

Lighting: features & controls in Vue

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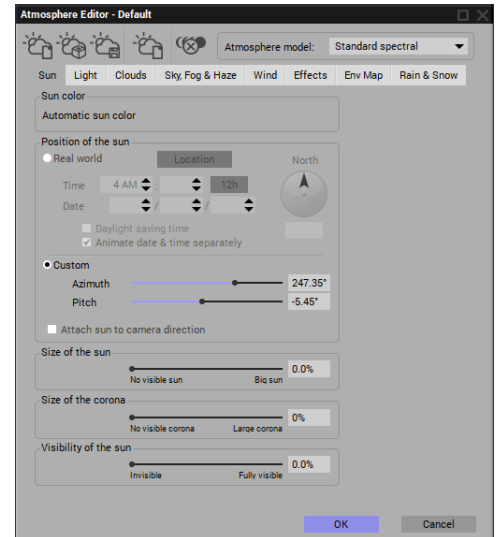
Getting that streaked sunlight effect in a Vue scene

Black Atmosphere

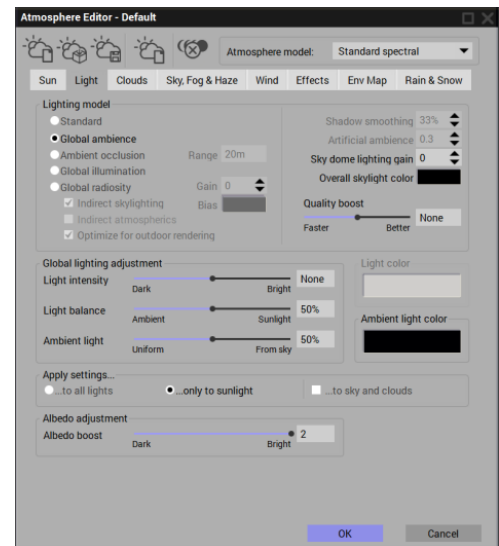
We start with the “Pitch Black” atmosphere:

This means that in the Atmosphere Editor, Sun tab, the sun size, corona and visibility is set to zero.

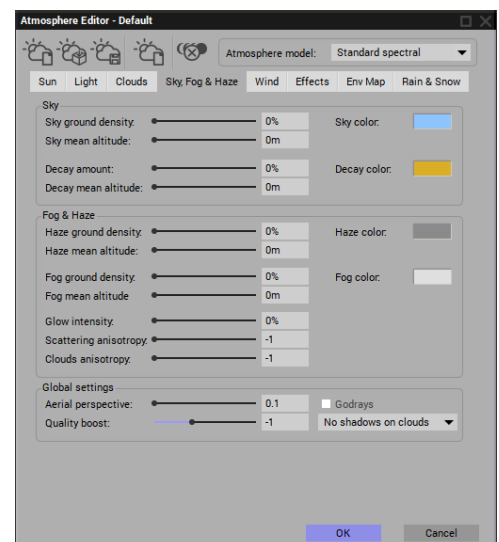
All sections are set to zero



In the Light tab we have Global Ambience on, the Global Lighting Adjustments at midway and the Overall Sky colour Ambient light Colour at black

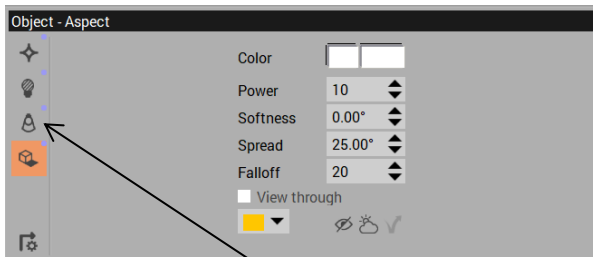


Under the Sky, Fog & Haze tab set everything to zero except Quality Boost, which is at midway (=zero).

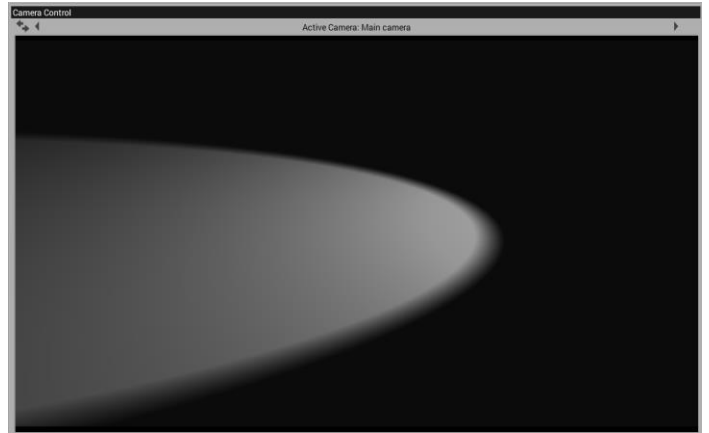


Using the Basic Spot Light

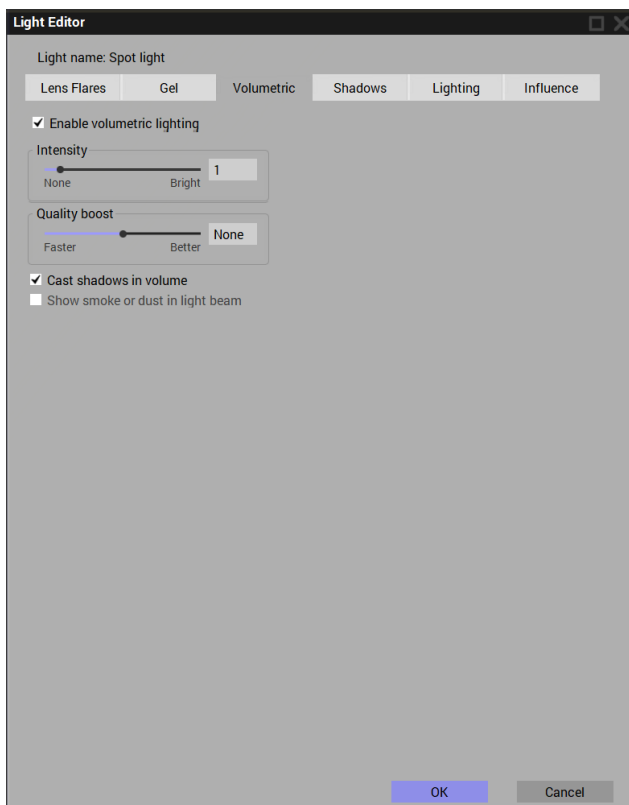
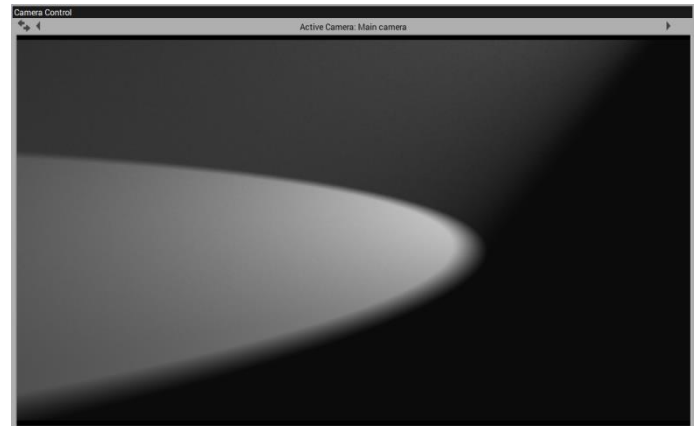
Change the ground material to the Basic group of materials - flat grey. Load a simple spotlight. Leave all of its default parameters but tilt it to the ground at about 45° just in front of the camera:



Turn on the Volumetric lighting, here in Object - Aspect or by double-clicking the Spot light in the World Browser. (frame 1)



See that the light beam itself is just visible. Double-click the Spot light to open the Light Editor. Click the Volumetric tab: (frame 2)



Note that the Volumetric lighting is Enabled. The Intensity is just 1. Change this to an intensity of 4 and uncheck the **Cast shadows in volume** (frame 3)



Place a Red Spruce tree in the center of the camera view and light beam. Perform a render of the scene and then uncheck the Autoexposure in the Post Render preview - Film settings and manually set the Exposure to 1.2 (Frame 4)



Open the Light Editor again (double-click the Spot light) and check the **Cast shadows in volume** box. Do another render; same settings. The shadow of the tree can be seen in the light beam as well as the ground. (frame 5)

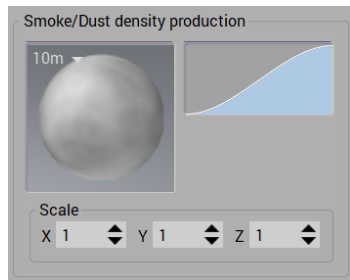


At a **Volumetric intensity** of 8 the beam is brighter but the volumetric shadows are not that much more distinct. (frame 6)



Changing the **Quality Boost** to **Better = 4** seems to give a less grainy shadow in the beam of light but it's not any more pronounced.
(frame 7)

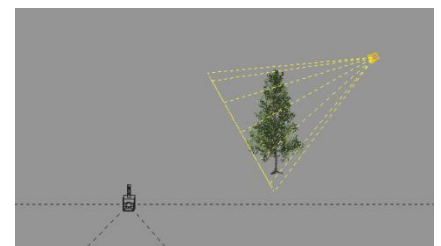
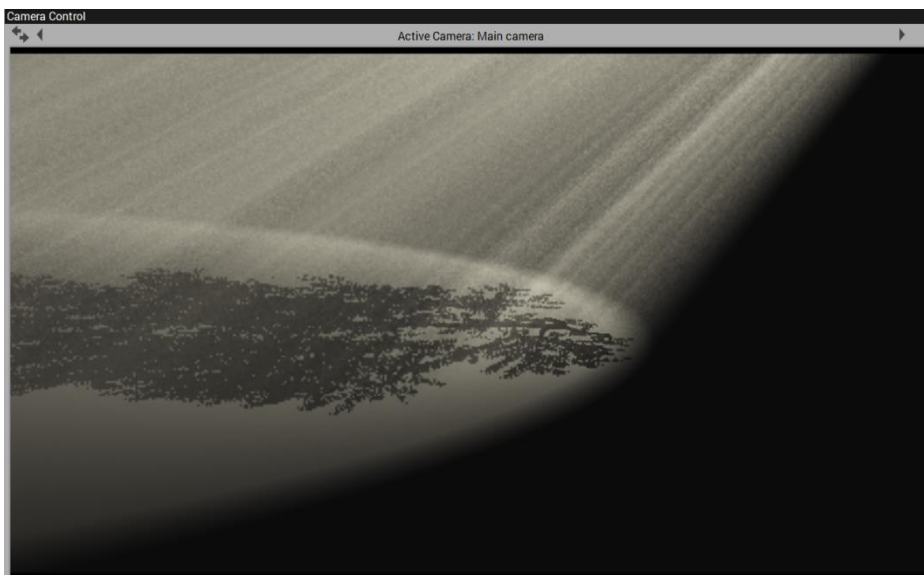
Check the **Show smoke or dust in light beam** box.



The function that creates the smoke can be loaded and changed.
(frame 8)
Uncheck the box.



Move the tree up and into the cone of the spot light.
Now the tree outline has much more influence on the



volumetric shadows in the light beam.

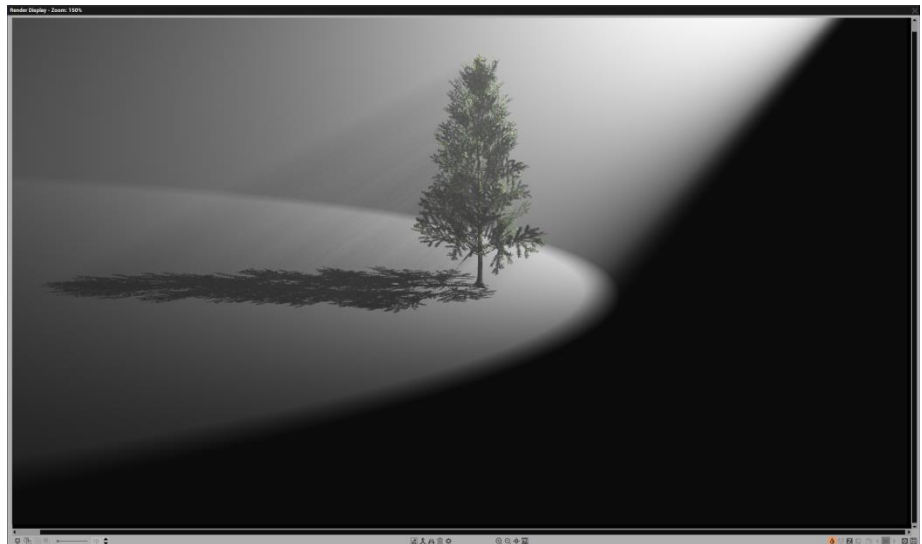
Now we get the kind of results we will be wanting want in a sun-streaked scene.
(frame 9)

Using a Quadratic Spot Light

Next, we'll see the difference with a Quadratic Spot light. We'll return to the scene of frame 6; with the tree on the ground, film exposure still set at 1.2. Remove the Spot light and replace it with a Quadratic Spot light. Arrange it at to also be at a 45° tilt.

It seems to take more power for the Quadratic spot light than for the same beam strength than it did for the simple spot light. Change the Quadratic light Power level to 30.

This shows an equivalent scene to frame 6 but with light power at 30, Volumetric intensity = 8
(frame 10)



The effect of moving the tree into the light beam, as in frame 9, earlier, looks to be about the same.
(frame 11)



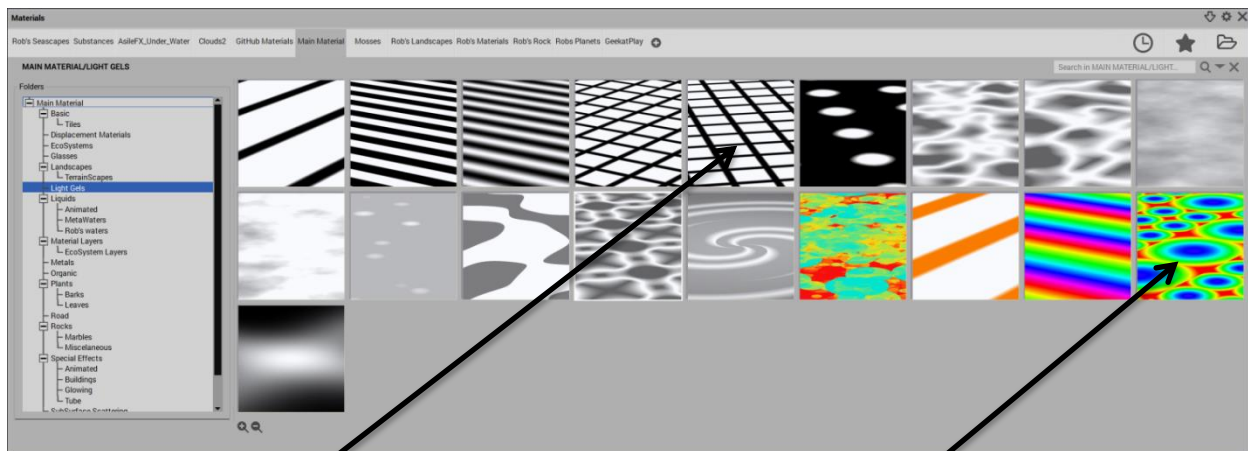
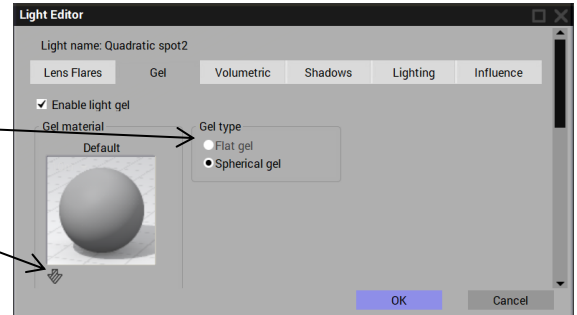
Another influencer of the generated light both in colour and beam shadows are called Light Gels.

Light Gels are a material file type found in the **Materials** section. They act like a filter placed over the light to manipulate the cast light.

- Remove the tree from the scene and then, in the **Light Editor**, reduce the volumetric **Intensity** to 4.
- Still in the **Light Editor**, click the **Gel** tab and click the **Enable light gel** On.

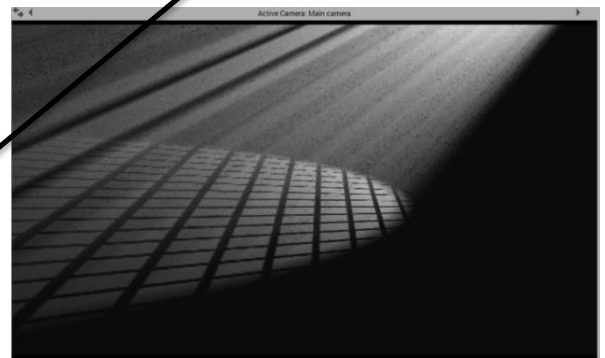
You can set a **Flat** or **Spherical** application of the gel but must select the material first.

Under the Default sphere, click the down-arrow. The **Gel materials** window will open

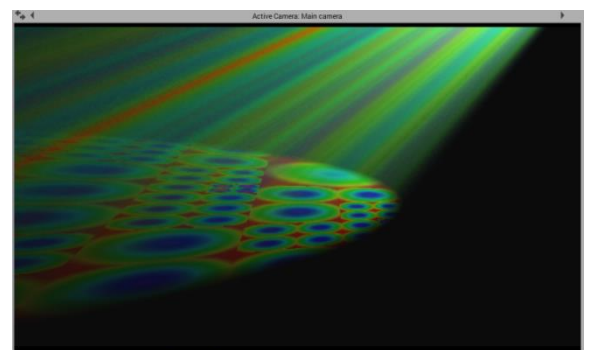


Select the **Tiles** gel material.

The Gel material influences the projected pattern and the shadows in the light beam if this is enabled in the **Light Editor - Volumetric** tab.



Now change it to the "Technoballs" gel material and see that the gel material influences colour as well.

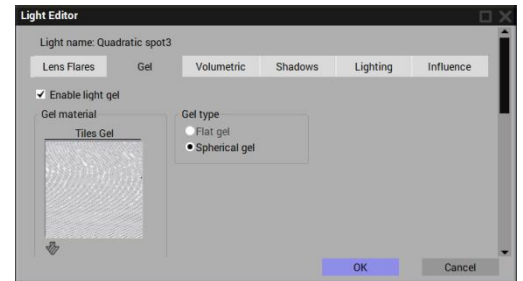


Switch back to the **Tiles** gel.

Editing Basic Gel Materials

The appearance of a particular Gel material can easily be edited.

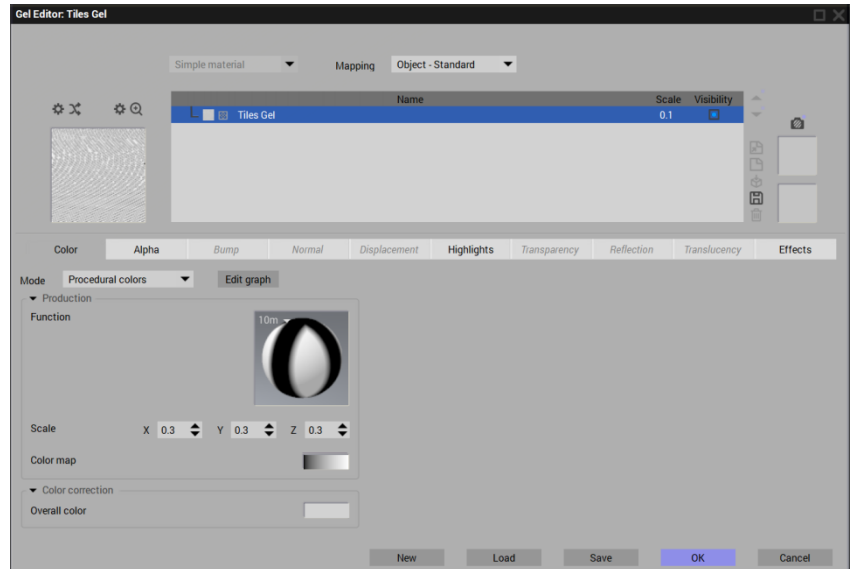
- With the **Tiles** Gel loaded into the **Light Editor - Gel** tab, double-click on the image of the material to load the Gel Editor:



There are many options here that, when changed, affect the projection and beam of the light Gel.

These changes can then be saved under a new name to add to the Light Gels compliment of materials.

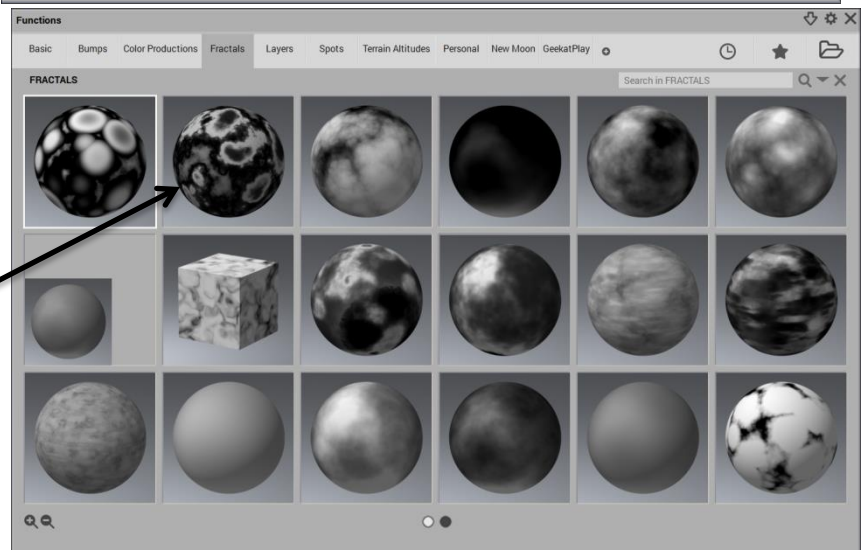
- Double-click the
- image to open the **Functions** window:



Now we can load a different function to act as the Gel material.

- For a bold pattern and black-white colour, double-click to select the **Asteroid** function.

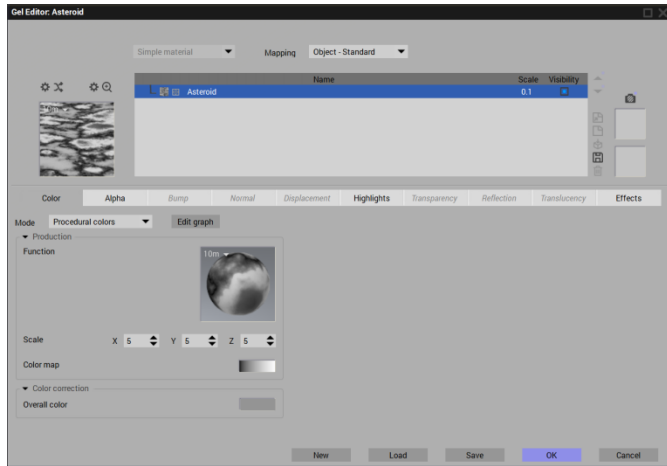
The pattern becomes clearer when the X, Y and Z Scale is changed to 5 for each in the Gel Editor.



- To save this gel, first rename it in the **Name** listing of the Gel Editor as **Asteroid**. Click on **Save** at the bottom of the Gel Editor. Save it in the **Light Gels** folder as **Asteroid Gel**.

A preview of the Gel's appearance will be made and then it will be saved.

- Click **OK** in the **Gel Editor** and then again in the **Light Editor**. The Asteroid pattern now is projected as a Light Gel.



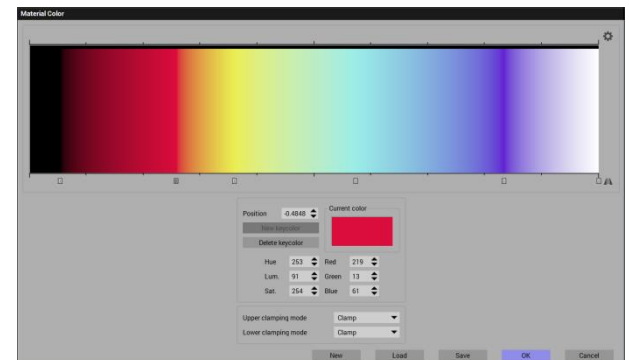
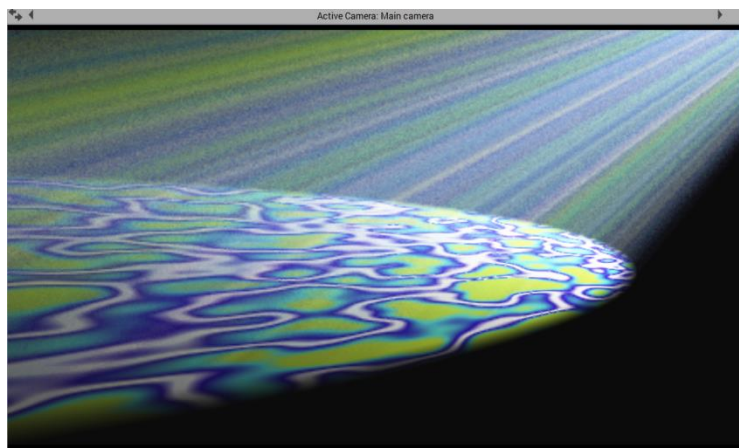
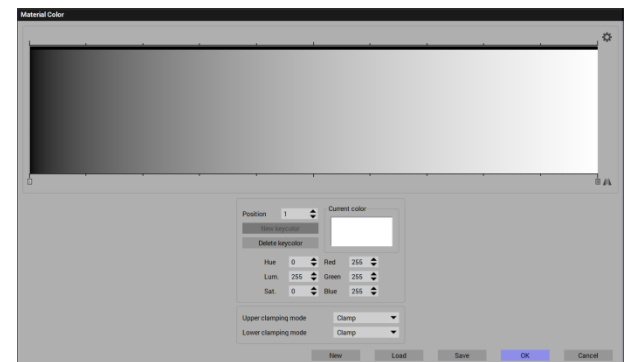
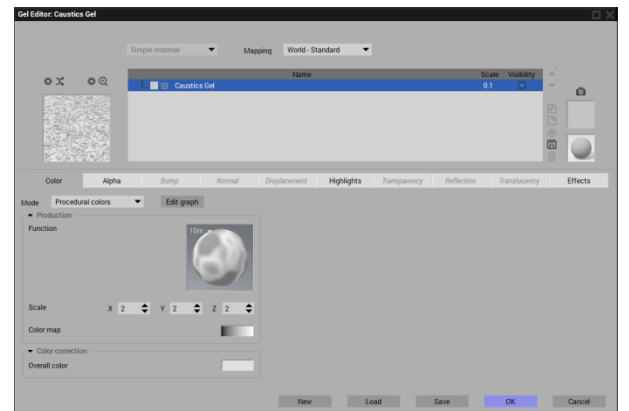
Further Gel Editing

The colour and translucent strength of a gel material can be further adjusted by altering the material's colour map.

Reload the Gel material and select the first Caustics Gel.

Right-click on the **Color map** and select **Edit Color Map** to open the Material Color window.

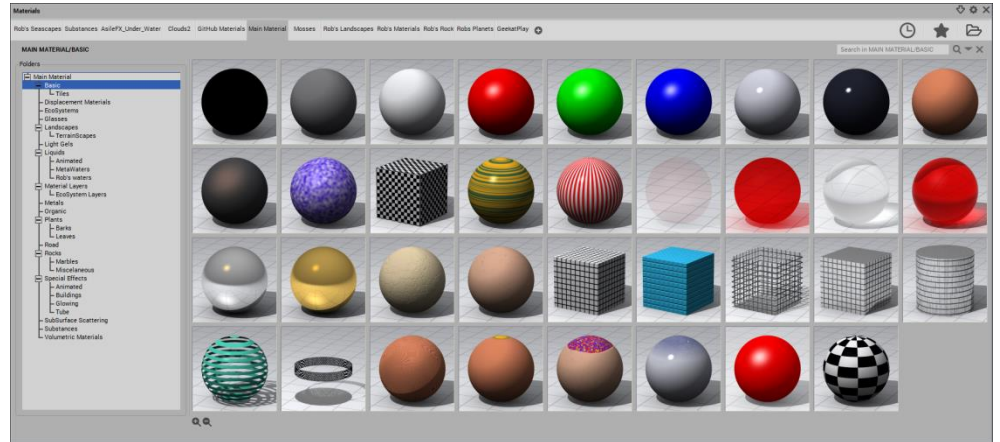
All along the colour ribbon you are able to click to apply a new "keycolor" and select another colour to place at that point. That colour point can be moved right or left to vary the center of its gradient colour in relation to the other colours in the ribbon. The resulting Gel can be quite colourful:



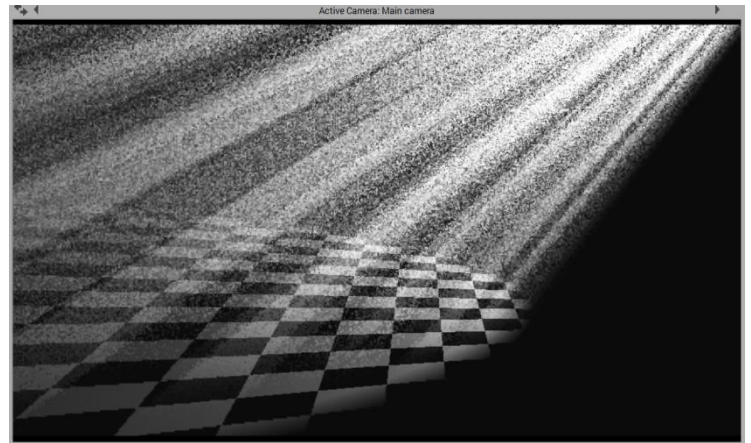
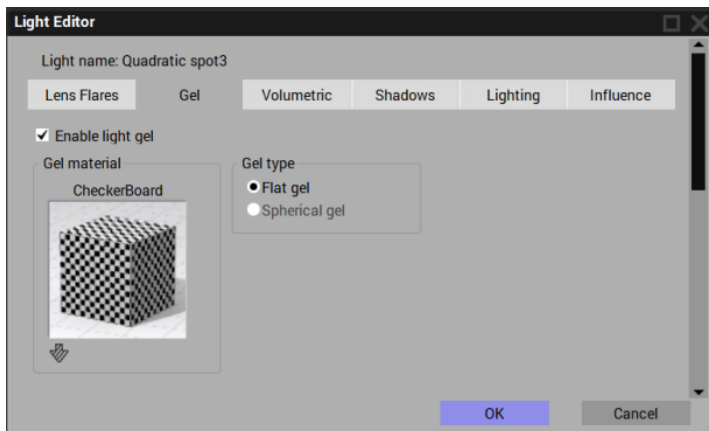
Creating various Gel materials

While there are a number of Gel materials provided in the basic Vue Creator, other simple (non-mixed materials) .mat-file materials can be used as a Gel material. Some materials won't project a gel as well as others, experimentation will be required.

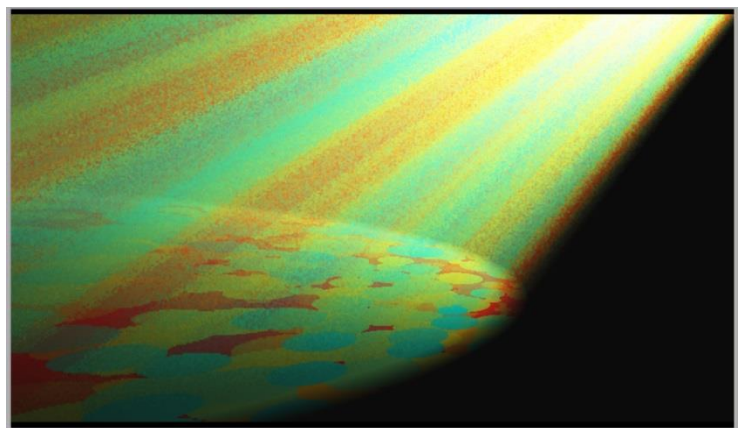
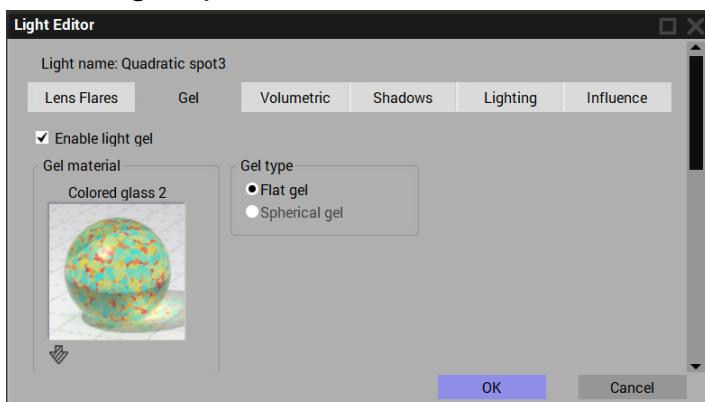
- Double-click the light (quadratic spot or normal spot) to open the **Light Editor**, then click the down-arrow beneath the current Gel material image to open the **Materials** window:



- Under the Basic group of materials that come with Vue, try loading the **CheckerBoard** material:



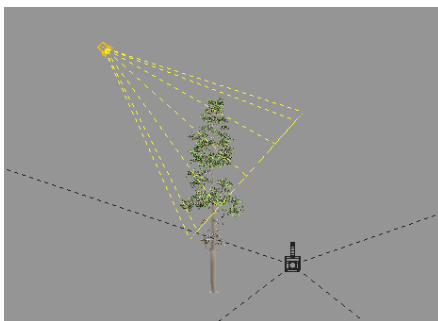
- Try the same thing for the basic Colored Glass 2 material in the Glasses group:



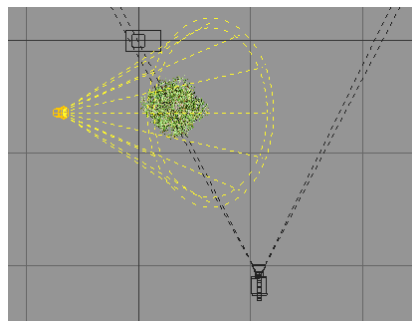
Using Volumetric lighting for emulating Sun rays in a Scene

To experiment with differing atmospheric conditions and lighting effects we will begin a new scene using Vue's Photometric - Noon atmosphere.

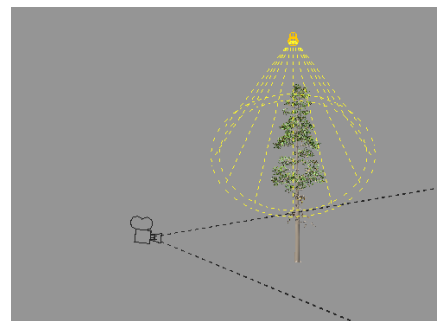
- Set the ground to flat grey material
- Insert a Scott's Pine tree just to the left of the frame
- Place a Spot Light, at default power of 10, just above the left of the Pine and tilt it down about 45° through the tree foliage.
- Set the camera just above the ground and tilted downward a few degrees to view the spot light's ground glow. Turn Autoexposure off.



Front View



Top View



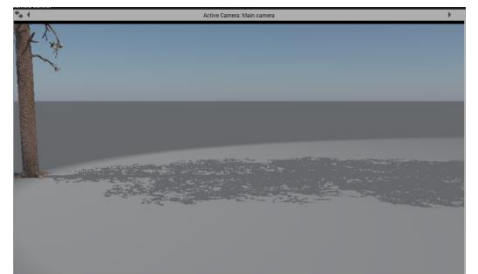
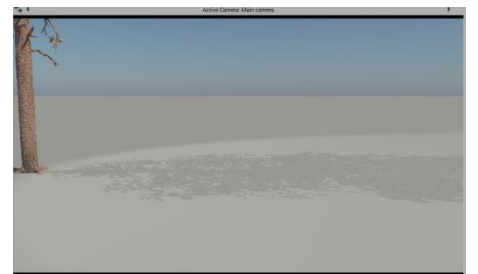
Side View

Under these conditions, the light of the spot light on the ground through the pine is barely perceptible.

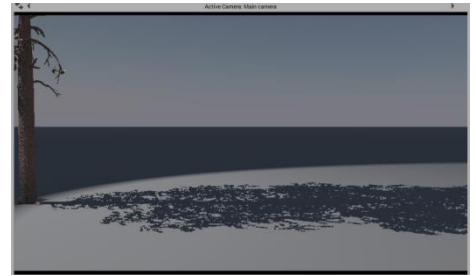
- In the Atmosphere Editor - Light tab we reduce the Light Intensity to -1.



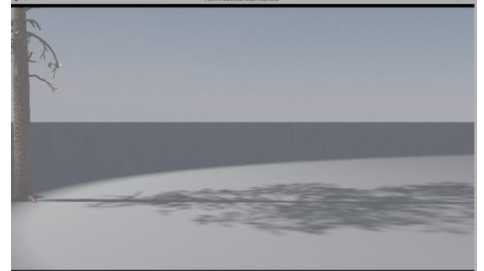
- Then reduce it further, to -2.



- The Light level can't be reduced further. So instead, lower the sun in the sky to just at the ground level.
(frame 12)

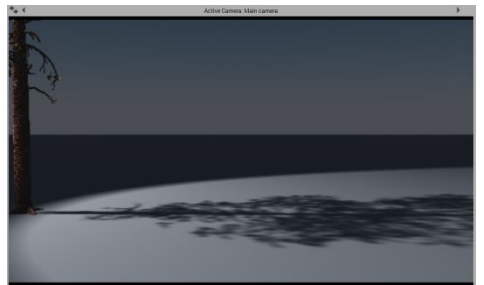


- Turn on Volumetric lighting, Intensity = 4, Boost =4 and turn the Cast shadows box, On:



No distinct beam or beam shadow yet.....How about at a volumetric intensity of 8, or even 10? (results are the same).

- Try a new atmosphere. Then repeat the above steps up to frame 12, with **Physical - Noon** atmosphere.



- Now add Volumetric lighting again, Intensity = 4, Boost = 4 and Cast shadows - ON.



It appears that the **Physical** atmosphere works well for creating streaked beam lighting and shadows.

- Under the **Light Editor - Shadows** tab, the value seems to be limited to 100% but type in a higher value; 200% will increase the shadow prominence:
- Set the Shadows back to 100%



In the **Atmospheric Editor** the **Physical/Spectral** model works better than the **Photometric** model for casting volumetric shadows in the light beam.

Testing the Volumetric light streams in real Scenes

Now we'll begin a new scene again. We will use The Physical/Spectral - Default atmosphere again.

- Create a 100m x 100m flattened terrain with a grass ecosystem material covering
- Behind this, create a 100m x 100m terrain stretched upward and sideways to create a darker backdrop behind the grass foreground. Make its material a darkened rock-type material
- Place a tree in the left of the scene.
- Set up a spot light with volumetric on at intensity=4, boost=4 and shadows ON. In the Shadows tab, enter a density of 200
- Leave the Gel off to see the shadows of the tree alone.
- Switching to the **Volumetric** atmospheric model in the **Atmospheric Editor** retains the volumetric streaking from the spot light but also allows for significant Fog and Haze effects manipulation as well. (here, Fog=100)
- Remove the tree and enable the Light Gel.
- Use the Chaos Gel material. (either set the spot light power to 20 or set the volumetric intensity to 8; close to the same effect)

Again, changing the **Shadow density** under the Light Editor's **Shadows tab** has good effect.



Final Testing

As a final test, we create a full natural scene of a meadow in the woods. We want to get that morning sun streaming through the woods effect.



We'll add a buck on the path in the center of the scene....



We'll change to a **Volumetric** atmospheric model in the **Atmosphere Editor** and add a bit of fog to be seen in the distance....



...and add a doe just beyond the buck, eating at the trees.

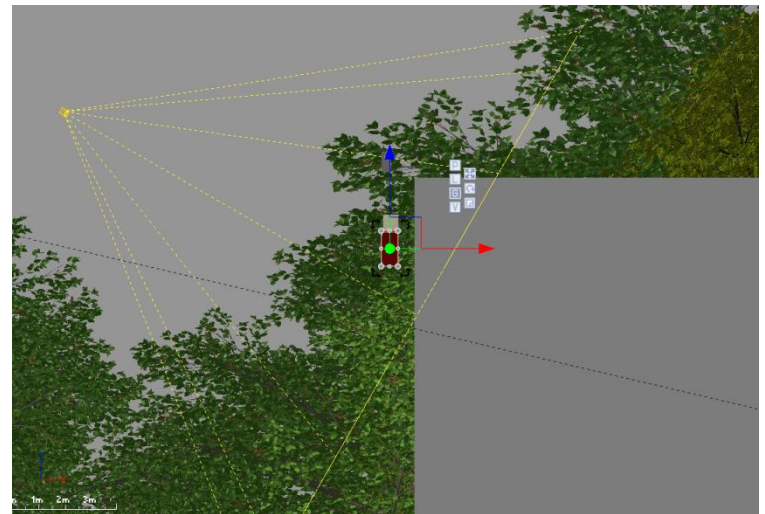
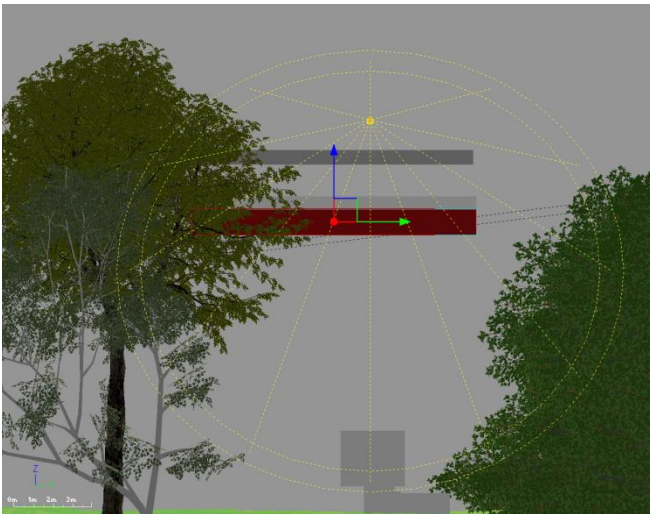
Now we place a spot light (where the sun should be) and aim the volumetric light toward the deer.



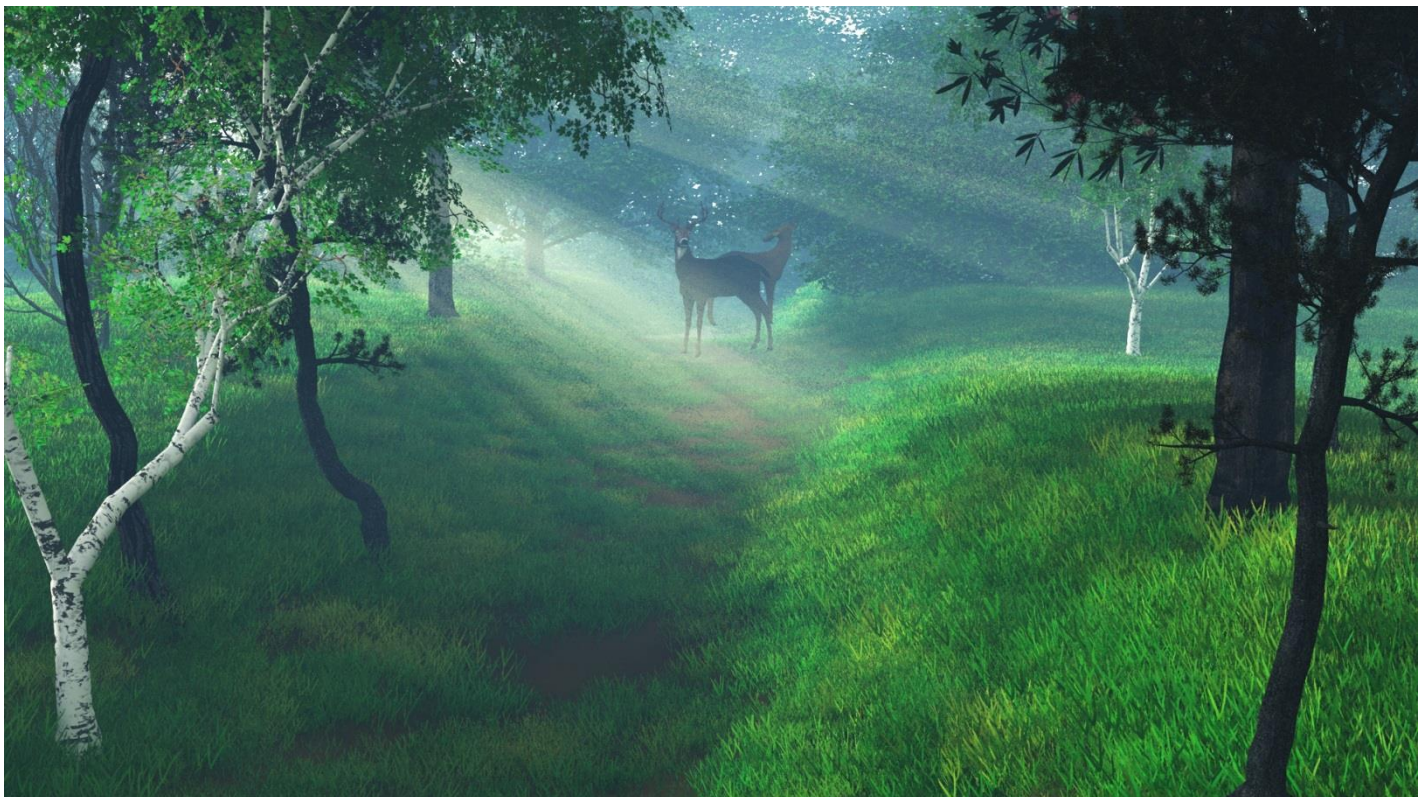
....that might be a bit much intensity. We don't want to obscure the deer.

We want to have a clearer spot in the volumetric light beam just around the deer's heads so we can see them more clearly.

- Create a simple cube primitive and stretch into a beam.
- Float the beam into the rays of the spot light in such a way that it is hidden from view by the trees of the scene.
- Adjust the placement, as well as the width and length of the beam so that it provides a shade to the spot light rays that are hitting the buck and doe.



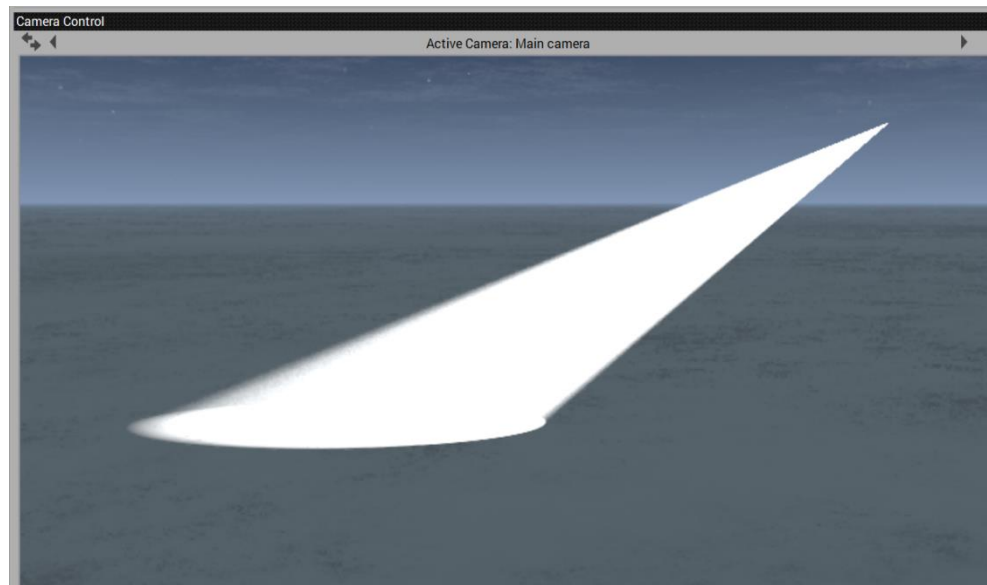
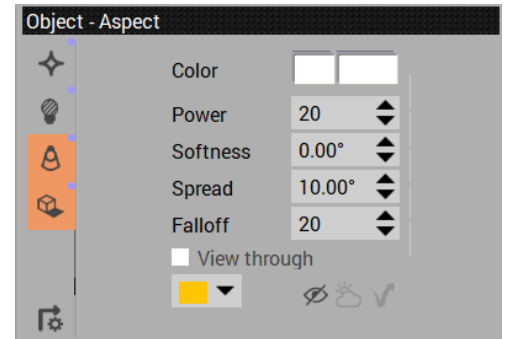
The scene of the morning sun streaming into the woods with two deer is complete.



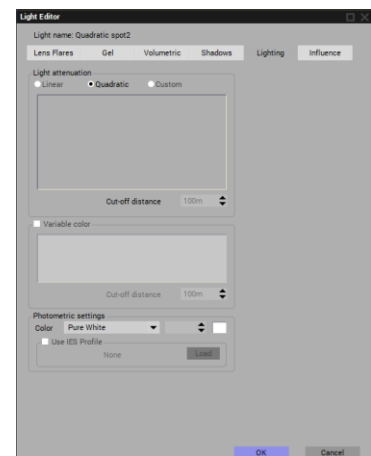
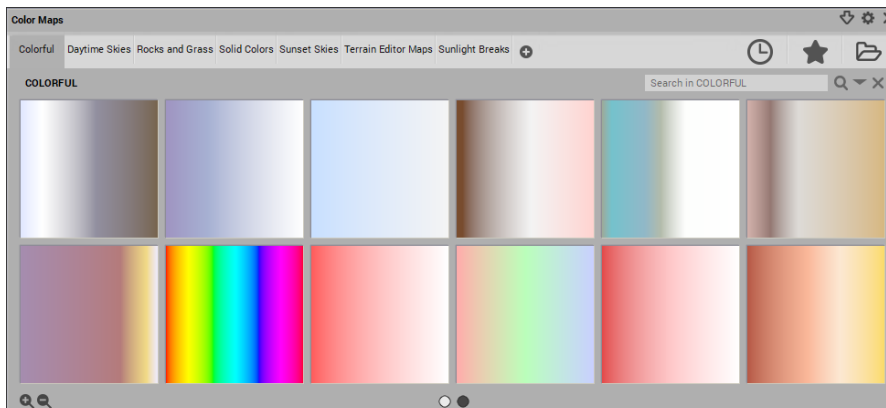
Colour in Volumetric Light Beams

Volumetric light beams are often used to show the sun's rays in a scene. The light source must be made **Volumetric** to be seen, as shown in the scene above.

Below is a simple scene with a Quadratic spot light, pointed at the ground, with the volumetric effect turned on.

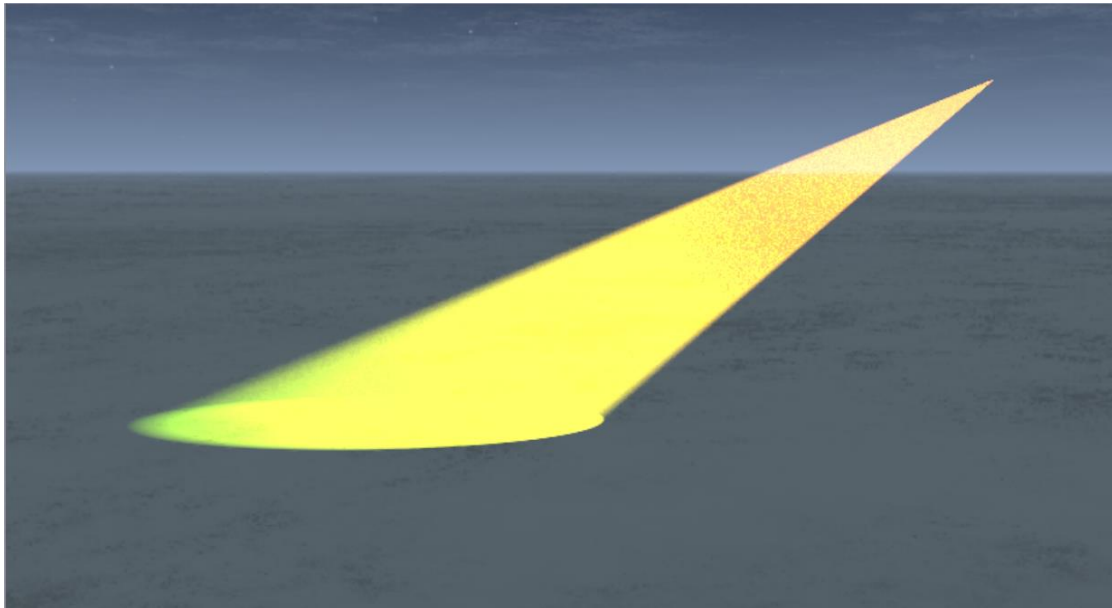
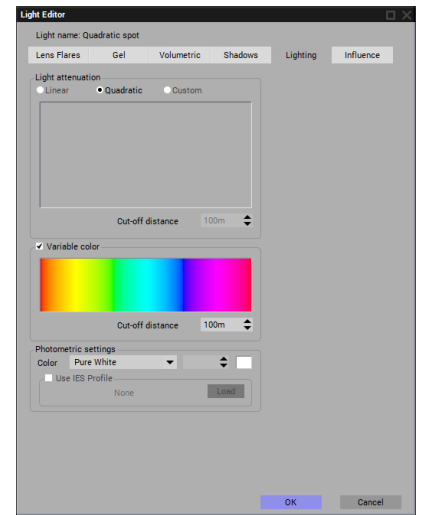


- To change the colour along the light beam, double-click the Quadratic light in the **Object Browser** to open the **Light Editor** and then select the **Lighting** tab.
- Click on the **Variable colour** box to activate it on. A white, editable, colour map is made active underneath.
- Initially, double-click on the colour map itself to open a window of Colour Maps:

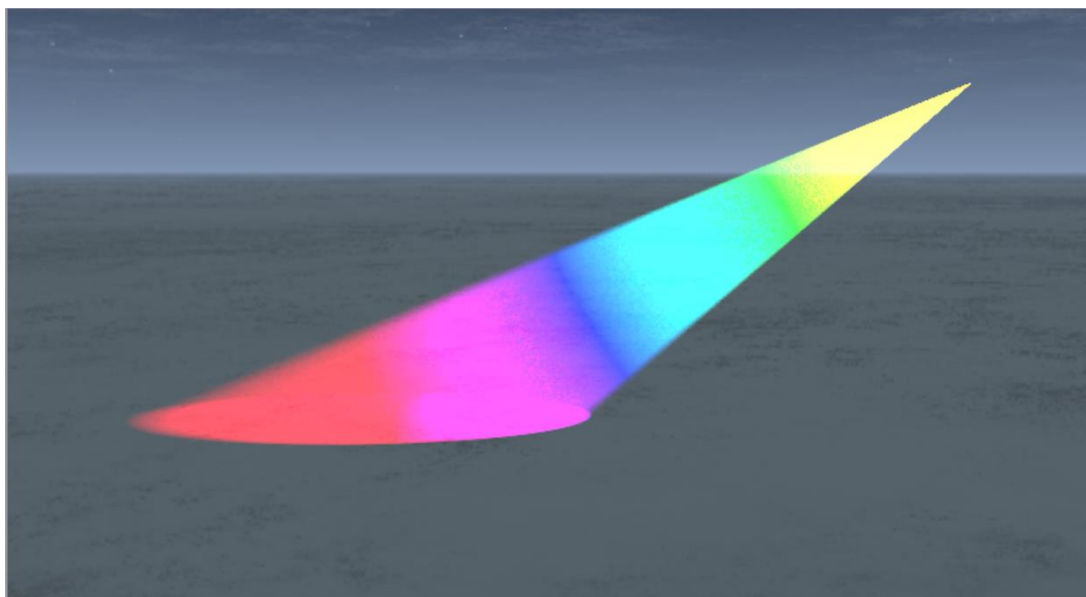


- In this **Colour Maps** window are various families of colour maps that can be applied to the volumetric colour. Under the **Colourful** tab, select the **Rainbow** colour map.

Note that this changes the volumetric light beam colour, but the light is mostly yellow, with a hint of red at the Quadratic light source and a hint of green at the ground,



This is because the **Cut-off distance** is set by default to 100m. So the colour map will cover that 100 meters. If we reduce the Cut-off distance to about 20 meters (which is the length of the beam) the complete colour map will be seen along the beam.

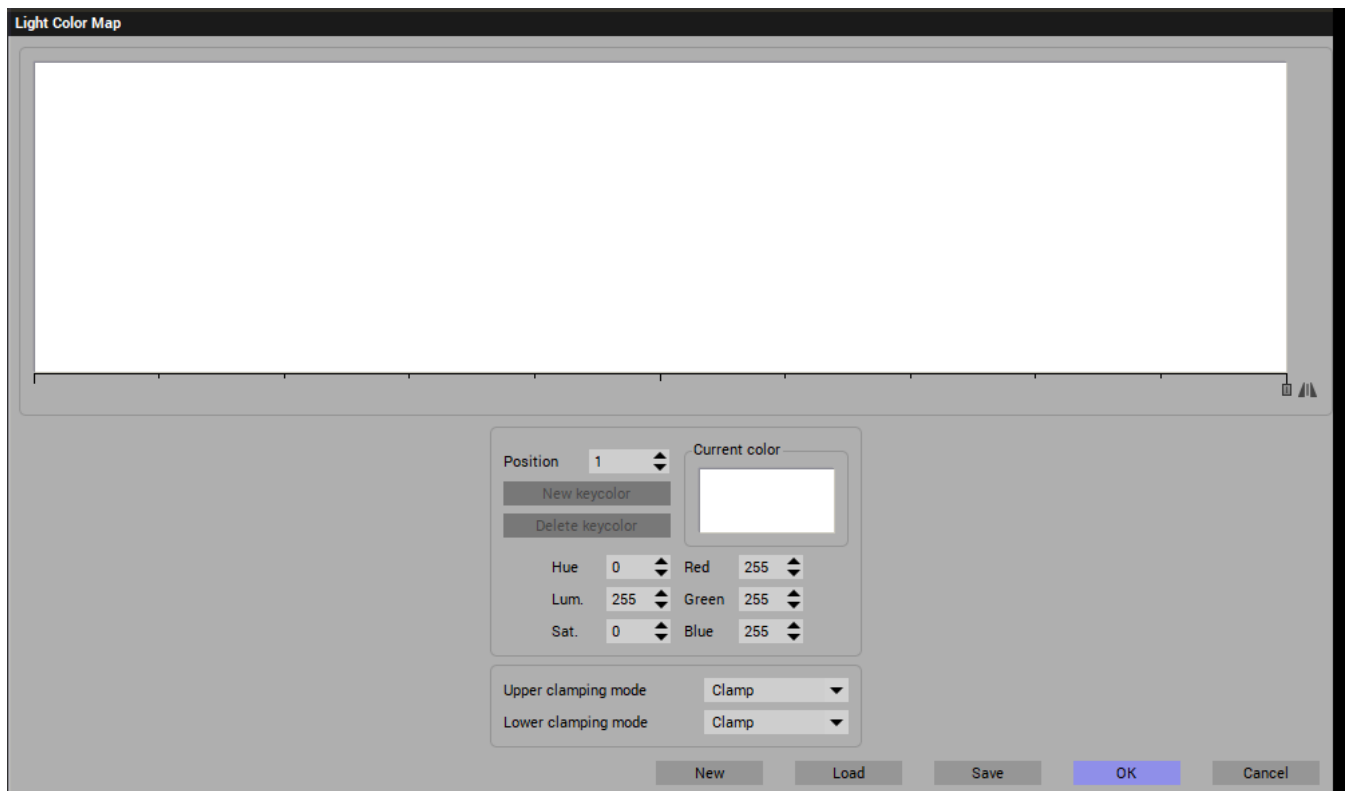


Transparency in Volumetric light beams

There may be times when it is desirable to have a portion of a volumetric light beam to be transparent and other portions be visible. In the colour map, when there are sections that are black in colour, those sections will be transparent. The more black the colour, the more transparent the area of the beam will be.

This will require us to both create a new colour map and possibly create a new colour map family within the **Colour Map Editor**.

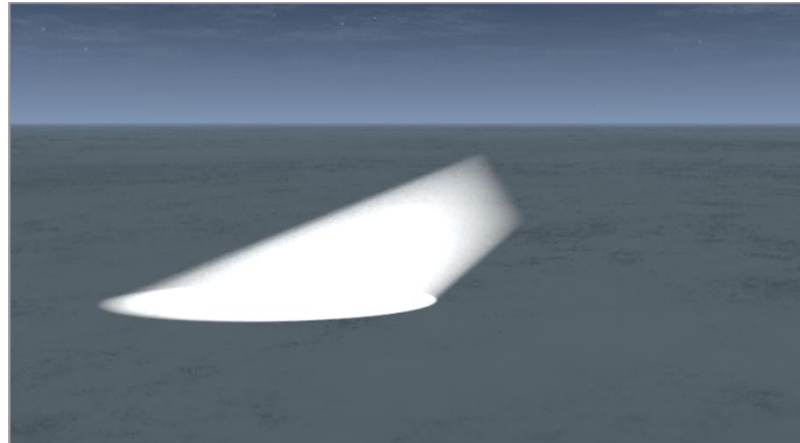
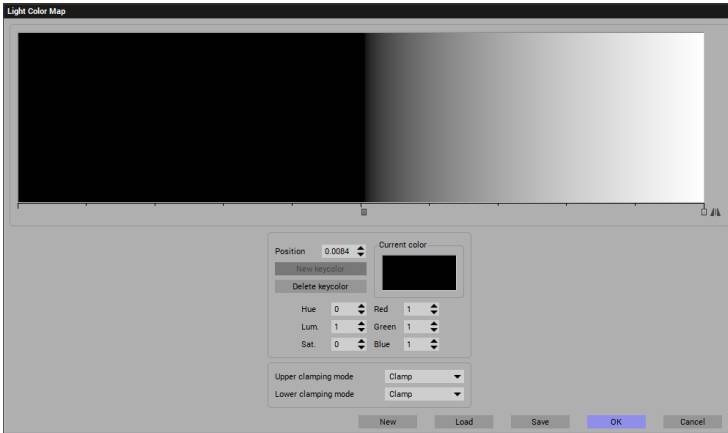
- First, load the **Light Colour Map** (if not already open) by double-clicking the **Quadratic spot** in the **World Browser**.
- Double-click on the map itself to open **Colour Maps** window. Under the **Solid Colours** tab select the **White** map
- Right-click on the colour map and select: **Edit Color Map** to open the **Colour Map Editor**:



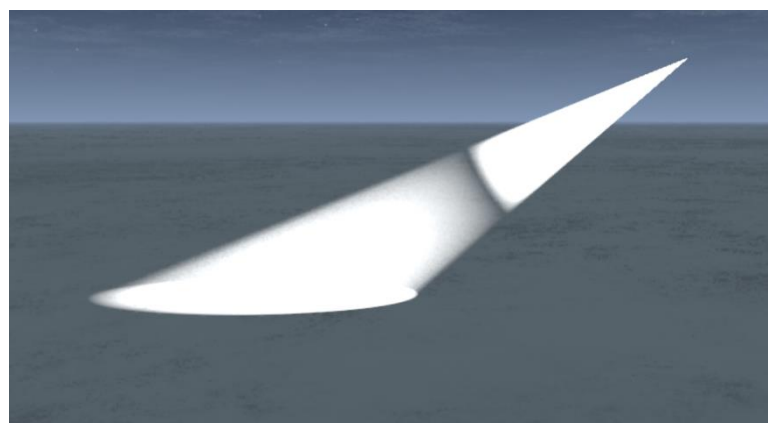
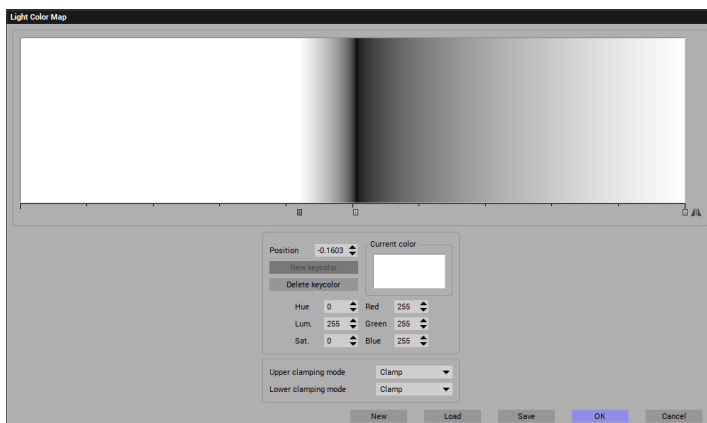
At any point along the map above, you are able to set a point and also define the colour at that point. Consider the left edge of the map to be at the light source and the right edge of the map at the specified **Cut-off distance**.

Remember, we have set the **Cut-off distance** down to 20 meters.


- At a point midway on the map, click the map to place a point. A short indicator line and small square will be shown just below the map. This is called a **Keycolor**.
- Right-click the **Current colour** window and select **Edit Colour** from the presented list. The standard **Colour Selection** window will be shown.
- Select a pure black colour; RGB = 1,1,1 and click OK:



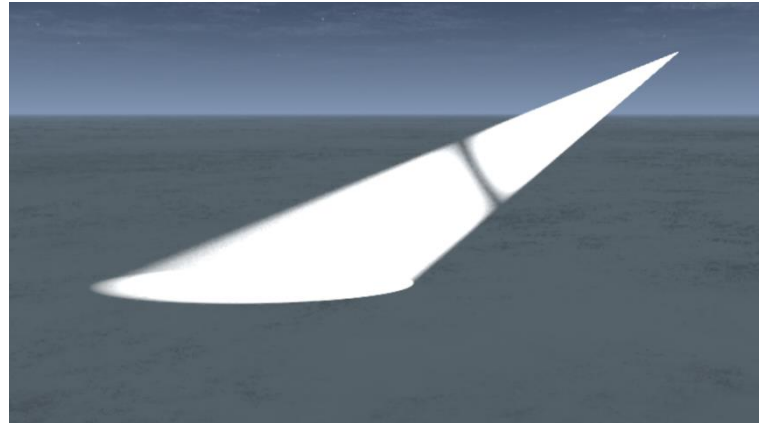
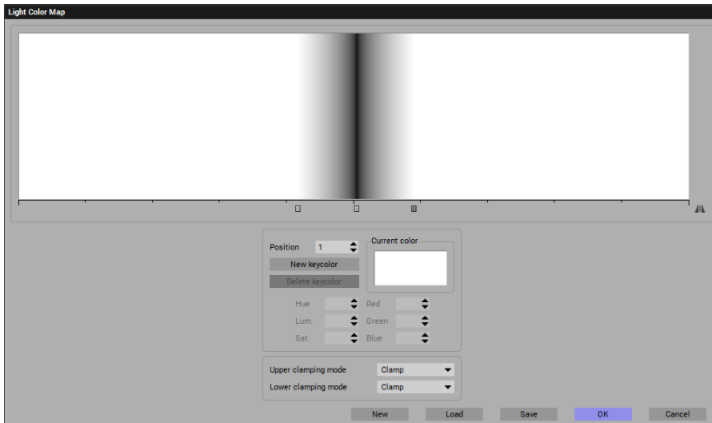
- The **Light Colour Map** shows black from the left to the middle, then graduates through grey to white as it goes right. As a result, the light beam is transparent closest to the light source and gains visibility the farther away.
- In the Light Colour Map, click just to the left of the current Keycolor to set another Keycolor.
- Right-click the **Current colour** window and select **Edit Colour** from the presented list. The standard **Colour Selection** window will be shown.
- Select a pure white colour; RGB = 255,255,255 and click OK:



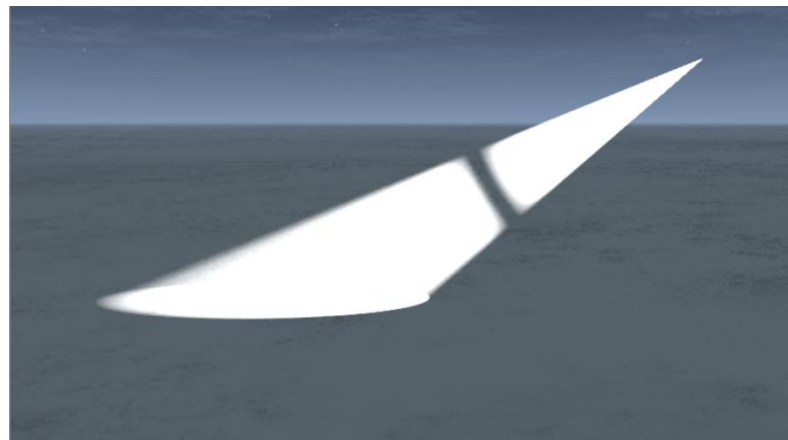
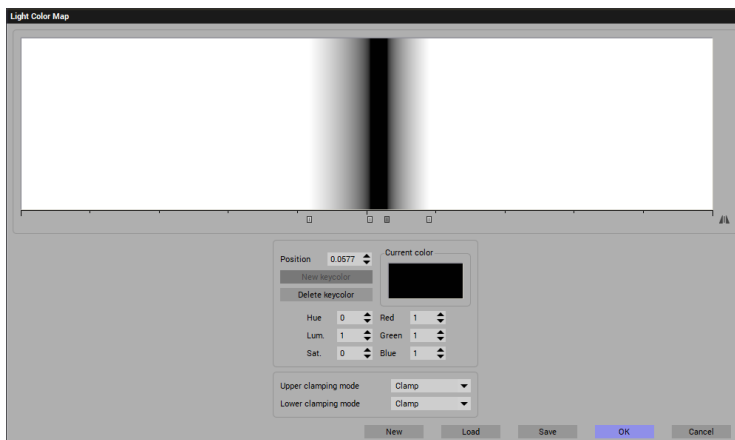
The colour map now shows a black at the first keycolor, a gradient to the second, white Keycolor, and a gradient to the right-most side of the colour map, where there is another keycolor at the edge.

These keycolors are selectable (when you click on it) and movable. (indicated with a  cursor)

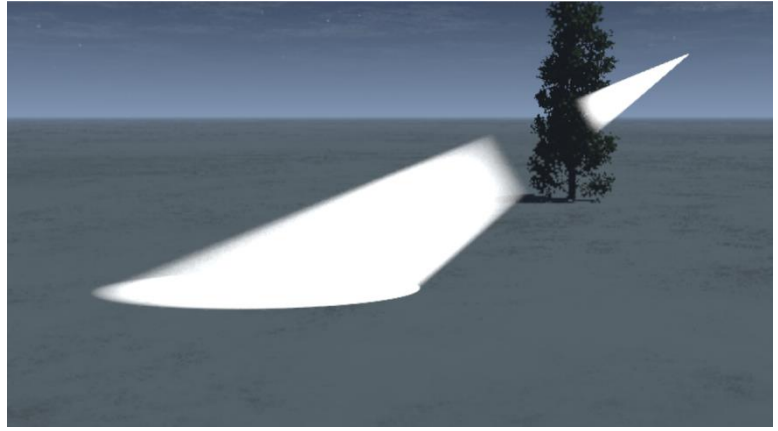
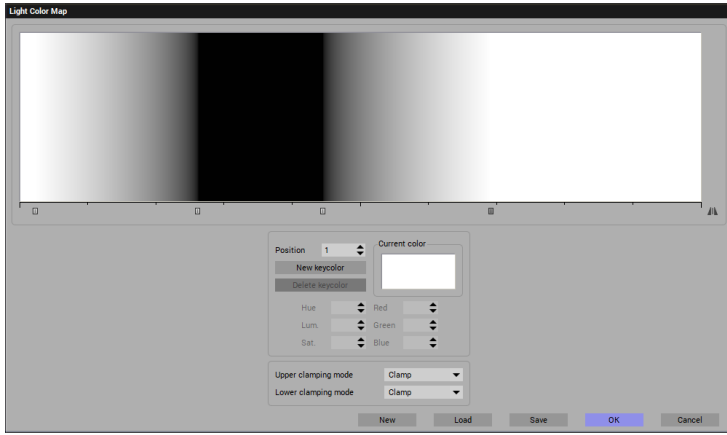
- Select the right-most keycolor and move it toward the center, releasing just to the right of the black keycolor.



- Now the black band is in the center and the gradients are limited to the left and right keycolors.
- To expand the black band, place a keycolor to the right of it but to the left of the right keycolor. Set its colour to black. The black band is a bit wider



- We now have four keycolors on our Colour Map. The two middle ones can control the width of the black, transparent band and the two outside ones can define how wide the gradient or “semi-transparent” bands will be.
- When you select one keycolor, you can **Ctrl-Click** on the other ones to select them as well. When all four are selected, the entire band can be moved left or right to adjust the placement of the band relative to the light source (left side).



The images above show a widened transparency band, relocated along the volumetric beam's length to partially obscure and reveal a tree in the background.

Shining Light on Clouds:

To show light illuminating the clouds there a couple of settings that need to be applied on the light source.


To begin, we'll open a default **physical spectral** atmosphere, create a basic terrain, and a default sea. Next, we'll load a Fuzzy Cloud Front from the Spectral group of clouds and move it to the right somewhat at an altitude of 500m.


Set the sun to about 25m in height (to darken the scene a bit) and place a quadratic spotlight, facing up, above the middle of the terrain at a power of 1000.

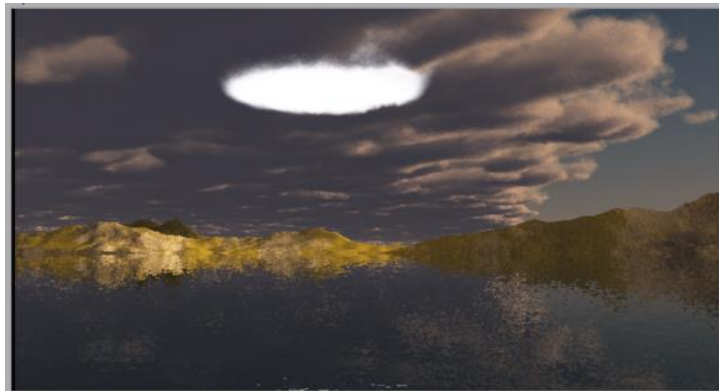
The light from the spotlight should illuminate the clouds somewhat. Currently it doesn't.

Now select the quadratic spotlight. Note in the **Object – Aspect** panel there are three light options that appear, two of which are available currently:

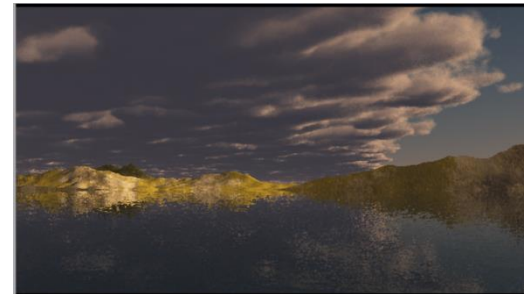
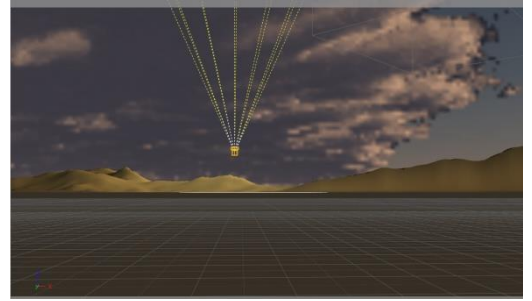
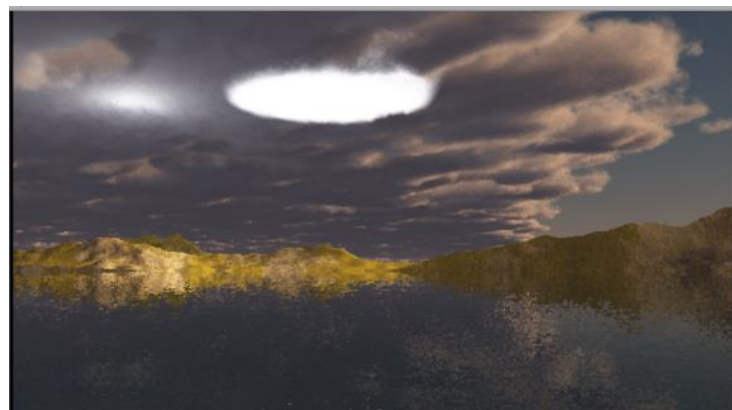


A) The “eye with the stroke through it” icon:  can turn the currently selected light source on or off (orange).

B) The “sun above a cloud” icon:  allows the light to influence the clouds (orange) or not. Click this icon to shine the quadratic spotlight onto the clouds.



This can be done with all light sources. Load a point light and place it just under the cloud layer and to its left. Set its power to 100 and turn on the “influence clouds” icon on:

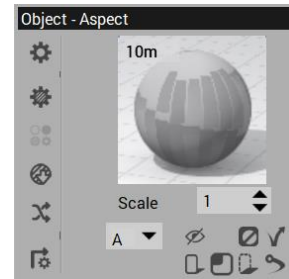


Using Lightning effect

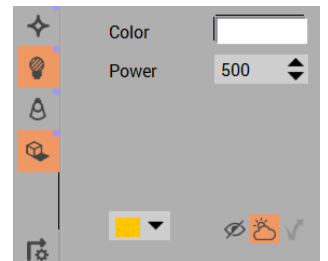
One cool effect is to have lightning come from the sky down to the earth. This would be best applied if the lightning would illuminate nearby clouds as well. Lightning can be made in various ways. Even using an inverted bare winter tree as illustrated near the end of this document.

First, we'll use a couple of available "Lightning" 3D models of the kind downloadable from **Turbosquid** or **CGTrader**.

When we load the first lightning bolt, we have the correct shape but the converted VOB does not suggest that it is a light source as lightning should be. (no "sun above a cloud" icon).



- To make this a usable light source, right-click the lightning object in the World Browser.
- From the list, select **Convert to...** and then select **Area Light**.
- Set the area light's **Power** to **500** and click the (now available) "illuminate clouds" icon.



Not Always...

Sometimes changing the object to an area light causes it to become a block that shows up as a block in the render, even. Then it should be left as the object it is but its **Luminance** value should be raised to a high level to make it bright.

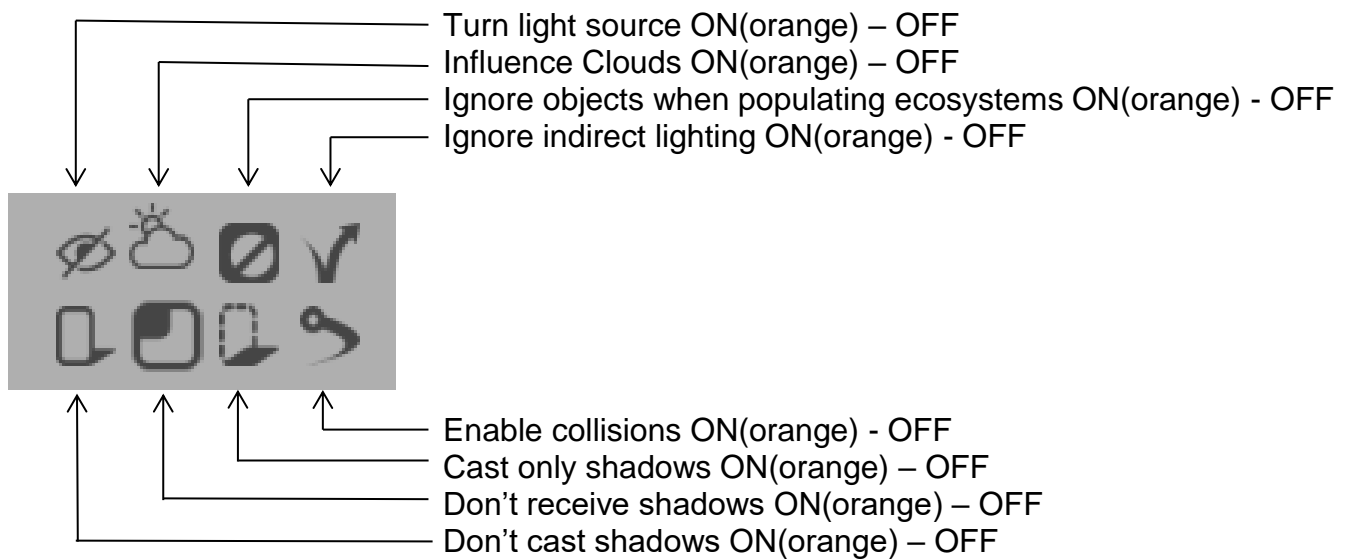
- The lightning bolt now illuminates the sky from where it originates as would be expected.





- To expand the effect, a quadratic spotlight could be pointed up where the lightning bolt exits the clouds to illuminate the clouds even further at that point.



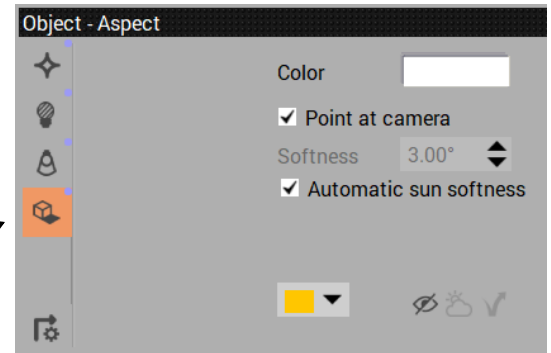
Lighting icons in the Aspect – Object panel:



To get the lightning to show up on overhead clouds, select the lightning source, turn it on:  and make it influence clouds: 

The Effect of Sun Softness setting on Shadows

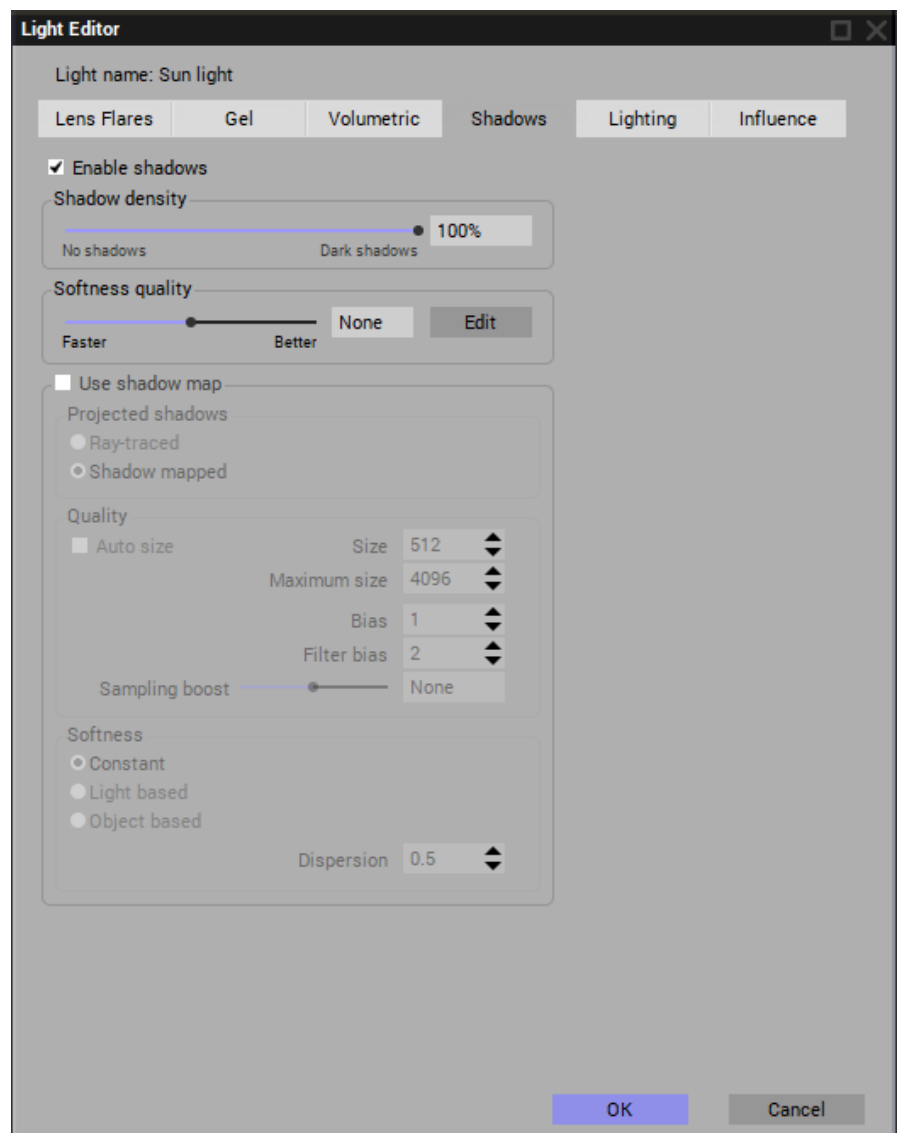
The softness setting of the sun in various Vue scenes has a considerable difference to the appearance of shadows in the scene.



When you click on the Shadows box Object-Aspect panel, the Light Editor window will be displayed with the Shadows tab highlighted.

The Shadow density can be adjusted (default at 100%)

The Softness quality can be adjusted here as well.



With **Automatic sun softness** off: Shadows are bold and sharply defined.



Woodland Stream 19

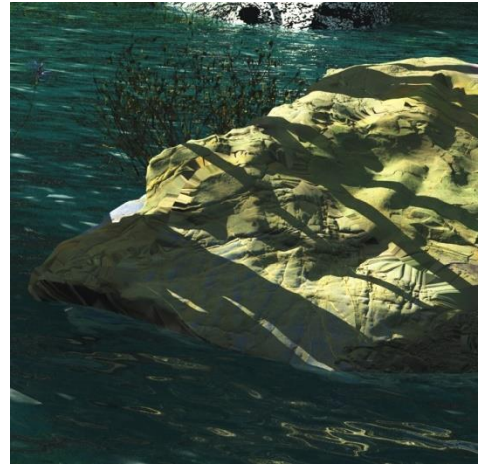
With **Automatic sun softness** on:



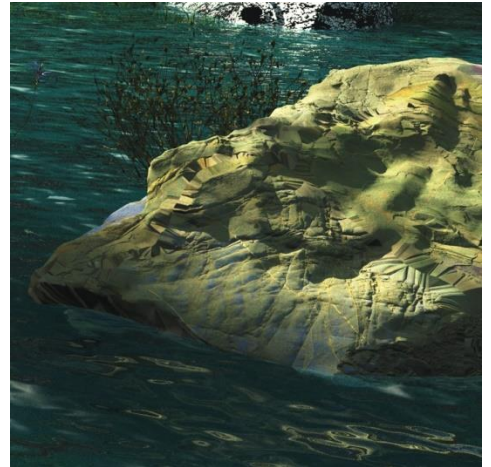
Woodland Stream 20

The following images of the lower-right rock shows the shadow effect at varying softness settings.

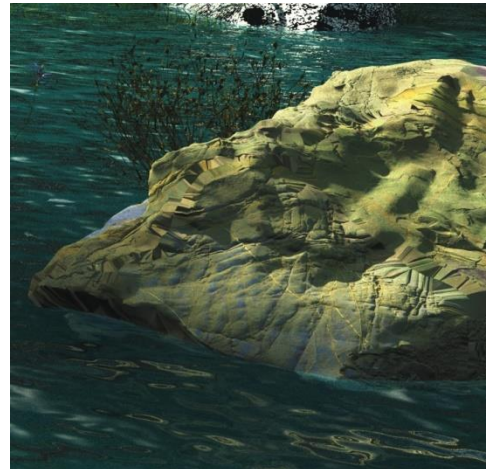
Softness set to 0°



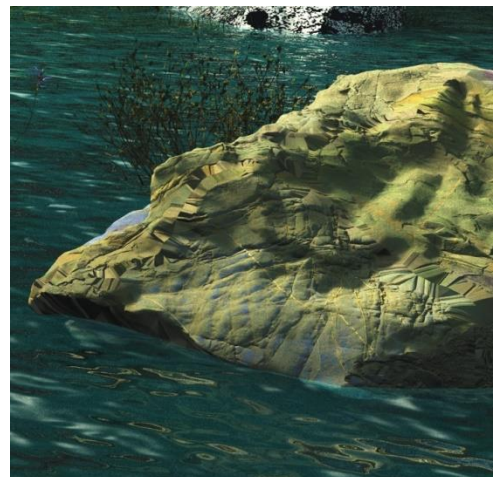
Softness set to 1°



Softness set to 3°



Softness set to 20°



Quality set to 4

