Beginning Vue tutorial #2: Creating a Night Scene with Aurora

The second tutorial in the Beginning Vue series is one that makes use of Volumetric Materials to simulate the wispy strings of light that are Northern Lights, also known as the Aurora.
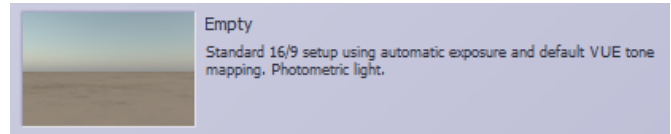
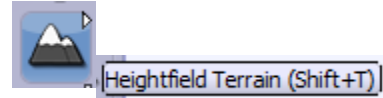*In these tutorials any text that calls for a specific action to be taken by the reader will be bulleted by a dart:* ➤

Any text without a dart bullet with be for explanation and clarification for what the reader is about to perform or clarification of what the reader has just performed.

1) Beginning a Basic Vue Scene:

➤ Create a new **Empty** Vue project:

Empty
Standard 16/9 setup using automatic exposure and default VUE tone mapping. Photometric light.

➤ Create a **Heightfield Terrain**. It will be 1km x1km in size by default.
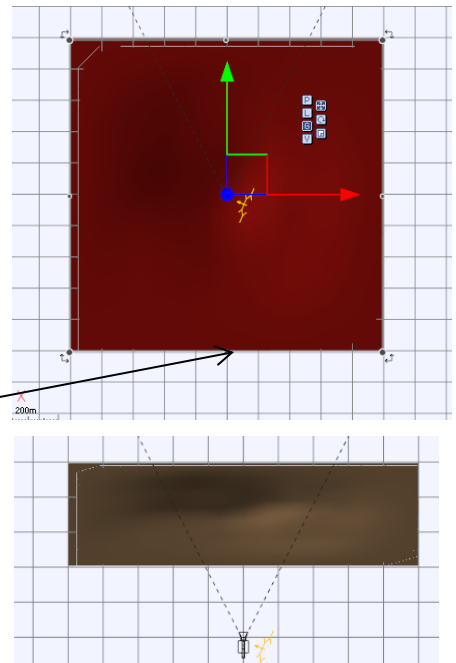
Heightfield Terrain (Shift+T)

We want the terrain to be more narrow but just as wide as the 1 Km.

➤ In the **Top View,** scroll the mouse wheel down to zoom out until the full terrain is in sight.

Each grid square is about 100 meters in size.

➤ Use the bottom center unidirectional resizing grip to reduce the terrain's width to about 300 meters wide:

200m

➤ Then, in the **Front View** use the top center unidirectional resizing grip to flatten the terrain to about half of what it was.
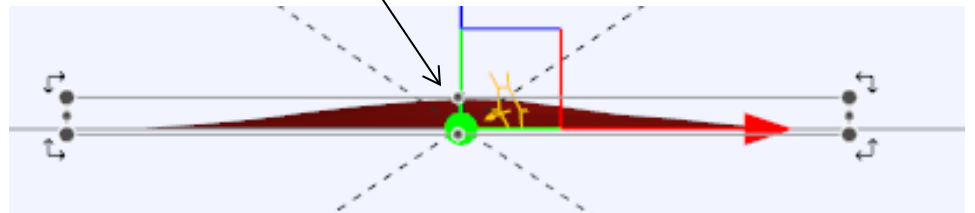
Eventually the scene will be a sunset scene with the foreground trees in silhouette. But for now we want to see the trees that we will plant quite clearly so we'll set the **Atmosphere** to bright daytime.

The etherealcanvas tutorial series: Beginning Vue. © 2018 Robert Woudsma

2) Setting a Specific Atmosphere

➢ Right-click on the **Atmosphere** icon above the display area. to load a predefined atmosphere.

An **Atmosphere** window will open with many predefined atmosphere types:

➢ Select the second; **PHYSCAL** tab of the atmosphere window to show physical atmospheric types.
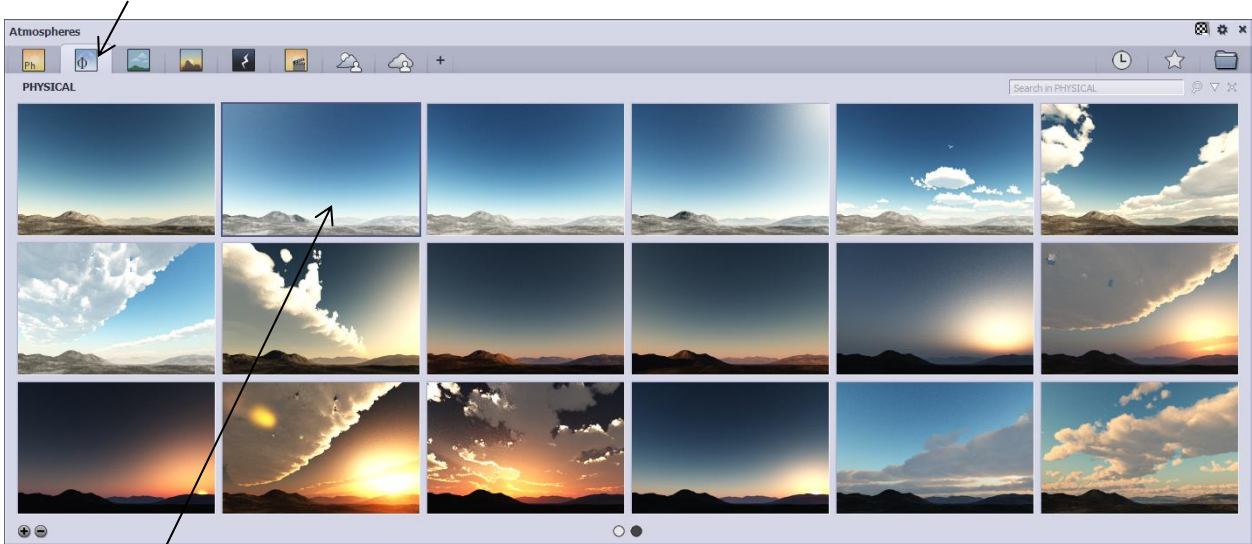
➢ Then select the second **Noon** atmosphere in the top line to load a bright, daytime sky & sun.
➢ You will be shown a warning that this will change the current camera settings. Click on the top bar #1: **Yes, update my camera.**
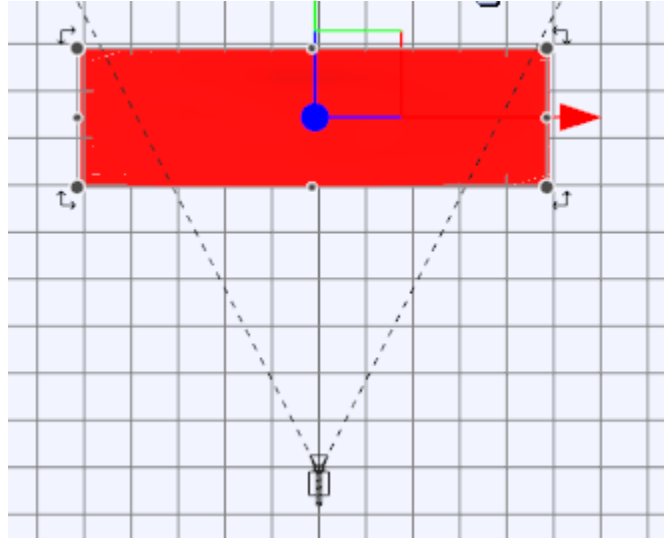

The sky and terrain should show up as very bright in response.
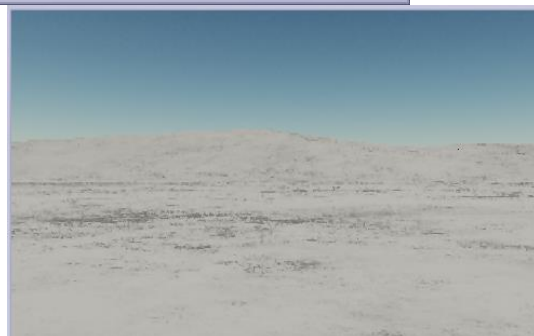
3) Planting a Tree Ecosystem

➢ In the **Top View**, move the terrain away from the camera untill the terrain just fills the frame:

➢ With the terrain selected, either in one of the views or by selecting it in the **World Browse**r, right-click on

the material circle in **Object/Aspect** window.

➢ Then click on **Edit Material** in the displayed list to open the **Advanced Material Editor:**
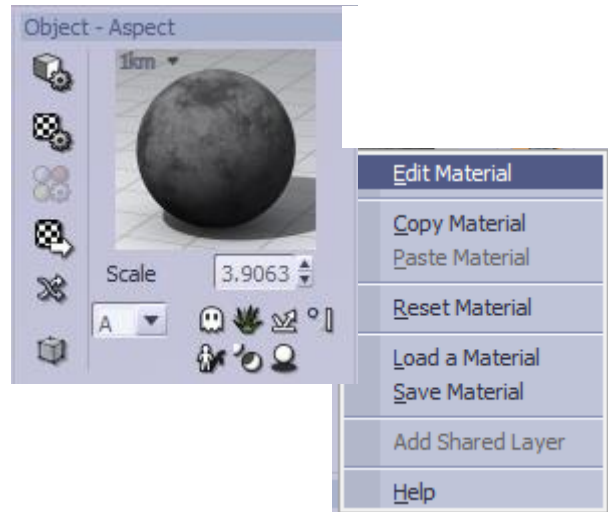
➢ Click on the **Add Layer** icon.

We will add a new layer of material overlaid on top of the existing terrain layer. That layer will be a "paintable" ecosystem layer of trees that will be painted on the terrain.
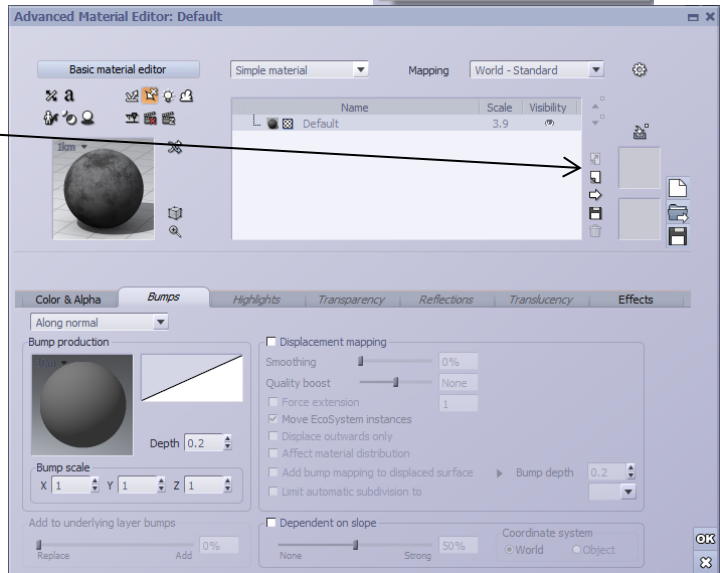
A materiel layer called: **New Layer** is shown on the layers list. Right now, the layer is considered to be a **Simple Material** layer type.

We want to change this to an **EcoSystem/Particles** layer type.

➢ Click on the down-arrow to the right of the **Simple Material** type and select: **EcoSystem/Particles** from the list provided.

So now there are two layers in the listing: one called **Default** and the new one, called **New layer eco**. Notice also that the lower half of the **Advanced Material Editor** changes depending on whether you click on the **Default** layer, which is a simple material layer or you click on the **New Layer eco**, which is an EcoSystems/Particle layer.
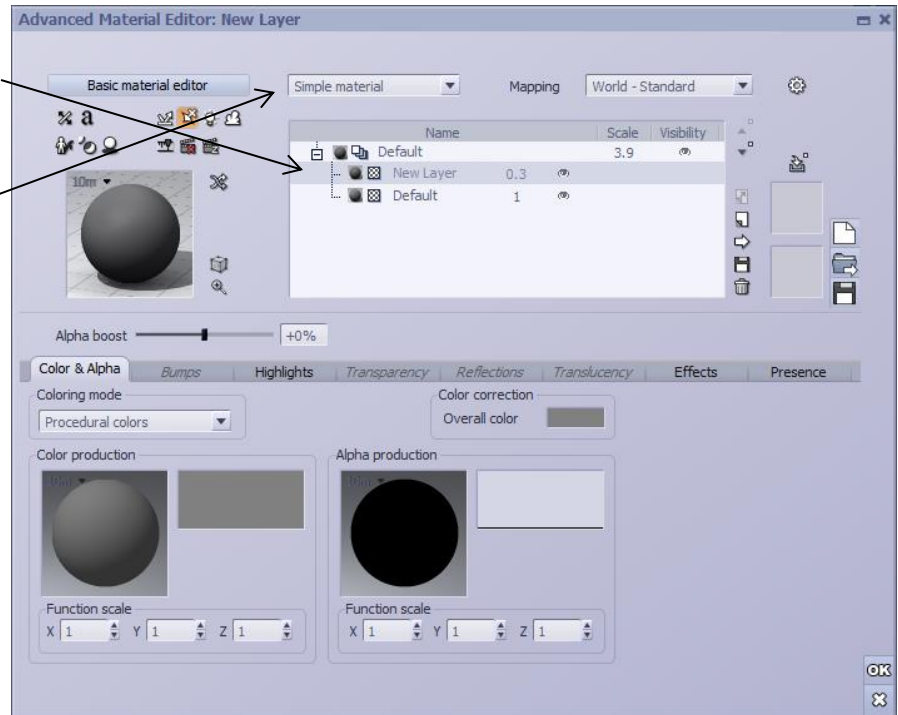
It would be better to have more descriptive names for the layers.

➢ Click on the **Default** layers name and change it to **"Hill"**. Then click on the **New Layer eco** and change its name to "**Trees**"

With the **Trees** layer selected you can see in the lower section of the window the area where various types of rocks, vegetation, or objects can be loaded in order for them to be painted onto the **Hill** terrain:
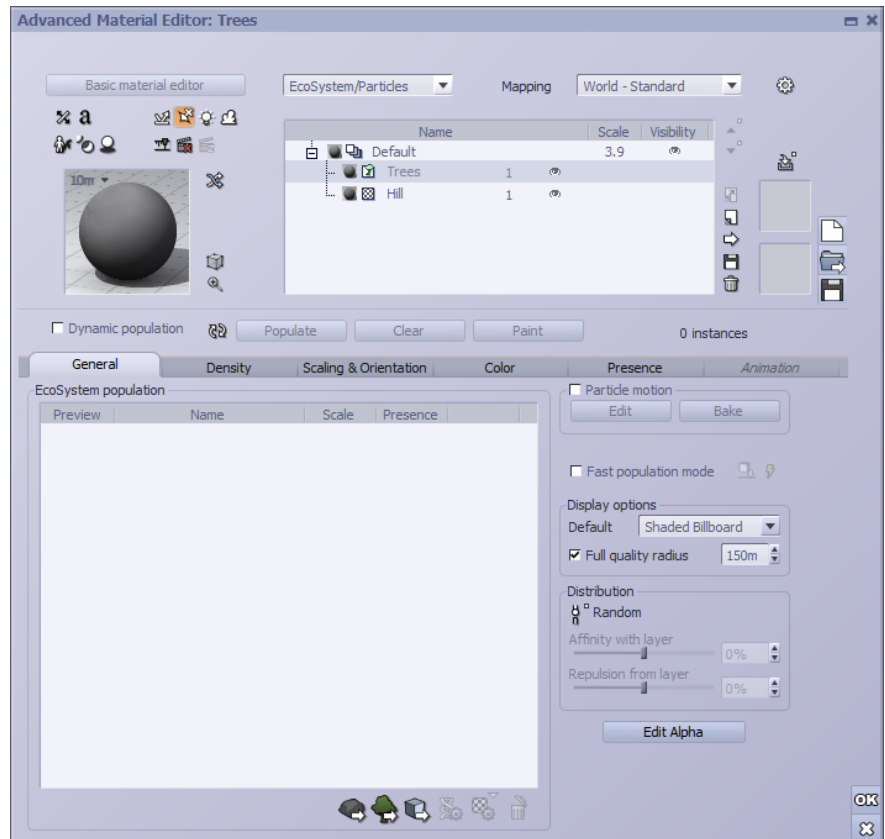
If you have a number of coniferous type trees in your plant files, select one by clicking on the **Load Plant** icon: and then select one from the various plants available in the displayed listing:
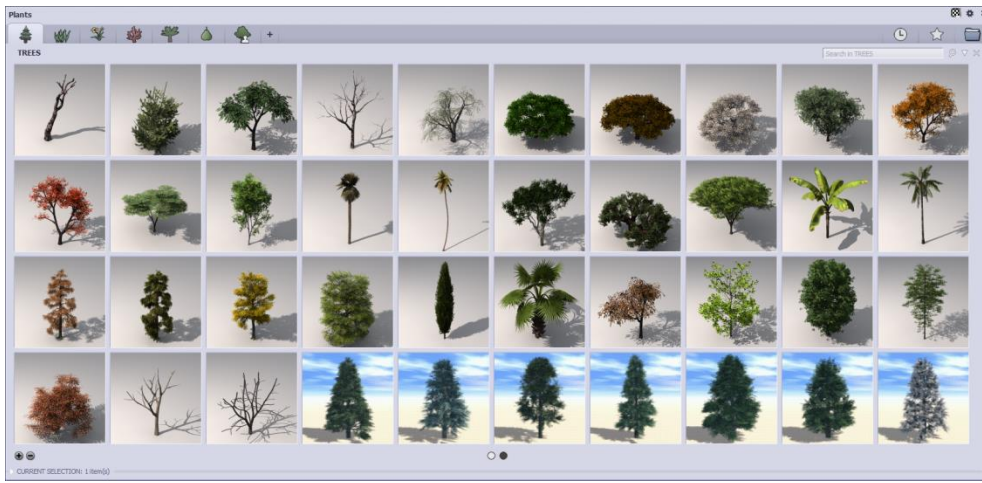

Alternatively, you could select trees as objects that may have been created with some other software and conforms to the Vue object file type (.vob) that can be read by Vue. In that case, click on the **Load Object** icon: Or the two methods can be mixed to select a number of trees species:
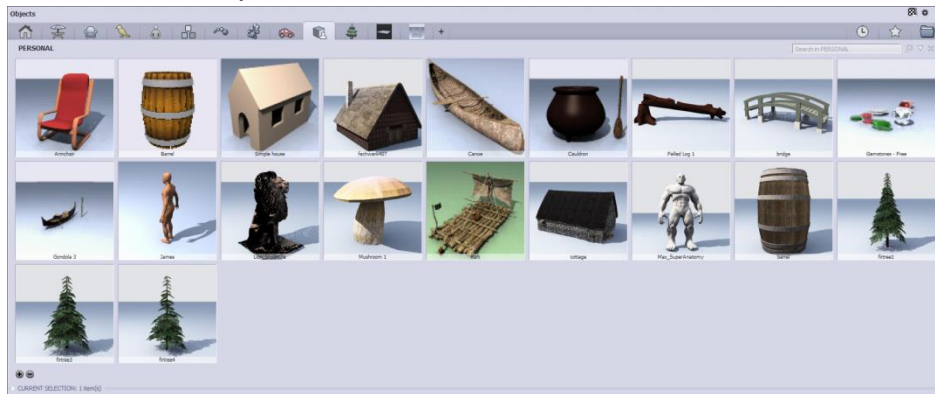
Here we will load three different types of coniferous tree types. As each one is selected, it will load and then appear in the **EcoSystem population** window of the **Advanced Material Editor**.

➤ With the **Advanced Material Editor** still open and the **Trees** layer still selected, zoom in to the terrain in the **Top View** until the terrain fills the frame.

➤ Now click on the **Paint** button just above the **EcoSsytem population** window.
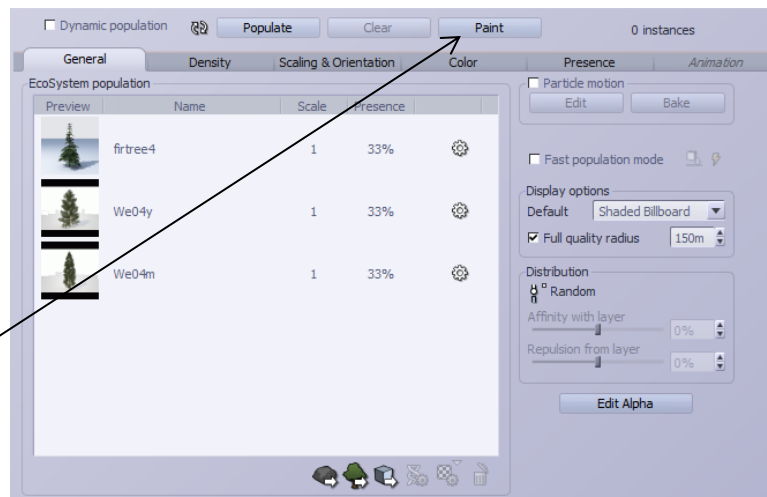
As a result, the ecosystems painter, or **EcoPainte**r window will be shown.

By default, when the **EcoPainter** is opened the **Paint Mode On/Off** is **On** and highlighted in orange.
Also, the **Brush preset** will be defaulted to **Populate** which will be indicated by a white square around the icon.
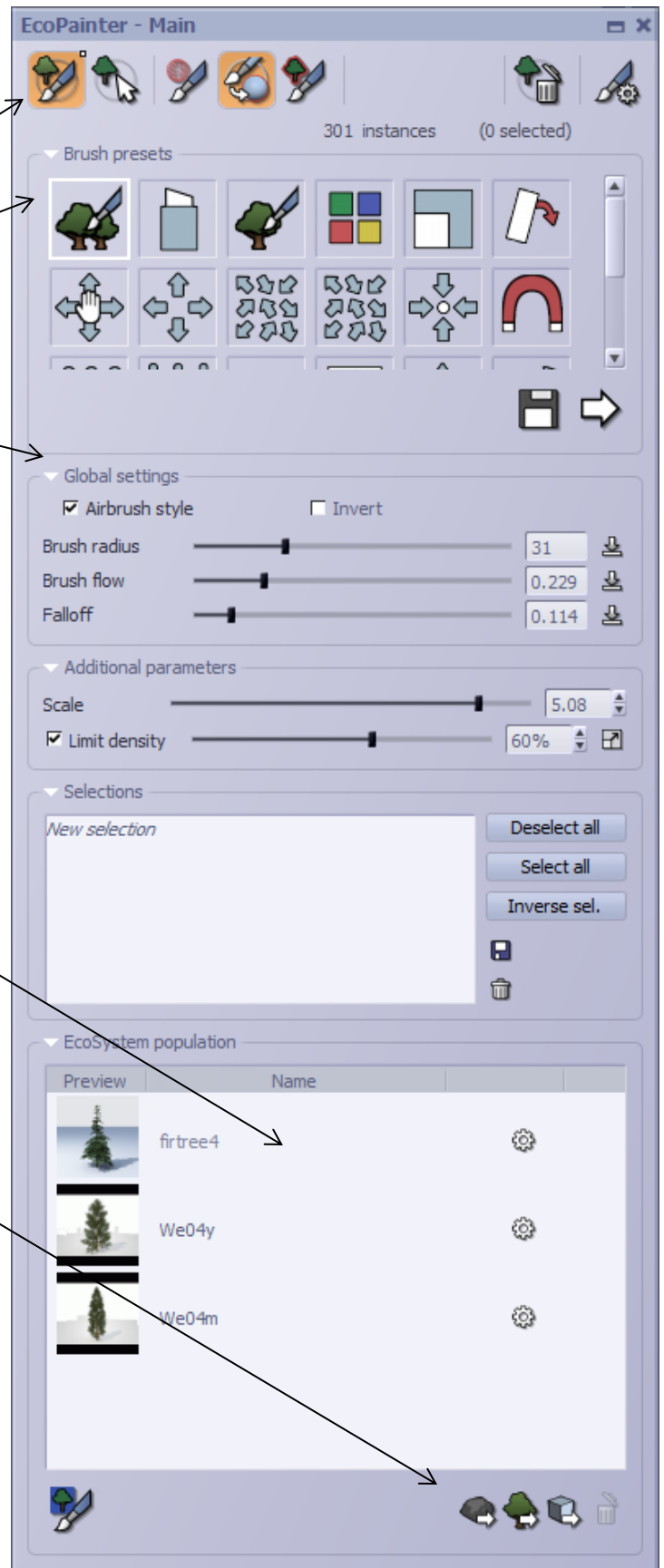
In the **Global settings** area, the three settings can be left at their default values: **Airbrush style** box checked on, **Brush radius** = 31, **Brush flow** (how fast the trees will be placed) = .229 and **Falloff** (how) = .114

➢ In the **Additional parameters** area the **Scale** for the trees that will be painted in this example should be set up to about 3 to 5 or so.
➢ The **Limit density** checkbox should be left checked **On** but the density should be increased from 50% to about 60%

The lower window of the EcoPainter shows the same area as the Advanced Material Editor for ecosystem type layers, where the plants and objects to be painted have been loaded.
The three icons at the bottom show that more plants or objects could be loaded for painting at this point in the process as well.

Finally, the cursor will alternate between its normal arrow symbol and a paintbrush symbol.

As you move the cursor into the active window (should be the Top View) it will show a red circle indicating where the ecosystem objects will be placed.

EcoPainter - Main

301 instances   (0 selected)

Brush presets

Global settings
☑ Airbrush style   ☐ Invert
Brush radius   31
Brush flow   0.229
Falloff   0.114

Additional parameters
Scale   5.08
☑ Limit density   60%

Selections
New selection   Deselect all
                            Select all
                            Inverse sel.

EcoSystem population
Preview   Name
firtree4   ⚙
We04y   ⚙
We04m   ⚙

> Press the left mouse button as you slowly move the red circle over the terrain. Dots representing trees will appear as you move the mouse about.
> The area to cover should be just within the bounds of the camera view.
> Move the circle over the terrain back and forth to increase the amount of trees that are placed.
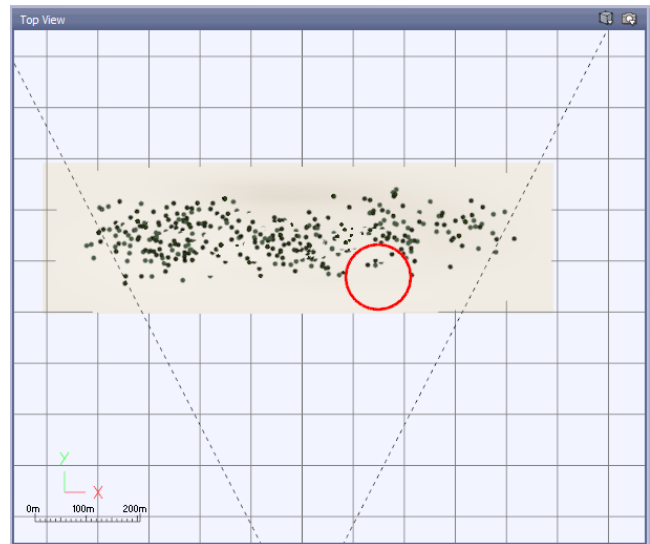
The **Main camera** render preview window will show the scene with the increasing population of trees as the mouse is moved about.

If, at any time you are unhappy with some of the instances of trees that have been placed, click on the second button at the top of the EcoPainter: the **Select Ecosystem Instances** button.
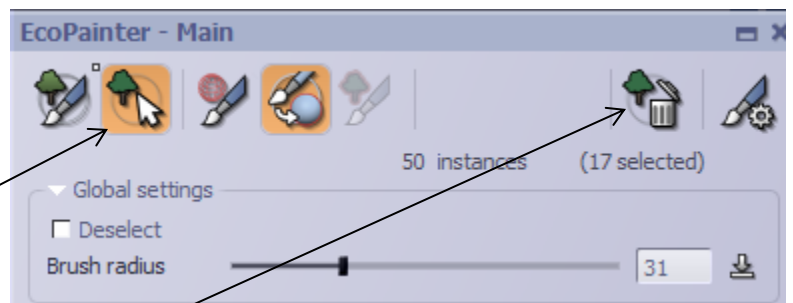
Then, as you move the red circle around with the mouse, individual tree instances can be selected and show as red dots.
Then the selected instances can be erased by clicking the **Clear** button near the right.
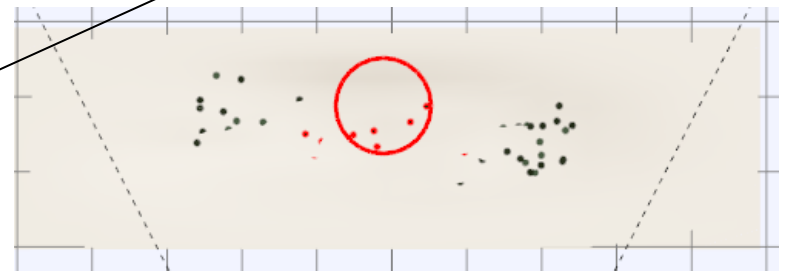
All instances of populated trees can be selected at once by clicking on the **Select al**l button in the **Selections** area of the EcoPainter. Then they can be erased in the same way: by clicking the **Clear** button.
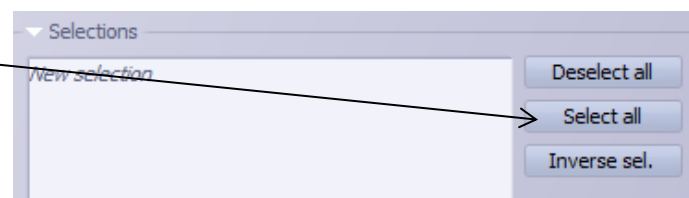
4) Resetting the Atmosphere to a night Scene

Now that we have been able to view the ecosystem of trees painted onto the low hill terrain, we're ready to place the atmosphere back into a night scene with just a hint of sunlight in the skies..

➢ Close the **EcoPainter** and the **Advanced Material Editor** (if they are still open)

➢ Right-click on the Atmosphere icon above the display area. To load a predefined atmosphere.

An **Atmosphere** window will open with many predefined atmosphere types:
➢ Select the second; **PHYSCAL** tab of the atmosphere window to show Physical atmospheric types.
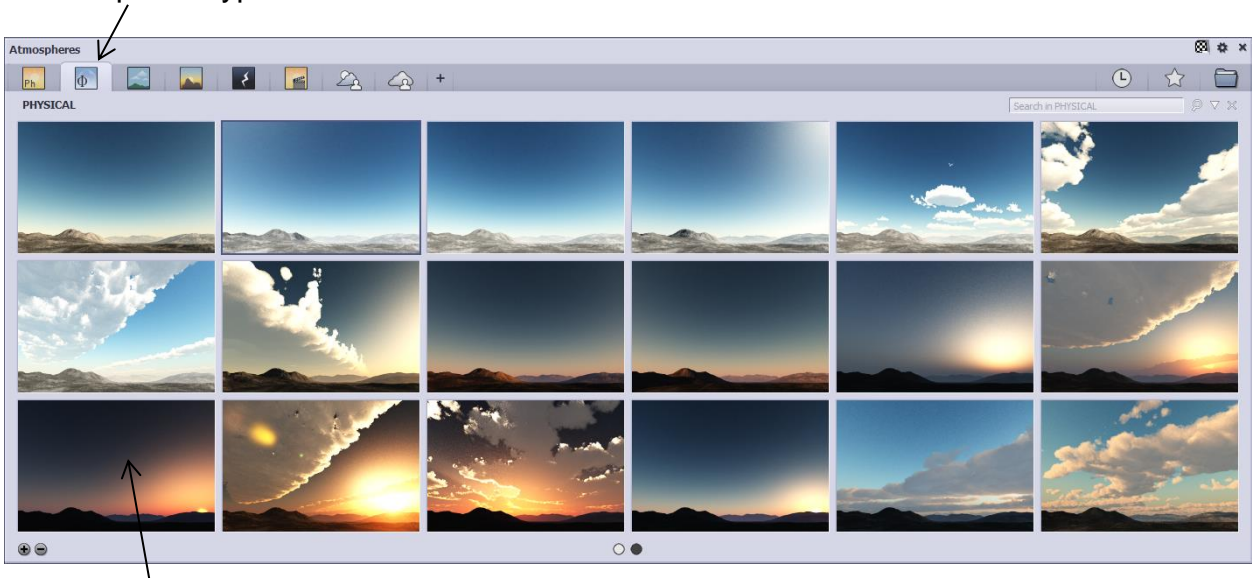
➢ Then select, first in the third row, the **Dusk** atmosphere to load a dark, almost past sunset sky with only a hint of sunlight to illuminate the sky.
➢ You will be shown a warning that this will change the current camera settings. Click on the top bar #1: **Yes, update my camera.**
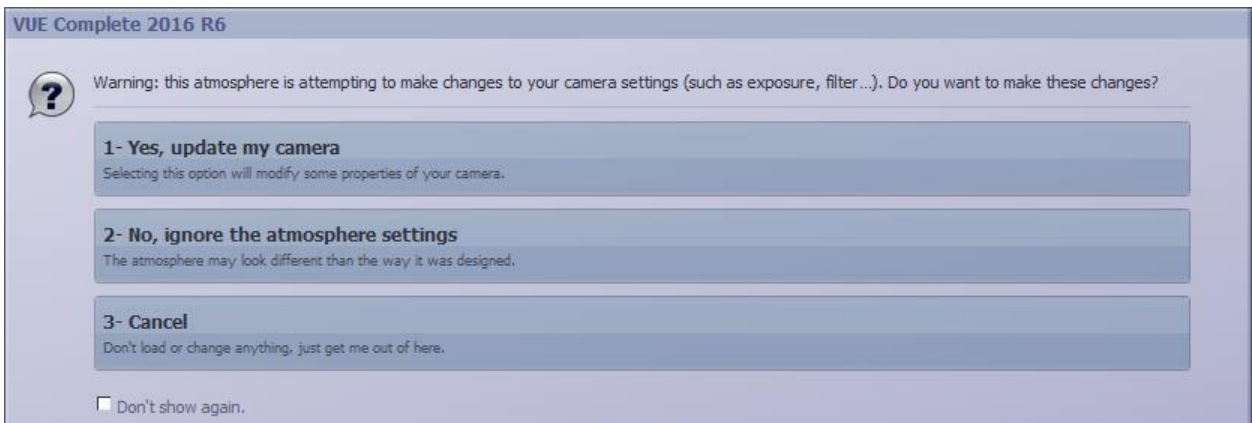
As a result, the trees will already be black, silhouetted against the sky. But the scene needs to be a little darker, with the trees just barely visible against an almost black sky. This will require adjusting the sun a bit.
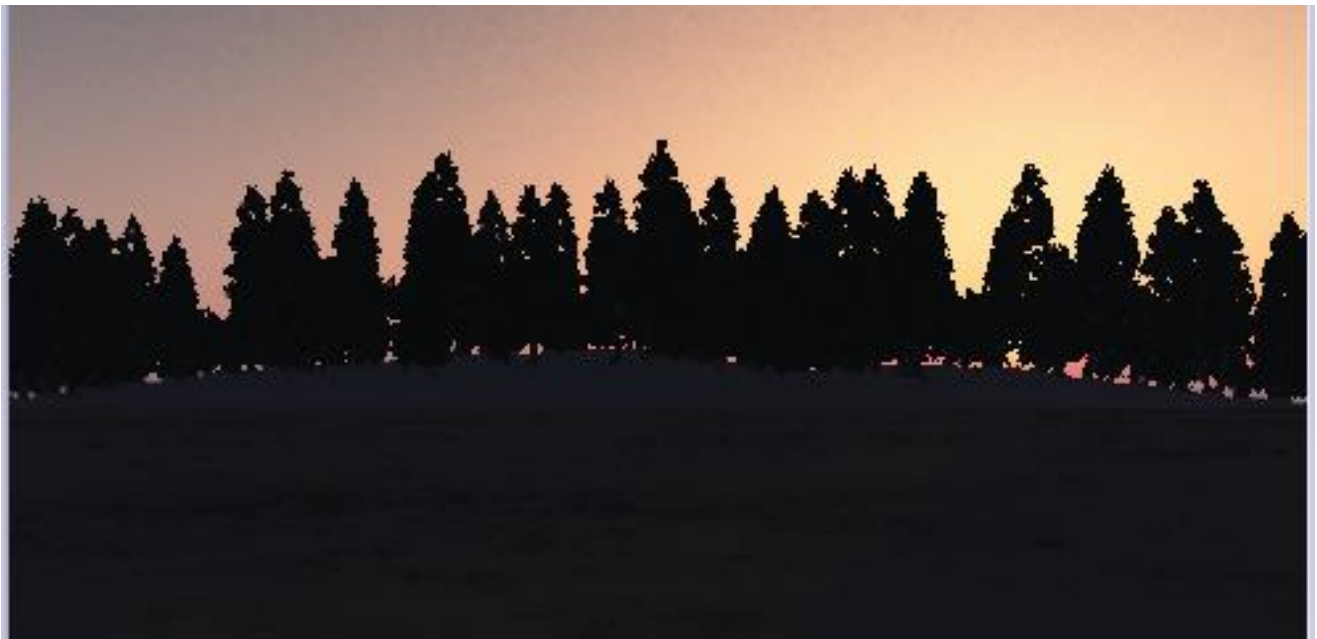
➢ In the World Browser select the Sun Light item.
➢ Zoom (mouse wheel) and pan (mouse left button) in the Top View and the Front View to get a good view of the sun and the camera field of view line:
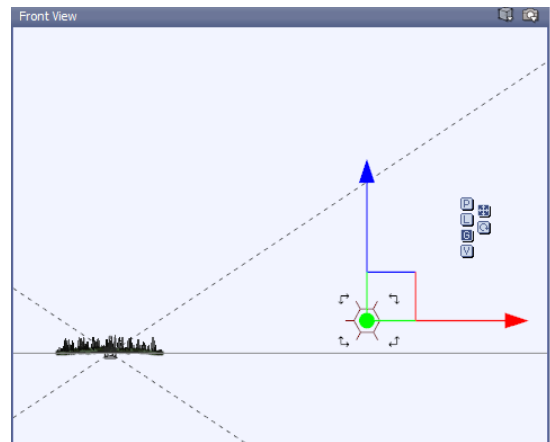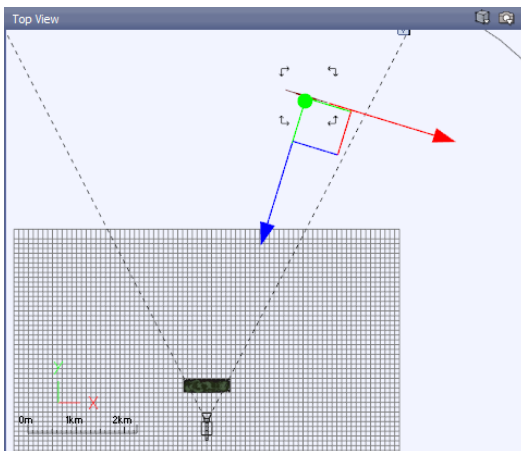

➢ In the Top View, move the sun to the right, just out of the field of view line of the camera.
➢ In the Front View, move the sun downward so that it is positioned just above the horizon line. Its height above the line will determine the general sky brightness.
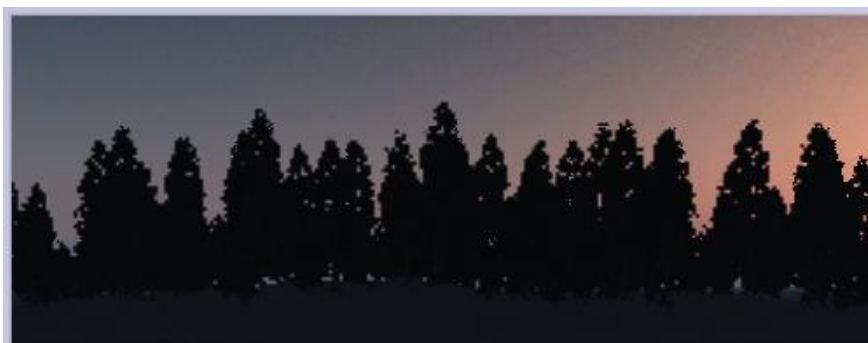
5) Creating the Aurora

We begin creating the aurora effect by simply inserting a cylinder object.

➢ Click on the small right-facing triangle just above **the Insert primitive object** icon (by default showing a cube) on the left-most tool bar to show a list of possible primitive objects that can be inserted: (the one selected will then become the default primitive icon shown)
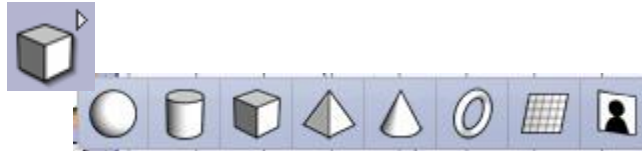

➢ Move the mouse to highlight the cylinder, then release the left mouse button to select it.

The initial size of the cylinder will be quite small compared to the forest scene.

➢ In the **Front View** display use the global resizing handles at each frame corner and the unidirectional resizing handles, midway along each frame side, to enlarge the cylinder to be much taller than the forest height and about 1/4 to 1/3 the width of the scene:
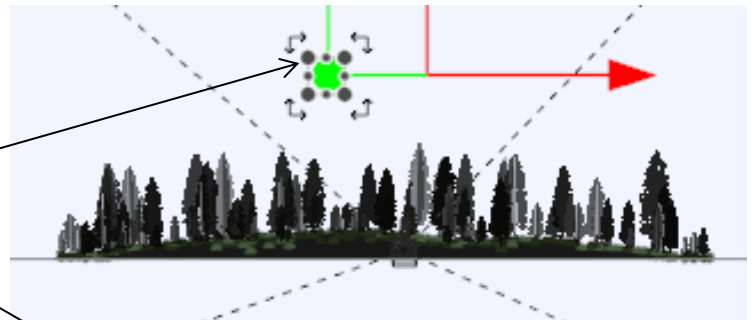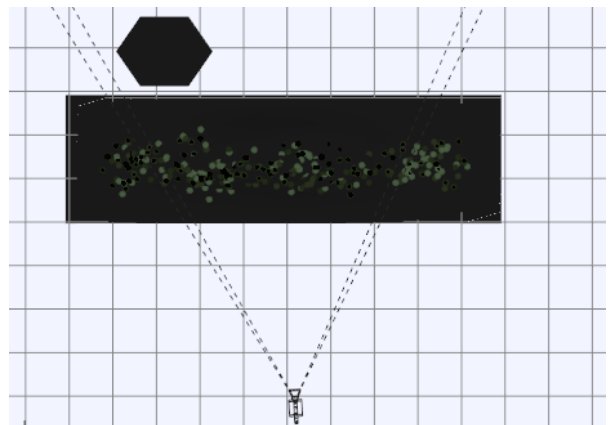
➢ Still in the **Front View** move the cylinder to almost the left edge of the scene.
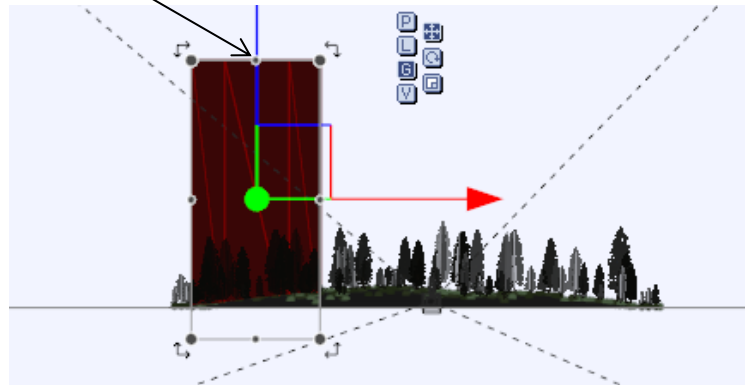
➢ Using the **Top View**, move the cylinder just behind the terrain and forest from the perspective of the camera:

(in the **Top View** the primitive of the cylinder object looks like an oblong shape but won't be so in the active view or rendered scenes)

6) Setting the Aurora Material

➤ Make sure the cylinder is still selected then click on the **Load Material** icon in the **Object- Aspect** panel at the upper-right of the screen

➤ From the **Materials** panel that is shown, select the tab for the **Volumetric** group of materials.
➤ From the Volumetric panel of materials shown, select the **Volumetric Fireball** material
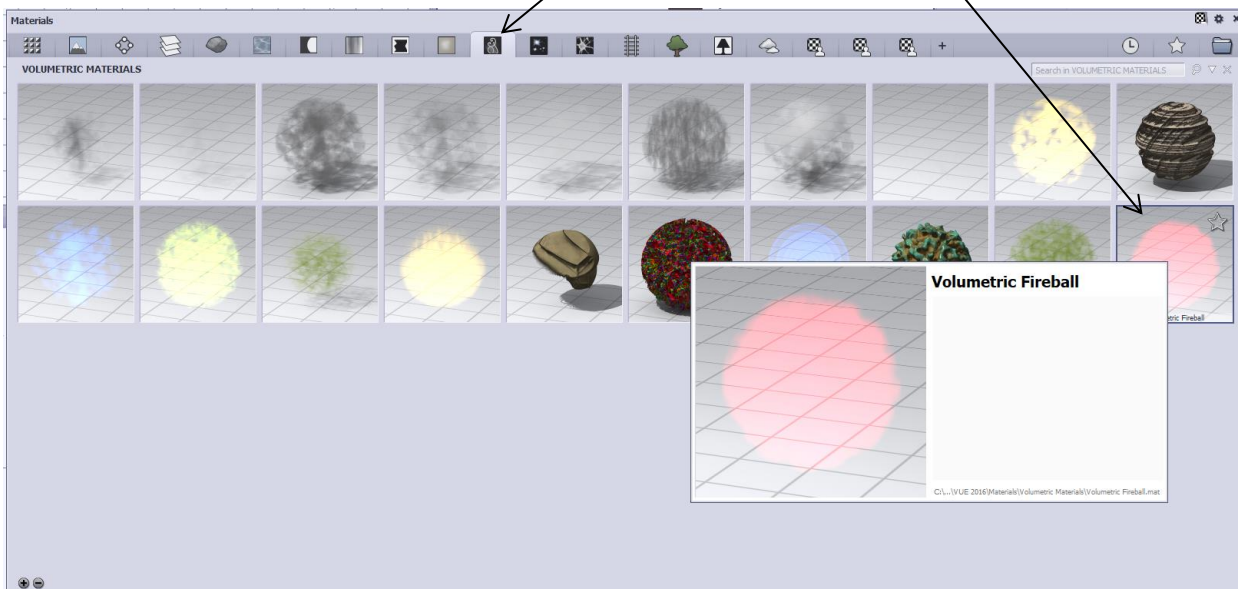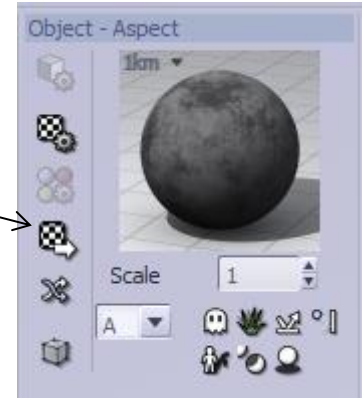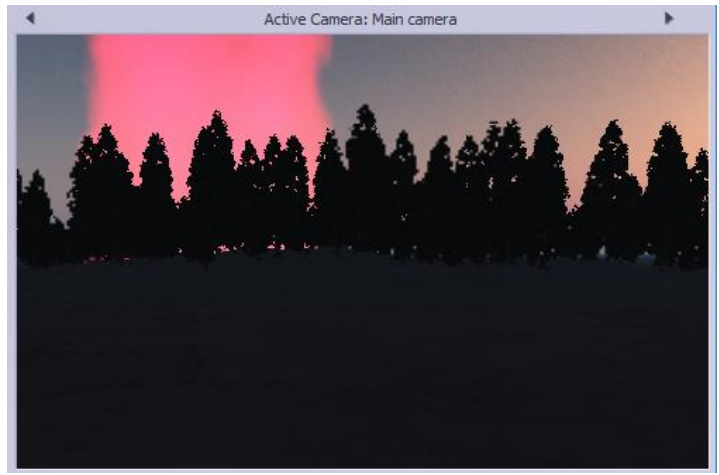

Now the cylinder will be shown in a red glow behind the forest:
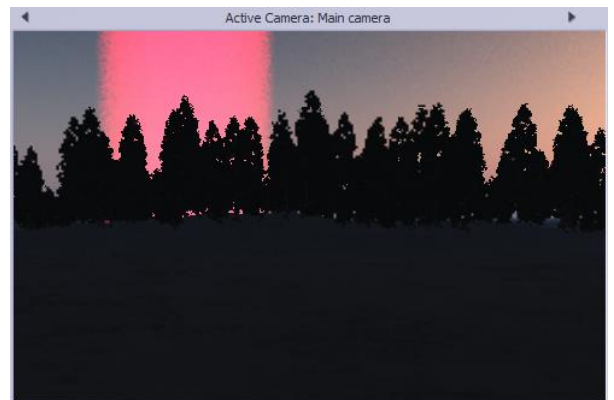
➤ Below the **Object – Aspect** sample view, set the **Scale** of the material to 10.
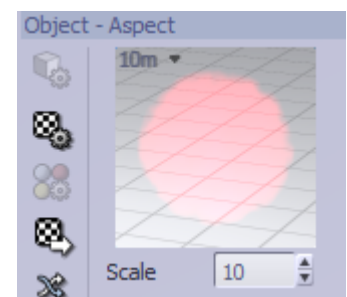
The glowing shape of the cylinder material may now not be as uniform.

Right-click on the **Object – Aspect** sample view to open the **Advanced Material Editor:**

➢ Under the **Color and Density** tab:

➢ Set **Function Scale** X and Y to 2.
➢ Set **Overall density** to 2 or less, **Fuzziness** to 100% and **Quality boost** to +2.

➢ Double click the **Density production** sample view:
➢ Click on the **Layers** tab of functions
➢ From the display of density **Functions** displayed, select the **Paths in the sand** function:
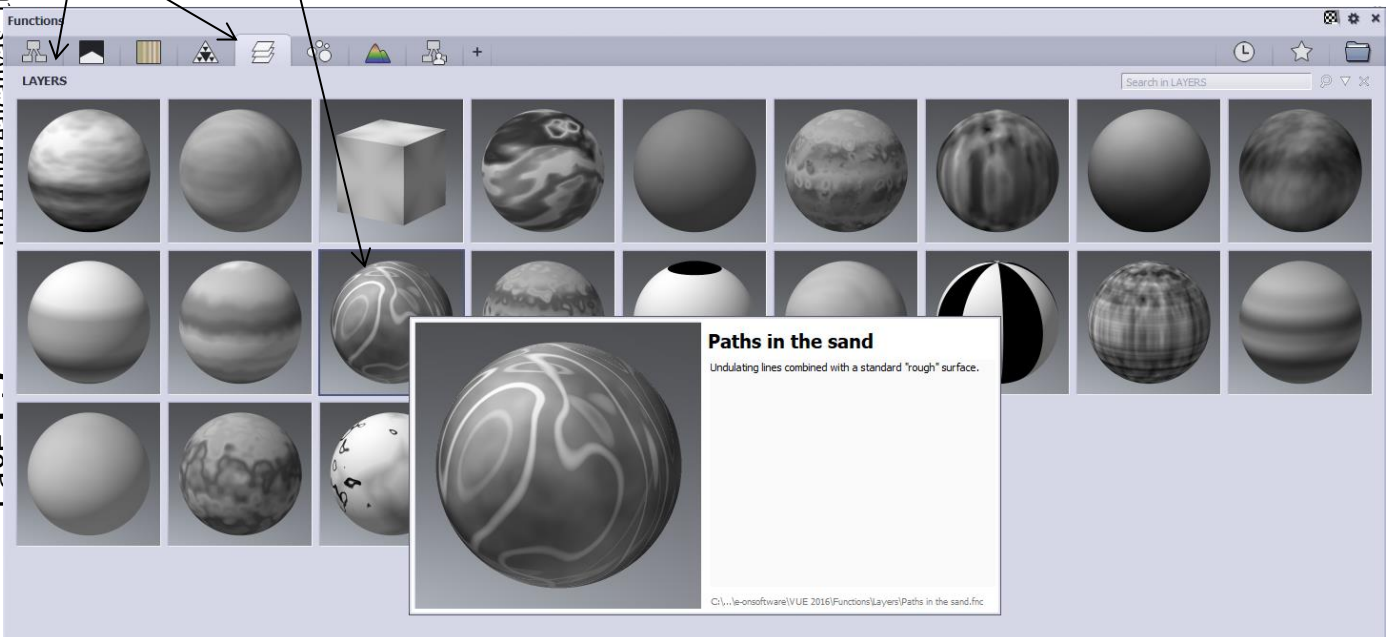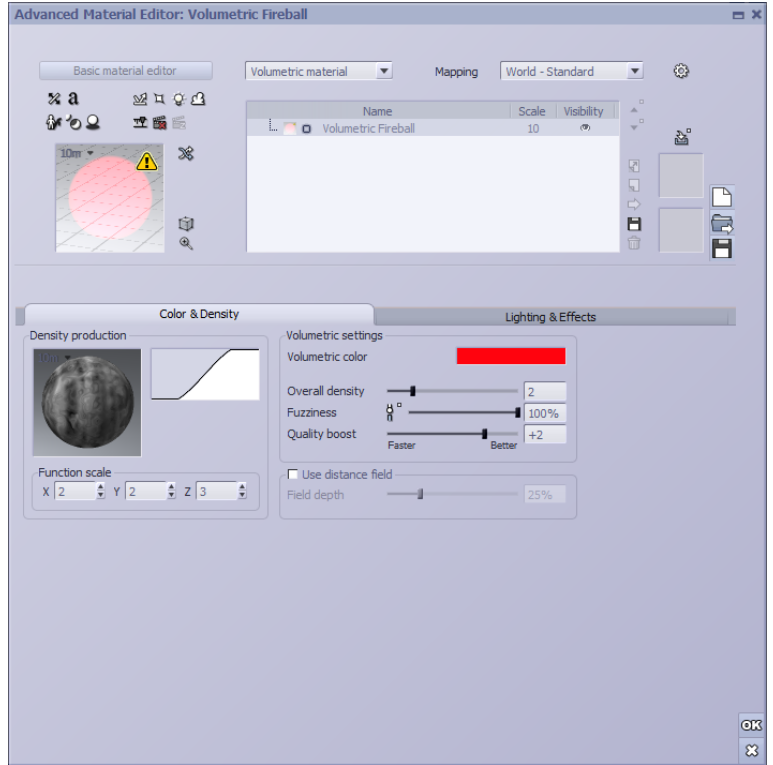

Paths in the sand
Undulating lines combined with a standard "rough" surface.

C:\...\e-onsoftware\VUE 2016\Functions\Layers\Paths in the sand.fnc

The **Lighting Effects** tab controls the brightness of the glow that the cylinder material will have.

Most of the **Lighting Effects** parameters can be left at their default settings.

➢ Make sure that the **Lighting model** is set to **Shaded** if it is not there by default.

The main parameter of influence over the cylinder's brightness will be the **Luminous** level.
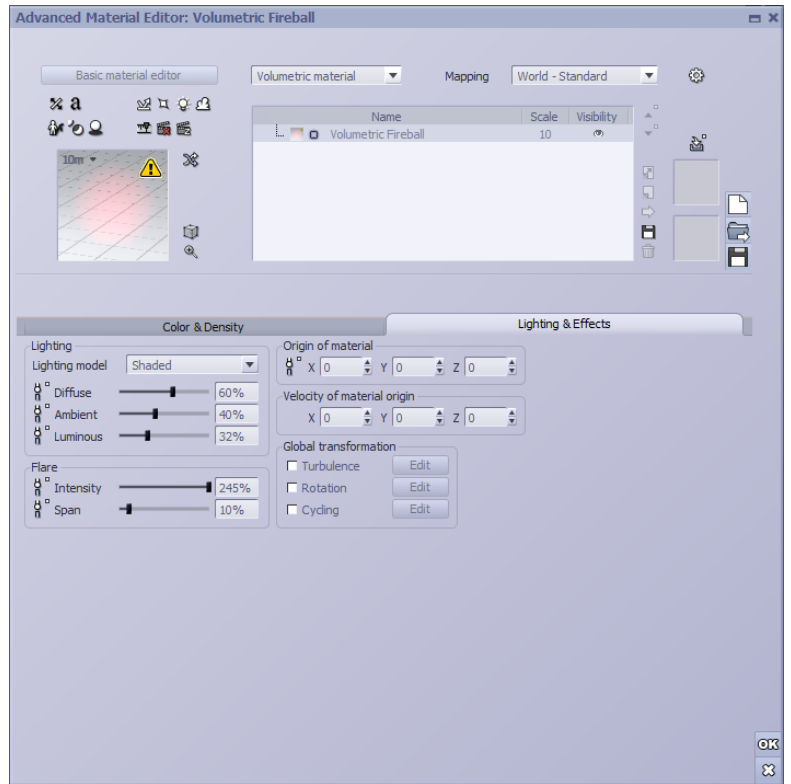
➢ Bring the **Luminous** level up to 50% or 60% or even 70% to see that the effect can be quite pronounced:
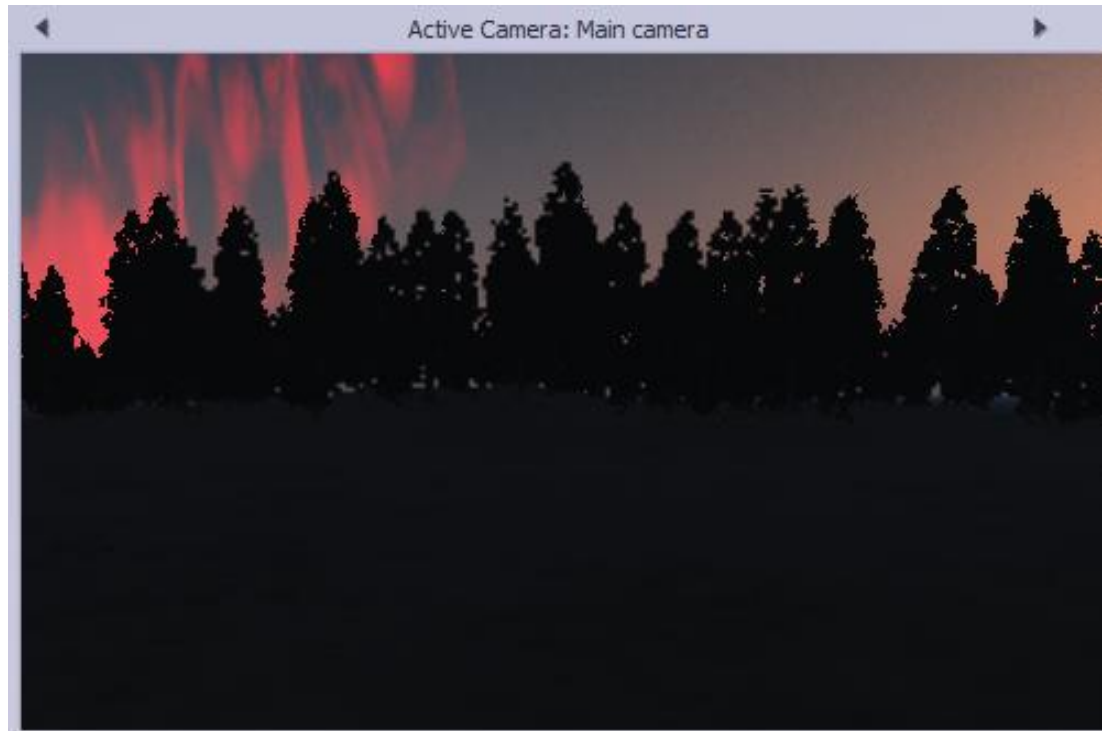
The full aurora effect will have this wispy lighted effect across the entire sky. But we didn't want to make one full-sized cylinder across the whole sky because we may want to use different colours in different sections of the scene. So we will copy the original cylinder two or three more times and shift each new cylinder to the right.

➢ To do this and keep all of the material and parameters of the original cylinder in the copies, in the **Front View**, press the **Alt** key while moving the first cylinder to the right using the X and Y gizmo. A copy of the cylinder, with the same orientation as the first, will be moved to the right with the original cylinder staying in place.

➢ Repeat the above copy process one more time.
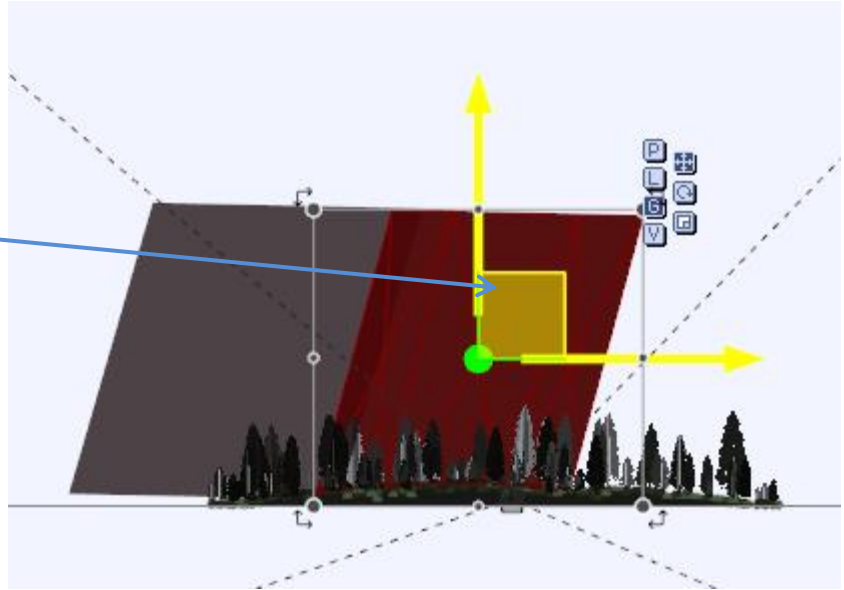
Initially, there will be three cylinders covering the width of the viewable sky in the scene. They will be of the same default red Volumetric Fireball colour.


Now each cylinder can have its colour changed to show variations in the aurora.

➢ Select the left-most cylinder and then right-click on the **Object-Aspect** sample view. Then select **Edit Material** to bring up the **Advanced Material Editor** again.

➢ In the center area of the **Advanced Material Editor,** click on the **Volumetric color** square to bring up the **Color Selection** pallet.
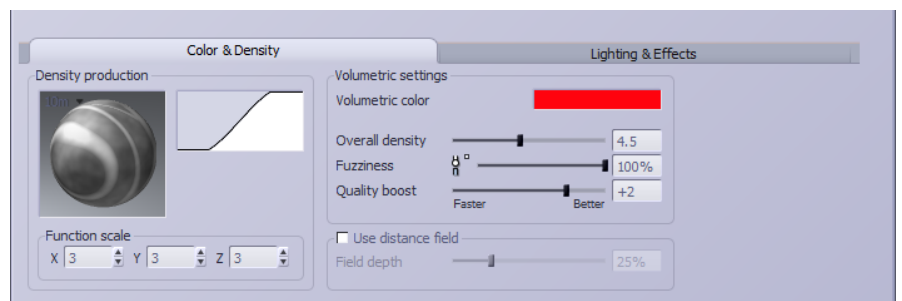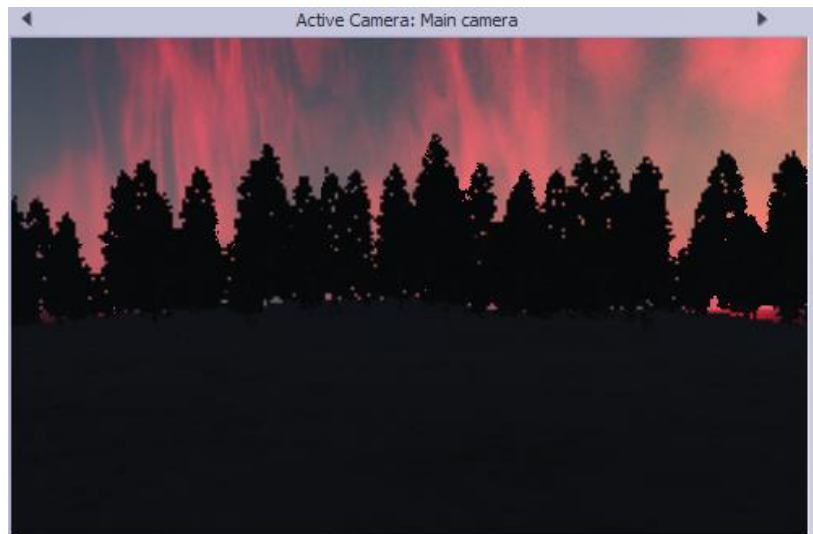
From the **Color Selection** pallet any colour and saturation level can be selected and applied to the cylinder.

➢ Repeat this for each cylinder to add colour variations to the aurora of the scene.

➢ When you are satisfied with the colour for that cylinder, click OK to close the **Color Selection** pallet.
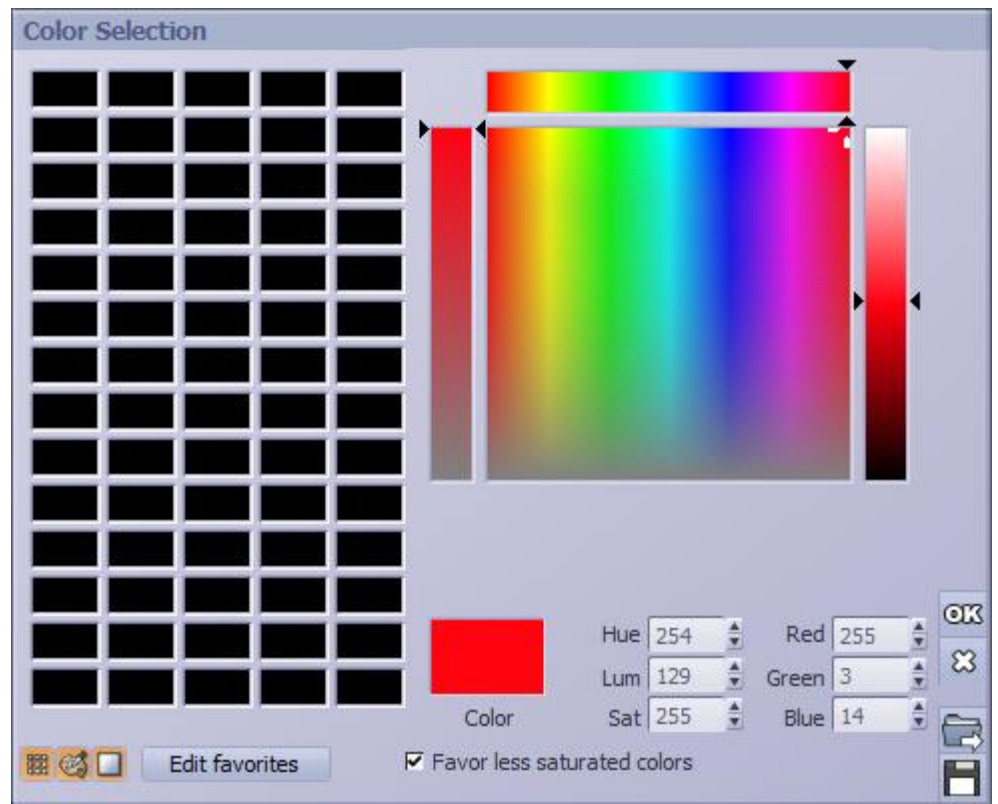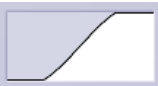
You can experiment with dramatic or subtle changes in the colour to achieve your desired effect.
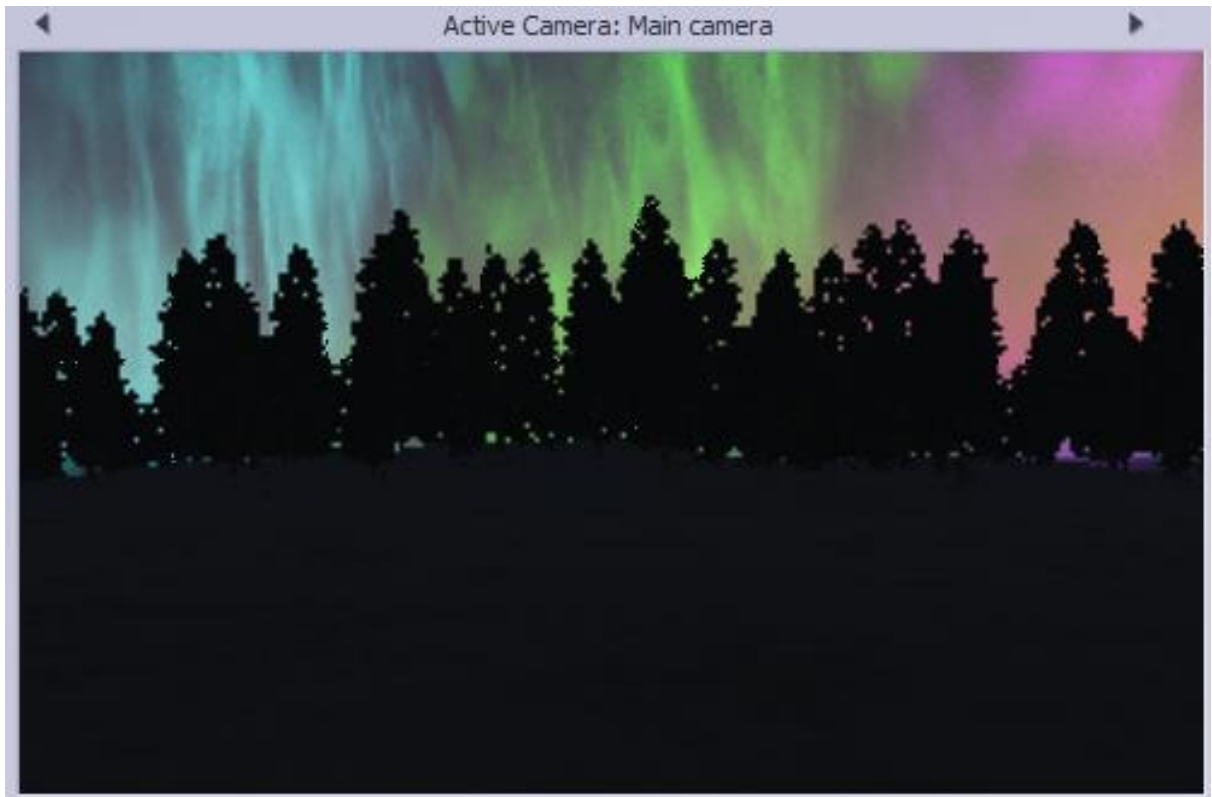
Back in the **Advanced Material Editor** the brightness of the aurora shapes can be controlled by the **Overall density** adjustment adjusted.
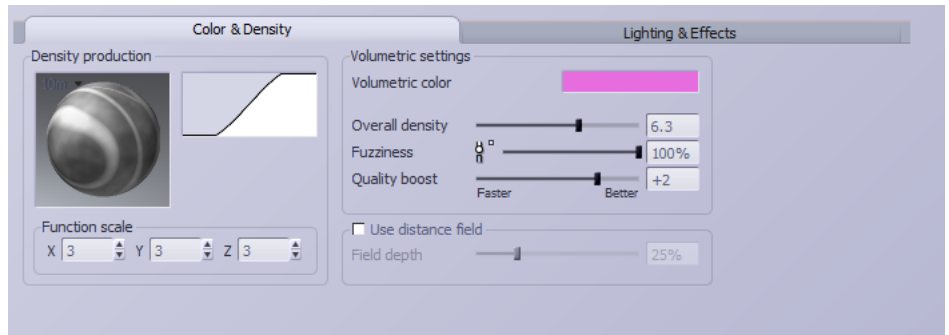
Many variations of the aurora shapes can be made by experimenting with the **Density production** type of **Function** (we used **Paths in the Sand** here) or changing the various **Function scale**: X Y and Z values.

You could even play with the **Density production Filter**: by double-clicking it and selecting from among many filter variations shown:
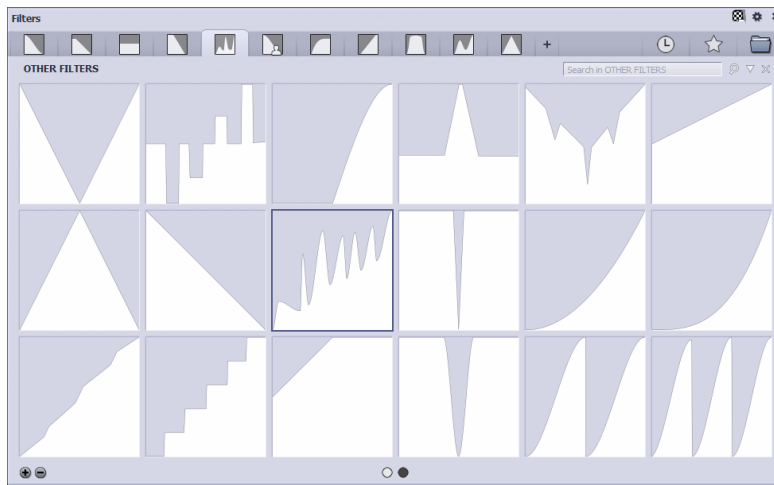
7) Adding a Reflective Foreground

The lower half of the scene is completely dark. To make the lower half more interesting, we'll add water in front of the terrain which will reflect the aurora. We will use the default water material.

➢ Click on the Water icon on the left toolbar: to place an infinite water plane in the scene.
➢ With the **Sea** item in the **World Browser** selected, Right-click on the **Object – Aspect** sample view and then select **Edit Material** from the displayed list.
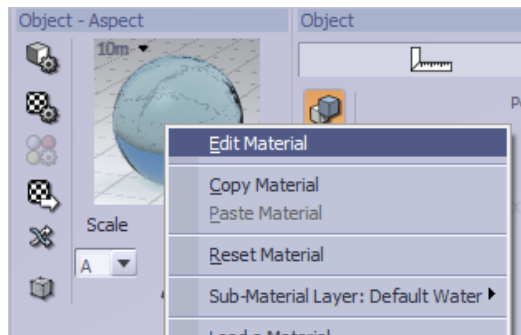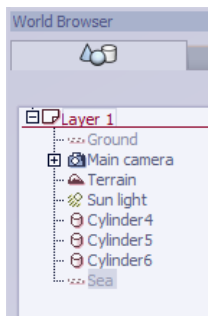
In the **Advanced Material Editor** that is displayed note that the **Physical Sea water** is made up of two layers; one is **Foam** and the other is **Default water.**
The **Foam** layer is selected and highlighted by default. The **Foam** layer will actually be detrimental to the scene so we'll delete it.

- ➤ Since the **Foam** layer is selected by default, press the **Delete** key on the keyboard to remove it. The **Default water** layer will then be automatically selected.
- ➤ Click on the *Reflections* tab and set the **Global reflectivity** parameter to 100%,
- ➤ Then click the **Transparency** tab and set the **Global transparency** level to 0%
- ➤ Then click **OK**.
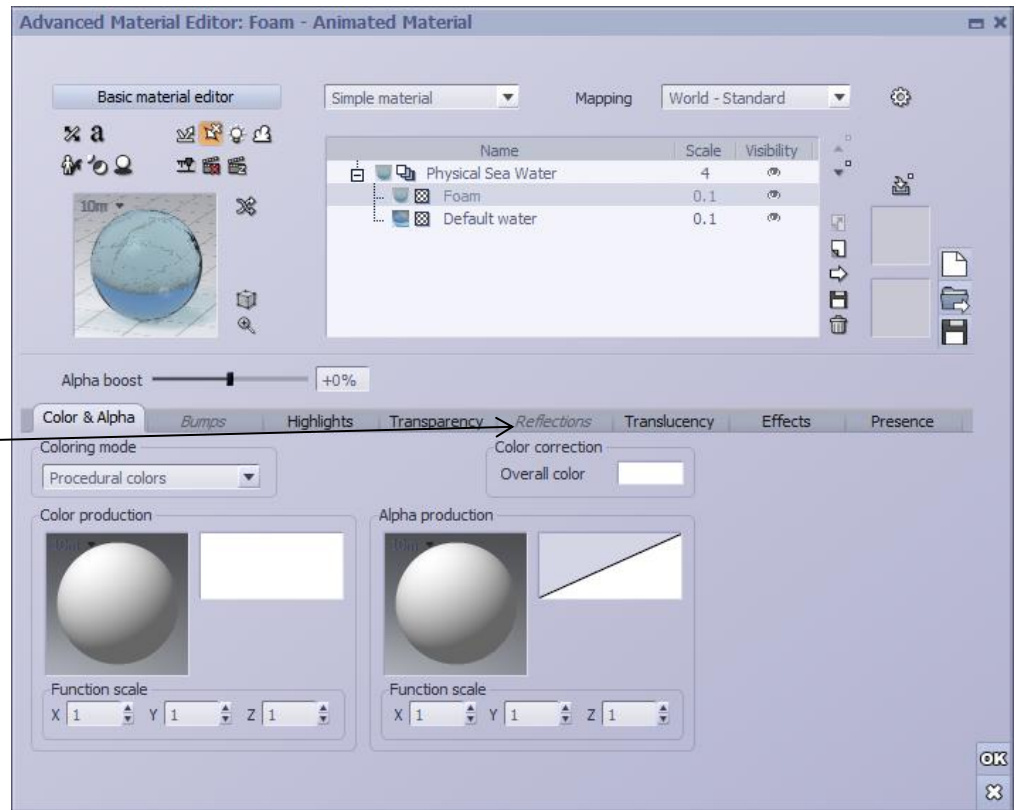
The reflection of the aurora will now be more clearly seen on the water. The waves are a bit rough and choppy.
We want to smooth the waves out to give a calming feel to the reflection on the water.
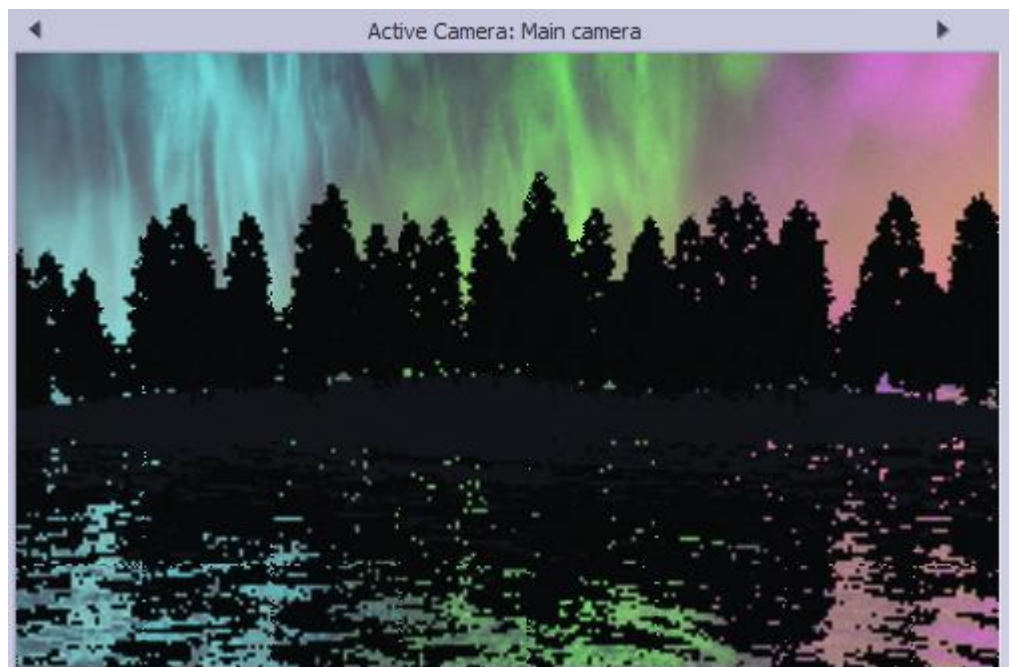
- ➤ Once again, with the **Sea** item selected in the **World Browser**, right click on the **Object – Aspect** material sample view and select **Edit Material** from the list.
- ➤ Under the **Bumps** tab, set the **Bump scale** from the value of 1 to the value of 3 or 4 in each of the X , Y and Z axis.
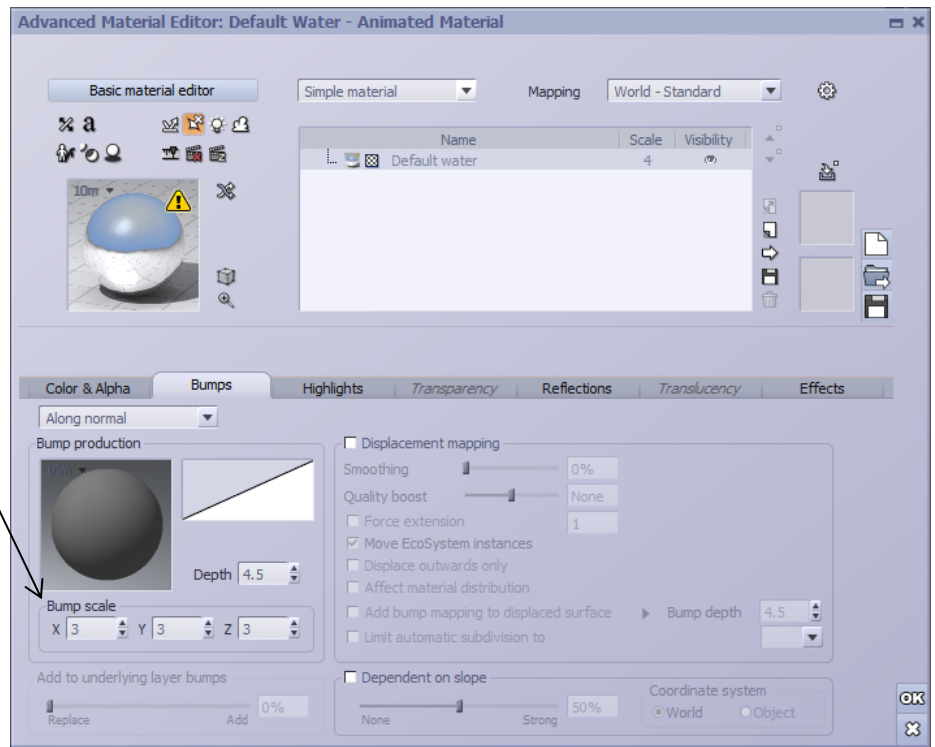
Finally, use the camera controls for 1- panning, 2 - move forward/backward, 3 - rotate camera and 4 - rotate camera around an object (which must first be selected) to position the scene to your satisfaction.

8) Adding Stars to the Sky

The final element we will add to the scene is some stars in the sky.

➤ At the top of the display area, left-click on the icon for the **Atmosphere Editor:**

The **Atmosphere Editor** window will be displayed listing the current atmosphere type that has been loaded (**Dusk** in our case)

➤ Click on the **Effects** tab to open its parameters window.
➤ Click on the **Stars** checkbox to enable stars in the scene.
➤ Set the **Number of stars** near 100%.
➤ Set the **Brightness** to about 65%.
➤ Leave the **Twinkle** value at 0%.
➤ Click the **With lens flares** checkbox to disable lens flares.
➤ Click **OK** to close the Atmosphere Editor.
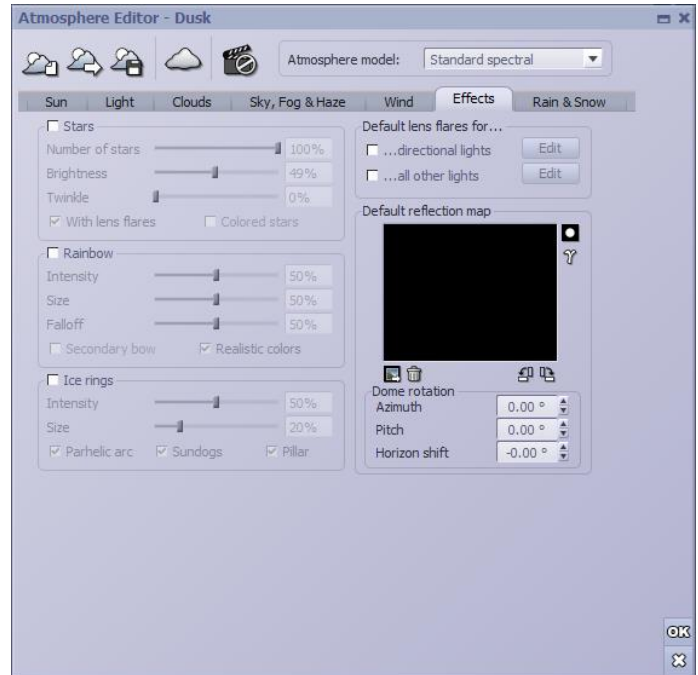
The scene is ready for rendering: