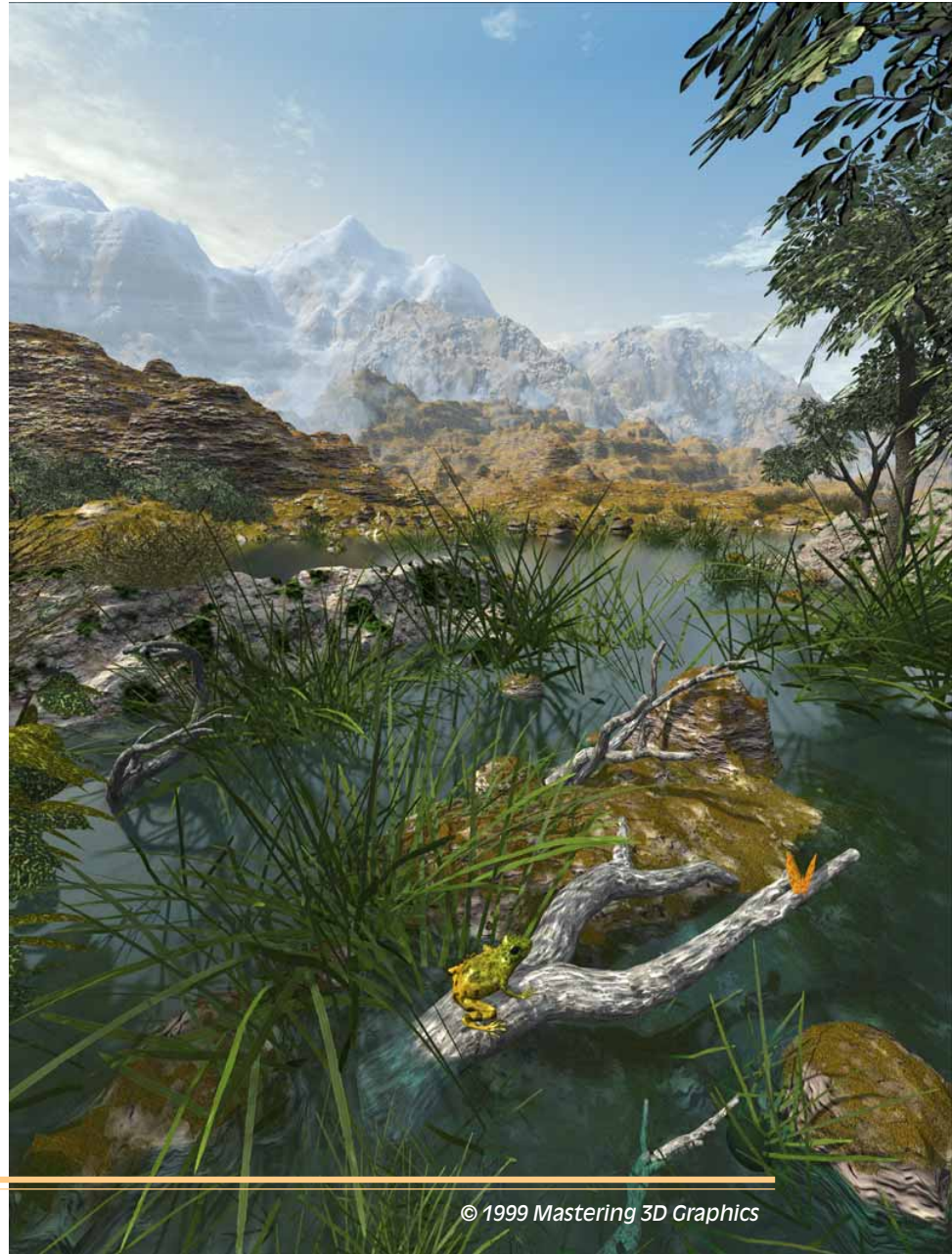


Realistic natural scenery

Mastering 3D Graphics ~ issue #1

with Vue d'Esprit San Maurici

Vue d'Esprit 2 is the hot new tool for natural outdoor scenery. As you will see from this tutorial, it's remarkably easy to use, and packed full of incredible features. Amazingly realistic vegetation are, together with soft shadows and blurred reflections, just some of those features that make for incomparable picture quality. Happy virtual trip!



Step 1: shaping out the pool

Off we go! Click the New icon and select an atmosphere (see [Figure 1.1](#)). Just pick one that corresponds more or less to what you want to achieve. The choice is not so significant. The atmosphere you select will only be used as a starting point. It'll be thoroughly modified later, until we eventually end up with something completely different! Anyway, we picked “Wispy winter”.

The picture has a vertical aspect ratio which is somewhat unusual for landscape imagery. However, such an aspect ratio will emphasize the overall depth of the scene. It will also result in a more “dynamic” composition. To change the aspect ratio of the camera, open the Render Options dialog (by long-clicking on the Render icon, or clicking with the right mouse button). Select “US Letter - vertical” from the aspect ratio drop-down list.

The main feature of our picture is the pool. It should be made of deep, still water. So the first thing to do is to add some water to our empty scene. Click on the Water icon (top left). This adds an infinite plane of water 10 units above ground level. By default, it is assigned a clear blue water material. This isn't what we're looking for... Click on the Load material button underneath the material preview in the Object properties panel (see [Figure 1.2](#)) and

select another material from the “Liquids” collection. We want something that looks like dark, still water; “Shasta Lake” is a good start. Besides, “Shasta Lake” has an interesting feature: a blurred surface which is particularly well suited for the kind of water we need. Blurred surfaces are a rare and convincing feature of Vue d'Esprit 2. They come in two flavors: blurred reflections and blurred transparencies.

Although the water is 100% transparent (which is basically what it should be!), when seen from a low angle of incidence, it becomes reflective. And this is where the blurring steps in: the reflections that you see on the surface of the water are not your usual, sharp Computer Graphics reflections. They are blurred. This, not unlike soft shadows, is much more realistic than the usual CG



Figure 1.1: Selecting an atmosphere using the visual browser (left).

Figure 1.2: The selected objects properties panel (right).

counterpart. Anyway, we'll come back to this later, when we fine tune the water ([step 7](#)).

Now we've got our pool water, we need to start roughing out its whereabouts by adding rocks, a shore, and mountains. What is particularly important when designing natural scenery is to achieve a good sense of scale.

Achieving a good sense of scale

This is done in a simple way: you need to add elements to your scene – at all scales. Start off in the foreground by creating tiny stones, then add larger rocks further away (use the global resize handles, see [Figure 1.3](#)). Keep adding terrains that get larger and larger as they move away from the camera. Don't be afraid to make them really large (e.g. the mountains in the far background of this picture are almost 10 thousand times larger than the rocks in the foreground!). That's the key to getting depth into your scenes. Distant mountains will automatically disappear in haze and fog.

Create a terrain and lay it out in front of the camera. This will feature the stones right up close to the camera. Open the terrain edi-

tor (double-click on the terrain) and press the Stones button (Effects tab). Raise the terrain size to 256×256 to make sure it is sufficiently detailed. If this isn't the case, horrible polygons will start showing along the edges. When this happens, press the ×2 button in the terrain editor to hastily wash them off. Be sure however to keep terrain resolutions down to a minimum to avoid uselessly overloading the render engine (a 256×256 terrain is already comprised of over 130,000 polygons...). See [Figure 1.4](#).

As you probably will have noticed, Vue 2 displays a list of all the objects that make up your scene (called the World browser). By default, objects get boring names such as "Terrain 1" or "Sphere 32". It is highly recommended that you rename objects to give them names that actually

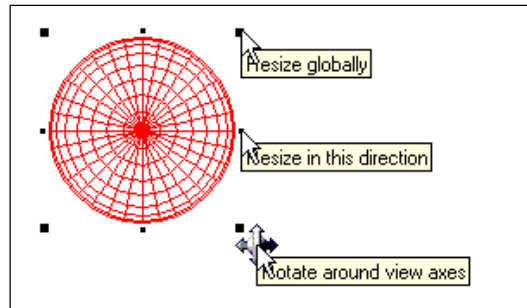


Figure 1.3: Resizing objects using the size handles.

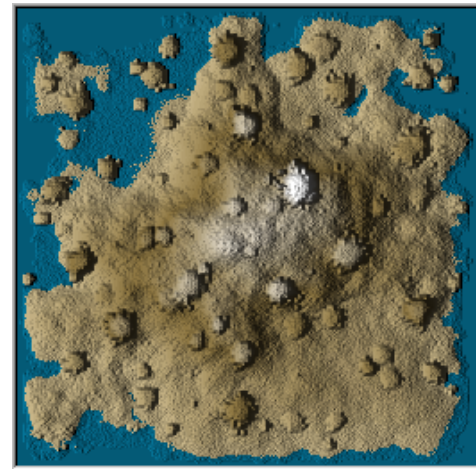


Figure 4: Adding stones to the terrain (terrain editor map).

mean something to you. This will make navigation inside your scene much easier as it becomes more and more complex. How about “Stones” for this first terrain?

Grab the terrain in the Side view and drag it down under the water so that only a few stones rise from the surface. Watch the Camera view for feedback (in this view, everything that is under the surface of the water is clipped out). Hit the Render icon to visualize the result.

Add a couple of other terrains to shape the opposite shore of the pool, and another few behind these to start modeling the background. Don’t forget to make the farther terrains larger than the close-up ones.

The stones effect was also used on the terrain that frames the pool. And the “Terraces” effect was applied to the larger terrain on the left (i.e. “Rocky hill (left)”). This creates numerous tiny ridges that look like layers of stone.

Old boring fractals

For highly realistic pictures, avoid using terrains straight from the fractal generator. Besides being boring, you may find out that they don’t give a completely natural look to your scene... Always add a tad of erosion (diffusive, thermal, fluvial, or wind), or a twitch of geological effect (12 effects to pick from). Ultimately, add

details manually using the paint tools supplied with the software, or copy-paste the terrain into a 2D app (e.g. Photoshop). As Bill Fleming explained in a previous issue of Serious 3D magazine, chaos is the mother of realism. This is particularly true for natural scenery. Nothing looks more boring and unrealistic than a range of mountains that all look like similar piles of fractal maps!

Use the vertical resize handle to make some of the terrains higher than others.

See [Figure 1.5](#). By default, objects created in Vue 2 are given a flat beige color. The terrains we just created are no exception to this rule. We need to give them a more natural look by adding surface detail (i.e. a material). Just as for the atmosphere and the water material,

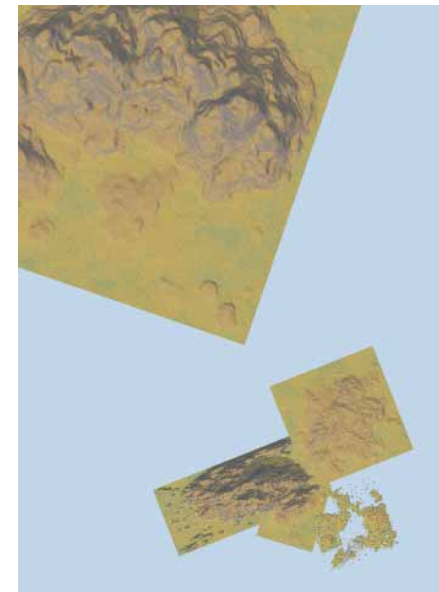


Figure 1.5: satellite view of terrains at different scales.

it is good practice to fish an approaching preset material out of the library of 250 materials supplied with the software. Once again, this will only be a starting point for the final material, since we will seldom find one that exactly matches our requirements. However, getting something close is good enough to rapidly give you an overall appreciation of the picture. At least, good enough to let you work on its composition.

Select all the terrains in your scene (select one terrain, and then click the “Select by type” icon to select all other terrains). Now click on the “Load material” button on the Object properties panel, and pick the “Rock and grass”

material from the “Landscapes” collection. This, like most materials from the “Landscapes” collection, is a complex material. It is made up of two sub-materials (i.e. rock and grass) that are distributed depending on the environment. Grass gets distributed on horizontal surfaces, while rock is found more at higher altitudes. It’s dead easy to get Vue 2 to mix two materials: all you have to do is pick a material and ask Vue 2 to mix it with another one! We’ll come back to the mechanics of this later ([step 7](#))...

Clutter the pool with a couple of larger rocks (one on each side), and assign them a different material (we picked “Aggregated” from the “Rocks” collection). This completes the shaping out of the pool. See [Figure 1.6](#).

Step 2: adding a distant background

In order to give more depth to the picture, we will now add a far background of a very distant mountain range, lost in atmospheric haze.

Add three more terrains in the background. The first will be some sort of transition between the hills and rocks that constitute the whereabouts of the pool and the mountain range seen in the distance. Don’t be afraid to really make those mountains large (see [Figure 2.1](#))! Remember

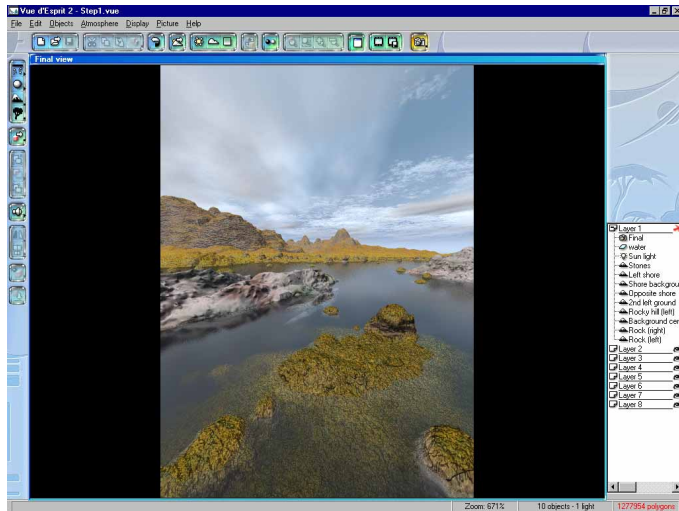


Figure 1.6: Final render of step 1.

the largest mountain is 10,000 times higher than the foreground stones... Resize them vertically and stretch them laterally to increase their size in the scene.

Since this is going to be a separate part of the picture, it might be an idea to take advantage of the possibility offered by Vue 2 to organize objects into different layers. Layers are a powerful way of organizing scenes. Using them, whole sections of the scene can be locked or hidden away. This is a godsend when designing scenes that are comprised of very large and very small elements together, which is the case here. If you fail to organize your scene in layers, you will be rapidly hindered by enormous objects that clutter your views as you try and work on smaller details, making progress extremely tedious.

Using the World browser (the list of objects on the bottom right of the screen), select the three terrains you just added, and drag them onto “Layer 2”. Now rename this layer to “Mountain range” (Figure 2.2). Click twice on the picture of the eye on the right of the first layer to hide it (click once more to restore it). All the objects in the foreground have disappeared from the wireframe views (hit Render if you want to make sure that they still exist when the picture is rendered). Now we can concentrate on the mountain range.

The three terrains we just created should have picked up the “Rock and Grass” material, since this was the last one used. We want to assign a different material for the mountain range in the background, to emphasize the sense of scale. Pick the “Desolate stripes” material from the “Rocks” collection and assign it to the two mountains. Whenever you have a material assigned to an object and would like to assign it to another one, just select the first object and drag its material onto the other object (you can drag it either on the object inside the wireframe previews, or inside the World browser). This is quicker than copy-pasting it. Also, you can select all the objects that use a given material by clicking that material once in the Summary of materials dialog. Open this dialog by clicking the Summary of materials icon.

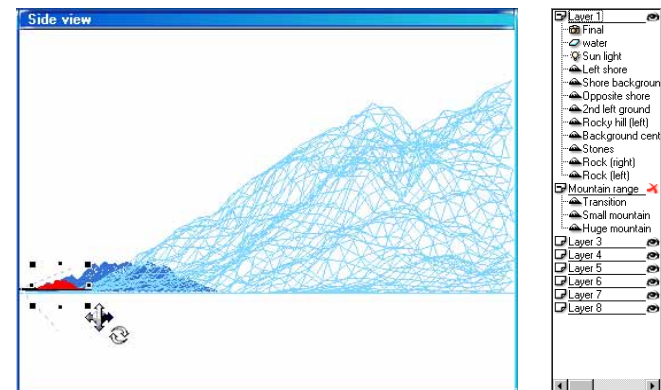


Figure 2.1: Scaling up the distant mountains (left).

Figure 2.2: Using layers inside the World browser (right).

Details at all scales

When you create pictures of natural scenery, it is extremely important to maintain details at all visible scales. It is a common error to apply materials on very large objects that look the same all over. While this is correct as a first approximation, things never quite look the same all over. You get subtle variations (in color schemes and patterns, surface roughness, etc.). If the large object is seen more or less at the same scale all over, all you need to do is resize the material. However, things get much trickier when the object is to be seen close-up on parts of the picture, and far away on others...

See [Figure 2.3](#). Since the mountain range is seen from a great distance, we have to enlarge the material so that it displays variations at the scale of the mountains. Set the scale of the material to 60 (using the object properties panel when the two mountains are selected).

You may have noticed that the farther mountain is less saturated. The reason for this is that since the mountain is very far in the distance, it is



Figure 2.3: the distant mountain range.

lost in fog and atmospheric haze. Fog and haze are two important aspects of Vue 2 atmospheres. They were predefined in the atmosphere preset we loaded at the beginning of this tutorial. We will come back to these in the section dealing specifically with the atmosphere (i.e. [step 5](#)).

One of the limitations of standard fog and haze is that they are more or less constant all over the scene. They cannot be used to generate realistic clouds. Another method has to be used. This is done by adding spheres with a material that efficiently fakes clouds. This kind of material is known as “fuzzy”, since it has no clearly defined edges.

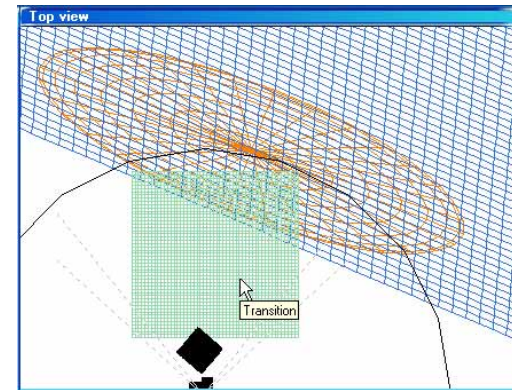


Figure 2.4: adding a cloud above the transition terrain.

We want to place a cloud in front of the mountain range, over the transition terrain... Create a sphere, and assign it the “Cloud sphere #6” material from the “Clouds” collection. Drag the cloud sphere above the transition terrain, and enlarge it so that it is at least as big as the terrain (Figure 2.4). Since fuzzy materials have no clearly defined edges they always look much smaller when they are rendered than what they looked like in the wireframe previews. This is why you should make the sphere really large. Having enlarged the sphere, we also have to increase the scale of the attached material. Turn it up to something around 30.

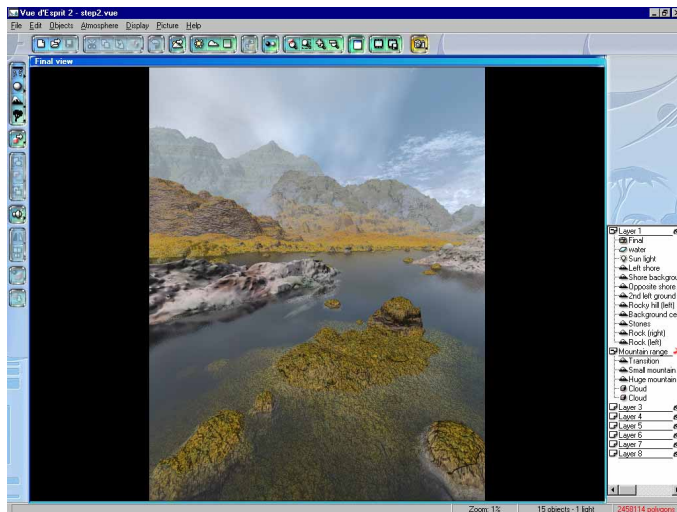


Figure 2.5: final render of step 2.

Fuzzy objects are difficult to adjust. The overall density of the cloud is linked to the depth of the object as seen from the camera. What this simply means is that you can vary the density of the cloud by stretching it or flattening it. This is what was done to reduce the density of our cloud. There are many other ways of customizing fuzzy materials; however, we won't detail them here.

Duplicate the cloud sphere and drag it in front of the small mountain. This will add a second cloud in between the transition terrain and the small mountain. Reduce its density by resizing the sphere along the Y axis.

This completes the distant background (see Figure 2.5). Since we have finished working on it, we can temporarily hide the corresponding layer. Click twice on the eye to the right of the Mountain range layer to hide it, and activate layer 1. The active layer is depicted by a red cross. Objects added to the scene are placed into it.

Step 3: adding vegetation

This is the step where we add vegetation. It may seem a complex step when you look at the picture, but, as you will see, Vue d'Esprit 2 makes the process incredibly easy!

Vue d'Esprit 2 vegetation were acclaimed by international press as being a major breakthrough in overall render quality. Indeed, the software comes with a surprisingly powerful and efficient set of algorithms called SolidGrowth. These algorithms generate a wide variety of vegetation species directly inside the program. With astounding quality! Plants are actually “grown” numerically inside your computer, which means that no two plants will ever be identical! Whenever you look for a particular shape of a plant from a given species, create several: you'll be sure to find one that matches your requirements. And just discard the others! It's so quick and easy...

Plants behave like other objects. They may be moved, resized, twisted, and rotated using the same set of tools. We'll take advantage of these features shortly! Currently, Vue d'Esprit 2 can grow over 14 different vegetation species (including coconut trees, cactus, ferns, tropical plants, and cultivated fruit



Figure 3.1: selecting long grass in the vegetation browser.

trees), with more being added all the time (downloadable from e-on software's website).

Since the scene we are creating takes place in a temperate area, we'll only use the following species: Plum trees, Bushes, Aucuba trees, Long grass and Dead trees.

The long grass species grows long blades of grass in clumps. Select it by long clicking on the Vegetation icon or by clicking with the right mouse button) and picking it from the vegetation browser (Figure 3.1). Grow a few long grass clumps in the foreground, close to the rocks

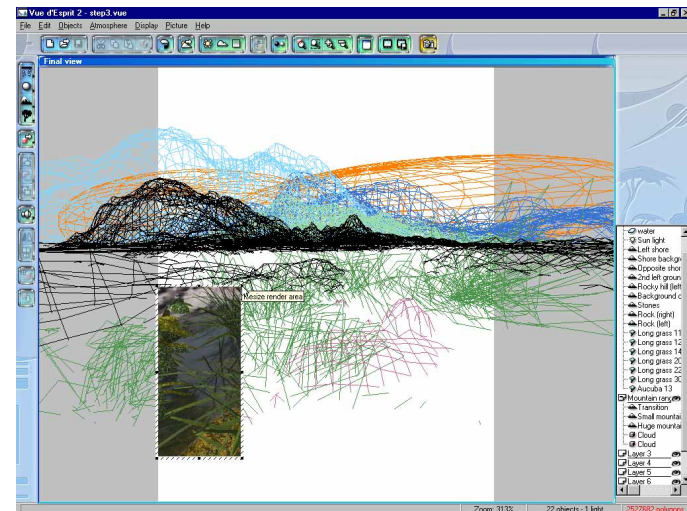


Figure 3.2: using a selected render area to control object positioning.

that jut out of the water. Use the global resize handles to adjust the size as necessary.

Framing out

When you create objects that are close to the edges of your picture, make sure that part of the object is outside the picture. If you fail to do so, your picture might lose realism. Framing part of some objects out gives the impression that the shot is taken at a real scene that doesn't just stop on the edges of the picture. It often helps to first create your scene with a camera that has a slightly wider field of view than that of the final camera. This ensures continuity on the edges of the final picture.

Now select the Aucuba vegetation species, and create an Aucuba tree. Drag it past the left side of the picture, so that only the edges of a few leaves show up on the side. Since it might take a few attempts to get the position right, and you only need to see what is happening in the bottom left corner, there is no point in rendering the whole picture. Select a render area by picking that option from the camera view pop-up menu, then draw the rectangle that you want to render (Figure 3.2). When you are done, just pick that option again, and click anywhere in the view to render the whole picture.

Select the Bush vegetation species, and add a couple of bushes on top of the left rock. Now switch to the Plum tree species and grow three plum trees in a line, on the right of the picture. Only a few leaves of the closest plum tree should be visible in the top right corner. This will create a dark mass that balances the picture pleasingly.

Finally, select the Dead tree species and create a small twig that will be placed on the bottom of the picture, with only its tip showing out of the water. Resize it using the global resize handles to make it really small. Once again, select a render area to visualize only the relevant part of the picture. When this is done, add another reduced dead tree in front of the left rock, placed vertically and sticking

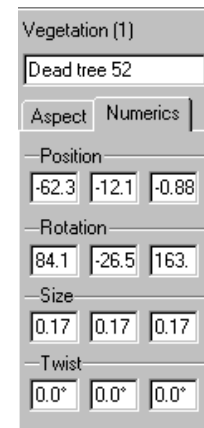


Figure 3.3: using a render blow-up of the dead tree (left).

Figure 3.4: the Numerics tab of the object properties panel (right).

out of the water. Add yet another one, resting on the central stone. Use the rotation handles to rotate the tree to the correct angle. Again, select a render area to control positioning, only this time you will probably need to enlarge it to get a sufficiently detailed view (this is called a “render blow-up”, see [Figure 3.3](#)): long click on the Render icon to display the Render options dialog and select Render to screen (with a resolution of at least 320 pixels wide.) Vue 2 renders a detailed view of the selected render area, letting you appreciate if the position of the Dead tree is correct. Use the Numerics tab of the object properties panel to move the dead tree precisely ([Figure 3.4](#), Z is the vertical axis).

Since the dead trees are seen really up close (and that they depict dead branches rather than dead trees...), we need to re-scale the material. We could do this by selecting each tree in turn, and modifying the scale using the Object properties panel. But Vue 2 provides a far more convenient way of doing so:

Summary of materials

The “Summary of materials” panel displays a list of all the materials used in the scene ([Figure 3.5](#)). It provides a fast and convenient way of editing materials. By clicking on one of the materials, you automatically select all objects that use that material. Thus, if you

edit a material using the Summary of materials panel, you are sure to modify all the objects using that material.

Using the summary of materials panel, scale down the dead tree material to 0.04.



Figure 3.5: the summary of the materials panel.

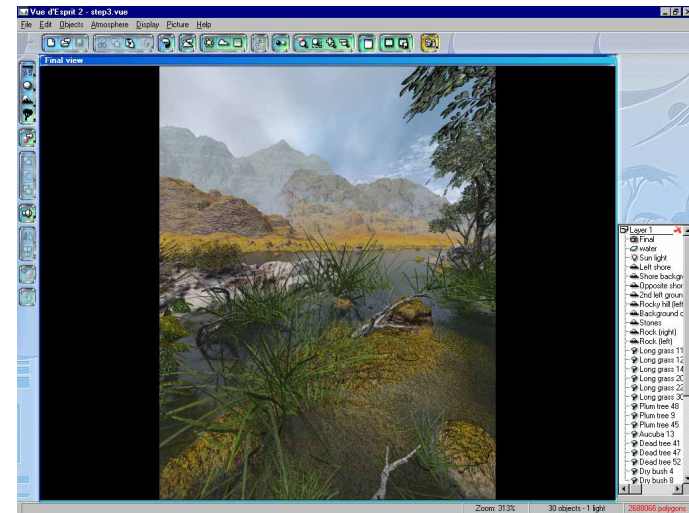


Figure 3.6: final render of step 3.

See [Figure 3.6](#). That's about it for the foreground. Collect all the vegetation we just added, plus the Stones and Rocks terrains and drag them into the third layer. Rename this as "Foreground" and hide it away. Now let's also add a bit of vegetation to the background.

Step 4: background vegetation

Homogeneous vegetation density

Adding vegetation to the background is important when creating realistic natural scenery. If your scene only has vegetation in the foreground, it won't be convincing. You have to give the impression that the density of vegetation is the same in the background as in the foreground.

Create a pair of plum trees and locate them in front of the "Rocky hill" terrain. Drag them down using the side view so that only the top of the trees are visible, thus making them look like thick scrub. Be sure to move part of the left-most tree out of the picture (use render blow-ups to control, as explained above; see [Figure 4.1](#)).

Create a set of bushes, and distribute them along the opposite shore of the pool. Since it is somewhat difficult to visualize where the bushes will be positioned, it would

be a good idea to take a shot from closer-up, and above. Thankfully, Vue 2 lets you create as many different cameras as you may need, and instantly reverts to previous settings.

Observing details

Whenever you need to observe details from a different angle than that of the final shot, use a dedicated camera: select the camera, and click on the Store camera settings button. This opens a dialog prompting you to enter the name under which you want to store the current camera settings. Since the camera is currently set for the final picture, let's call it "Final". Click OK and check that the drop-down list of cameras now includes a new camera called "Final". The currently selected camera is still "Main camera", but we can now move if freely, knowing that we can revert to the final camera settings any time.



Figure 4.1: render blow-up of plum tree "shrub".

Move the camera up close to the opposite shore, so that it looks down at the bushes (Figure 4.2). It will make positioning the bushes much easier.

Once they are placed satisfactorily, you'll have to make sure they rest precisely on the surface of the terrain. Select the bushes, and drag them up, way above the surface of the terrain. Then hit the Drop object icon to position the objects precisely on the surface. Check the result with a render blow-up from the "Final" camera, and when you're satisfied, hit the Group icon. Rename the group as "Distant bushes" and fold it up. This avoids having too many objects at the root of the list of objects. Organizing

objects into groups and subgroups makes searching for objects easier. And since Vue 2 lets you modify objects directly inside groups, you won't have to ungroup the objects to modify one of the members! Just click on the list, on the member object you want to modify. You can even add or remove objects from existing groups by simply dragging them into or out of the group! Besides, grouping objects that are close together also improves render times.

See Figure 4.3. In much the same way that you added vegetation to the opposite shore, add a few long grass clumps in the water, close to the shore. This is to make

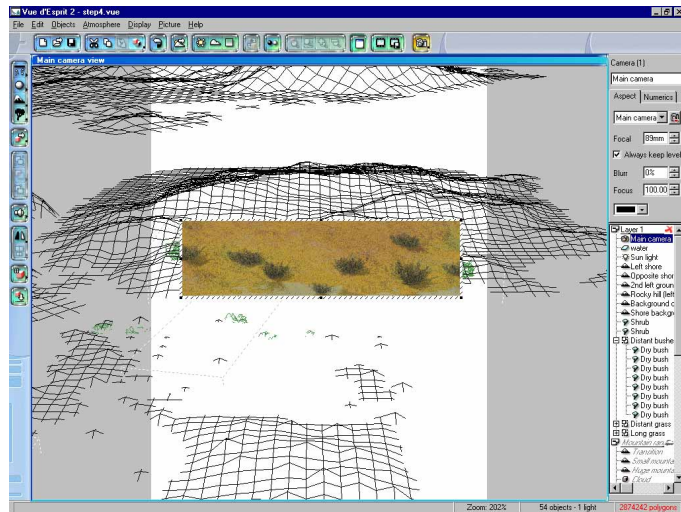


Figure 4.2: using a dedicated camera view to position the bushes.

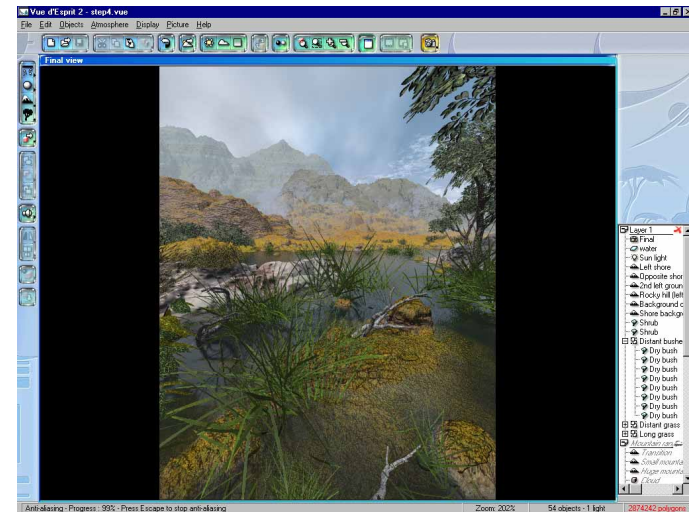


Figure 4.3: final render of step 4.

sure that long grass doesn't only appear close to the camera. Group them, and call the group "Distant grass" or something like that. Create another group of long grass clumps in the water, only this time closer to the foreground. Again, use a dedicated camera view and render blow-ups to control the result.

Step 5: tuning the atmosphere

The scenes you build inside Vue 2 are part of a world. A world with an atmosphere, with clouds, fog, haze and all... Real clouds, infinite ones, not just a backdrop picture of a sky. And this world is coherent. And best of all, you can act upon every aspect of it... and turn the gloomy atmosphere of our picture into a happy, warm and bucolic one.

Atmospheres are one of the most elaborate and complex features of Vue 2. Unfortunately, with no instant visual feedback, they are also one of the most difficult to adjust. To get around this difficulty, use a selected render area of your sky, and regularly hit the Render icon to visualize any modifications. The proc-

ess of adjusting an atmosphere is mostly iterative; thankfully, rendering skies is fast enough... And you don't have to master all the parameters that make up an atmosphere to achieve spectacular results!

First we want the sunlight to lick the scene from the left. Select the sun in the top view, and drag it to the left of the camera, slightly ahead of it. By default, directional lights (such as the sun light) are designed to always aim at the camera (although this feature can be disabled by deselecting the "Always point at camera" option). So if



Figure 5.1: modifying sunlight to reduce gloominess.



Figure 5.2: modified haze and fog.

you place the sun to the left of the camera, sunlight will come from that direction. Now switch to the front view, and drag the camera down until the light points at the scene at an angle of approximately 30° .

Next we want to make the light stronger with warm morning overtones. Click on the Sun and Light editor icon, and double-click on the Light color swatch. Select a bright yellow color. This will be the color of light coming from the sun. Select a bright blue color for the ambient light: ambient light mostly comes from the sky, so when the sky is clear, ambient light is blue. Now push the global exposure slider up slightly to make the scene just a bit brighter, and give a little more importance to sun light (relative to ambient light) using the light balance slider. Notice how the scene has already lost most of its gloominess (Figure 5.1)...

Warm air means a lot of blue haze. Open the Fog and Haze editor, and select the Haze tab. Pick a dark gray-blue color for the haze. Haze acts as an atmospheric filter that reduces contrast on distant objects. Keeping it dark ensures that the distant mountains won't look too bright relative to the rather dark foreground. Bring the Haze density slider up to something around 50. Nice weather also means little or no fog. Well, in fact, there is always some amount of fog on earth... Bring the fog

density slider down to something around 50, and pick a dark gray color (once again, to contribute to a darker mountain range). Notice how the mountain range now vanishes into the distance (Figure 5.2).

Last (but not least), we have to concentrate on the sky dome itself. Open up the Sky and clouds editor, and double-click on the sky color map. Pick the "Warm horizon" color map from the "Skies" collection. This will change the overall colors in the sky. Now we have to edit the color map to make it less saturated. Control click on the color map (or pick "Edit color map" from the pop-up menu; see Figure 5.3). Double-click on the right-most key color (depicted as a small triangle under the colored strip) and select a deep blue color. Now double-click on the left-most key color and desaturate the yellow color. Click OK to close the color map editor. Adjust as necessary the position of the color map on the sky dome using the position and distortion sliders, until you get a bit of yellow showing against the blue of the sky.

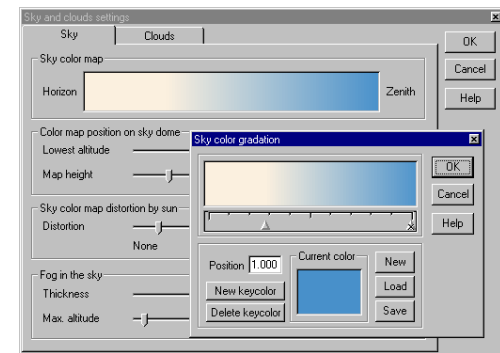


Figure 5.3: sky color map editor.

Next, switch to the Clouds tab. Vue 2 can handle multiple layers of clouds. Since we want a clear sky here, we will get rid of most of the clouds. There are currently 3 layers of clouds in our atmosphere. Delete the first (i.e. the lowest) by clicking on the Delete button. Now move to the last cloud layer by pressing Next layer, and delete it too.

Reduce the density of the clouds close to the horizon using the Thickness near horizon slider. Take it down to approximately 30%. This will ensure that the clouds dissolve as they get close to the horizon. Also reduce cloud illumination boost to a global value of 25%, and a peak value of 40%. This controls how clouds are illuminated depending on their position relative to the sun. Very interesting effects can be achieved using these controls, especially when dealing with sunsets. Make the clouds a little brighter by pushing the Global exposure slider up slightly. That's all!

See [Figure 5.4](#). We made a lot of in depth modifications to the predefined atmosphere; thankfully, it isn't always necessary to make so many. Please also note that clouds are standard materials, and, as such, can be fully customized. In fact, any material could be used for clouds (try loading "Psyche lights" for a strange effect...). Now the scene is almost settled, we can bring in our main subject.

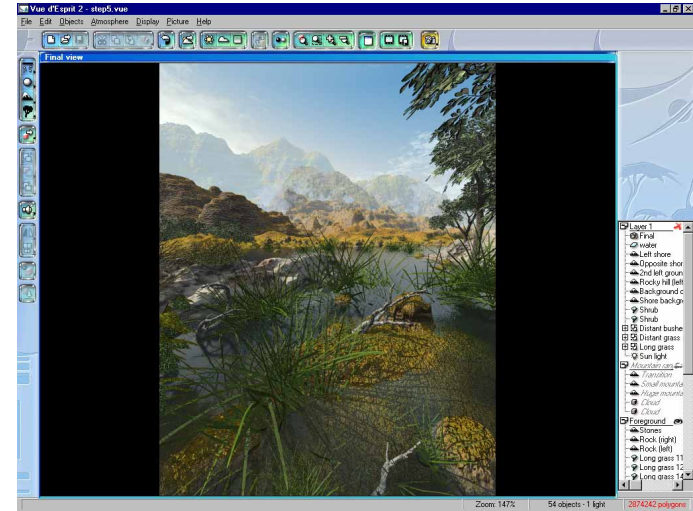


Figure 5.4: final render of step 5.

Step 6: importing the subject

Our subject is a dead branch, at one end of which rests a butterfly. At the other end, a frog is getting ready to pounce on it. We want the frog and the butterfly to be small enough to give the impression that they are “discovered” by the person looking at the picture. The frog should be hiding more or less in the long grasses in the foreground.

Activate Layer 4 (by selecting it in the list of objects), and rename it “Subject”. As in step 3, create a dead tree and scale it down so that it fits neatly in the foreground. Dip

one end of the dead branch in the water, and rest the other on the stone terrain arising from the water. Use a selected render area for precise positioning.

The butterfly and the frog were created in LightWave, but any 3D application supporting DXF export could have been used. Select the Import object option from the Objects menu (or click on the Load object icon and press File in the browser). Pick the butterfly DXF file. Repeat for the frog DXF file. Vue 2 can also export terrains using DXF file format, together with the corresponding material maps for use in other 3D apps!

Select both the frog and the butterfly, and resize them to an acceptable size. Then drag each of them over one end of the dead branch using the top view. Now press the Drop icon to drop the two objects at the surface of the dead tree. Unfortunately, dropping objects only takes into account the center of the object, not, for instance, the legs of the frog. So dropping only positions the objects approximately. When precise positioning is required (such as here), you have to place them by hand. Assign the “Red plastic” material from the “Basic materials” collection to both objects. This is to allow easy identification of the objects while positioning them. Now make a render blow-up of the butterfly to see how it should be positioned. Use the Numerics tab of the object properties panel for precise positioning.

Reducing render times

Since this is going to be an iterative process, you need to cut render times to a minimum. A good way of doing so is to ask Vue 2 to only render what is useful. Select “Hide all but this layer” from the pop-up menu of the World browser to hide everything except the subject, then select “Render only visible layers” from the Render options dialog. The subject will be rendered alone, but much faster (Figure 6.1).

Once the butterfly is positioned, repeat the above operations for the frog. Now we want to assign convincing materials to the butterfly and to the frog.

Vue 2 DXF import preserves the layers of imported objects (if applicable). Since the butterfly was made out of five layers, we can assign a different material to the wings and to the body. We’ll build a custom material for the wings. We’d like them to be red and yellow with some sort of tiling.

Select the two wings, then double-click the material in the object properties

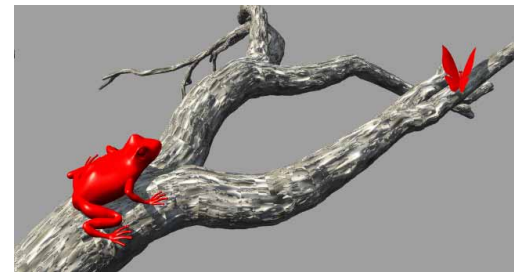


Figure 6.1: fast render blow-up for frog positioning.

panel. This opens the material editor. Go to the “Colors” tab, edit the color map and create a red to yellow gradation (using the same method as that described for the sky color map). This color map will be used to color the wings. Now double-click on the function preview (the picture of a sphere) and select “Crystals” from the “Basic functions” collection. This defines the color pattern. Rename the material to “Butterfly wings”. Since the butterfly is extremely small, you will need to make the crystals smaller, using the scale box. That settles the wings of the butterfly. Select the other parts of the butterfly, and assign them a colorful material (such as “Enameled pottery” from the “Basic material” collection).

See [Figure 6.2](#). Now we will cater for the frog. Select the eyes of the frog, and assign them the “Black porcelain” material from the “Basic material” collection. Make the eyes look wet by turning up the highlight: double-click the black porcelain to open the material editor, go to the Highlights tab and reduce shininess to something around 60% (this will make the highlights bigger).

For the frogs body, we would like a material that ranges from yellow on the frogs hind section to green on its head. Open

the material editor for the frogs body and go to the Colors tab. Create a color map with bright and dark shades of green (such as that found in the “Foliage” color map from the “Rock and grass” collection). Now double-click on the function preview, and load “Fractal” from the “Basic functions” collection. Switch to the Bumps tab of the editor, and load the same function. Reduce the amplitude of the bumps to make it look like irregular skin. Finally, increase the size of the highlight to make it look wet.

Now add the yellow: check the “Mix materials” option. The green skin material we have just created will be mixed with another one (black for the moment). Choose to blend only lighting and color in order to retain all other aspects of the green skin (such as bumps and highlights). Conse-

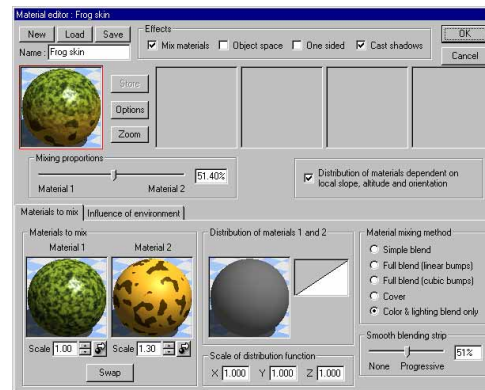


Figure 6.2: mixing the frog's skin.



Figure 6.3: test render of the frog.

quently, we only need to redefine the colors of the black material.

Open the editor for that material, create a brown to yellow color map and load “Noise (smooth)” from the “Basic functions” collection. This creates soft brown spots. We want the spot edges to be hard, so double-click on the filter and load the “Step 40%” filter from the “Saturation” collection.

Now we have to instruct Vue 2 on the way to mix the two materials. Check the “Distribution of materials dependent on slope, altitude and orientation” box. This will make

the yellow material appear at low altitudes and on horizontal surfaces. To make the transition progressive, push the Smooth blending strip slider up to 50%, and use the mixing proportions slider to adjust the amount of yellow skin visible on the frog. Use a render blow-up to control the aspect of the frog (Figure 6.3). How’s that for a quick alternative to tedious bitmapping? (Note that bitmapping can also be done in Vue 2...).

See Figure 6.4. The subject is now looking fine. The picture is almost finished. All we need to do now is fine tune materials and lights.

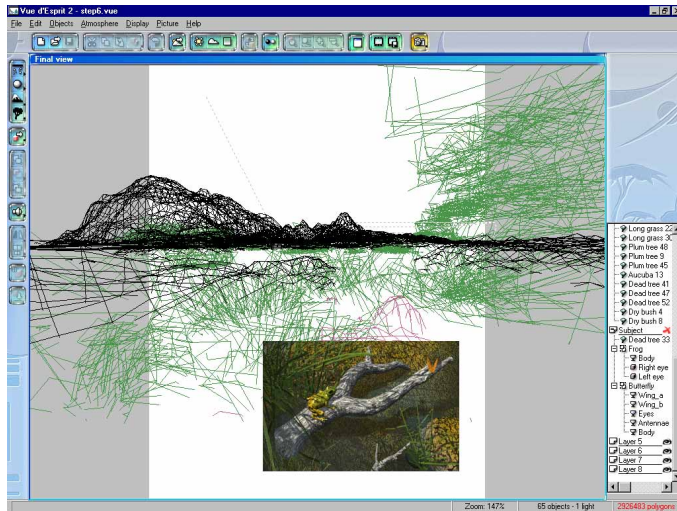


Figure 6.4: final render of step 6.

Step 7: tuning materials and lights

This is the shortest step to describe (once you’ve decided what material should be used for such an object, and how it should be lit up. Getting there does take some time, though!).

Materials

Let’s make the water more convincing: we want it to be somewhat more green. The first thing to do is to change the color of light as it enters the water. Open the material editor by double-clicking on the preview of the water

material. Change its color by creating a pale green solid color map. Now switch to the Effects tab, and check the Color transmitted light box. You can test render one of the branches to check that parts under the water take up the green color.

Now switch to the Transparency tab, and enter shades of green for Fade out color (dark shade) and Light color (brighter shade). The fade out color is the color that the water will look when it is very deep. Light color acts as another filter that colors light as it travels deeper inside the water.

Finally, we would like the reflections on the surface of the water to be less blurred: turn to the Reflections tab, and push up reflections slightly (to activate the blurring slider), reduce blurring to 2° , and reset reflections to zero (reflections automatically appear at the surface of the water when it is seen in the distance, even though the value is 0. Increasing that value would result in the water being reflective whatever the angle of incidence). That settles the water (Figure 7.1).

Next we will improve the rock and grass material. We want to replace the rock by that found in the “Scrubland” material (with a rougher surface). Use the summary of materials to open the rock and grass material (so that

you are sure you won’t forget to modify one of the objects using it). Click on the Load material button and load “Scrubland” from the “Landscapes” collection. Unfortunately, “Scrubland” is itself a material that mixes the rocks we covet with grass...

Materials produced by Vue 2 have the potential to become extremely complex. You can easily mix materials together that are themselves mixed materials. And this can go on and on... You end up with a multi-layered hierarchy of materials producing unbelievably realistic materials!

Double-click on the preview to open the editor for Scrubland, and un-check the Mix materials box. Vue 2 will stop mixing the rocks with grass. Close the Scrubland editor. Back to the Rock and grass editor, we now want to improve the way rock and grass mix. Up to now, grass appeared on horizontal surfaces, at low



Figure 7.1: test render of a branch dipped in water.

altitudes. We want to make the mixing process a little more realistic by creating clumps of grass. For this, we will need to throw in a distribution function (Figure 7.2). The distribution function will favor either the rocks or the grass, thus creating clumps. Double-click the function preview, and select “Paths in the sand” from the “Layers and lines” collection (since this function features winding lines, winding lines will appear in the grass, like paths left by animals). This settles our rock and grass material. Just close the editor and increase its scale up to 2.

Having identical materials in the foreground and in the background is not good: the range of scales at which the material will be seen is too important for the material to look realistic everywhere. Let’s simply make the scale smaller in the foreground: select the Stones terrain, and reduce the scale of the rock and grass material to 0.1 using the object properties panel.

Now let’s improve the material used on

the rocks in the pool. Open the editor for that material using the Summary of materials panel. We’ll add clumps of moss in places. Check the mix materials box, and load the “Grass” material from the “Landscapes” collection. As for the rock and grass material, use a distribution function to create clumps (load “Soft spots” from the “Spots and clumps” collection). Use the mixing proportions to adjust the amount of moss on the rocks. Close the editor and reduce material scale to 0.1.

The last material we need to work on is that of the distant mountain range in the far background. We want it more brown, with snow showing at high altitudes. Open the editor using the Summary of materials panel. Double-click on the color map and load “Stone” from the “Rocks and grass” collection. Check the Mix materials

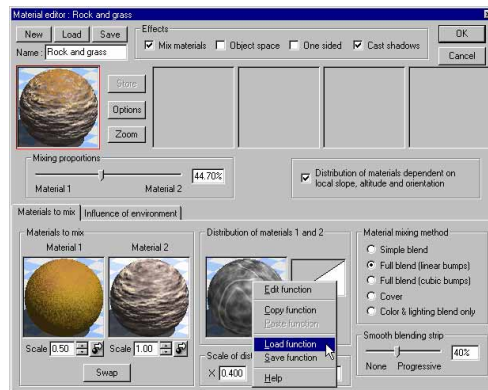


Figure 7.2: adding a distribution function.



Figure 7.3: render blow-up of mountain range with snow.

option and mix it with “Snow” from the “Landscapes” collection, and check the “Distribution of materials dependent on slope, altitude and orientation” box. This will make snow appear at high altitudes and on horizontal surfaces. Use the Mixing proportions slider and the Smooth blending strip sliders to adjust the amount of snow on the top of the mountain range (use a selected render area to control, see [Figure 7.3](#)).

That’s it for materials. Now we add the final touch to the picture by improving lighting conditions.

Lights

Although natural scenery is illuminated by a single light source (i.e. the sun), it is usually necessary to add secondary lights when recreating it. The reason for this is two-fold: first, using secondary lights, you can improve the color and brightness of certain parts of the scene, and second, it is a good way to fake radiosity.

As you will probably have noticed, the subject of our scene could do with a little more light (to attract the eye to it, and to balance it better with the bright background).

Adjusting a spotlight

Add a spotlight, placed behind the camera, and aiming at our subject. Make sure it is powerful enough so that you can clearly see what it is lighting ([Figure 7.4](#)). Adjust the spread and falloff as required, then reduce the power of the light until it is adding just a tad of light to the scene.

Repeat this process to add a bit of light to the rock on the left of the pool, and to the Rocky hill. Add color variations in the plum trees to the right by using a green colored light (double-click on the light color control in the Object properties panel to adjust the color of the light).

To complete the picture, turn on soft shadows for the sunlight: use the Softness control of the object properties panel and raise it to approximately 5°. This will soften the shadows cast by sunlight, turning the hard edges

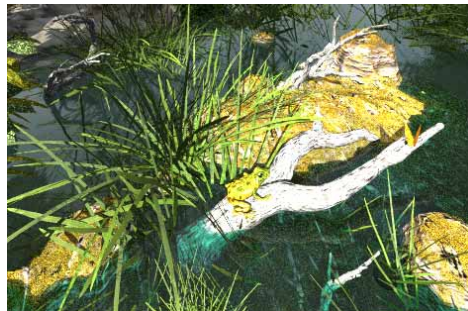


Figure 7.4: test render with spotlight at full power.



Figure 7.5: render blow-up of soft shadows.

of standard shadows into a soft and realistic transition from light to shadow (Figure 7.5).

Never turn soft shadows on for secondary lights though: such lights are much more demanding in terms of computation, and the improvement won't be noticeable anyway. The combination of soft shadows and blurred reflections in the water guarantees an extremely realistic rendering of the pool...

The picture is finished! Congratulations! In this tutorial, we discovered the basics of composing pictures using Vue d'Esprit 2. We saw how easy it is to create realistic scenery, cleverly placing terrains and vegetation, and then importing objects from other 3D applications. We also saw how spectacular results can be achieved using Vue d'Esprit 2's powerful procedural material generator. Obviously, there's a lot more to be learned... but hopefully we've managed to give you the desire to create your own natural scenery using this exciting tool.



Please select an atmosphere for your scene



Selected atmosphere



Wispy Winter

Gray sky with many small white wispy clouds.
The sun shines weakly from the back left
(middle afternoon).

d:_daytime\08_Wispy Winter.atm

OK

Cancel

Help

Available collections

Daytime

Sunrise / Sunset

Other atmospheres

User atmospheres



New

Del

File

Infinite plane (1)

Water

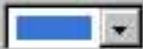
Aspect

Numerics

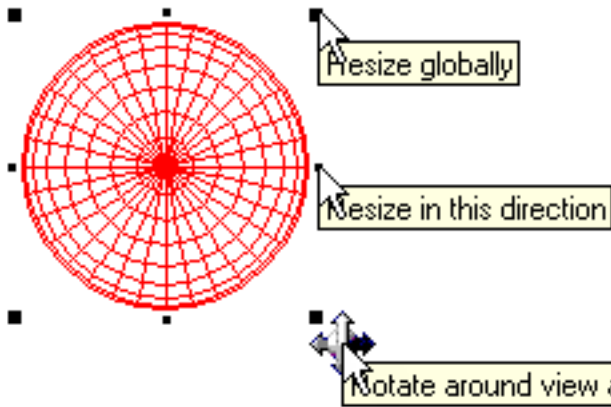


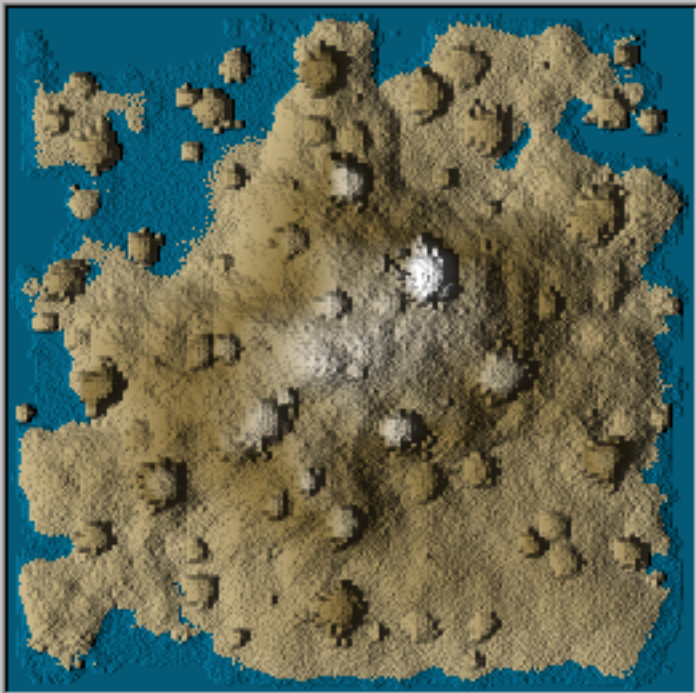
Scale

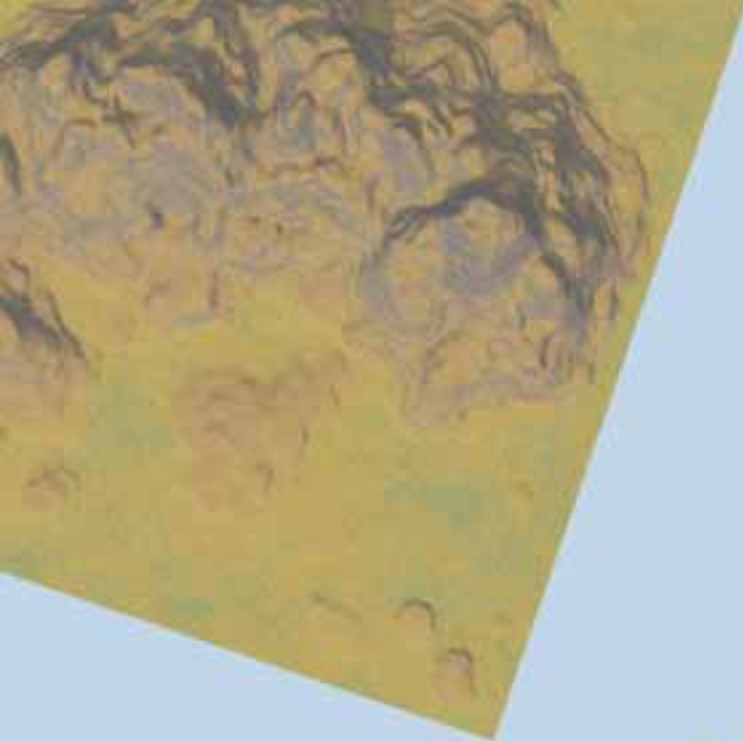
1.00



Box





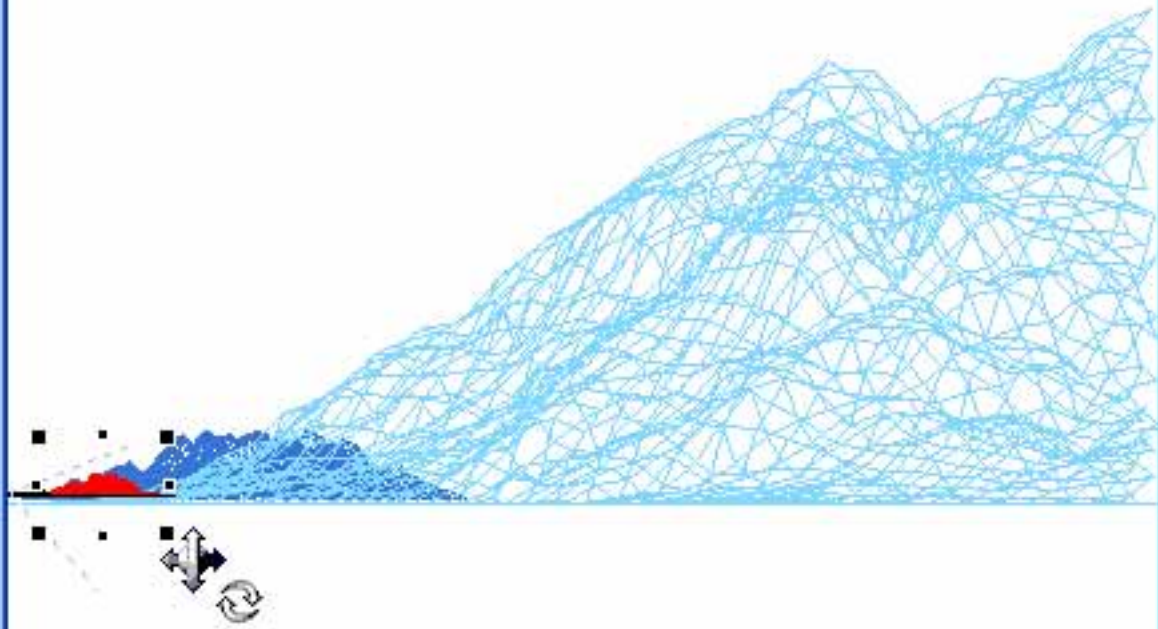




Final view



- ☒ Layer 1 ✖
 - ☒ Final
 - ☒ water
 - ☒ Sun light
 - ☒ Stones
 - ☒ Left shore
 - ☒ Shore background
 - ☒ Opposite shore
 - ☒ 2nd left ground
 - ☒ Rocky hill (left)
 - ☒ Background cent
 - ☒ Rock (right)
 - ☒ Rock (left)
- ☒ Layer 2 👁
- ☒ Layer 3 👁
- ☒ Layer 4 👁
- ☒ Layer 5 👁
- ☒ Layer 6 👁
- ☒ Layer 7 👁
- ☒ Layer 8 👁



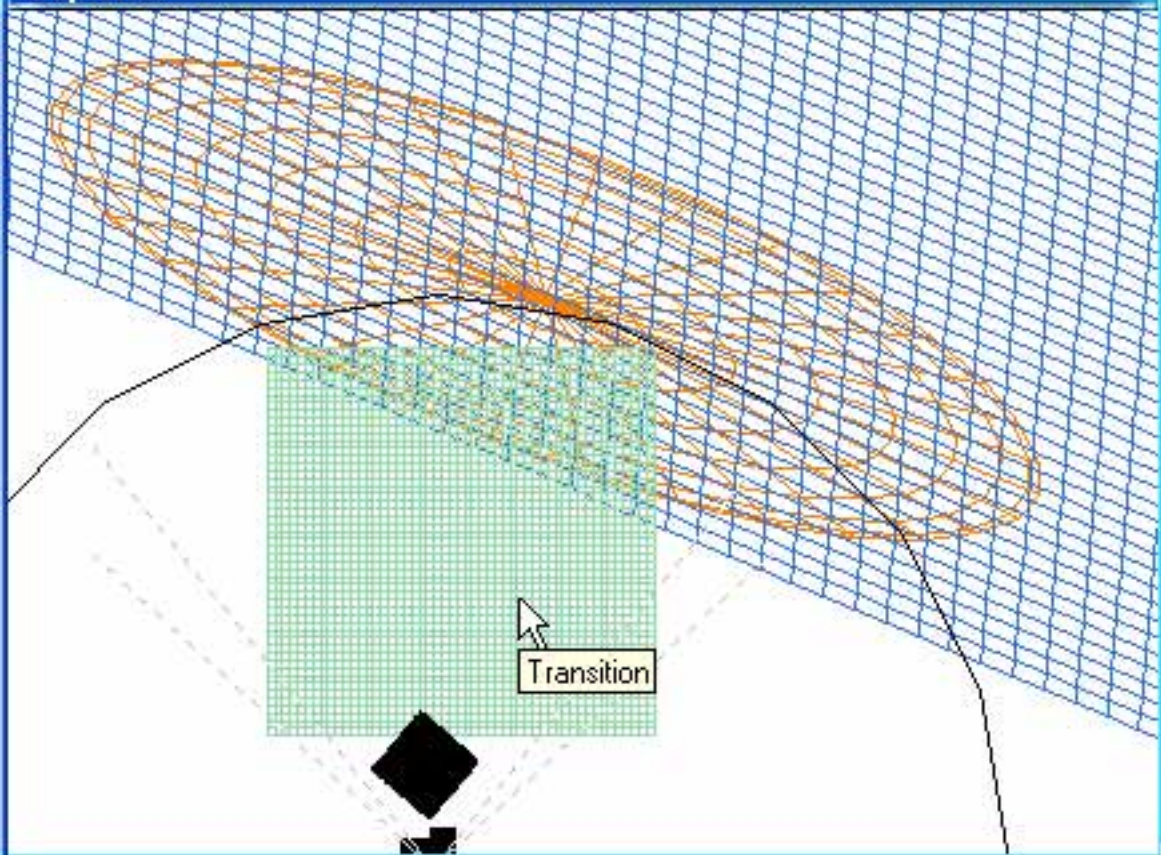
-  Layer 1 
 -  Final
 -  water
 -  Sun light
 -  Left shore
 -  Shore background
 -  Opposite shore
 -  2nd left ground
 -  Rocky hill (left)
 -  Background cent
 -  Stones
 -  Rock (right)
 -  Rock (left)

-  Mountain range 
 -  Transition
 -  Small mountain
 -  Huge mountain

-  Layer 3 
-  Layer 4 
-  Layer 5 
-  Layer 6 
-  Layer 7 
-  Layer 8 



Top view





Final view



- ☒ Layer 1
 - ☒ Final
 - ☒ water
 - ☒ Sun light
 - ☒ Left shore
 - ☒ Shore background
 - ☒ Opposite shore
 - ☒ 2nd left ground
 - ☒ Rocky hill (left)
 - ☒ Background cent
 - ☒ Stones
 - ☒ Rock (right)
 - ☒ Rock (left)
- ☒ Mountain range
 - ☒ Transition
 - ☒ Small mountain
 - ☒ Huge mountain
 - ☒ Cloud
 - ☒ Cloud
- ☐ Layer 3
- ☐ Layer 4
- ☐ Layer 5
- ☐ Layer 6
- ☐ Layer 7
- ☐ Layer 8

Selected vegetation



Long grass

Soft plant that grows in clumps in very humid soils; it is often found close to rivers.

Parts of the grass that are above the ground die every year.

Approximately 8000 polygons per clump of grass.

at \vue2\plants\000LongGrass.vap

OK

Cancel

Help

Available collections

Plants



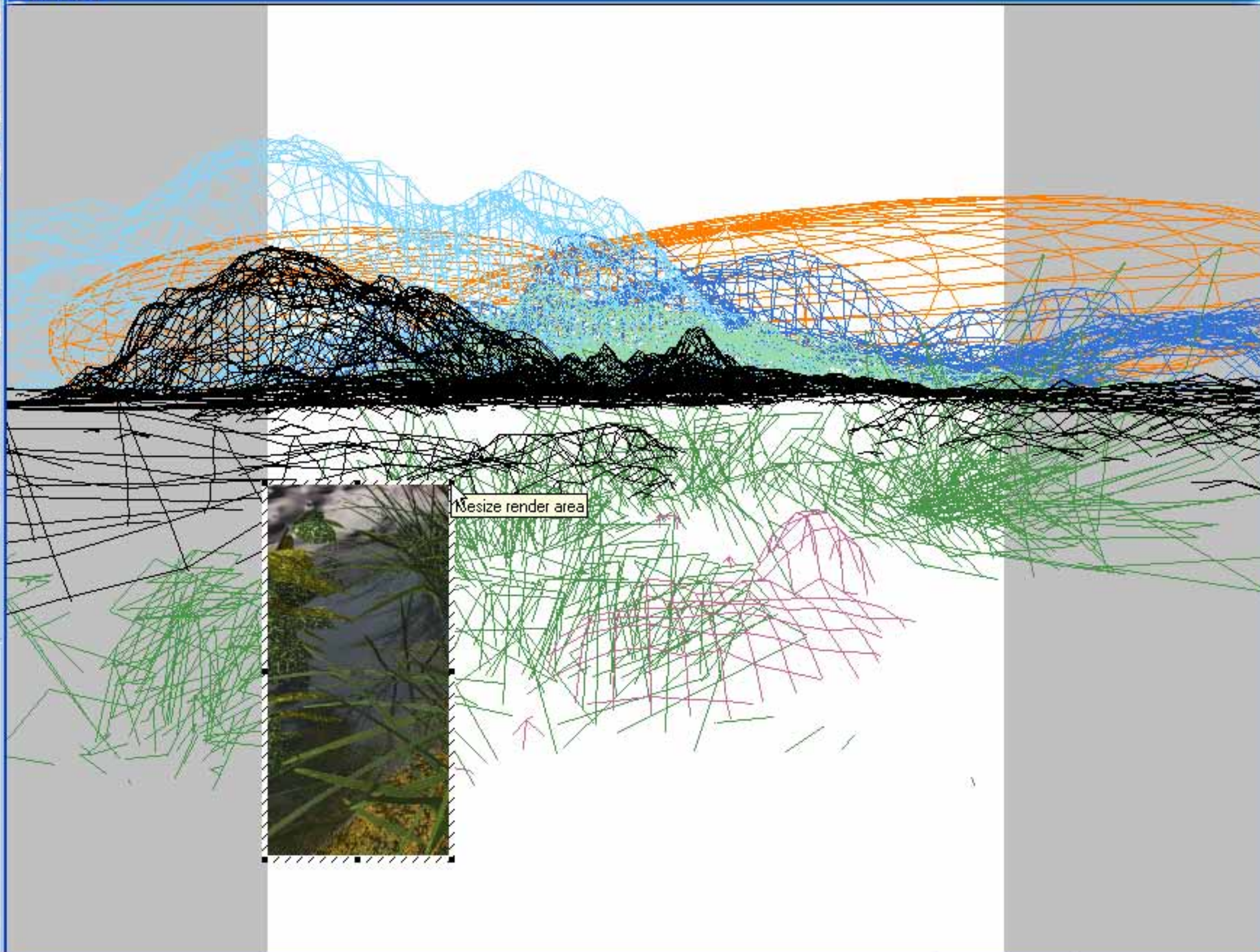
New

Del

File



Final view



Resize render area

- ☐ water
- ☐ Sun light
- ☐ Left shore
- ☐ Shore backgr
- ☐ Opposite shor
- ☐ 2nd left groun
- ☐ Rocky hill (left
- ☐ Background c
- ☐ Stones
- ☐ Rock (right)
- ☐ Rock (left)
- ☐ Long grass 11
- ☐ Long grass 12
- ☐ Long grass 14
- ☐ Long grass 20
- ☐ Long grass 22
- ☐ Long grass 30
- ☐ Aucuba 13
- ☒ Mountain range
 - ☐ Transition
 - ☐ Small mountai
 - ☐ Huge mountai
 - ☐ Cloud
 - ☐ Cloud
- ☐ Layer 3
- ☐ Layer 4
- ☐ Layer 5
- ☐ Layer 6



Vegetation (1)

Dead tree 52

Aspect

Numerics

—Position—

-62.3

-12.1

-0.88

—Rotation—

84.1

-26.5

163.

—Size—

0.17

0.17

0.17

—Twist—

0.0°

0.0°

0.0°

Summary of materials : 14 materials used in this landscape

Rock and grass



Scale 1.00

Shasta water



Scale 1.00

Aggregated



Scale 0.58

Cloud sphere #6

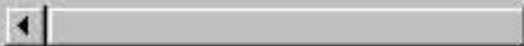


Scale 32.00

Desolate stripes



Scale 60.00





Final view

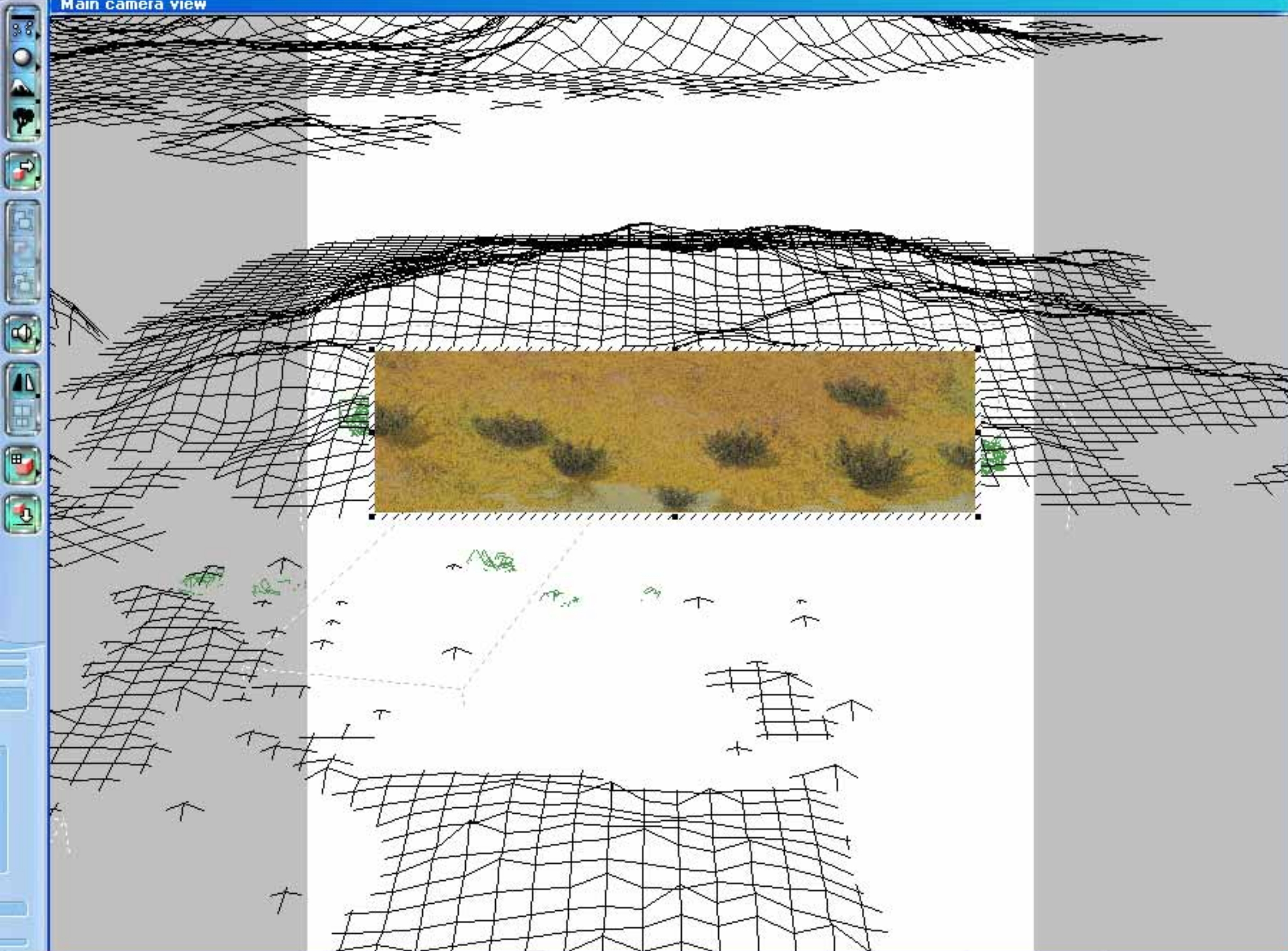


- Layer 1
- Final
 - water
 - Sun light
 - Left shore
 - Shore backgr
 - Opposite shor
 - 2nd left groun
 - Rocky hill (left
 - Background c
 - Stones
 - Rock (right)
 - Rock (left)
 - Long grass 11
 - Long grass 12
 - Long grass 14
 - Long grass 20
 - Long grass 22
 - Long grass 30
 - Plum tree 48
 - Plum tree 9
 - Plum tree 45
 - Aucuba 13
 - Dead tree 41
 - Dead tree 47
 - Dead tree 52
 - Dry bush 4
 - Dry bush 8





Main camera view



Camera (1)

Main camera

Aspect Numerics

Main camera

Focal 89mm

☒ Always keep level

Blur 0%

Focus 100.00

Layer 1

Main camera

water

Sun light

Left shore

Opposite shore

2nd left ground

Rocky hill (left)

Background cloud

Shore background

Shrub

Shrub

Distant bushes

Dry bush

Dry bush

Dry bush

Dry bush

Dry bush

Dry bush

Dry bush

Dry bush

Distant grass

Long grass

Mountain range

Transition

Small mountain

Huge mountains

Cloud



Final view



Layer 1

- Final
- water
- Sun light
- Left shore
- Opposite shore
- 2nd left ground
- Rocky hill (left)
- Background clouds
- Shore background
- Shrub
- Shrub
- Distant bushes
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
 - Dry bush
- Distant grass
- Long grass
- Mountain range
 - Transition
 - Small mountains
 - Huge mountains
 - Cloud





Sky and clouds settings

Sky

Clouds

Sky color map

Horizon

Zenith

OK

Cancel

Help

Color map position on sky dome

Lowest altitude

Map height

Sky color map distortion by sun

Distortion

None

Fog in the sky

Thickness

Max. altitude

Sky color gradation



OK

Cancel

Help

Position 1.000

Current color

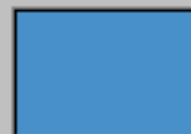
New

New keycolor

Load

Delete keycolor

Save





Final view



- Layer 1
 - Final
 - water
 - Left shore
 - Opposite shore
 - 2nd left ground
 - Rocky hill (left)
 - Background clouds
 - Shore background
 - Shrub
 - Shrub
 - Distant bushes
 - Distant grass
 - Long grass
 - Sun light
- Mountain range
 - Transition
 - Small mountains
 - Huge mountains
 - Cloud
 - Cloud
- Foreground
 - Stones
 - Rock (right)
 - Rock (left)
 - Long grass 11
 - Long grass 12
 - Long grass 14



Material editor : Frog skin

New Load Save

Effects

☒ Mix materials ☐ Object space ☐ One sided ☒ Cast shadows

OK

Cancel

Name : Frog skin



Store

Options

Zoom

Mixing proportions

Material 1 Material 2 51.40%

☒ Distribution of materials dependent on local slope, altitude and orientation

Materials to mix | Influence of environment

Materials to mix

Material 1

Material 2



Scale 1.00



Scale 1.30



Swap

Distribution of materials 1 and 2



Scale of distribution function

X

1.000

Y

1.000

Z

1.000

Material mixing method

- ☐ Simple blend
- ☐ Full blend (linear bumps)
- ☐ Full blend (cubic bumps)
- ☐ Cover
- ☒ Color & lighting blend only

Smooth blending strip

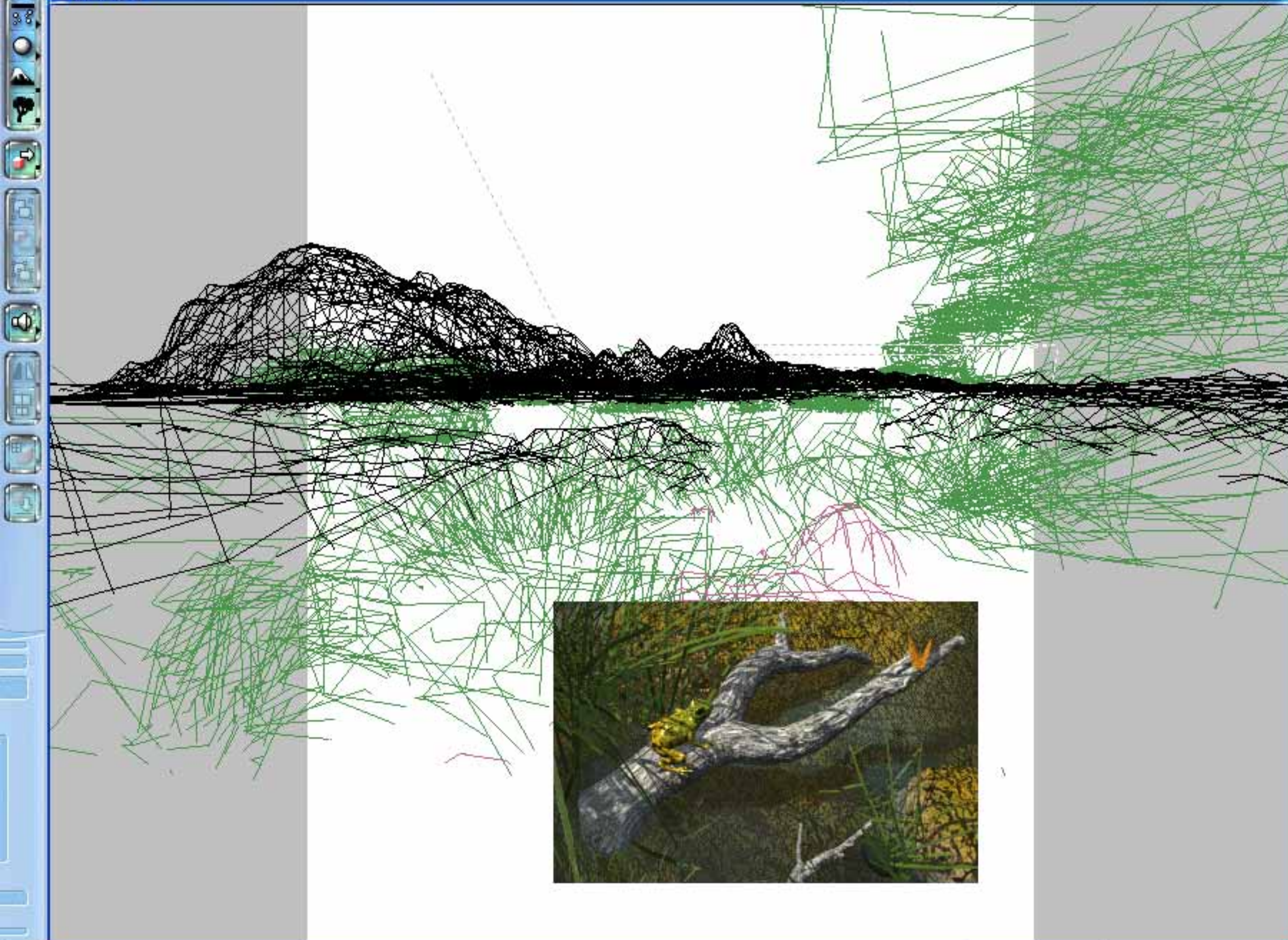
51%

None Progressive





Final view



- Long grass 22
- Long grass 30
- Plum tree 48
- Plum tree 9
- Plum tree 45
- Aucuba 13
- Dead tree 41
- Dead tree 47
- Dead tree 52
- Dry bush 4
- Dry bush 8
- Subject
- Dead tree 33
- Frog
 - Body
 - Right eye
 - Left eye
- Butterfly
 - Wing_a
 - Wing_b
 - Eyes
 - Antennae
 - Body
- Layer 5
- Layer 6
- Layer 7
- Layer 8



Material editor : Rock and grass

New Load Save

Effects

☒ Mix materials ☐ Object space ☐ One sided ☒ Cast shadows

OK

Cancel

Name : Rock and grass



Store

Options

Zoom

Mixing proportions



Material 1

Material 2

44.70%

☒ Distribution of materials dependent on local slope, altitude and orientation

Materials to mix

Influence of environment

Materials to mix

Material 1

Material 2



Scale 0.50



Scale 1.00



Swap

Distribution of materials 1 and 2



Edit function

Copy function

Paste function

Load function

Save function

Help

Scale of dist

X 0.400

Material mixing method

- ☐ Simple blend
- ☒ Full blend (linear bumps)
- ☐ Full blend (cubic bumps)
- ☐ Cover
- ☐ Color & lighting blend only

Smooth blending strip



40%

None

Progressive





