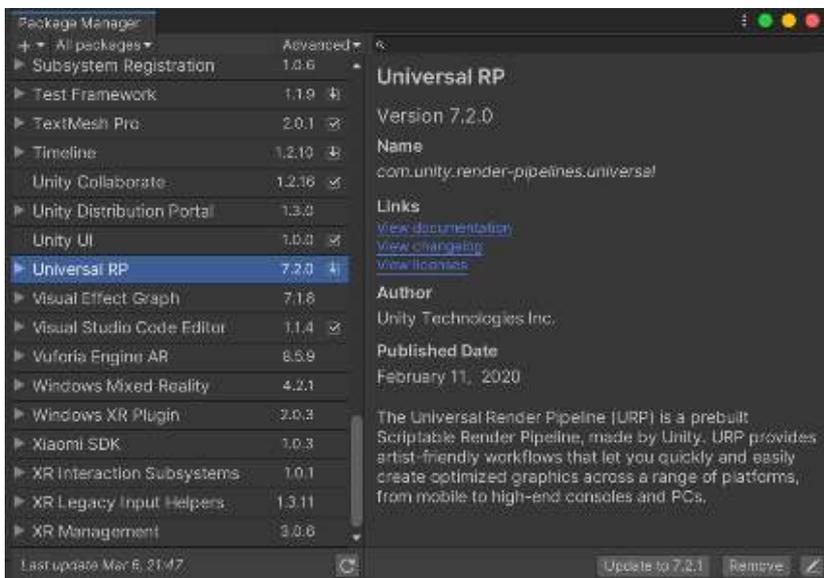
Dynamic Fog & Mist for Universal Rendering Pipeline requires:

- Unity 2019.3 or later
- Universal Rendering Pipeline 7.1.8 or later
- Universal Rendering Pipeline asset must have “Depth Texture” enabled.

## Setup Instructions

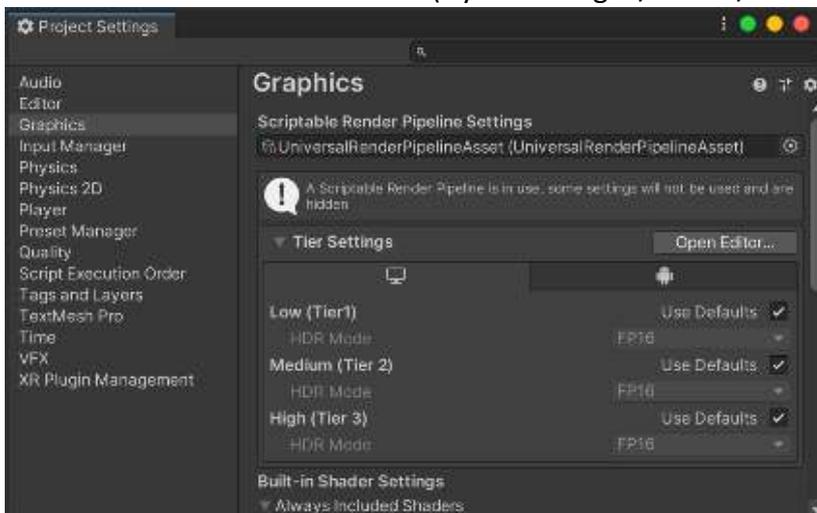
### Step 1: Install Universal Rendering Pipeline

Go to Windows -> Package Manager. Select Universal RP (7.2.0 or later preferably) and click “Install”.



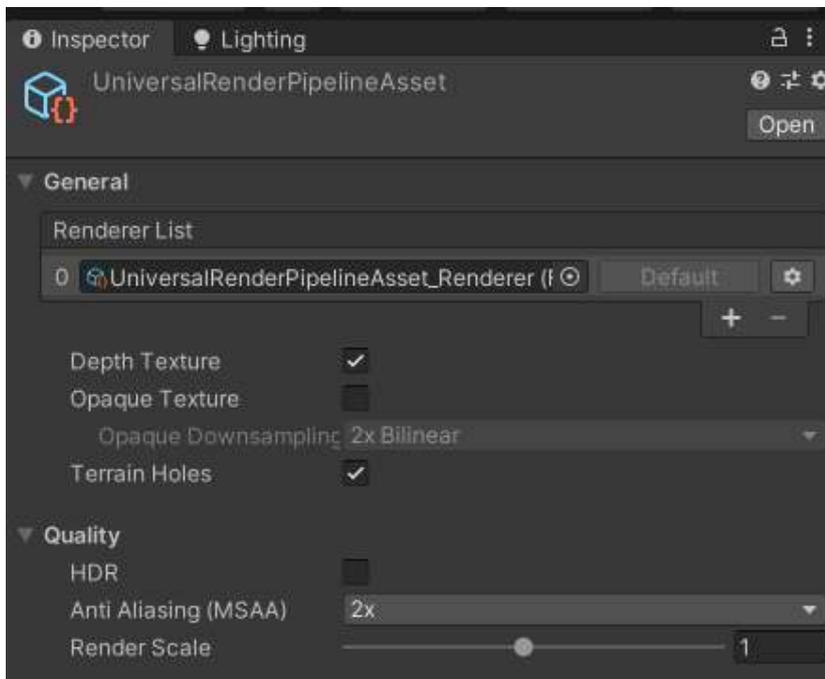
### Step 2: Assign the Universal Rendering Pipeline asset

Go to Project Settings -> Graphics and assign an Universal Rendering Pipeline asset. You can use the asset include in the demo folder (Dynamic Fog 2 /Demo /URP Pipeline Settings folder).



### Step 3: Configure Universal Rendering Pipeline asset

Double click the Universal Rendering Pipeline asset to show its properties. Then enable “Depth Texture”. Enabling MSAA is also recommended:



#### Important note!

Check both “Project Settings / Graphics” and “Project Settings / Quality” sections since you can define URP settings overrides in Quality levels. You need to enable Depth Texture option in all URP settings used in any Quality Level.

Now you can use Dynamic Fog & Mist!

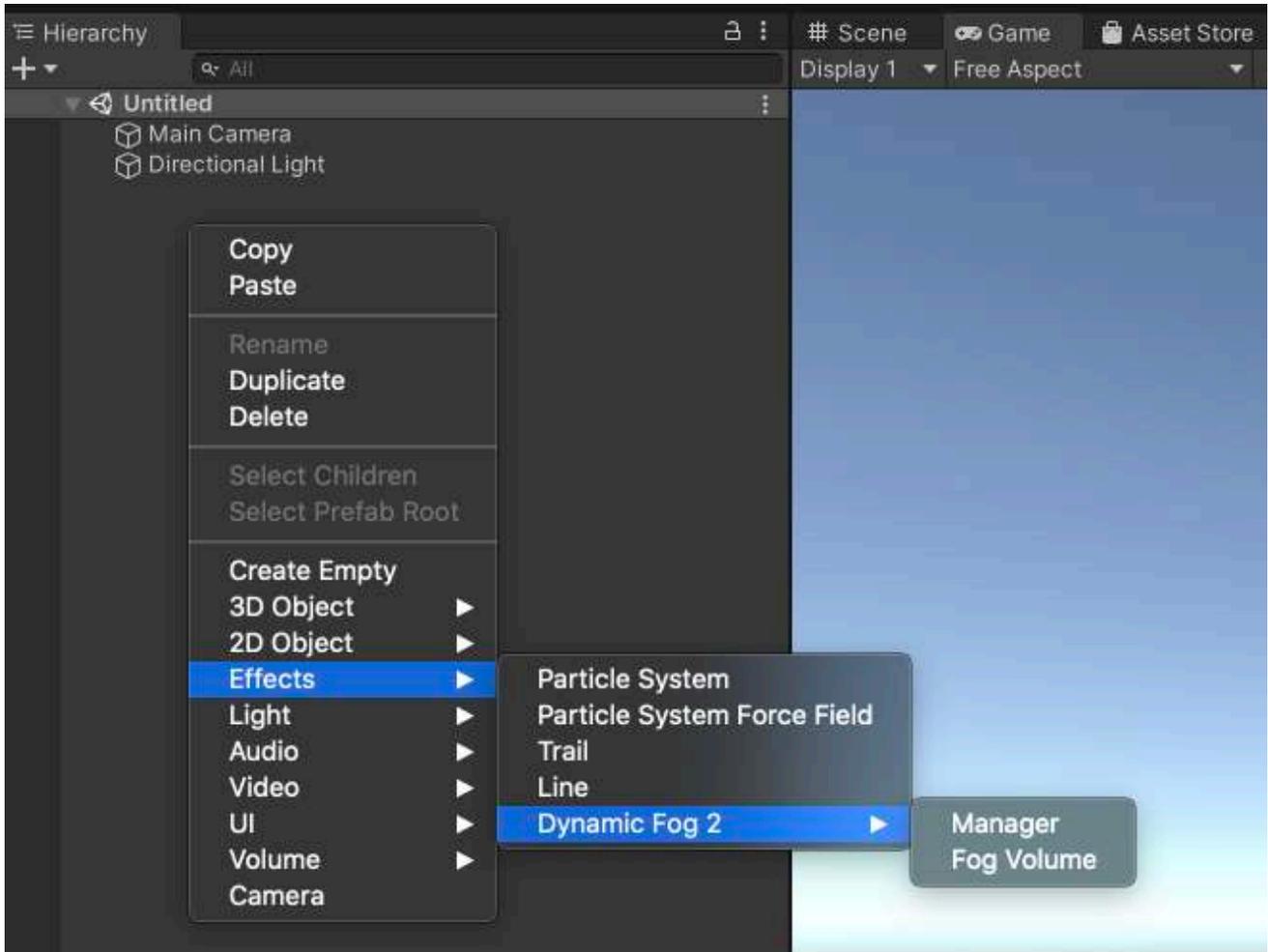
## Demo Scenes

The asset includes two demo scenes to let you quickly familiarize with the different features. Please make sure you have completed the Setup explained in previous section.

Inside the demos folder you will find a Fog Presets with a few sample profiles that you can assign to the demo scene 1.

## Adding Dynamic Fog & Mist to your scene

**Step 1)** Right click in the Hierarchy panel and select “Effects” -> “Dynamic Fog & Mist” -> Fog Volume:



A Fog Volume is a boxed area that contains the fog effect.

Note: the first time a fog volume is added, a “Dynamic Fog Manager” gameobject is automatically created. This manager exposes common settings for all fog volumes (in case you use more than one fog volume in the scene) like the main camera or directional light used as Sun.

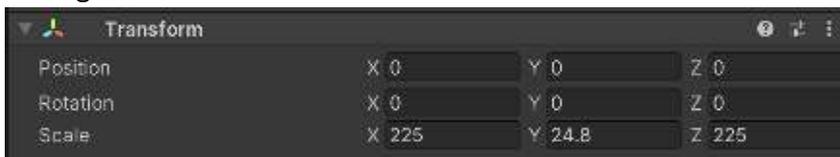
**Step 2)** Create or assign a fog profile

A Fog Profile contains many appearance options and can be reused among fog volumes. Click “New Fog Profile” or assign an existing profile.

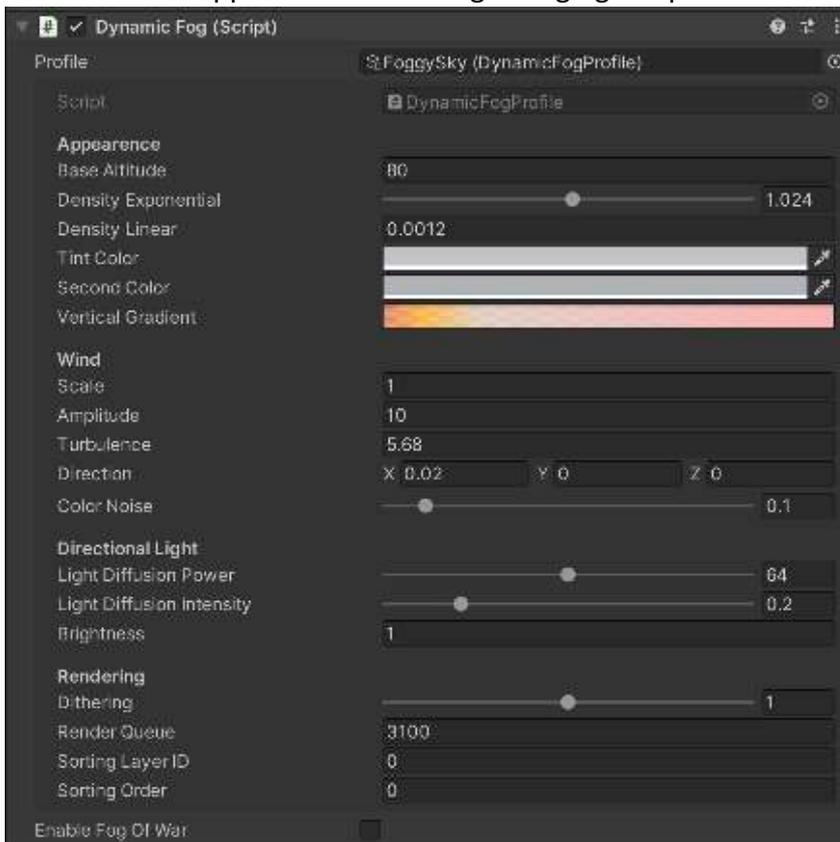


**Step 3) Position/scale/customize fog properties.**

Adjust position and scale to ensure fog covers the desired area. Note that fog will only be visible through this volume.



Customize the appearance of the fog changing the profile values:



Most profile settings are self-explanatory. Default values are recommended for most cases:

- **Base Altitude:** determines the base height for the fog effect.
- **Density Exponential & Density Linear:** controls fog density over distance. Experiment with different values to produce a wide array of effects, from distance fog to foggy sky. Important: the vertical size of the volume influences the fog appearance so volume size is also important.
- **Tint Color:** the base color for the fog.

- **Second Color:** fog color is modulated based on color noise amount between the tint color and second color.
- **Vertical Gradient:** let you define a gradient of colors and alpha keys that influences the color based on vertical angle. You can use this property to make horizon fog more reddish for example (left edge of gradient matches horizon, right edge of gradient equals to zenith).
- **Wind Intensity / Scale / Amplitude / Turbulence / Direction:** allows you to add wind / animation effect to the fog. Scale determines the horizontal scale of the noise while Amplitude refers to the vertical displacement of the fog.
- **Directional Light:** controls the Sun light diffusion and intensity across the fog.
- **Rendering:** this section let you control different aspects of the fog effect rendering like dithering (to reduce banding artifacts) and rendering order.

## Special Features

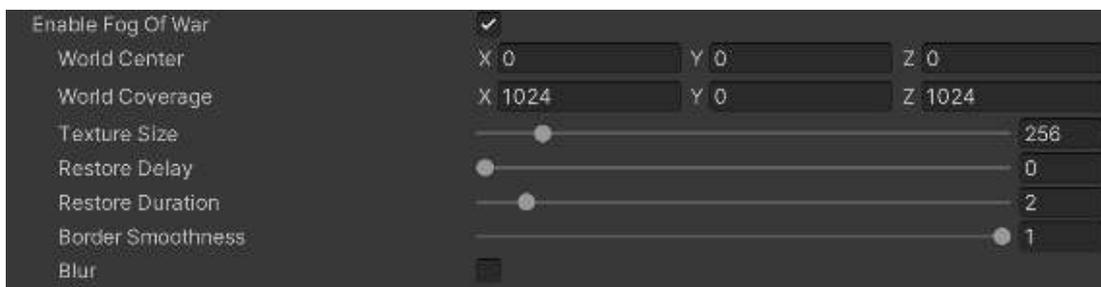
### Orthographic Camera Support

Locate and edit **CommonsURP.hlsl** file and uncomment this line:

```
#define ORTHO_SUPPORT
```

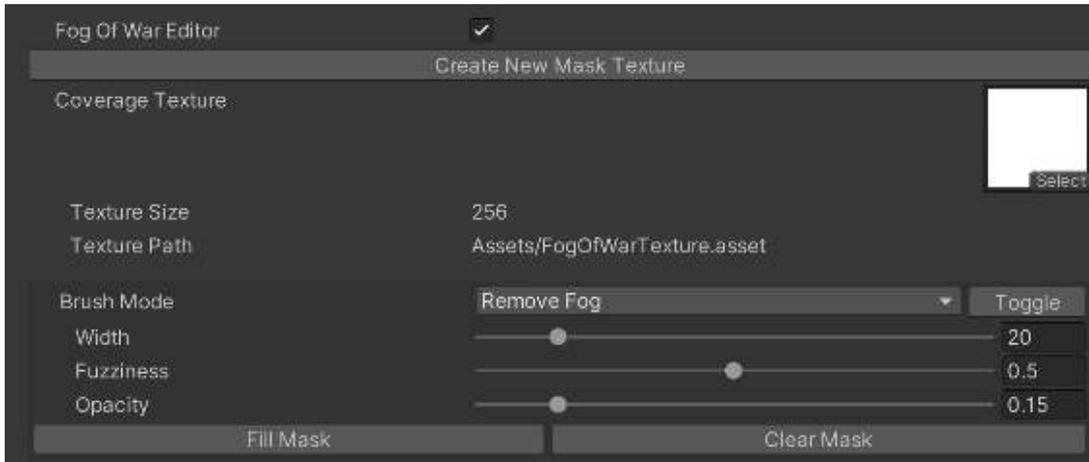
### Fog of War

The fog of war feature uses a color texture to control the opacity of the fog on the world. It can be used to clear / add fog at any custom position. This feature is commonly used to show which areas of the world have been visited or are visible to the player.



- **World Center / Coverage:** maps the fog of war texture to the world using this center and size.
- **Texture Size:** the size of the fog of war texture. A big texture allows finer details but it can result in a slower operation.
- **Restore Delay / Duration:** controls when the fog restores its original appearance. It can be used to allow the fog to disappear while the character is at a certain position and gracefully restore the fog when the character abandons the place. A delay of 0 means the fog won't ever be restored. A duration of 0 means immediate change (no transition).
- **Border Smoothness:** controls the smoothness of the border of clear areas.
- **Blur:** produces a softer transition between clear and opaque fog areas.

## Fog of War Editor



Enable the Fog of War Editor to interactively add, paint with color or remove fog in Scene View.

Click “Create new Mask Texture” to create the texture asset which will hold the opacity states of the fog of war.

The Brush Mode selects the paint/erase mode as well as Width, Fuzziness and Opacity allow you to customize the artistic result.

## Transparency support

### Customizing the rendering order

Each Dynamic Fog volume can have a different render queue setting, located in “Rendering Section”:

Render Queue	3100
Sorting Layer ID	0
Sorting Order	0

These settings allows you to control the rendering order.

### Respecting other transparent objects

The fog effect relays on the depth buffer to compute ray marching distance. Since transparent objects do not render to depth buffer, it means the fog effect will always render on top of previously rendered objects, regardless of the space position, for example water, rivers and any other transparent objects located between the fog and the camera.

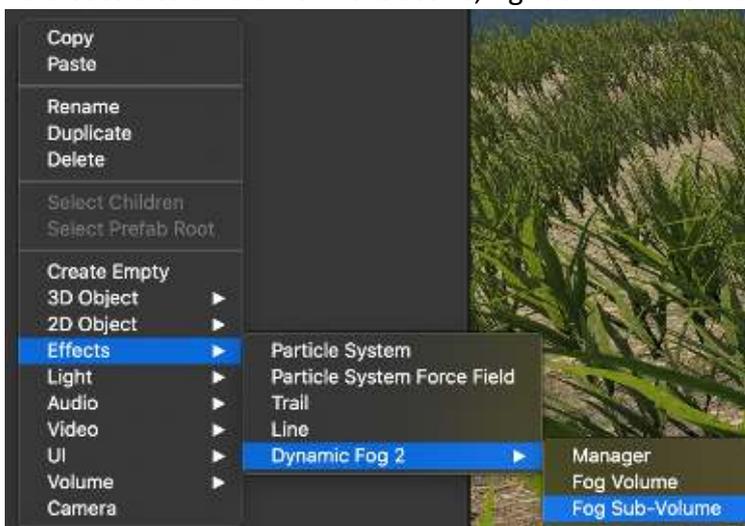
To avoid this issue, you should first try solving the issue by customizing the rendering order (see previous section).

## Sub-Volumes

A sub-volume is a special area where you can assign a different fog profile and a fade distance. Fog appearance will transition to the new profile in this area when the controller enters it.

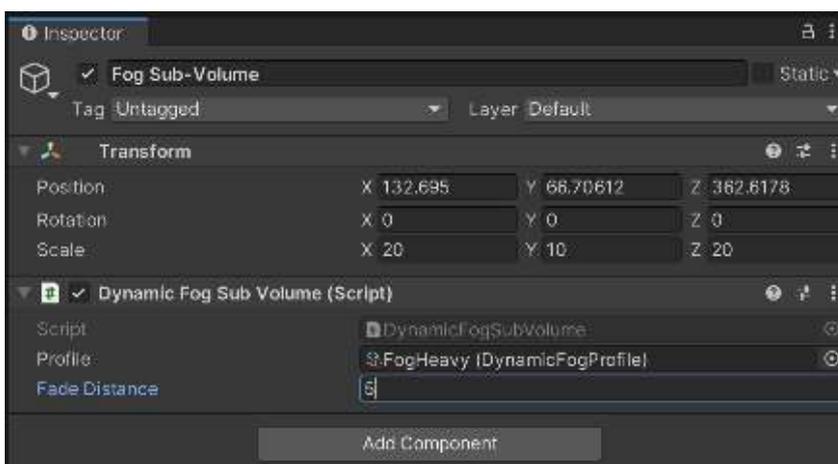
This is useful if you have a general fog preset that covers the entire gameplay area but you want the fog to change colors or appearance in certain rooms or zones.

To create a sub-volume in the scene, right click in the Hierarchy window as shown below:



Then, you the sub-volume will be created.

Change its position and scale to cover the desired area and assign a profile and a fade distance:



## Scripting Support

### Accessing global fog properties

All properties shown in the inspector can be set or modified at runtime using scripting. First you need to get a reference to the main script which can be done easily using:

```
using DynamicFogAndMist2;  
...  
DynamicFog fog = dynamicFogVolume.GetComponent<DynamicFog>;  
(where dynamicFogVolume is the gameobject of the fog volume)
```

Then, you can set any property like the fog color or wind speed/direction:

```
fog.profile.color = new Color(1,0,0);  
fog.profile.windDirection = Vector3.right;  
etc.
```

### Creating fog volumes at runtime

Use this code to create a new fog volume using code:

```
GameObject fogVolume = DynamicFogManager.CreateFogVolume("New Fog Volume")
```

## Fog of War methods

The following fog of war methods are available:

### **fogOfWarTexture**

Property that returns or set the fog of war texture.

### **ResetFogOfWar()**

General reset function which removes any previous change to fog of war transparency.

### **ResetFogOfWarAlpha(...)**

Restores fog immediately at a given position with radius or bounds.

### **GetFogOfWarAlpha(...)**

Returns the opacity of the fog at a given world position.

### **SetFogOfWarAlpha(...)**

Changes the transparency of the fog in an area. This method is overloaded and can accept different parameters and options:

- A world position and a radius, or a bounds object or a world position and size.
- Desired alpha and specify if this value replaces the existing transparency or if it blends with it (blendAlpha parameter).
- The duration of the transition (pass 0 to set the alpha immediately).
- The smoothness/harshness of the border (by default it uses the global setting in Fog Of War section which is 1f).
- The restore delay and duration (by default it uses the global settings in Fog Of War section). Pass 0 to restore delay to make the change permanent.

## Known Issues / Questions

### Inverted Depth Bug

Universal Rendering Pipeline 7.2.0 has a bug which produces an incorrect (flipped) depth texture. This bug occurs when HDR is OFF, MSAA is x1 and Render Scale =1. More details here: <https://forum.unity.com/threads/inverted-depth-texture-and-unresolved-shadowmap.824703/#post-5466879>

Solution:

Option 1) Enabling HDR, MSAA or changing Render Scale (any of the three) produces the correct depth texture.

Option 2) Enable “Flip Depth Texture” option in Dynamic Fog Manager.

### Fog not rendering correctly when using VR in URP

URP 7.4 has a known bug related to inverted matrices not being set correctly in VR. While this bug is not fixed by Unity, the workaround requires editing the file CommonsURP.hlsl and uncomment the line below:

```
///define USE_OLD_RECONSTRUCT_API
```

## Support

Please visit [kronnect.com](http://kronnect.com) for questions, support and more info.

If you have any suggestion to improve the asset, please contact us. We'll gladly consider it.