DIGITAL MAYHEM

3D LANDSCAPE TECHNIQUES

WHERE INSPIRATION, TECHNIQUES, AND DIGITAL ART MEET

EDITED BY DUNCAN EVANS

DIGITAL MAYHEM: 3D LANDSCAPE TECHNIQUES

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The secrets to creating stunning landscapes are at your fingertips with Digital Mayhem 3D Landscape Techniques. Compiled by Duncan Evans, launch Editor of *3D Artist* magazine, *Digital Mayhem* features a variety of beautiful art from some of the finest digital artists working today.

Inspiration and technique meet here as you learn how to create every type of landscape from harsh desert savannahs to icy tundra. Using a blend of showcase images, step-by-step and long-form tutorials, you will be guided through the featured artist's process so you can incorporate their techniques and workflow into your own projects. Not just another button-pushing manual or coffee table book, *Digital Mayhem* will help develop your critical eye for composition, choice of camera lens, lighting, rendering and post production, allowing you to work more intuitively. With insight from some of the best digital artists in the world, *Digital Mayhem* will have you creating your own masterpiece in no time!

- Unique coverage of a variety of software allows you to hone your skills across different platforms.
- Illustrious and colourful artwork coupled with artist insight will both inspire and inform your creative decisions.
- Comprehensive companion website offers additional resources for you to further expand your skillset.

Duncan Evans is a journalist, author and photographer with a passion for 3D. He is the founder and former editor of *3D Artist* magazine, a leading UK magazine dedicated to the art of 3D and the talented people who make it, from enthusiasts to Hollywood studios. In addition to his work at *3D Artist*, Duncan has had a varied career as the Editor of *The Official PaintShop Pro* and *Digital Photo User* magazines, as well as being the author of over a dozen how-to-do books and developing short-form and digital content for the digital art community.

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DEDICATED TO JOAN HUNTER, EVEN THOUGH SHE ISN'T HERE TO READ THIS, FOR THE ENCOURAGEMENT, ALL THOSE YEARS AGO.

RENDER CAMERA LENSES

MOUNTAIN SCENES TUTORIAL

RIVERS AND LAKES SHOWCASE: DOMINIC DAVISON

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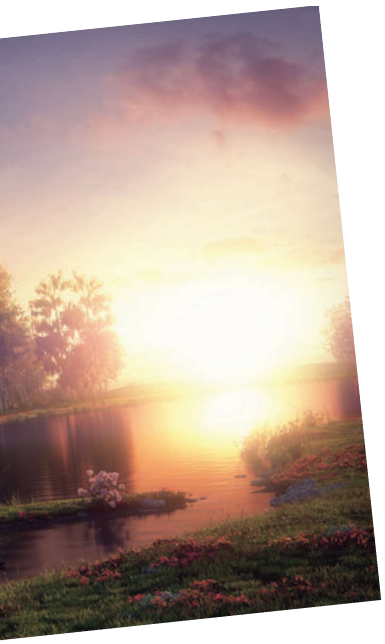

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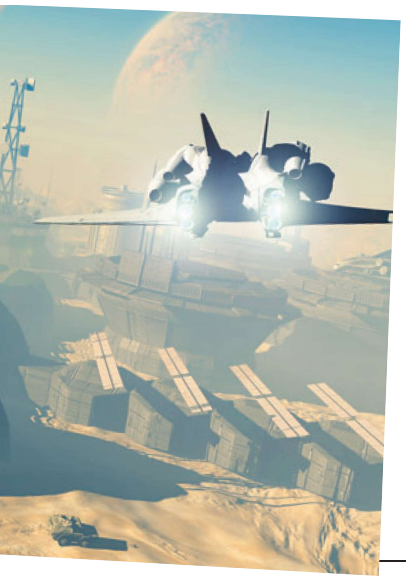

FANTASY TUTORIAL

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Welcome to 3D Landscapes, the first in a new range of books from Focal Press in the *Digital Mayhem* range. The format and style of *Digital Mayhem* is a little different from what you've seen in book publishing before. It marries the showcase aesthetic of the coffee-table, CGI book with the practicality of magazine-style tutorials, workflow guides and tips.

There are three main sections to *3D Landscapes* – previz considerations for planning and designing your images in the first place, post-production editing for enhancing or creating completely different variations at the end of the process, and then the landscape images themselves. This is the meat of the sandwich, the jam between the bread. Over the course of 13 chapters *3D Landscapes* brings you the best in 3D landscape art, showcasing the talents of enthusiasts and professionals alike. There's everything from traditional mountains, rivers and lakes, to using characters in the landscape, water features, the use of seasons, as well as urban and post-industrial landscapes. At the end of each chapter is a tutorial, either as a workflow guide or a step-by-step, that explains the concepts and processes used to create it. The entire book has self-contained sections: you can read it in any order, just drop in and out of the parts that interest.

Over the course of the 300 pages we hope you'll feel inspired and encouraged to create your own amazing 3D landscapes and if you liked this first book in the Digital Mayhem series, keep an eye out for the next one – *Machines*.

Duncan Evans
Series Editor

SECTION 1: PREVIZ FOR LANDSCAPES

Before starting scene construction with your choice of software there are some basic concepts that need to be considered. These include composition and camera lenses, depth of field and lighting models. They also include deciding what software you're going to actually use for your 3D landscapes. This then is the previz section, the stuff you need to know about before starting out on a scene, or, if you already do, things that are worth considering when you're building a brave new world.

16 Software choices – all the apps that are worth using for 3D landscapes

18 Composition – how to arrange the elements in an image more effectively

20 Render camera lenses – what effects focal lengths and field of view have

22 Depth-of-field – just because it's 3D doesn't mean everything always has to be sharp

24 Lighting models – different lighting types and atmospheric models affect realism and render times

28 Close-up work – sometimes the near view can work as well as the sweeping vista

30 Black and white styles – colour isn't everything but mono has its own rulebook

SOFTWARE CHOICES

There's a handsome selection of 3D packages you can use for landscape creation, each with their own strengths and weaknesses.

There are two types of landscape creation package and which one you use really depends on what you are creating landscapes for: as a hobby, as art or for commercial use. There's the standard system where, although you can buy in plenty of models, you are expected to model most of the scene yourself. Needless to say this is the more painstaking and longer route. One advantage is precision and complete control and for this reason it tends to suit arch-viz projects or one-off scenes. One of the other advantages is because the software package itself is so configurable that it can easily fit into an existing studio pipeline. For the newcomer to the genre though, the disadvantages are numerous, not least the time required. This is where the specialist landscape creation program comes in. With this it's much easier to sculpt or design the landscape and populate it with thousands of trees. There's also some cross-over where packages can use instancing, or ecosystems. Here a type of flora is assigned to the system, and the instances are spread over the terrain. It's down to the software to position and render them where the instances are. It's a much faster system for creating dense forests or acres of grass, but not all systems support this.

Autodesk 3ds Max

While you will see some landscapes created with 3ds Max, it's usually as a student project, involves other features like houses or, and more commonly, is in fact an arch-viz scene so the landscape is more of a background feature. Max is a very complex, industry standard and as such it's well used, but not really in animation or game environments. It also carries a commercial price tag and, while there are trial versions and educational discounts, it's only worth learning if you are looking for a job in architecture and visualisation.

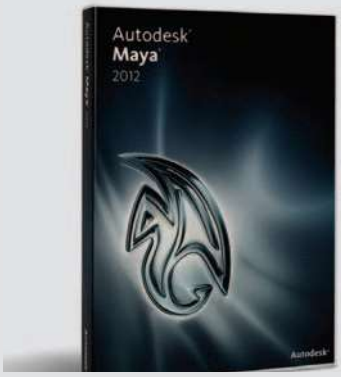
Autodesk Maya

The role of Maya in TV and film is well documented – it's the software of choice for big budget visual effect studios. As such its primary role is in animation rather than static imagery, though it can be used for scenes equally well. Maya is often the centrepiece of a studio pipeline that involves other apps or custom-built elements. The overall learning curve for Maya is very steep, often leading to users having specialisation in key areas. For a career in TV/film, Maya is clearly the number one choice and as such also has the studio-orientated price tag.

Maxon CINEMA 4D

Popular with studios creating work for TV such as advertising logos as well as visual effects for programmes and animations. Uses an instancing system for landscape population and has scaled pricing according to the version – each is designed for the separate markets. Also used extensively in architectural visualisation, particularly in Europe. Is easier to learn and use than either Maya or Max.

INFO
Website: www.autodesk.com
Price: from $3495/£3421.25
Best for: Architectural visualisation, industrial product design
Format: Windows XP/Vista/7



INFO
Website: www.autodesk.com
Price: from $3495/£3507.50
Best for: Big budget film/TV, animation
Format: Linux, Windows XP/Vista/7, Mac

INFO
Website: www.maxon.net
Price: $995–$3695/£780–£2800
Best for: TV/film, advertising, architecture, animation, hobbyist
Format: Windows XP/Vista/7, Mac

INFO
Website:www.newtek.com
Price: $1495
Best for:TV/film
Format: Windows 32-bit, 64-bit, Mac

INFO
Website: www.daz3d.com
Price: Standard $149.95, Pro $549.99
Best for: Hobbyist
Format: Windows XP/Vista/7, Mac

INFO
Website: www.e-onsoftware.com/
Price: $199–$1495/£166–£1250 +VAT
Best for: TV/film, animation, hobbyist
Format: Windows XP/Vista/7, Intel Mac

INFO
Website: www.daz3d.com
Price: $75/£55.75
Best for: Hobbyist
Format: Windows 2000/NT4/XP/Vista/7, Intel or PowerPC Mac

INFO
Website: www.planetside.co.uk
Price: Free, $199–$699
Best for: Specialist TV/film, animation, hobbyist
Format: Format: Windows XP, Vista, 7, 8 (32-bit and 64-bit), Intel Mac

TOP TIP
Many of these packages come with light or personal editions where you can download the software for free to try it out, the limitation being on the final output size. There are also demo and time-limited versions.

e-on Vue
This is the number one tool for creating professional quality landscapes and it starts with some simple, content-driven packs for just $50. The features then scale up to the pro-level xStream plug-in and Infinite versions that have been used in everything from *Indiana Jones* to *Avatar*. In *Indiana Jones and the Kingdom of the Crystal Skull* for example, e-on's Vue was used to create the lush jungles that appear along a cliff-edge. The best features of Vue are the terrain sculpting and the ecosystem which uses instancing to place thousands of plants and trees quickly over a scene.

NewTek LightWave 3D
An all-in-one package that covers modelling, animation and rendering. Most popular with studios creating work for American TV, though it has contributed to plenty of big-budget films. However, it can't compete with Autodesk's Maya for film studios and CINEMA 4D is more popular in Europe. Highlights are geometry instancing and fracturing animation. This isn't a package you would choose to learn for yourself, rather because the studio you were joining used it.

DAZ3D Carrara
If you're looking for a package that offers integration with DAZ3D's range of figures, modelling, landscape design and animation yet doesn't break the bank then Carrara is probably your best bet. It isn't as sophisticated as the packages designed for studios, but for the hobbyist it adds a level of control over the modelling process. The Pro version is much more expensive but adds support for 64-bit multi-core rendering.

DAZ3D Bryce
Bryce has its origins in the 1990s, which goes some way to explain the bizarre interface. It has also gone through various hands before finding a home at DAZ3D. Really, this isn't a patch on Vue, though water and rocks from a distance can look good. If you want to import DAZ characters into your landscapes it's worth a look.

Planetside Terragen
The main alternative to Vue has also been used in big-budget Hollywood films thanks to extensive configuration possibilities. Doesn't feature terrain sculpting so is much more difficult to learn but can create very attractive, if basic, scenery. Needs third-party collaboration with Xfrog to add much-needed flora. Classic version is free, Xfrog version of Terragen 2 ramps the price up. ■

COMPOSITION

How you arrange all the elements of an image determines where the viewer looks and how effective it will be. Good composition makes an image work, bad composition will ruin it.

Unlike landscape photography, where you have to look for the best composition in a scene, with 3D the composition is entirely yours to control and arrange. That also means that if an image doesn't work, there's only one person to blame. Composition is what sets apart a good technical photographer from a great, creative one. You have to be able to see what the image will be before you address the lighting and the technical considerations. It's exactly the same for the 3D artist, if not more so, because you are creating all the elements.

TOP TIP

Try to make sure there is something to look at in each of the boxes created by using the rule of thirds.

For the landscape creator then there are two rules of composition that are designed to help make the image both more pleasing and also work better. One is the rule of thirds, the other is the golden ratio. A quick word on the latter first, because we're going to discard it. The golden ratio is an algebraic equation that philosophers, mathematicians and artists from the middle ages onwards claim can be used to create aesthetically pleasing results. The upshot of this is that the ratio has a numerical value of 1.618, which in real terms relates to the relationship between specific elements that go to make a whole. Okay, so avoiding the pseudo-philosophical garbage that comes with this topic, what it means for photographers is to place objects roughly one-third or two-thirds of the way into scenes, or inside scenes and relating to other objects of interest. Happily, this also sits nicely with the rule of thirds, which will, undoubtedly, make more sense, so let's have a look at that.

Imagine the picture, then draw two vertical and two horizontal lines through the image, all equally spaced so that they fall a third and two-thirds of the way through the image. The rule of thirds would like you to place the items of most interest in the scene where the lines intersect. The reasons are balance, spacing and extracting maximum impact. In purely practical terms, it means placing the horizon on either the top third horizontal line, or the bottom third. Rules can of course be broken, but this is a good starting point. If there is lots in the scene for people to look at, and especially if the viewpoint is high, looking down, then place the horizon on the upper line. If the sky is a dramatic sunset with flocks of birds and hills pointing into the sky, then place the horizon on the bottom third horizontal.

DRAFT VERSIONS OF THE IMAGE

This is how the final image came into being.

This is one of the first versions of the image. The horizon is too high and there wasn't enough interest in the foreground.

In order to try to make the foreground more interesting a shark and a sunken boat were added and the view is from inside a cave.

The final version added a beach and trees. The horizon is now lower and sits on the lower horizontal with the islands and ship. The shark, boat and an island are on the two verticals, the birds are on the top horizontal.

That's the starting point – the trick is to then use the verticals to place other main landscape features. The intersections at the bottom of the screen should be used for things nearer the camera, the topmost intersections are the least important. Although this can add to a photo, it's the main horizon placement that's the most important immediate consideration. The next stage is to avoid mistakes which will ruin an image. This is where there's a large vertical structure right down the middle of the image, splitting it in two, or having nothing of note in the first third, or leading the eye out of the image. Where possible, you want to lead the eye in, up and through the image from foreground to background. Some of this will be automatic if the positioning of main elements is right in the first place. Also, bear in mind the alternative to this compositional thinking is one of symmetry. Here you are reducing the landscape to more abstract shapes and it best suits very simple scenes. Instead of placing things on the third intersections, look instead to create a perfectly symmetrical image, whether that's a windmill or tree, alone in a field, placed dead centre, or silhouetted against a setting sun. ■

RENDER CAMERA LENSES

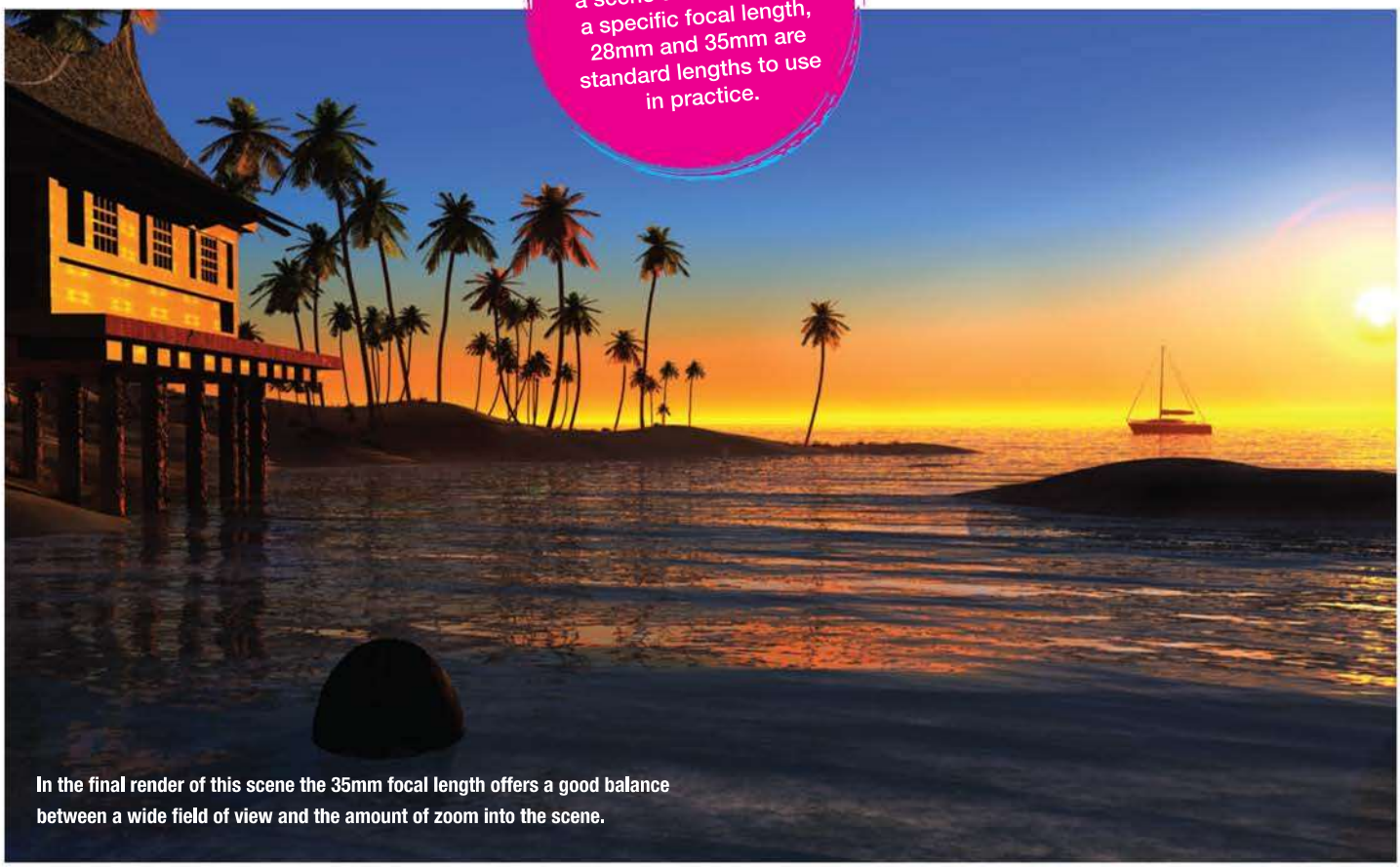
The focal length of the main camera you are going to render from dictates how much of the world you get to see and represents an important starting point for building a scene.

Camera focal lengths are one of those things that are often overlooked because it's tempting to just use the default settings. However, the focal length of the camera determines how much of the scene you can see and how distorted it can appear. If you are looking to create a scene that resembles what the human eye can see then it's usually around the 45mm–50mm area, – but what you also have to take into consideration is that you have two eyes which produce an overlapping image, giving a much wider field of view than 50mm. It can be said that you have a near 180 degree field of view but the periphery of that is not sharp so for rendering purposes a focal length of 24mm will give a more accurate field of view. However, it isn't directly comparable because at 24mm the foreground will appear much closer and the mid and background will appear much further away than what you actually see with your eyes. Note that anything lower than 50mm is usually referred to as a wide angle lens and anything above it as a telephoto lens.

There are consequences to selecting any focal length for your render camera. The first is that the shorter the focal length, the wider the field of view, but the more distortion will appear. Anything near the camera will appear elongated and larger than objects further into the scene. If you are creating a scene which has someone in it, and they are anywhere near the front, then they will suffer extreme distortion. It's better to either move them back or use a 50mm focal length and live with the narrower viewpoint. If you use a longer focal length, say 100mm upwards, then the field of view narrows. It's a common misconception that using a telephoto lens flattens the perspective, making objects in a scene that are behind each other appear closer together. It doesn't. What happens is that you cannot see anywhere near as much to the sides of the point of focus, and the subject at the point of focus appears much nearer the camera, bringing with it the objects in the background. The perspective isn't flattened, it's simply that you can see the things in the background better.

TOP TIP

Unless you are designing a scene to make use of a specific focal length, 28mm and 35mm are standard lengths to use in practice.

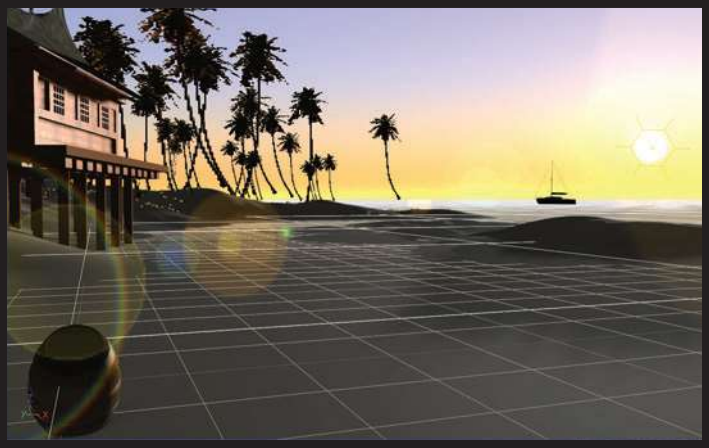


In the final render of this scene the 35mm focal length offers a good balance between a wide field of view and the amount of zoom into the scene.

PRACTICAL EXAMPLES OF DIFFERENT LENS SETTINGS

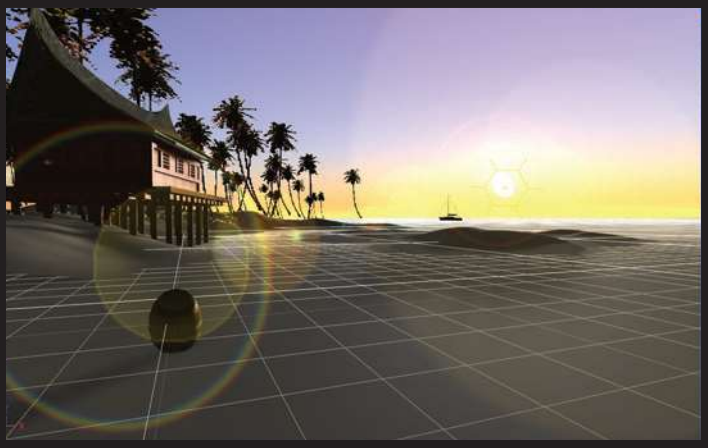
Here's how changing the focal length impacts a scene in practice.

35MM



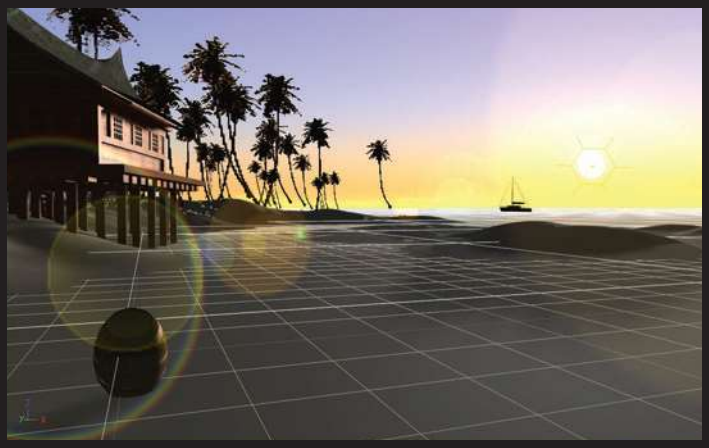
This is the standard 35mm view of this scene. The barrel in the foreground is only slightly distorted and the boat in the background is clearly visible.

20MM



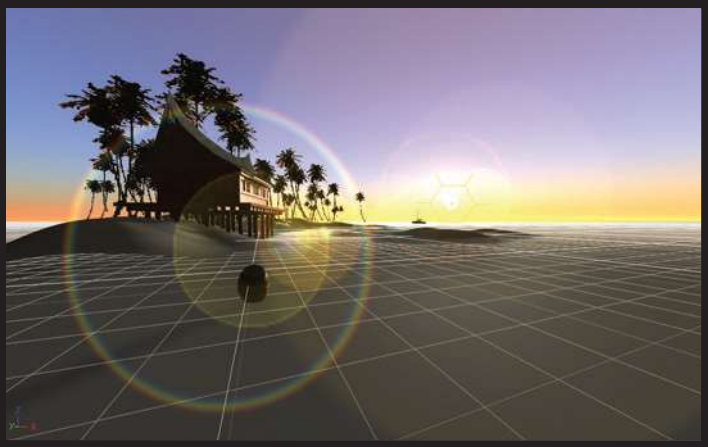
At 20mm the boat in the background is very far away and you can now see around the back of the house, which wasn't intended. Note how much more water there is in the first third of the scene.

28MM



A 28mm view is quite acceptable for this scene though the camera needs moving slightly.

10/12MM



A focal length of 10mm or 12mm is considered to be a fish-eye lens with huge distortion and almost all the image being taken up by the foreground, which this scene wasn't designed for.

In practice, using a lens focal length of 35mm will give you a fairly standard view of a scene with only foreground objects becoming distorted. A 28mm focal length will give you a wide angle view that is commonly used in landscape photography, so the viewer will be accustomed to the amount of scenery in the render. Wider angles than that produce super-wide views with evident distortion. Using 24mm is fairly standard, and anything wider needs to have a reason. It may be the content or the composition, but the foreground will be so extended and the background so diminished, the scene has to be created specifically to suit that view.

At the other end of the spectrum, a telephoto lens is used to pick out details in the landscape where the photographer can't get any closer for the shot. In 3D you can move the camera wherever you like so the main reason for using a telephoto focal length is negated. However, don't overlook it. There are times when having a narrow field of view can be advantageous – if you create a ravine for example, with a rushing river at the bottom and rocky sides with trees. A standard view or wide angle wouldn't work anywhere near as well as a telephoto shot. What it comes down to is considering what is going to be in the scene you are creating and what kind of view of that scene you want to end up with. Then use the appropriate focal length in the main render camera when creating it. ■

DEPTH-OF-FIELD

Bring some variation to your landscape rendering by using creative depth-of-field rather than making everything in focus.

One of the features of CGI landscapes is that it's tempting to just render everything in sharp detail. In fact, it's often the default option and while that's fine most of the time, there are occasions when it's worth looking at the alternatives. This, of course, is the subject of depth-of-field. Quite how it works in practice depends on your software, but the theory revolves around lenses and apertures. Depth-of-field is the amount of front-to-back sharpness in an image. If all the image looks sharp then it has a lot of depth-of-field, if only the foreground subject is sharp, then it has a shallow d-o-f. The amount of d-o-f is dependent upon the type of lens being used and the aperture of that lens. Wide angle lenses create more d-o-f; telephoto lenses create far less at the same aperture settings. The aperture is the width of the hole in the lens mechanism that lets light through. The wider the aperture, the more light comes in, but the less depth-of-field is created. Wide apertures have lower f/stop numbers, such as f/1.8 and f/2.8. Narrow apertures let in less light but create more depth-of-field and have high f/stop numbers, such as f/16 and f/22. There are other considerations, such as lens sharpness, which don't really come into play here, so the question is how your render camera uses f/stops and depth-of-field. Some software will allow you to set a specific f/stop to create customised d-o-f, while other software basically makes everything sharp regardless, only taking into account weather, light and atmosphere. Software in this category is likely to be restricted to a focussing distance and a blur amount. Software that uses f/stops for the render camera will also allow you to specify the focus point, but the use of the aperture will determine which area is sharp and which isn't. There's usually a projection showing the limits of the sharp area.

TOP TIP

A real lens has more sharpness at f/11 than it does at f/22 but unless your software supports actual lens characteristics, you don't have to worry about this.

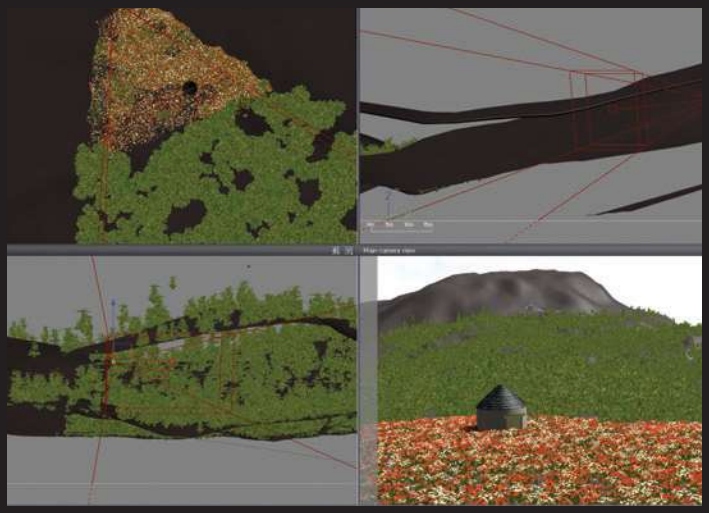
A final version of this scene using a shallow depth-of-field, more high atmospherics and toning that really reduces the background.

DEPTH-OF-FIELD IN PRACTICE

Here's how changing the focal length impacts a scene in practice.

The standard view of a scene with as much depth-of-field as possible.

Now the focus setting has been changed so that most of the foreground is sharp but the background is out of focus. The point of focus is the cart.



Here there's a narrow band of focus where the cart is, everything else from foreground to background has gone out of focus.

The camera settings in the draft version of this scene show the focal point as being about 30m from the camera with 100% blur, signifying a very shallow depth-of-field.

So what does all this mean for you when rendering a scene? Well, you can either render it out with sharpness throughout, or you can try some creative options. One is to focus on an object – a house, river, person, flower or whatever – in the foreground and use a shallow depth-of-field to make the rest of the image go out of focus. This both looks interesting and makes the viewer concentrate on a specific subject. The alternative to this is the differential focussing technique. Here you focus on something in the near-mid ground and use a shallow d-o-f, with the result that the background is out of focus, but so is the immediate foreground. This is particularly useful for images with a narrative or characters in them as it forces the viewers' attention to a much more limited area. Of course, you can also be more varied, with the first third of the scene in sharp focus, but then the rest of it slowly going out of focus, but not a complete blur. So whatever you try, there's more than one way to render the same image. ■

LIGHTING MODELS

The way you use light in your rendering affects how realistic the result is. Here are some of the options available.

Although many of the lighting options available to you will depend on the software used, there are some common lighting types that you will find across the board. The first distinction to make is whether to use a general lighting model or a specific one that uses ray tracing. In landscapes it's usually the case that the sun is your light source, but what you have to bear in mind is that the sun will be some way off the actual scene – not a realistic distance away, but scaled a couple of kilometres or miles above a cloud layer or behind any terrains. The sun lights up the sky and the sky acts as a giant light source for the scene. In a standard model the colour of light that is cast onto the scenery is uniform, it does not matter what cloud cover is in the sky. Flat surfaces parallel to the sky will be brighter, but that's as complex as it gets. The important point to note is that this isn't an accurate lighting model, but it is a fast one. Much faster than anything else in fact. Some software offers a slight step up from this which is to use shadow maps for objects. These use the same uniform lighting but then add shadows based on the objects in the scene. It still isn't accurate but it can appear more realistic.

TOP TIP

A Global Radiosity lighting model can take three times longer than the standard ambient lighting model but the results are considerably more realistic.

After that we're into ray tracing territory and here rendering times will get longer because the software has a lot more to do. If you are going to add features like artificial lights, especially near water (since they would create reflections), then you pretty much have to use a more sophisticated lighting model.

The advanced options

The first lighting model to look at is Global Ambience. As you might gather from the name this uses colour variations from the ambient light. As the sun shines through the clouds different colours are cast depending on the amount of cloud, the thickness of the atmosphere and the time of day. This means that white and grey clouds will cast white and grey light, whereas blue sky will add blue light and sunset reds will add reddish light to those areas. The Global Ambience model takes into account these colours in the sky itself so it looks more varied, but it doesn't cast realistic shadows. It's worth using for the variety and the speed when you're making a really complex scene that would otherwise take a long time to render out. It works best where there's lots of water because there are fewer natural shadows. Where it really doesn't work very well is in scenes with woodland, lots of trees or fields of flowers. The difference here is quite dramatic.

So, the next step up from this is Ambient Occlusion, which is a form of Global Illumination. How they both work is that the entire sky becomes a light emitter and as the light ray is traced towards the ground, anything in the way casts a shadow. This can be small amounts from clouds, or large amounts from buildings, trees or other objects. The difference between Ambient Occlusion and Global Illumination is that AO has a depth limit in which the occlusion that produces the shadows can occur. This is useful for creating more realistic shadows thanks to clouds, but keeping the speed of rendering advantage by not creating shadows from objects near the ground. It really suits a seascape image because there the only things really creating shadows are the clouds. Needless to say, Global Illumination delivers significantly better and more realistic results than the standard or Global Ambience models, but it increases the rendering time significantly as well.

If you want the ultimate in realistic rendering though, especially for woodland or tree-filled scenes, then have a look at the Global Radiosity model. Rather than working out shadows for light rays, this approaches the subject differently. The rays are emitted from the light source and traced to the subjects. Any subject receiving light then re-emits, or radiates, a percentage of that light based on the reflective properties of the material. Anything under a subject which doesn't receive a direct ray trace is therefore in shadow, while very reflective surfaces will shine more because they re-emit more. In complex scenes, particularly under partial cover, this leads to more sophisticated and varying light patterns. The rendering time can be much longer than any other model if the scene is a complex one. If it isn't a very complex scene requiring sophisticated shadows and light, then it's tantamount to overkill. You'll spend longer rendering for no real benefit. ■

PUTTING IT INTO PRACTICE

Here's how different lighting models can affect the same scene. The trees in the foreground are actually yellow, the ones in the middle are red and burnt orange and over in the background they are green. See how the lighting models change the colours artificially.

The first example uses a normal lighting model and as you can see, it's uniform over the trees which are the wrong colour. This took 6:40m to render.

The next version uses Global Ambience which has made the sky much lighter and more even, but the trees are still the wrong colour. This took 10:39m.

Now we're on to the Ambient Occlusion version which has clouds in the sky. The trees have much better shading and are the right colour. This version took 16:50m.

The Global Illumination version took 15:28m and is similar to the AO version. The trees are quite dark because each leaf is blocking light.

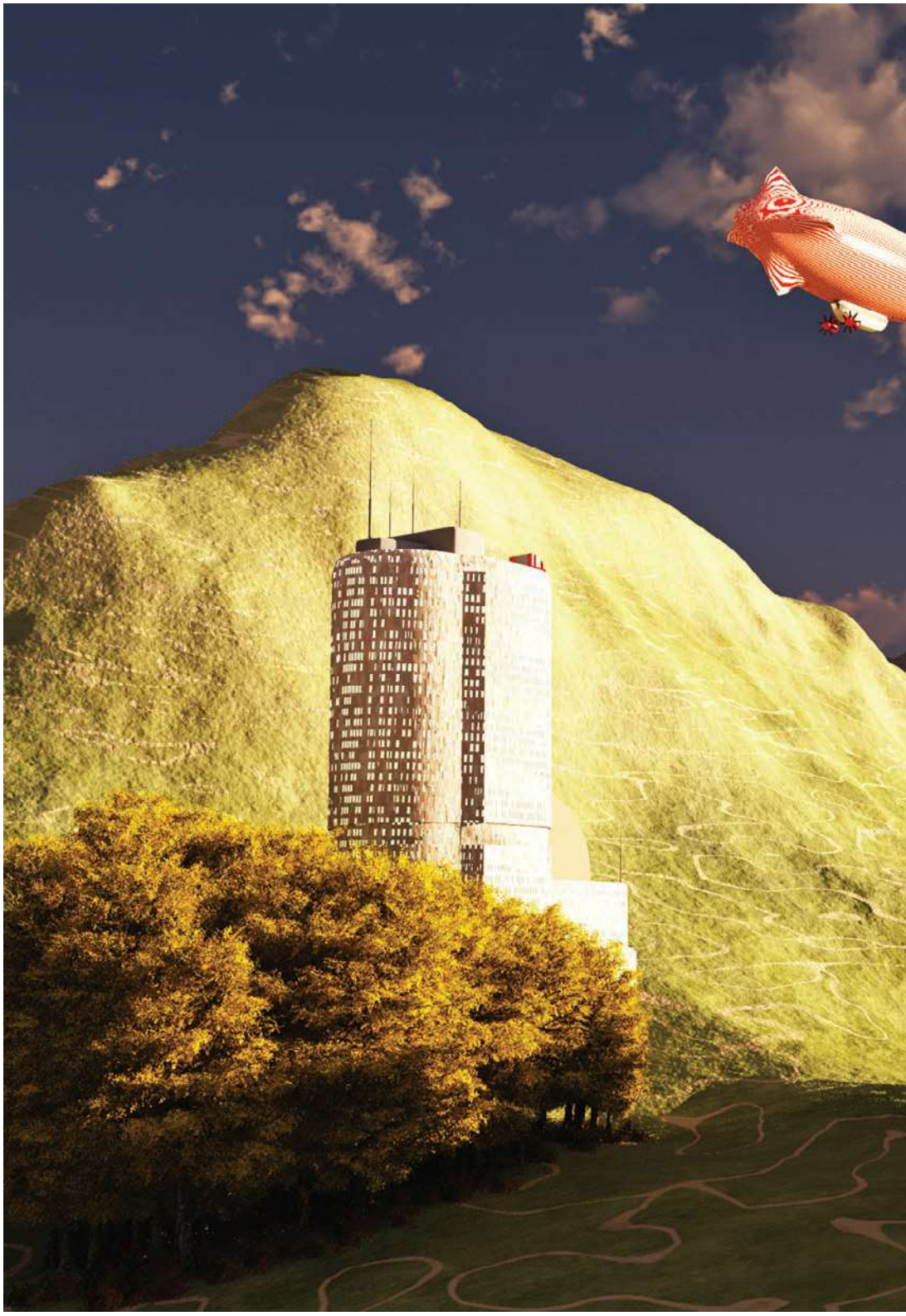
The longest render came from the Global Radiosity version at 19:29m. The leaves of the trees are brighter because they're reflecting light onto each other.

Volumetric and spectral lighting and atmospheres

It's worth discussing atmospheres here because they can be created in tandem with the various lighting models already discussed. These are volumetric and spectral atmospheres. Volumetric light is basically where the rays of light illuminate particles in the atmosphere or appear as rays through blocked areas of scenery. Particularly for landscape creation software you will find pre-built skies categorised as a volumetric scene which let's you know that the light itself will have volume in the atmosphere. The position of the sun and the amount of dust in the atmosphere both affect how a volumetric atmosphere will look.

Spectral lighting is in fact volumetric as well, but it uses a lot more components to create a more realistic result. A spectral atmosphere uses three-dimensional clouds rather than flat ones and these can be manipulated in the same way as 3D object. The light coming through them from the sun then takes into account the density, height, the amount of wind, dust and water in the air. There are also more controls for spectral atmospheres so that the density of clouds can be altered and additional effects like sun coronas can be tweaked. A spectral atmosphere is certainly a more realistic element to use than a volumetric or standard atmosphere, but it all adds to the render time. Also, you'll find that it's best to use pre-made skies as they were designed. A spectral atmosphere will look completely different if rendered as a volumetric one.

For speed, use a standard atmosphere with a quick-to-render lighting model: if you want haze and volume in the sky – sunset and sunrise are great for this – then use a volumetric atmosphere, and if you want the ultimate in realism then use a spectral atmosphere with a Global Radiosity lighting scheme.



This scene uses a volumetric cloud layer and a spectral atmosphere and Global Radiosity lighting to disperse the light within the tree canopy.

CLOSE-UP WORK

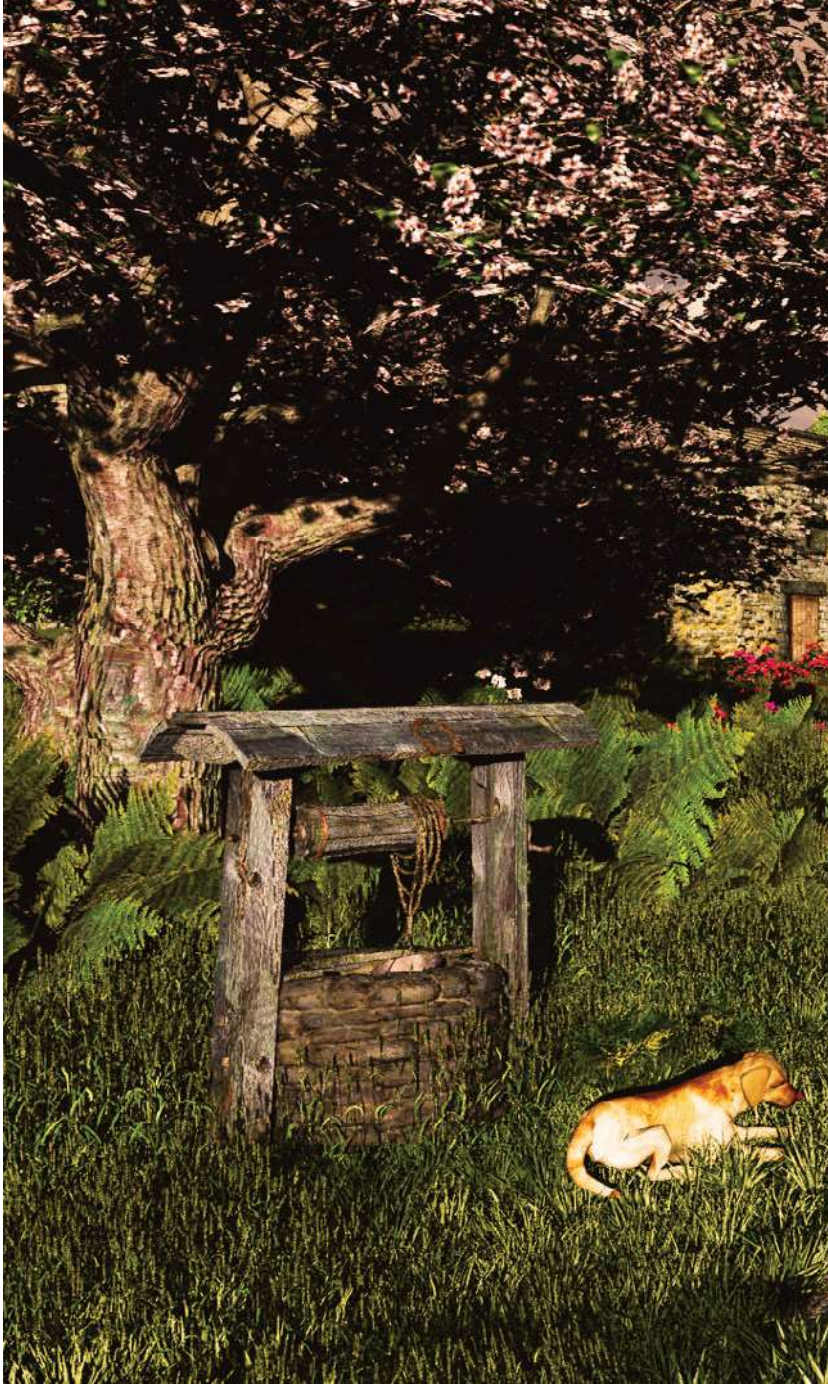
Landscapes don't all have to be massive alpine vistas with soaring eagles and speck-like figures in the fields below – get close up for a change of pace.

While the traditional landscape may have acres of land and represent the open prairie, a mountainous range or endless miles of sea and surf, presenting a more localised scene offers its own rewards and sets specific challenges for the 3D artist. A typical scene here can be anything from the contents of a wooden glade to a country house set in quaint gardens. It can even be more close up than that, and approach the macro scale, where you are looking at individual fungi and plants. In fact, the small-scale scene offers an opportunity to use lots of plants and flowers that would be lost in a large scene.

The first consideration, then, is one of scale, which is much more difficult if you are modelling everything yourself. A small difference in scale that would be impossible to spot with the camera at a few hundred feet becomes glaringly obvious at five feet off the ground. This doesn't really apply to flowers unless they're a clearly identifiable species and the scale is completely wrong. It's more a case of other objects in the scene like transport, fences, sheds and so on that are dwarfed by trees, or tower over grass. It's one of the areas that dedicated landscape creation software programs have where all objects have a scale function so you make sure everything matches.

The other obvious consideration is one of composition. In a tight area, the composition really needs to work well, much more than a big, open scene, because this scene is all about the specific elements. See the section on composition for more on this but composition in a small scene can make or break the overall impact.

Quality and lighting now come into the equation much more. Because the camera is so much closer to everything, the actual quality of the model and the textures are more open to critical gaze. Certainly while populating a scene if you are using anything that's purchased, you need to make sure that the objects are high enough quality. Needless to say, the better quality models need to be nearer the camera. As the scene recedes into the distance, you can use things like trees that have a low polygon count as fillers. The lighting model now has an increased importance as well because you're going to see more defined shadows, more reflections and the quality of the final render is more important. See the section on lighting models but now bear in mind that this is where you want to use the more realistic options.



As the scene heads down into the very small, or macro level, depth-of-field becomes increasingly important too. This is where a very shallow d-o-f can be used to great effect. Isolate the most interesting elements and use the aperture or depth options for the camera to throw the background completely out of focus so it's just a colourful, blurred backdrop. You can create great-looking macro shots this way. Even if your scene isn't that small there's still potential here for coming up with something that's a little different. If you have a horse in field for example, make the focal point the horse and allow the rest of the scene to drift out of focus, but not to the same extent as the macro shot. This concentrates the eye on the main subject, still offers the rest of the scene as context, but gives it a closer and more personal feel than just rendering with everything perfectly sharp. ■

↑ The well and grasses close to the camera were all replaced during the making of this image for ones with higher resolution textures and quality.

↘ This shows the other end of the scale: a very close-up shot with shallow depth-of-field. The texture map needed to be redone to render it in hi-res from so close.
© Gill Brooks.

BLACK AND WHITE STYLES

Look beyond the colours in a scene and discover the potential of using monochrome imagery.

One of the reasons black and white images can have a great deal of impact is simply that we are used to looking at things in colour. You don't tend to see much of it in the 3D world though, where colour proliferates. For that very reason, a well executed monochrome image can stand out from the crowd.

When dealing with black and white a different approach is required and some things work better than others. For a start, without colour in the scene, you are reducing it to shape, tone and texture. A busy scene that would look great in colour won't work in mono because there's just too much going on. It's much better to have more clearly defined shapes, objects and areas. That's why seascapes or beach scenes always work well – they are much simpler and more defined. The attribute connected to this is tone. If everything is the same tone then the shapes will blend together so there needs to be variety of tone in clearly defined areas. Again, land, sky, water are three clearly defined areas with different tones. That leads on to the question of contrast. Very little can mean subtle shades in specific areas, but if it applies to the entire image then again, the tones aren't going to be well defined. Unless you are aiming for an antique or retro print look with faded tones, then it's usually better to have more contrast. A scene with punchy contrast will make a bigger impression and catch the eye more.

↑ **This version of the image uses a lot of contrast with dark, fluffy clouds for maximum impact.**

This is a standard, low-contrast conversion from colour. Notice how flat it looks.

Here the Nik Efex HDR Pro 2 filter in Photoshop has created a pseudo-HDR effect and conversion.

The clouds have been darkened with a Curves adjustment layer but the rest of the scene is still flat.

The other area of consideration is texture. Without any colour in a scene you notice the textures a lot more. You don't have to have objects with lots of defined textures but be aware that those you do have will carry more weight. What can be overwhelming though is a scene where everything has a distinct texture because that tends to make it too busy. It's better to spread them around so they have more impact.

As mentioned, seascapes, beach scenes, anything with rocks and water work well as a black and white subject. For focal points of interest you can include a lighthouse, boats or islands. Turning inland, an isolated cottage against a mountain range provides a good focus, while a woodland river scene can offer lots of contrast with shade and light. Another avenue to explore is industrial decay. Here you are looking at the textures and emphasising the structures but it's important to compose the scene well and include some sky to help define the landscape. Don't forget grain effects too, as these can help give a scene more contrast and impact. ■

CONVERSION OPTIONS

It seems that each new version of Photoshop includes a new way to convert from colour to mono. Some of the latest options include using a dedicated Black and White filter that has more colour channel options. It makes the Channel Mixer defunct as this works in the same way, but with fewer channels. For a quick and easy conversion, use the Gradient Map from black to white. Also, there are numerous film stock plug-in filters like Alien Skin's Exposure series and DFT's Film Stocks that can convert an image to mono as well as give it certain characteristics of a specific black and white film.

SECTION 2: LANDSCAPE MASTERS – SHOWCASES AND TUTORIALS

Welcome to main section of this book where you can admire the work of landscape masters in a variety of showcase images and learn vital tips, tricks and workflow processes in the tutorials. This section is split into chapters covering everything from mountains and water features to architecture, characters, weather and fantasy images. In each chapter there are showcase images and a tutorial explaining how a fantastic image was created.

34 Mountains – from alpine lakes to grand follies and railways

52 Seascapes – fishing boats, harbours and undersea adventure

80 Rivers and lakes – ponds, tumbling rivers, lakes at sunset

102 Water features – deep canyon streams and African watering holes

120 Desert scenes – dusty planets and a fabulous beach scene

136 Woodlands – misty forests, alpine trees and an Elven village

152 Architecture – buildings in the landscape for professional design

172 Characters – how to add people and figures as a focal point

190 Urban landscapes – into the city for streets, yards and places of worship

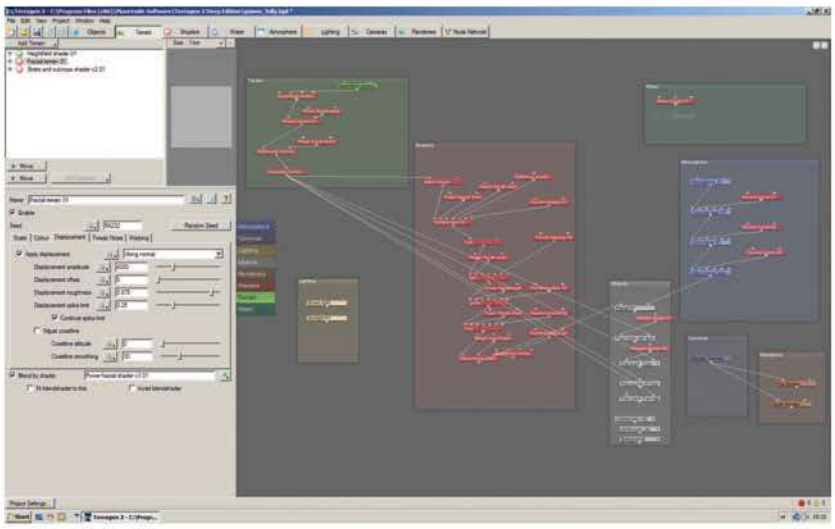
208 Weather and seasons – let it rain, snow and the wild wind blow

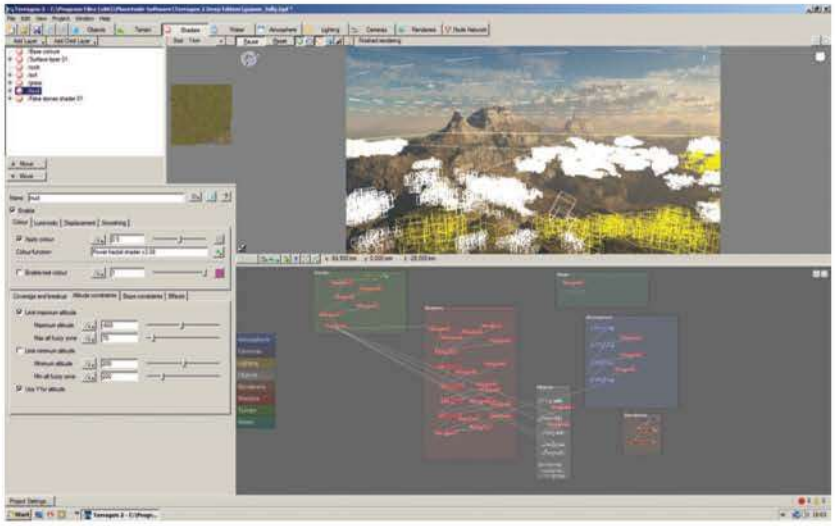
224 Post-industrial – signs of commerce and the decay left behind

238 Sci-Fi – let your imagination run riot with these tales of the future

256 Fantasy – from warring wizards to houses for gnomes and dragons

There's an Arthur's Seat in Edinburgh, so I thought Guinevere should have something to remember her by. I generally create scenes on impulse with little or no project planning. The main objective here was simply to create a scene with interestingly formed mountains and good depth to it. I also wanted to try out Terragen's recently introduced cloud localisation. I then thought a woodland lake would look good in the mid foreground with some kind of structure overlooking it. The folly itself is a simple 3D mesh made using XenoDream, imported into Terragen and textured using image projection.

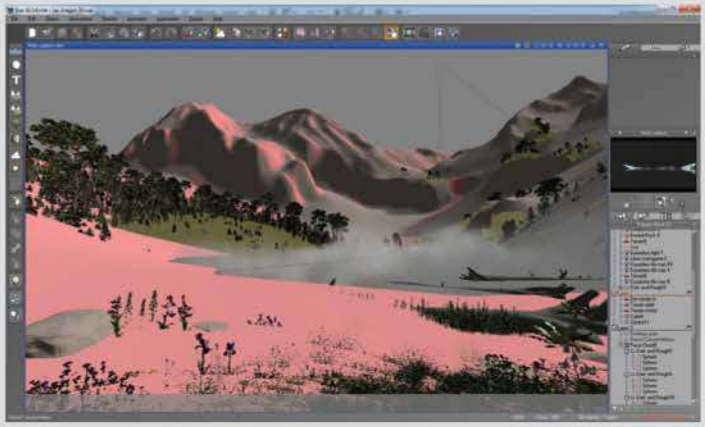




PROJECT	LAKE IN SPANISH PYRENEES
SOFTWARE USED	TERRAGEN 2
RENDERING TIME	3 HOURS
ARTIST	JOHN ROBERTSON
COUNTRY	UNITED KINGDOM (SCOTLAND)

MOUNTAINS SHOWCASE: FRÉDÉRIC BEC

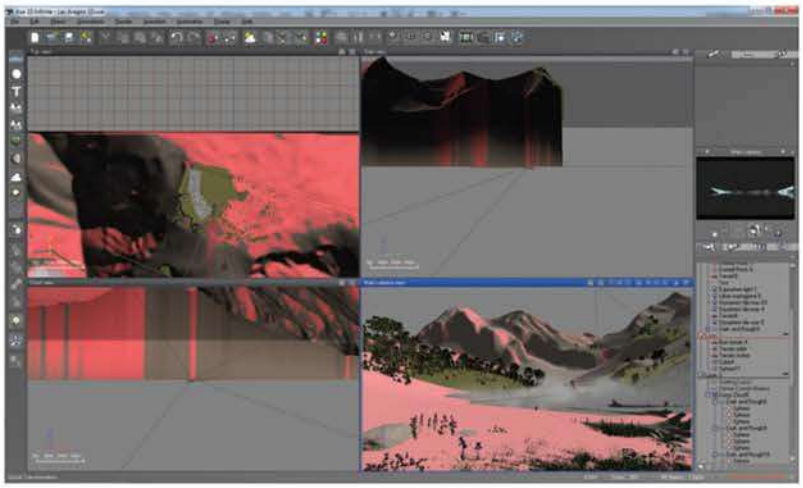
PROJECT	LAKE IN SPANISH PYRENEES
SOFTWARE USED	VUE 10 INFINITE AND ONYX GARDEN SUITE
RENDERING TIME	48 HOURS
ARTIST	FRÉDÉRIC BEC FOR GRAPHI-PAYSAGE (SARL)
COUNTRY	FRANCE



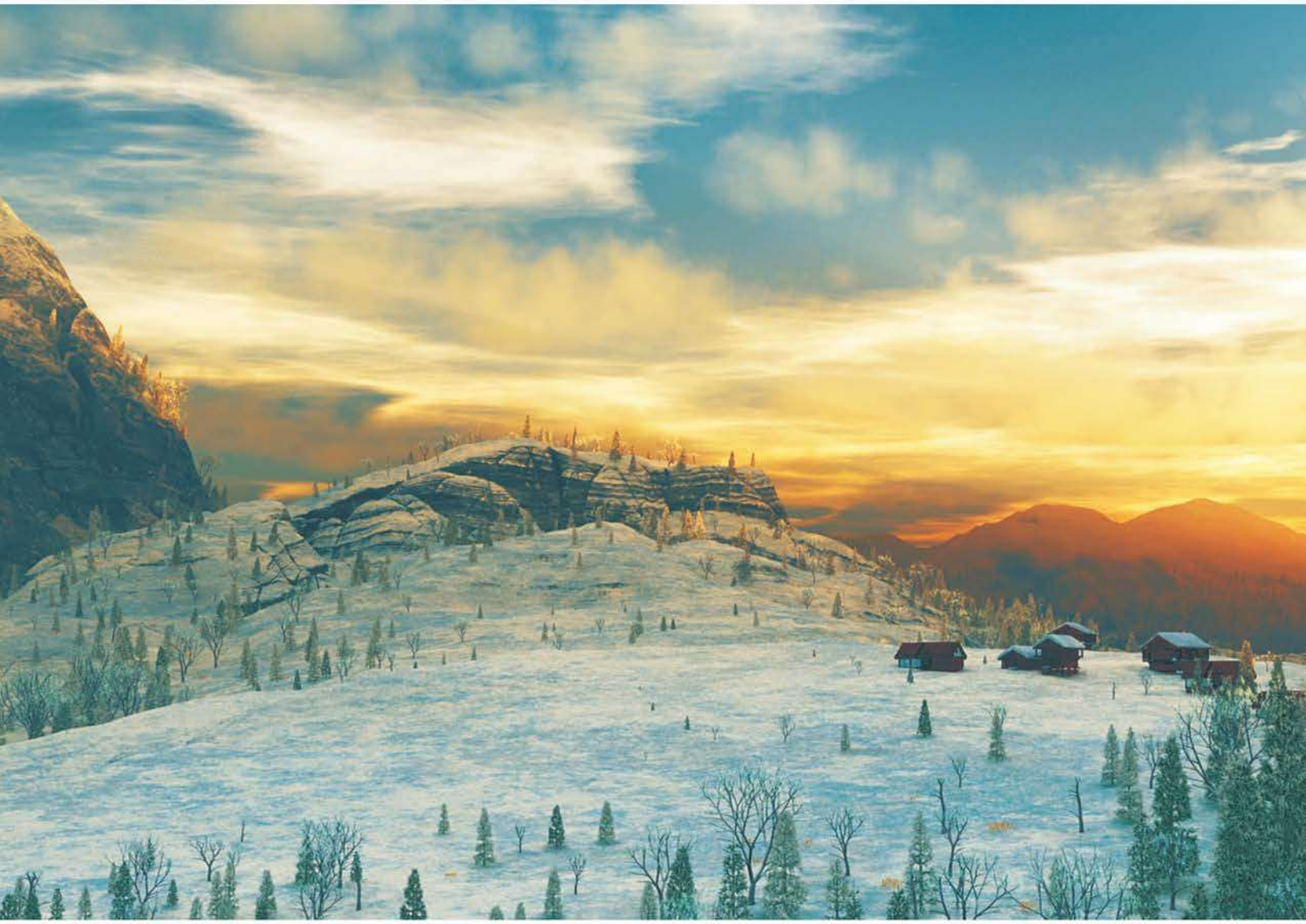
"The picture was made for the Vue Environment Competition 2012. I wanted to represent a mountain landscape I know and love with as much realism as possible: the Ibon de Plan in the Spanish Pyrénées (Aragon).

In the real landscape, the pines are Pinus unicinata. I have replaced them with Pinus sylvestris because they are more graphic. All the other plants are growing in the zone and some are endemic (like the Iris xyphoides in the first plan). All the plants were made using Onyx Garden Suite, textured in Vue and placing using the Vue Ecosystem. I spent a lot of time modelling the plants to be as realistic as possible. I represented the plants and flowers as they really are in the late spring season at 1800m altitude.

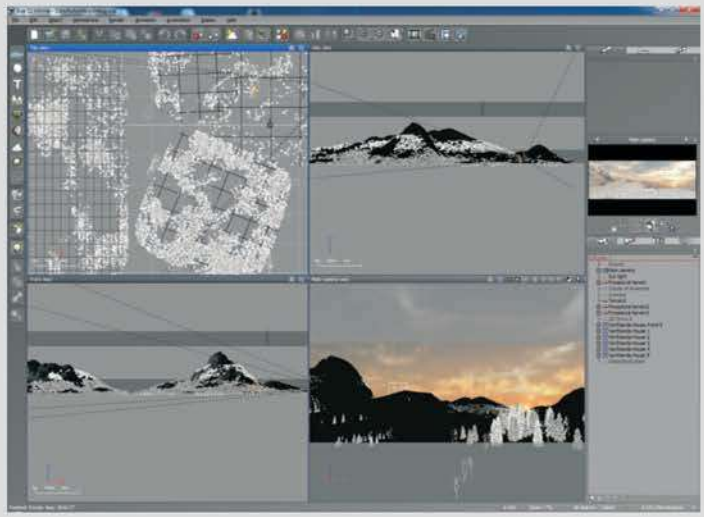
The rock materials were made with procedural textures using bitmaps for some zone distribution. One of the main tasks was to build a realistic procedural texture simulating the calcareous sandstone of the zone."

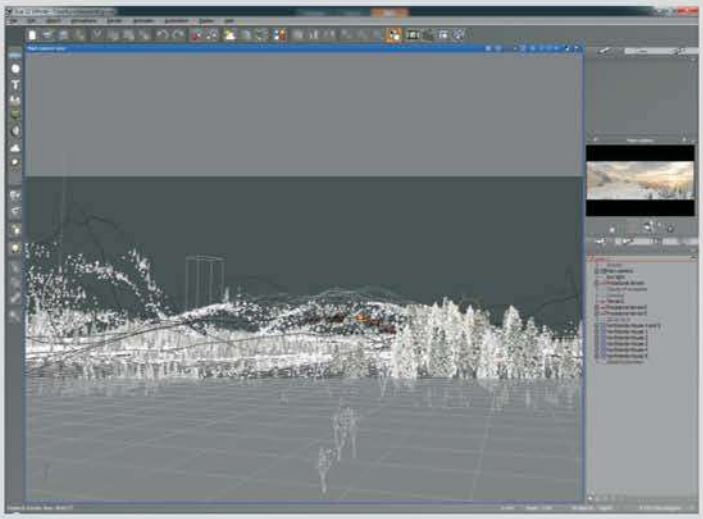


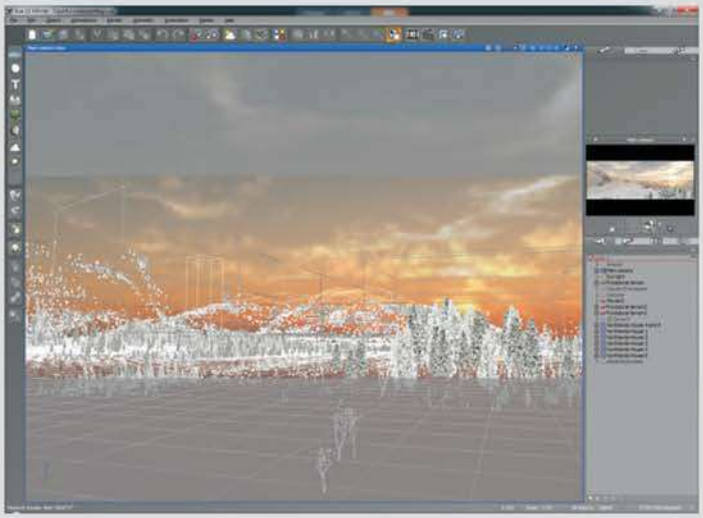
"Winter images are my favourite to create of all landscape images I do in Vue. This one was done to show that winter isn't only painting the landscape in white and blue or shades of grey on a foggy day. The unbelievablly colourful sunsets in winter we get here in Appenzell were the inspiration to recreate such a sunset in Vue."



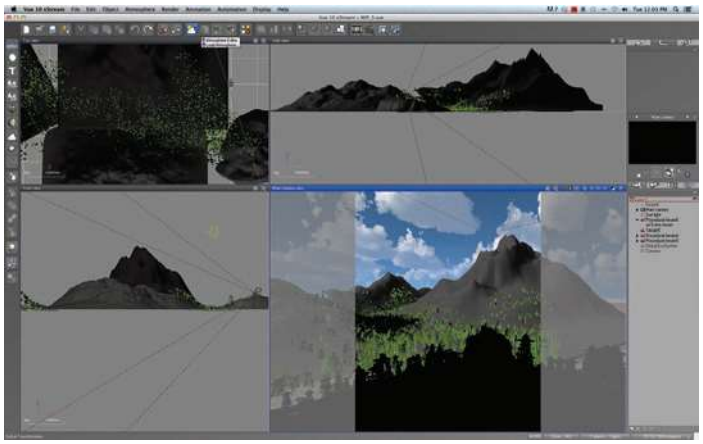
PROJECT	COLOURFUL WINTER
SOFTWARE USED	VUE 11 INFINITE
RENDERING TIME	7 HOURS AT 2720X1000
ARTIST	BRITTA JACOBS
COUNTRY	SWITZERLAND

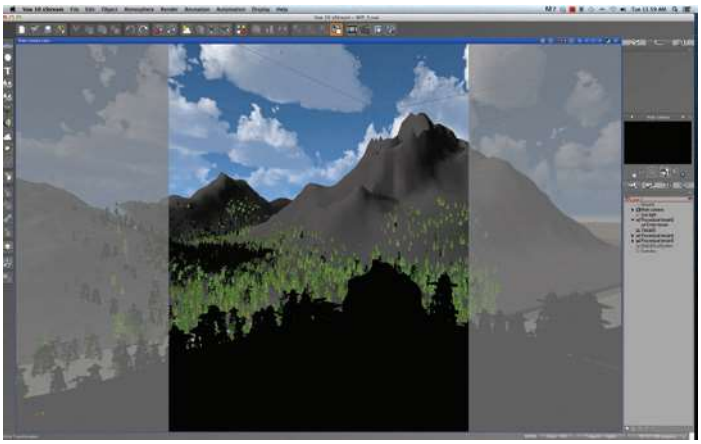


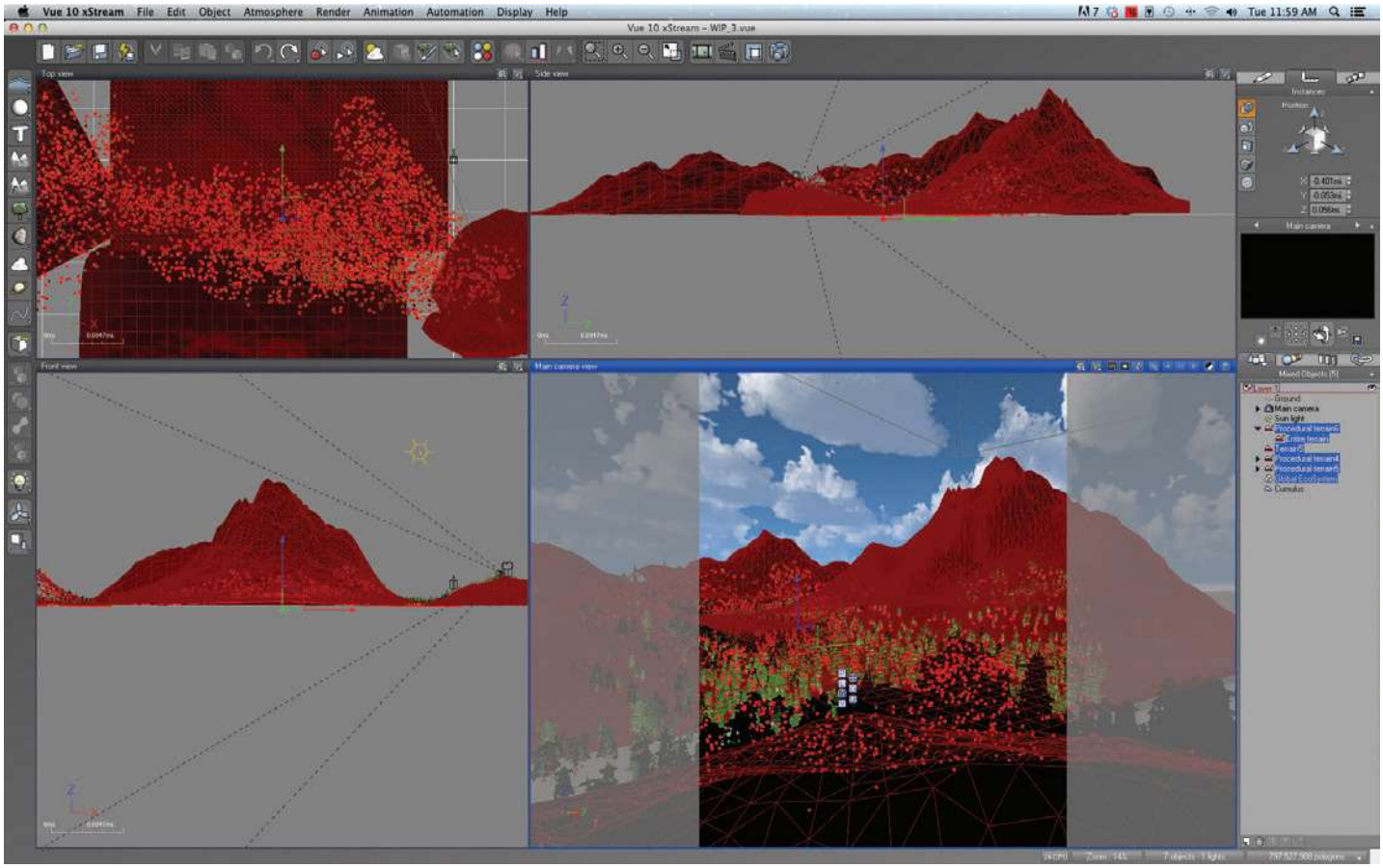


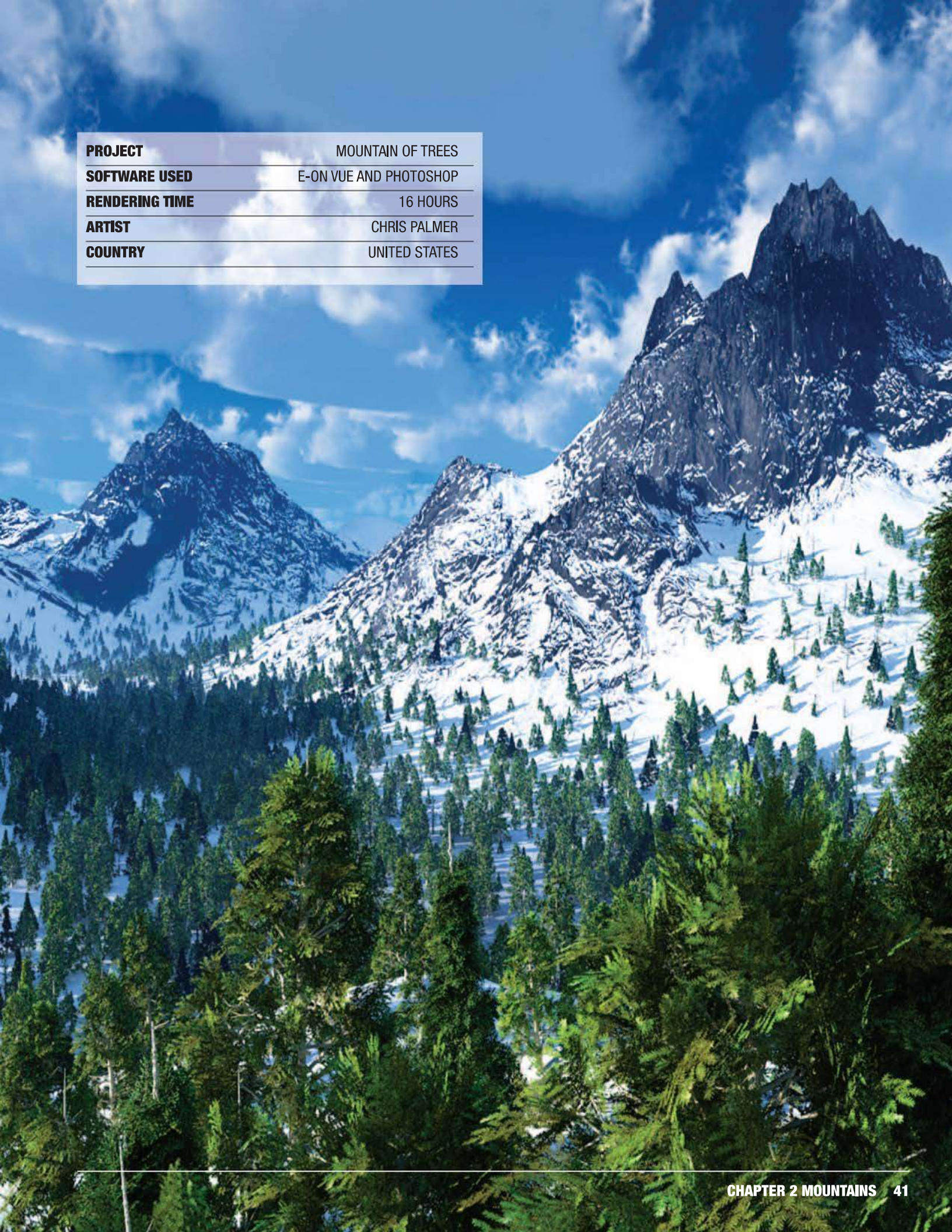


"I was inspired to make this image due to my love of the mountains during the winter. As a snowboarding enthusiast I wanted to convey the feeling I get as I glance over the perfect untouched snowy terrain and the feeling of crisp, clean mountain air. I drew from numerous reference images and my own personal experience to get the look that I desired. After about three days of working with the composition I finally achieved the view I wanted and I was pretty happy with the results."









PROJECT	MOUNTAIN OF TREES
SOFTWARE USED	E-ON VUE AND PHOTOSHOP
RENDERING TIME	16 HOURS
ARTIST	CHRIS PALMER
COUNTRY	UNITED STATES

HOW TO CREATE MOUNTAINOUS SCENERY

Drea Horvath explains how to build a large-scale scene and populate it with enough detail to keep it interesting.

BACKGROUND

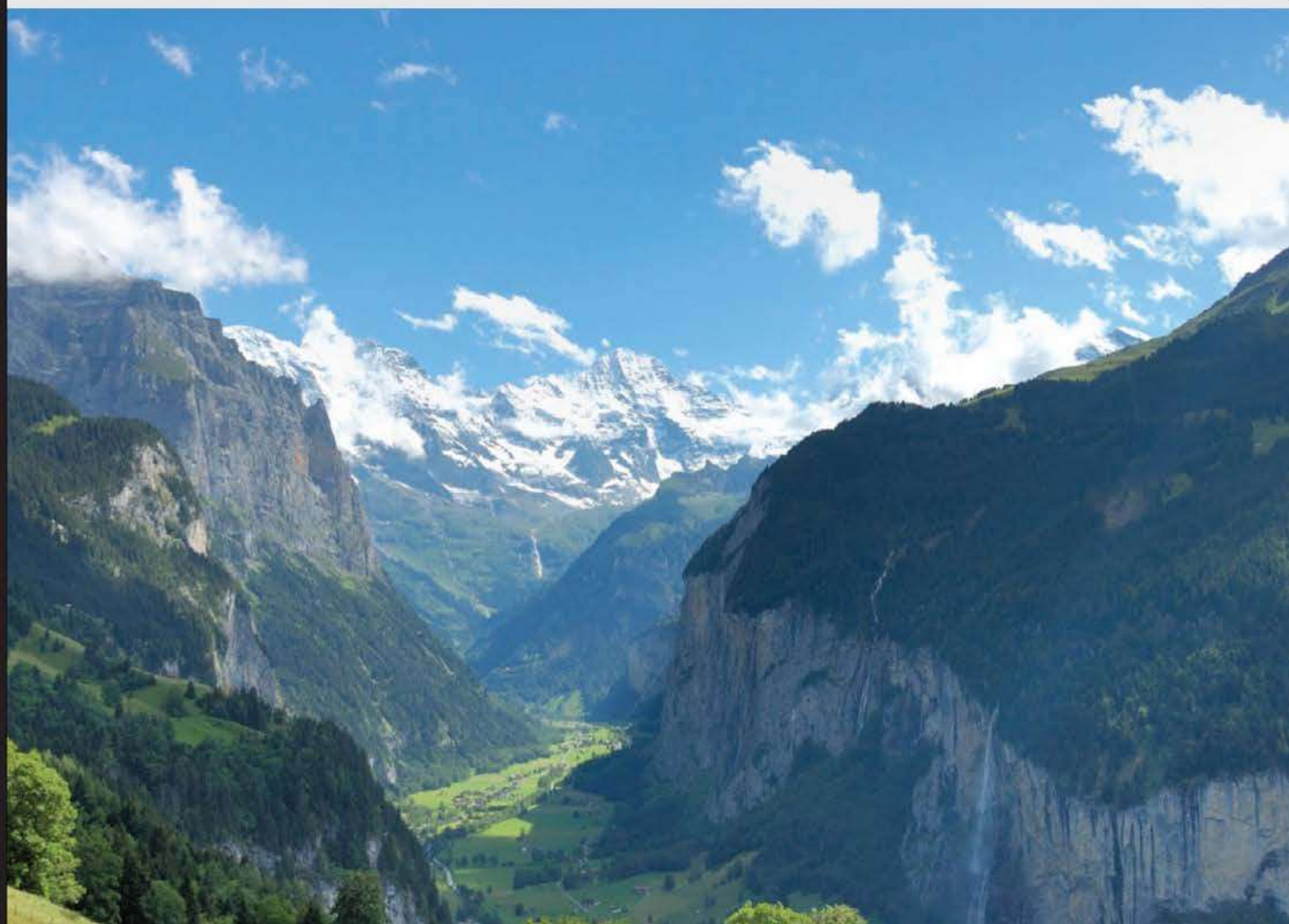
Switzerland is considered one of the most beautiful countries of the world with its high mountains, green valleys, snowy peaks and cute little alpine towns. The country's landscapes have inspired lots of artists, including myself.

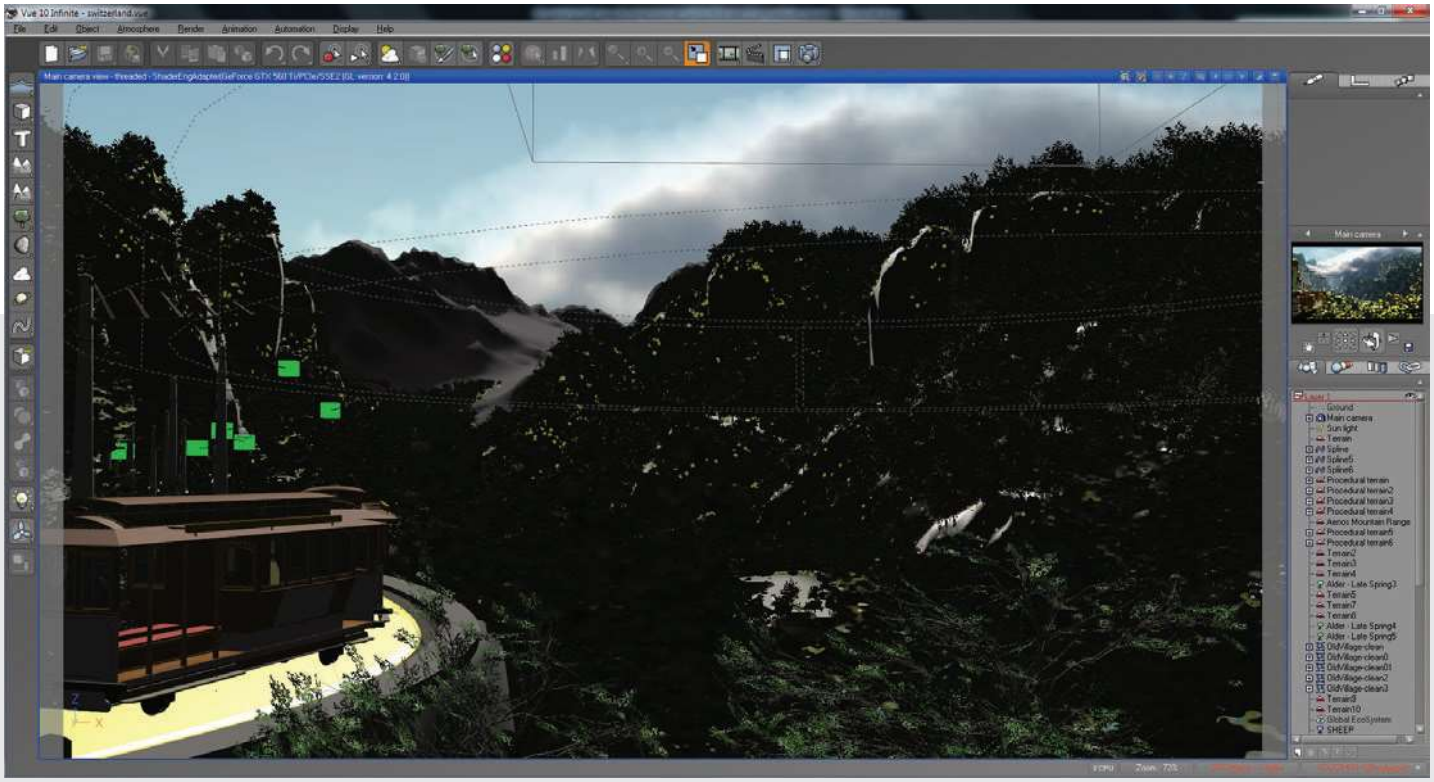
The picturesque Lauterbrunnen Valley in the heart of the Swiss Alps is a well-known destination and a perfect inspiration for landscape artists. The pictures online caught my eye right away, and I knew I just had to create a digital version. After some planning and improving skills, I gave it a try.

This landscape has everything I like: high peaks, steep cliffs, a nice valley with green pastures and lots of small, beautiful details. It was a great challenge.

The scene was created as a personal project, and it was a perfect practice for material and ecosystem tweaking, atmosphere and lighting, and – most importantly – achieving realism. In this tutorial I will cover all the important steps of creating this landscape in Vue 10 Infinite, including planning, terrain creation, material and ecosystem manipulation, use of the new Spline tool, adding details, render settings and a few steps in Photoshop as post production work. I will also share some general tips and tricks that help you bring the best out of your work in Vue.

Lauterbrunnen Valley in Switzerland; one of the great shots of the valley



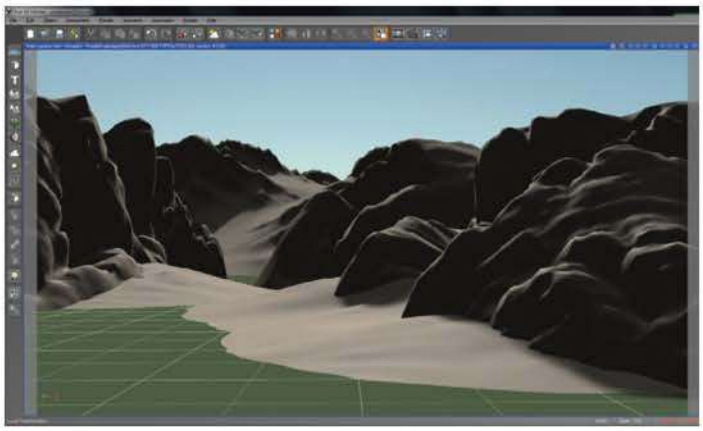


Smooth shaded main camera view of the full scene in Vue 10 Infinite. Shader 4 was enabled.

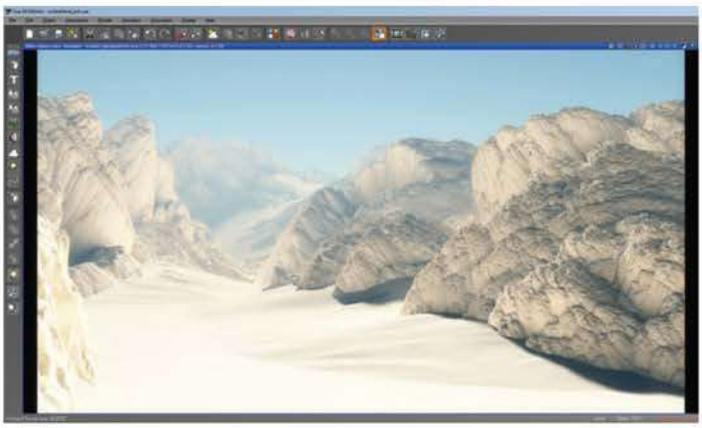
FINAL IMAGE – THE SWISS RIDE BY DREA HORVATH

PROJECT	SWISS RIDE
SOFTWARE USED	VUE 10 INFINITE
RENDERING TIME	14 HOURS
ARTIST	DREA HORVATH
COUNTRY	THE NETHERLANDS

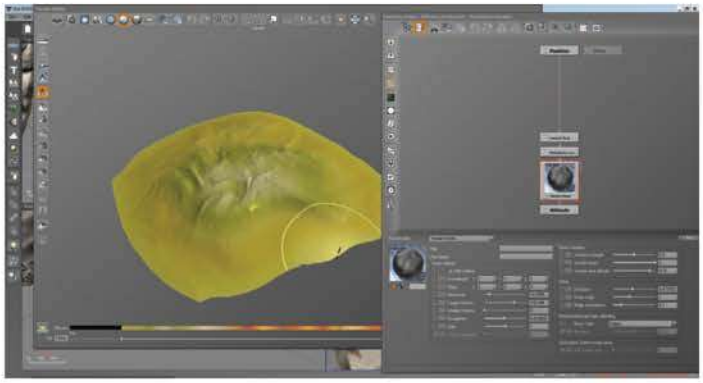
STEP 1 EXAMINING THE REFERENCE It's much easier to create a scene based on a reference image, so the first step was to pick out some shots of the scene to recreate. These shots served as a guide to help with the composition, choose the materials and ecosystem instances. They also suggested ideas for the small details that brought the image to life.



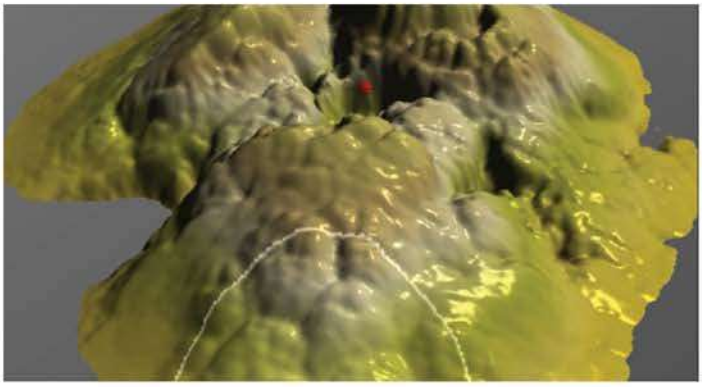
STEP 2 PLANNING BASED ON THE REFERENCE However, the goal in this case was not to make an exact copy of the photo, but one that was inspired by it. Initially the camera was positioned high off the ground and some terrains were placed into the scene as a basic composition to build upon. The terrains of the cliffs were tilted.



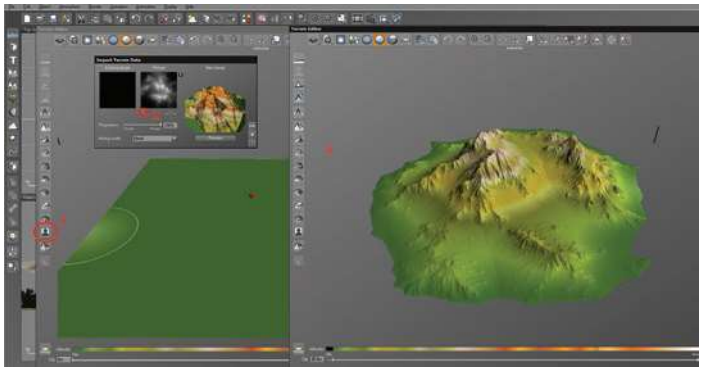
STEP 3 TYPES OF TERRAINS In this scene there were three types of terrains. The cliffs and the pastures were both procedural terrains with different types of fractals. The background mountain was a high-resolution standard terrain with imported height, flow and deposit maps. The extra terrains around the cliffs were standard terrains with a lower resolution. The following steps focus on these types of terrains and materials in detail.



STEP 4 TERRAINS OF THE PASTURES The procedural terrains of the pastures were the first thing to tackle. The height of the terrains in the viewport were lowered, then the Terrain editor was opened. The resolution was left at 256*256, then the function editor was opened, the fractal node selected and switched to Terrain fractal. The metascale was set to 15, then the sliders were adjusted until it produced a pleasing result. For more complexity the distortion value was set to 0.47.

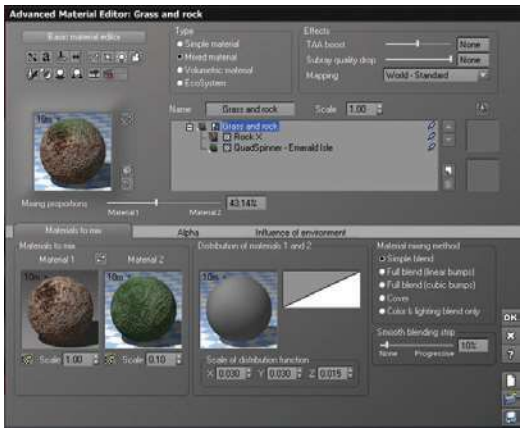


STEP 5 TERRAINS OF THE CLIFFS On the cliffs, a new feature in Vue 10 was applied; the cyclic fractal, in a combination with Voronoi noise. The wavelength was set to 5 on all axes, the metascale was set to a value between 1.4 and 1.5, and the sliders were adjusted until the terrain looked good and complex enough. To enhance the details, the canyon profile filter was loaded.

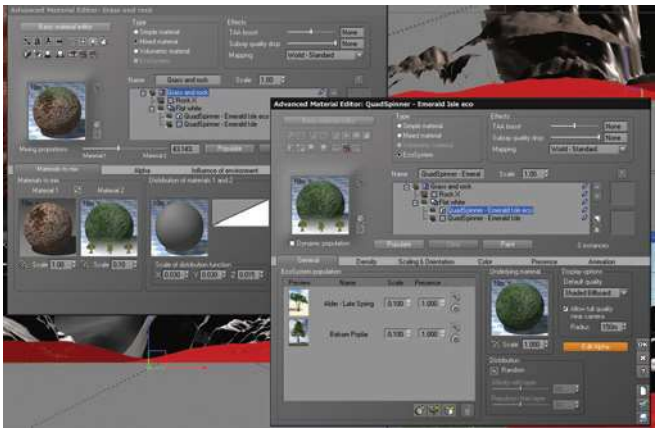


CREATING BACKGROUND MOUNTAINS

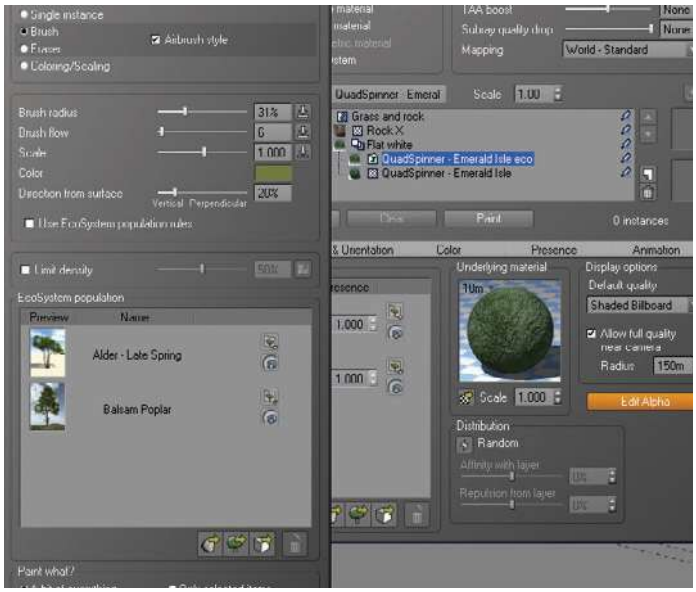
STEP 6 THE BACKGROUND MOUNTAIN For the background mountain the Aenos Mountain Range, a free product by my company, D&D Creations, was used. A standard (heightfield) terrain was loaded and its dimensions were increased to 5km*5km. Then the Terrain Editor was opened, the terrain reset and increased in resolution to 4096*4096. After that the terrain data importer was opened and loaded Aenos.tga, the height map of the terrain that comes with the pack. In the viewport the height of the mountain was lowered.



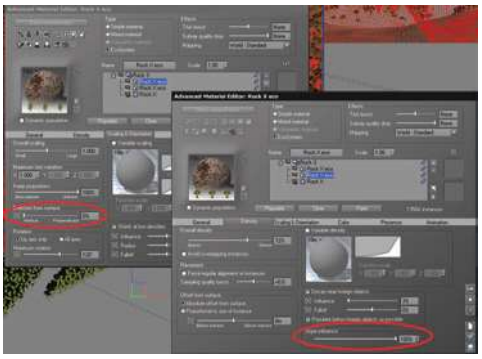
STEP 7 ADDING MATERIALS – PASTURES As a starting point for the pastures, the "Grass and Rock" material preset from Landscapes was loaded. The rock material was changed to Rock X from QuadSpinner's Master Trinity pack, and the grass to Emerald Isle from Grasslands, also from QuadSpinner. Some roughness was added in the function editor to enhance the details.



STEP 8 ECOSYSTEM – PASTURES The Ecosystem on the pastures was a simple single-layer system, which consisted of two tree species: Alder - Late Spring and Balsam Poplar from Incredible Lush Western Mountains pack. The grass material layer was selected and the trees loaded onto that. This Ecosystem didn't require further tweaking, because it was controlled with the EcoPainter.



STEP 9 USING THE ECOPAINTER Instead of populating the whole terrain with trees, the Ecosystem painter was used to paint random patches of trees onto the pastures, as you can see on the reference photo. By clicking on the Paint button, the EcoPainter was opened and, in the top view, painted with a scale of 1 and a low flow of 6.



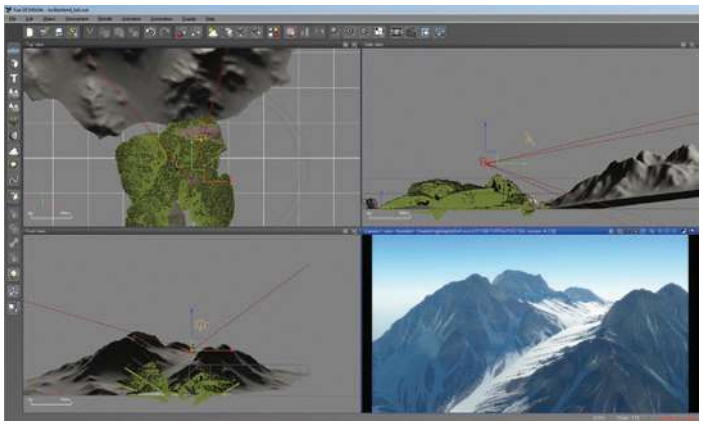
STEP 10 MATERIALS & ECOSYSTEM – CLIFFS For the cliffs QuadSpinner's Rock X was also selected for the rock material as it was perfect for that type of rock. The Ecosystem consisted of two layers; a dense layer of Alder - Late Spring (72% density) and a less dense layer of Balsam Poplar (56%). For both layers it was important to set the slope influence to 100%, so the instances didn't grow on very steep slopes. This added to the realism. The poplars' direction from surface was set to vertical (0%).

TOP TIP – THE ECOSYSTEM PAINTER

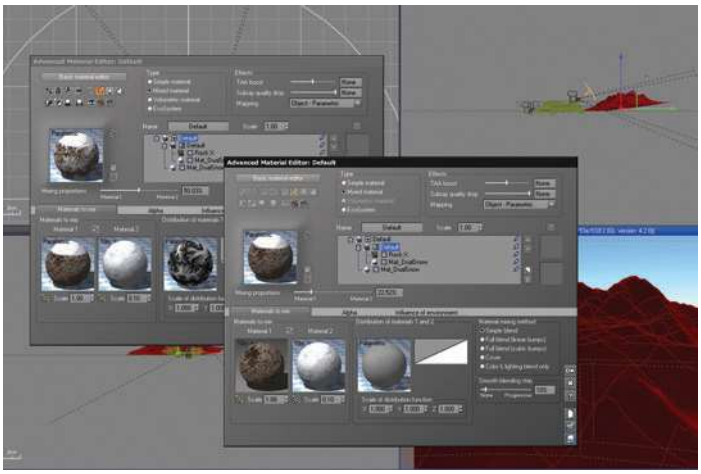
The Ecosystem Painter in Vue is a great tool for making Ecosystems with a determined shape. It gives you more control over the placement of the instances, and it can even be used for painting riversides of rocks without any complex terrain work.

DISTRIBUTING MATERIALS

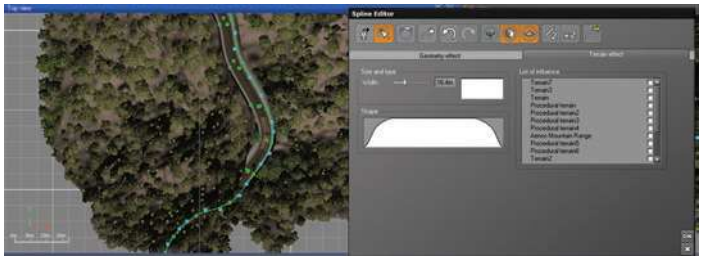
STEP 11 FORESTS AROUND THE CLIFFS As a transition between the cliffs and the pastures, some extra terrains were added with a simple ecosystem to the areas where the cliff terrains met the pastures. The Emerald Isle grass material was applied with a dense layer of Balsam Poplar trees on these terrains.



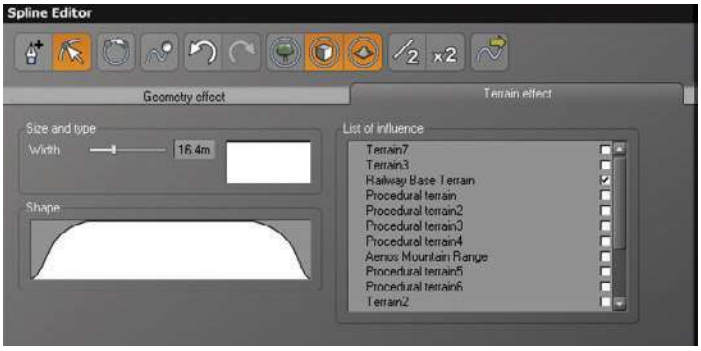
STEP 12 BACKGROUND TERRAIN MATERIAL DISTRIBUTION Besides a height map, Aenos Mountain Range comes with a flowmap, a wear map and a deposit map as well. For the material distribution a flow map was ued. In the material editor the Mixed Material was select, and first both materials were highlighted in order to see the distribution clearly. Then the function editor of the material distribution was used, connected a texture map and loaded with the flow map. The mixing proportion was set to 50.03%.



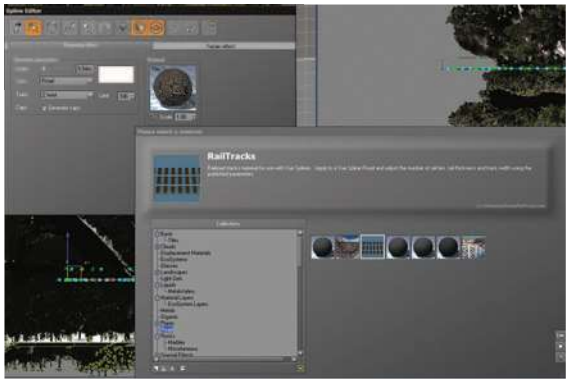
STEP 13 BACKGROUND TERRAIN MATERIALS For the first material Rock X was loaded, and for the second material, DualSnow from "Rock My World". Since some snow was needed for the tops of the mountains as well, the rock was turned into a mixed material, loaded with the same snow material as the second material, and set with the mixing proportions of 22.52%.



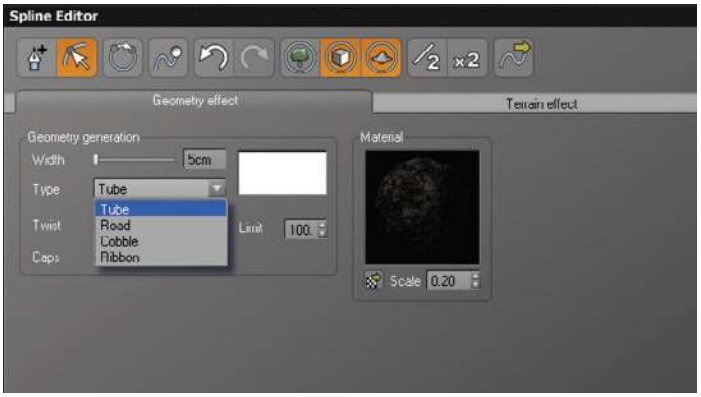
STEP 14 FOREGROUND – THE SPLINE TOOL In this scene another new feature in Vue 10 – the Spline tool – was used. The splines are created by defined points and their connections form the shape of the spline. With Vue 10's spline materials you can create roads, railways, ecosystem effects, terrain effects and objects. In this railway there were four splines and one spline-driven terrain.



STEP 15 RAILWAY BASE SPLINE For the base of the railway a simple road spline was needed that gave the shape of the railway, and a terrain that was influenced by that spline. So, a standard terrain was loaded and the resolution increased in the terrain editor to 512*512. Then reset was clicked on. Then the Spline tool was selected and some points were randomly added onto the terrain, then lifted up from the ground. Lastly, the Spline editor was selected, then the Terrain Effect tab, and the base terrain was picked from the list.

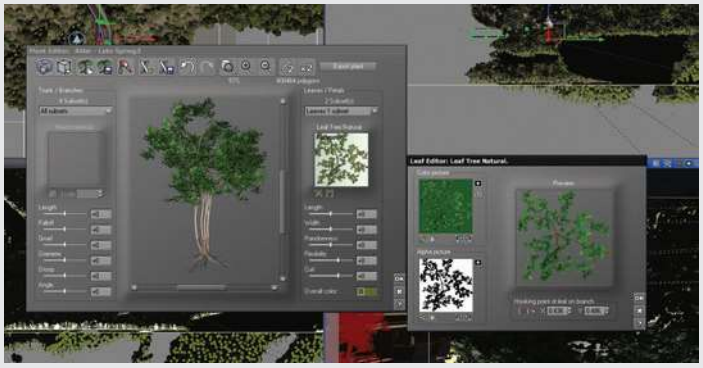


STEP 16 RAILWAY CONTINUED With the terrain effect enabled, the terrain's shape was adjusted to the spline. In the Geometry tab the width was set to 5.54m. It was important to adjust the terrain shape in a wider range, so the width in the Terrain Effect tab was set to 16.4m. For adding the railway, all that was needed was to duplicate the spline and load the railway material from Vue's spline (Road) materials.



STEP 17 MORE SPLINES I decided to add some edges right next to the railway track. The Spline tool was perfect for this too. Basically, the railway's spline was duplicated and the material and the parameters changed. The type was changed to Cobble, and the width to 1.3m. Then this spline was duplicated again, and the points adjusted to the railway track. The screenshot shows how the splines looked together as a railway.

STEP 18 TRAIN & ELEMENTS While the railway track was being built, it was time to add a train and elements such as poles and wires. The train was a free item from 3D Warehouse, and the poles were from a Railway Pack from Cornucopia3D. For the wires splines were also used; the type was switched to Tube with a few centimetres as the diameter.

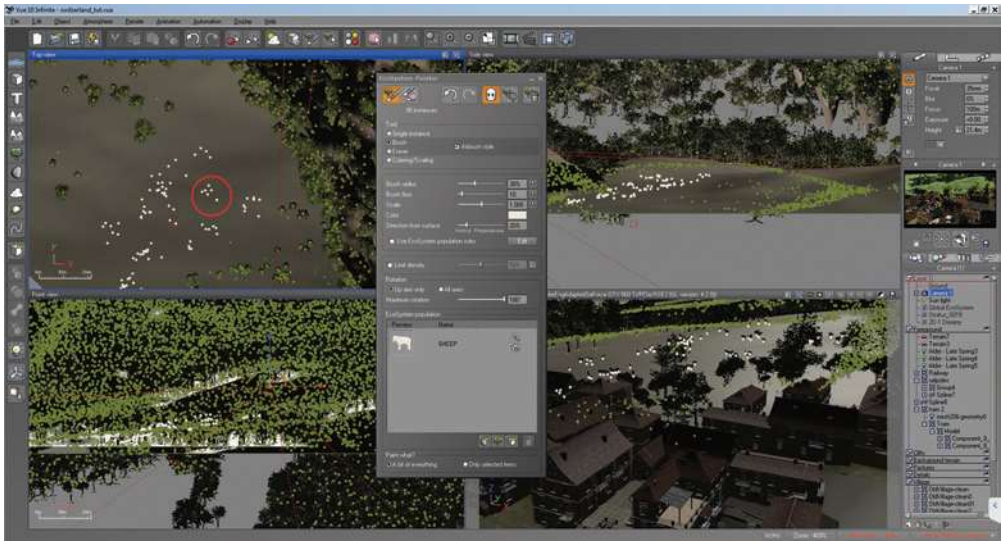


STEP 19 FOREGROUND DETAILS The foreground in this scene is not complicated; some smaller terrains were used around the railway with a single layer of Balsam Poplar ecosystem. Some Alder trees were also placed closer to the camera. Since they were HD trees, they could look good in the foreground as well, although it was important to make sure that the hooking points of the leaves met the branches.

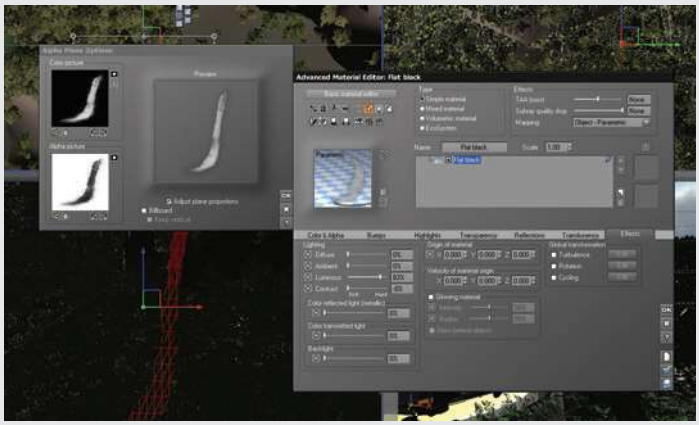
TOP TIP – HOOKING POINTS OF SOLID GROWTH PLANTS

Vue comes with lots of nice plants, but they might have a minor issue: the leaves are floating, because the hooking points of the leaves are not attached to the branches. To fix this, go to the plant editor, click on the small leaf button on the right under the image, and move the red hooking point to its place.

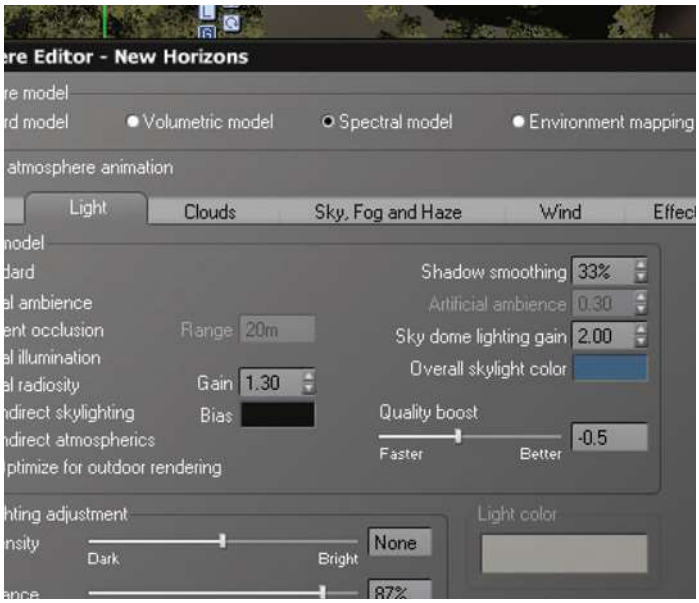
STEP 20 SMALL DETAILS – VILLAGE To add some details to the valley, some houses were placed onto the pasture terrains, just visible through the foreground trees. "Old Village" from RealMesh at Cornucopia3D was a perfect choice with its multiple houses and small, detailed streets.



STEP 21 NO PASTURE WITHOUT SHEEP Those fresh green pastures looked nice but would be better if they had some sheep on them. A sheep herd was added as a global Ecosystem. A low-poly sheep model was loaded, the maximum rotation set to 180 degrees and then they were painted onto the meadow.



STEP 22 ALPHA PLANE WATERFALL The waterfall in the scene was a 2D alpha plane. Some really nice alpha images of waterfalls can be found on the internet. One of them was loaded as both colour and alpha picture, with the alpha then being reversed. The Material editor was opened and, in the Effects tab, the Luminous lighting option was set to 83% and all the other options to 0%.

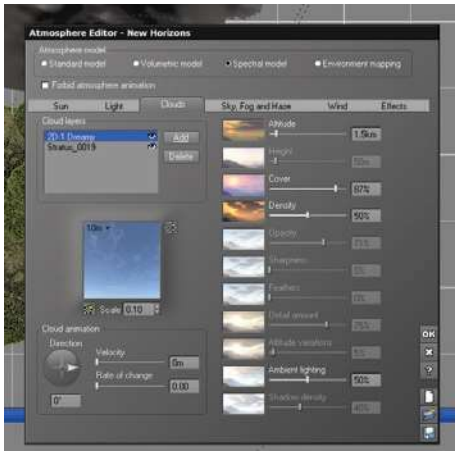


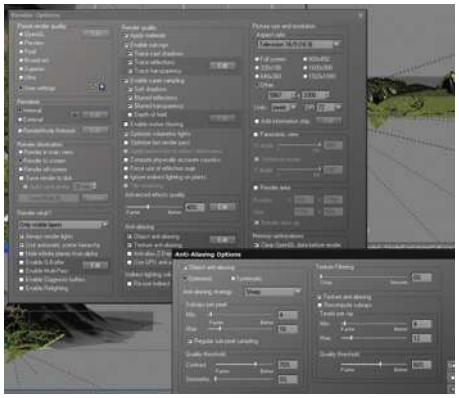
STEP 23 ATMOSPHERE – LIGHTING As a starting point in the atmosphere, the atmosphere called "New Horizons" from the Spectral Atmosphere Pack Vol.1 by D&D Creations was used. This atmosphere's purpose was to achieve realistic lighting, based on the Global Radiosity lighting model. The light balance was pulled way towards more sunlight (87%) and less ambient light, and the Bias color was set to a dark green tone for the more natural look. The screenshot shows all the lighting settings.

STEP 24 ADDING CLOUDS – ASCENDING FOG The scene had two layers of clouds; a high-altitude sparse cirrostratus layer and a low-altitude ascending fog layer, covering a part of the cliffs. For this layer "Stratus_19" from AsileFX's free sample cloud pack was used as a starting point. The screenshot shows the settings; the height and feather amount were increased, and altitude and the density were decreased. Since it was needed to cover the whole sky, Localized cloud layer was enabled and the circle was expanded to the valley area.

TOP TIP – INCREASING RENDER SPEED

If your computer is low on resources and you expect longer render times, you can decrease the sky dome quality boost to -0.5 or even to -1.
This speeds up the render process.



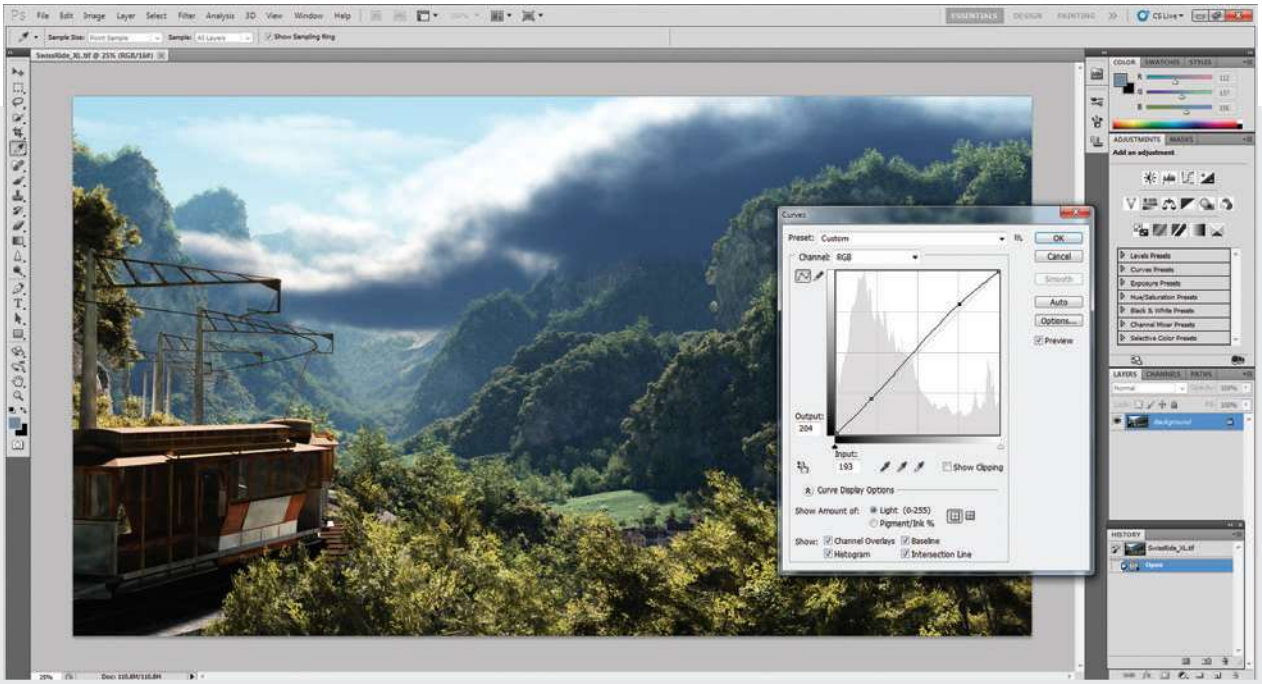


STEP 25 ADDING CLOUDS - CIRROSTRATUS For the high-altitude cirrus "Dreamy" was used from the fantastic 2D cloud pack "White Magic" from Dick Scherzinger. These 2D clouds are not realistic, but since they don't require as many complex calculations as regular 3D clouds, they render really fast as well.

STEP 26 SKY, FOG & HAZE Besides the Lighting, this tab had the key role in achieving a realistic atmosphere. For a natural atmosphere the best option was to set a very dark blue haze colour and keep its ground density at a low (10%) value. For adding depth the Aerial Perspective was increased to 5.81, and the quality set to +2.

STEP 27 RENDER SETTINGS & RENDERING It may sound surprising, but the custom render settings used for this scene were based on the Final preset. The Advanced Effects quality was decreased to 40%, and depth-of-field was not needed, so it was disabled. The key to a good-looking render is the right Anti-Aliasing (AA) settings; with the Sharp AA strategy the settings used were the following: minimum 4, maximum 16 subrays per pixel at 70% quality and minimum 4, maximum 12 texels per ray at 60%. The scene was rendered in 14 hours, at 5867*3300px resolution.

STEP 28 POSTWORKING IN PHOTOSHOP When the render was done, it was loaded into Photoshop to make some minor corrections. To enhance the realism, the green colours were desaturated a little, there were some corrections with colour (midtones towards blue), and Levels and Curve settings (Image > Adjustments). To add some extra details, a new layer was created and a little fog added down in the valley with some cloud and fog brushes.

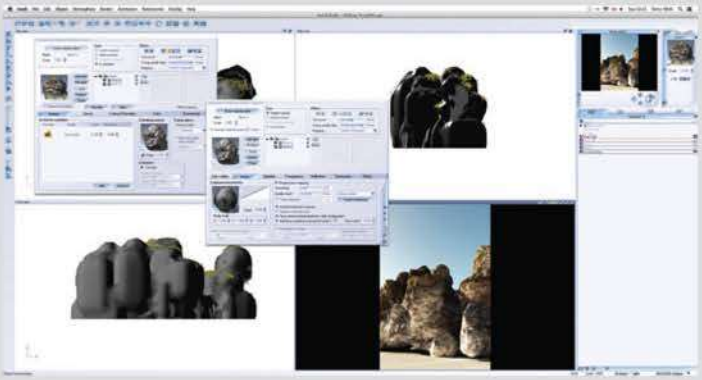


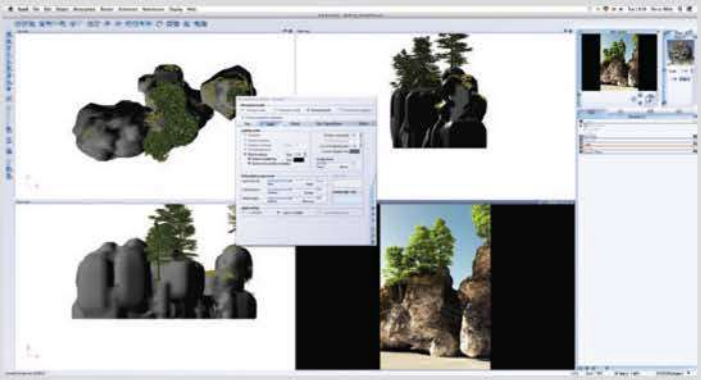
TOP TIP – GETTING THE RENDER QUALITY RIGHT

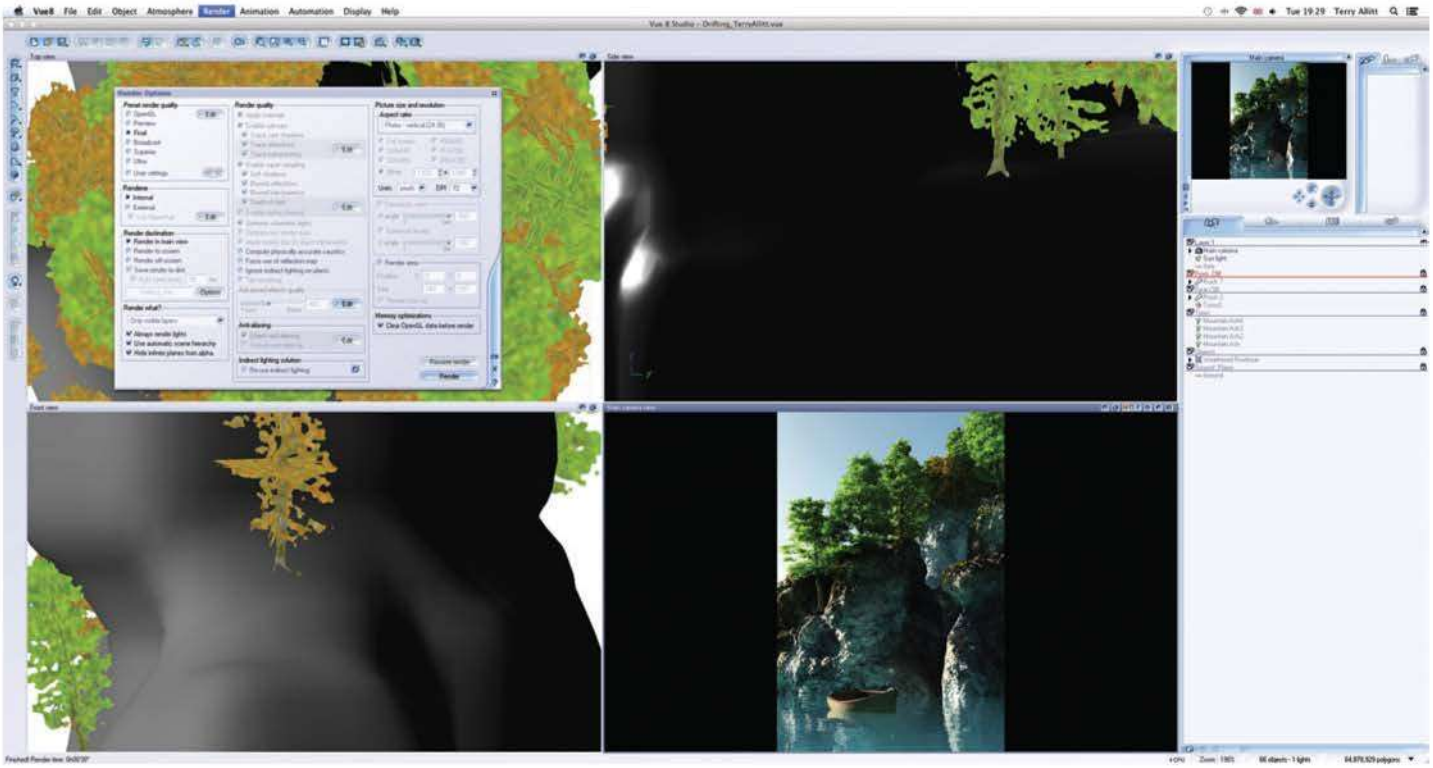
If you want to render good quality images in shorter time, you need to follow a golden rule: if the render doesn't look good enough in your preview, it won't look good after the final render either. If the preview render is too noisy due to low atmosphere quality settings, there is hardly any chance to get the noise completely removed, even using high Anti-Aliasing settings. If the bump is too strong on your foreground plants, no render settings will change that. Sometimes even a small change like repositioning the sun can fix issues, but before starting a render, you need to fix these little things in your scene. This way you need less AA boost, and your render will be done faster.

THE SWISS RIDE BY DREA HORVATH

CREATED IN VUE 10 RENDER TIME 14 HOURS

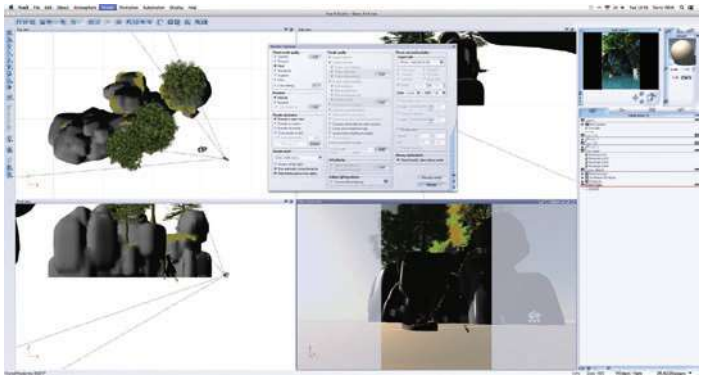


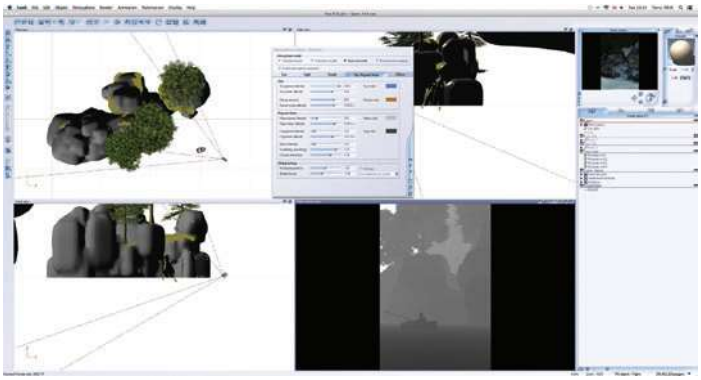


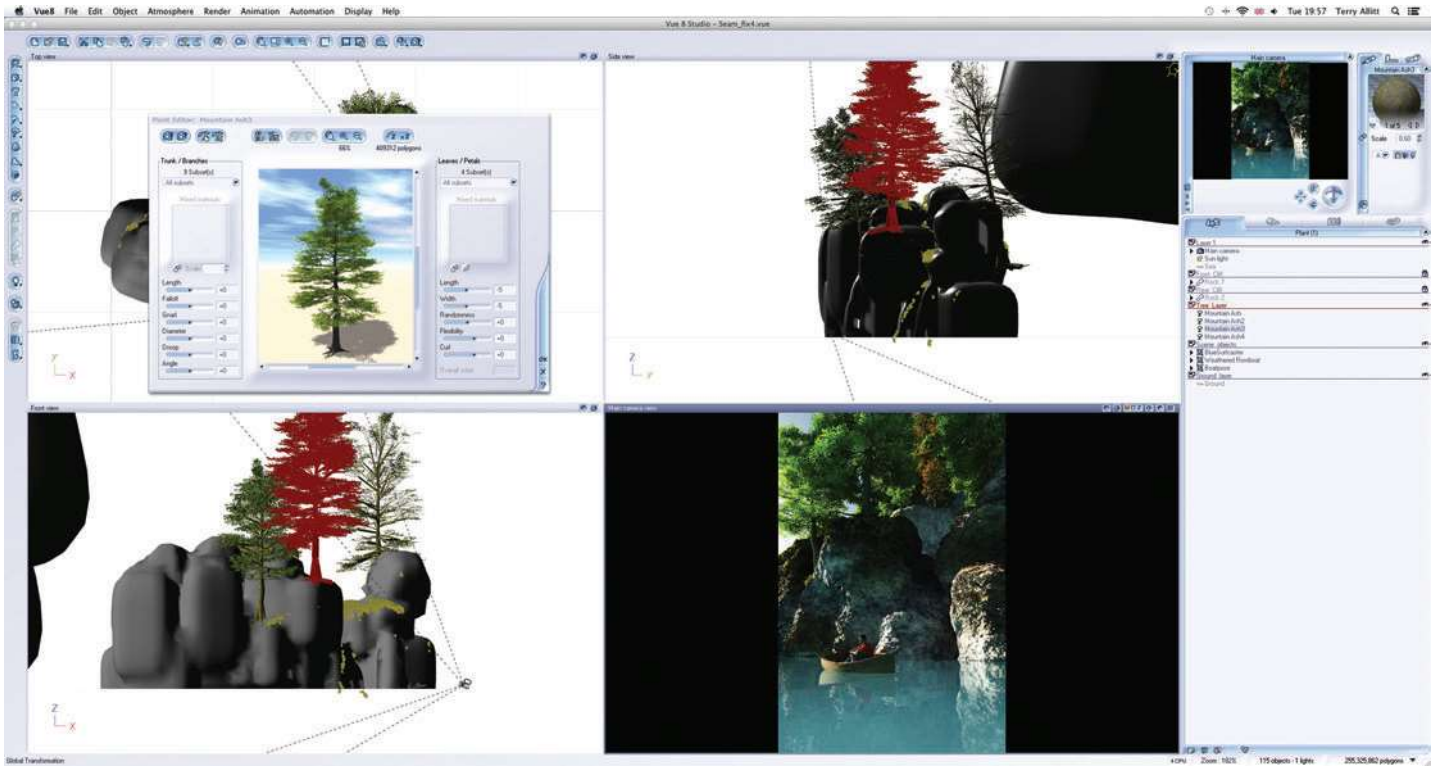


PROJECT	DRIFTING 2
SOFTWARE USED	VUE 8 STUDIO, POSER 8
RENDERING TIME	6 HOURS
ARTIST	TERRY M. ALLITT
COUNTRY	UNITED KINGDOM

“After creating an earlier version of this image without any characters in it, I decided to give the picture a broader appeal. Using Vue’s ability to move around the 3D landscape, I adjusted the camera settings so it focused in towards the boat. I imported a figure I created in Poser 8 and positioned him so that his thoughts were drifting, as well as the boat.”

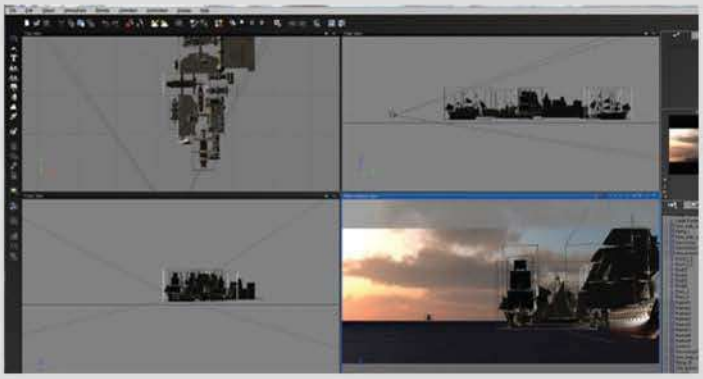






"I don't usually create images in a medieval style but I had an idea for a harbour picture using old sailing ships. I duplicated and positioned many ships to fill the harbour up so it didn't look empty.

For extra interest I added another ship, but this time at sea that's heading in. The camera angle was set low to give the viewpoint of someone on a small boat, heading out to one of the ships or just rowing around the harbour. The smooth lighting was created with a low sun angle and shadows that were soft. The scene uses spectral lighting for more accurate light tracing. The rays of sunlight were automatically generated with some appropriate atmosphere settings for thick, high clouds."



PROJECT	ANNO 1712
SOFTWARE USED	VUE8 XSTREAM
RENDERING TIME	4 HOURS
ARTIST	SYLVAIN CHEVALLIER
COUNTRY	FRANCE

POPULATING AN UNDERSEA WORLD

Paul Nicholls of FactoryFifteen explains how to fill up a dense, object-filled underwater scene complete with VRay rendering and a huge Photoshop composition.

THE STORY OF JONAH

Jonah is a film set in the fishing town of Zanzibar about a changing man in a changing town. Aggressive tourism sparked by Jonah's discovery of the world's biggest fish has caused the town and himself to change beyond recognition. The town is now a glowing, tacky, money-making, wildly opportunistic beach resort, which has abandoned its original fishing roots. As an old man Jonah is ashamed of what his old fishing town has become and decides to hunt down the legendary fish and kill it, killing what it represents.

After the artwork was actually completed, a follower on Twitter pointed out the resemblance of the city to a film and artwork series called Tekkonkinkreet. It's not a direct reference since we'd already finished, but you can draw parallels from this. Check out the trailer here: http://www.youtube.com/watch?v=lWOCf1wNlk0

Jonah was written by Jack Thorne and produced by Ivana MacKinnon. It was made in partnership with Film4, BFI, Channel4, Shine Films, Rubedo Studio and Warren Holder. This is the promotional poster for the film, produced by, and copyright of Factory Fifteen.

PROJECT	JONAH
SOFTWARE USED	3DS MAX, ZBRUSH, VRAY, RAYFIRE, PHOTOSHOP, AFTEREFFECTS
RENDERING TIME	VARIOUS ELEMENTS WERE RENDERED SEPARATELY AND COMPOSITED.
ARTIST	PAUL NICHOLLS, FACTORYFIFTEEN
COUNTRY	UNITED KINGDOM

This is a useful reference for the style of the city. It's a film and artwork series called Tekkonkinkreet.

TOP TIP – SCATTERING OBJECTS

Rather than create and place lots of individual elements, use the PhysX scatter simulation in 3ds Max to do the hard work for you.

MODELLING AND PAINTING

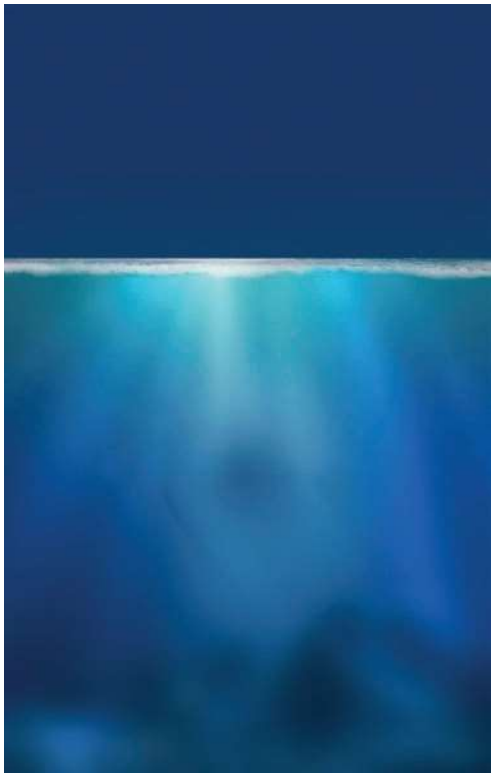
Everything in the image was custom made, which was no small task, so we split the town and the underwater up between two of us and started to build assets. These assets were to be used in a whole series of artwork for the project, not just this one image. The town models took inspiration from places like Shanghai and Tokyo to create an intense array of fish-related signs and models. Some of these were holographic and animated. They were created with basic modelling and texturing in 3ds Max for the most part, with a select few hologram models created with p-flow, Krakatoa and Frost.

The underwater elements were largely created in ZBrush, sometimes from the beginning and sometimes from a basic model in Max. All texturing of the rocks and boats were created in ZBrush. One thing which worked quite well was painting custom scatter maps on the rocks and boats and then using multi-scatter to scatter coral and grass on them. It added a lot of extra detail and covered the less worked up areas of the model or textured areas.

The overall background started as a painting in Photoshop so that there was a general scene to create the composition with. This was built up with extra layers to show light coming through the surface of the water.

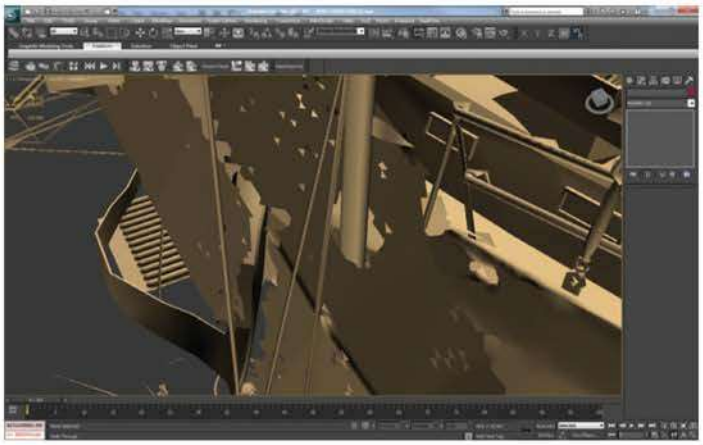
3ds Max was used to assemble the basic ship formations. Some stock models were used but they were edited heavily, adding lots of other elements to them like cars and bits of broken metal and wood. I made the model single sided with no thickness in many places as this, when brought into ZBrush, can create great rust effects. In ZBrush they have a new feature called Dynomesh. It allows you to essentially re-topologise the mesh evenly but it also blends parts together. What this does to single sided faces is add lots of tiny holes to create a very realistic rust effect. One of the other features of using ZBrush was to use Z-Spheres to create objects like the coral. You can see a video of the kind of technique used for that here: http://www.youtube.com/watch?v=6gMwK1T-c9A

This image was constructed from a pretty huge collection of custom-made models and textures and they were used to create a variety of imagery. I will attempt to go through the fundamental elements of the image's construction including modelling and texturing and post production. I'm not going to talk much about lighting as it was all pretty basic, HDRI setup using CG-skies and an underwater HDRI pack. That involved loading the HDRIs into the VRay HDRI loader. I knew a lot of work would be done in post production so I wasn't too precious with the raw render and everything was saved out to EXR 32-bit. ZBrush was used for much of the modelling and texturing so hopefully seeing how it was used will be more interesting than the bog-standard render settings.



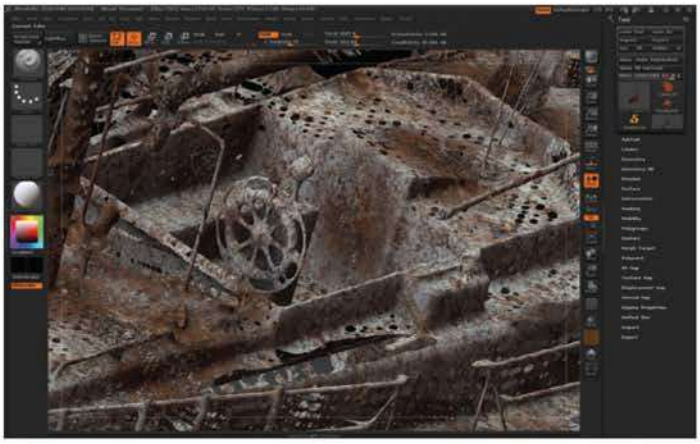
The basic scene as painted in Photoshop with extra layers adding light streaks from the surface.

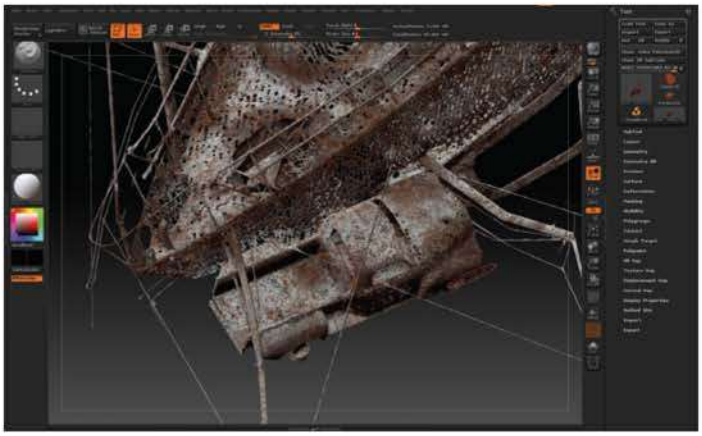
Very detailed textured models were created of sunken ships using both Max and ZBrush.



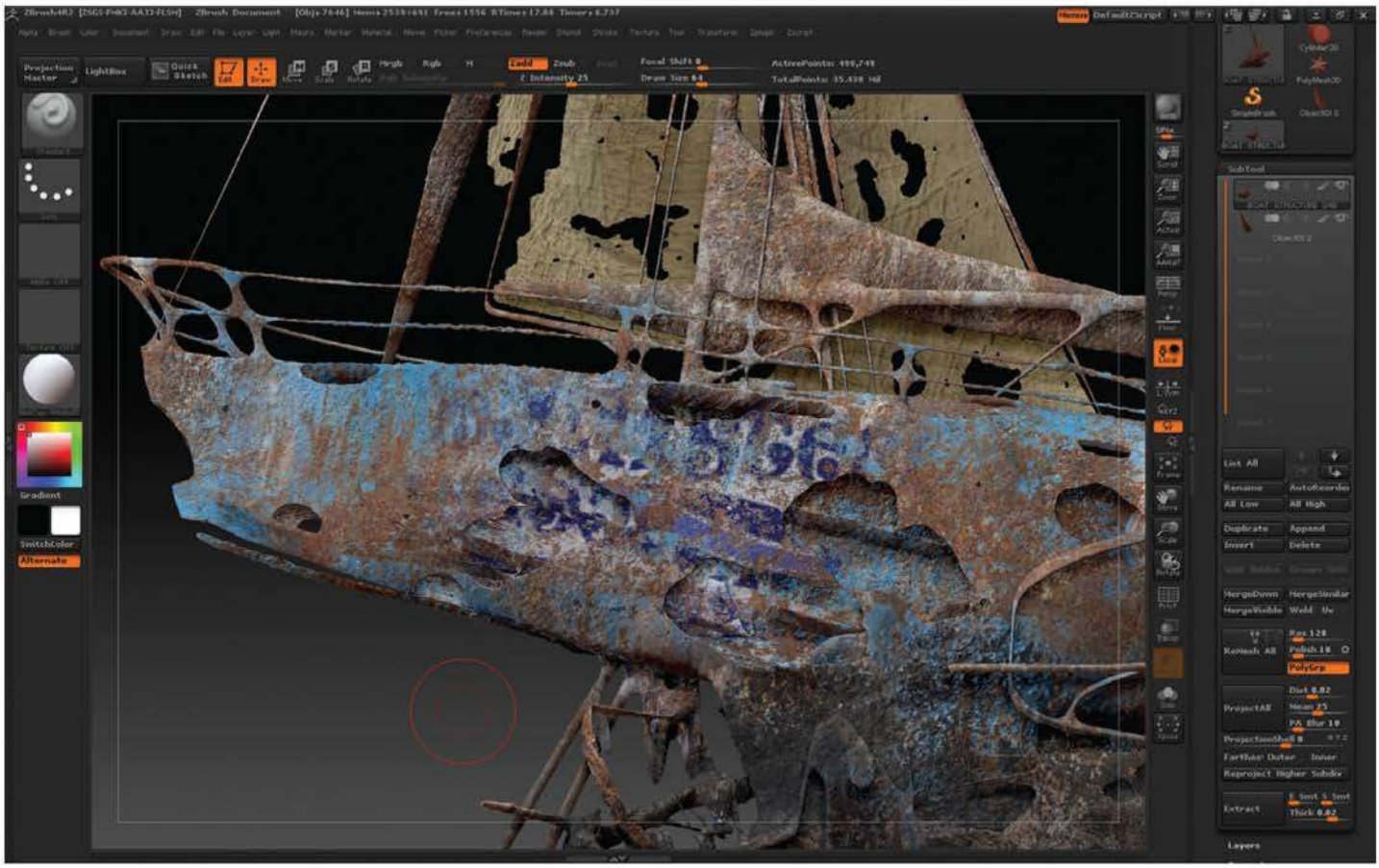
I carved up the model in places to create a decayed old rusted look. Here in Max it is just deleting polys from the model; the effect comes in ZBrush.

The rocks were made completely in ZBrush using Z-Spheres and sculpted from there.



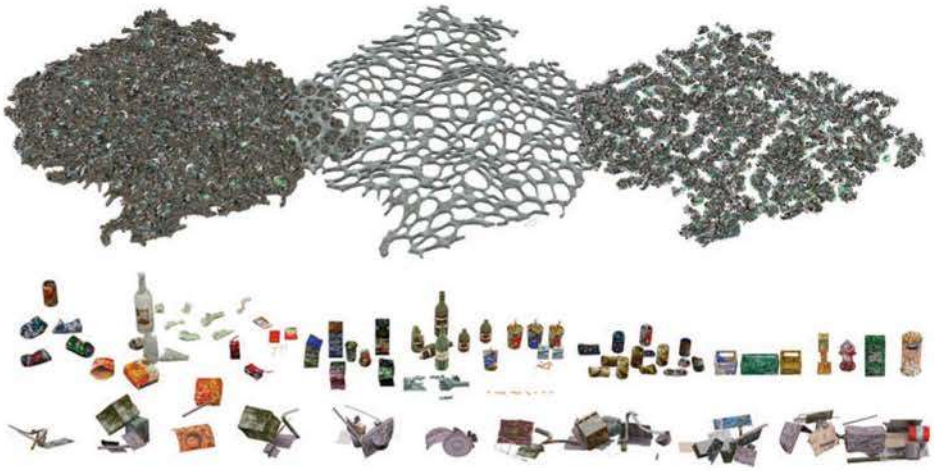


Detail of rust and welded car. By using the specific modelling techniques in Max and ZBrush you can see all the rusty holes.



Another boat in the middle of painting on the details using ZBrush. The same technique was used for anything that needed to look rusty.

Rubbish was modelled to create all the kinds of things you see being dumped in the ocean. It was dropped in piles using PhysX by nVidia.

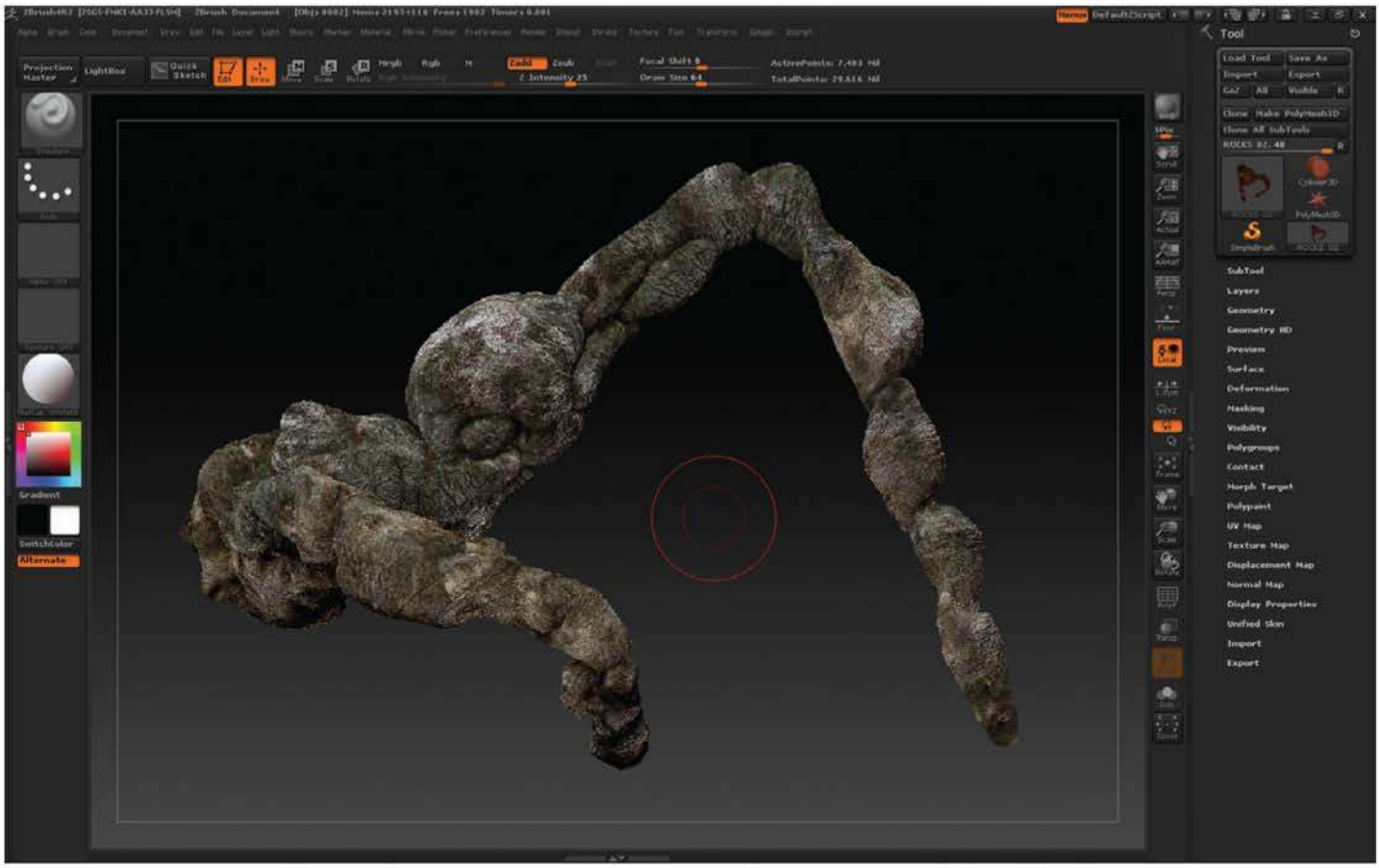


Here's how the rubbish was scattered on the ground and the pieces of garbage used to populate it.

Lots of simple coral shapes were modelled and then the same scattering process was used to populate the sea bed.

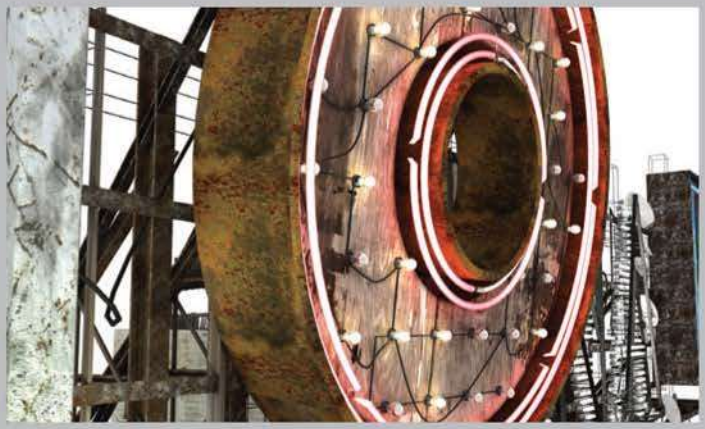
Here's a painted ZBrush model of a coral growth. Making the models for these was both easy and quick.

These are some of the models made for the town, including buildings, TV aerials and signs.



One of the main models was a sign with the title JONAH itself. Some other ones feature here as well.

One of the main models was a sign with the title JONAH itself. Some other ones feature here as well.



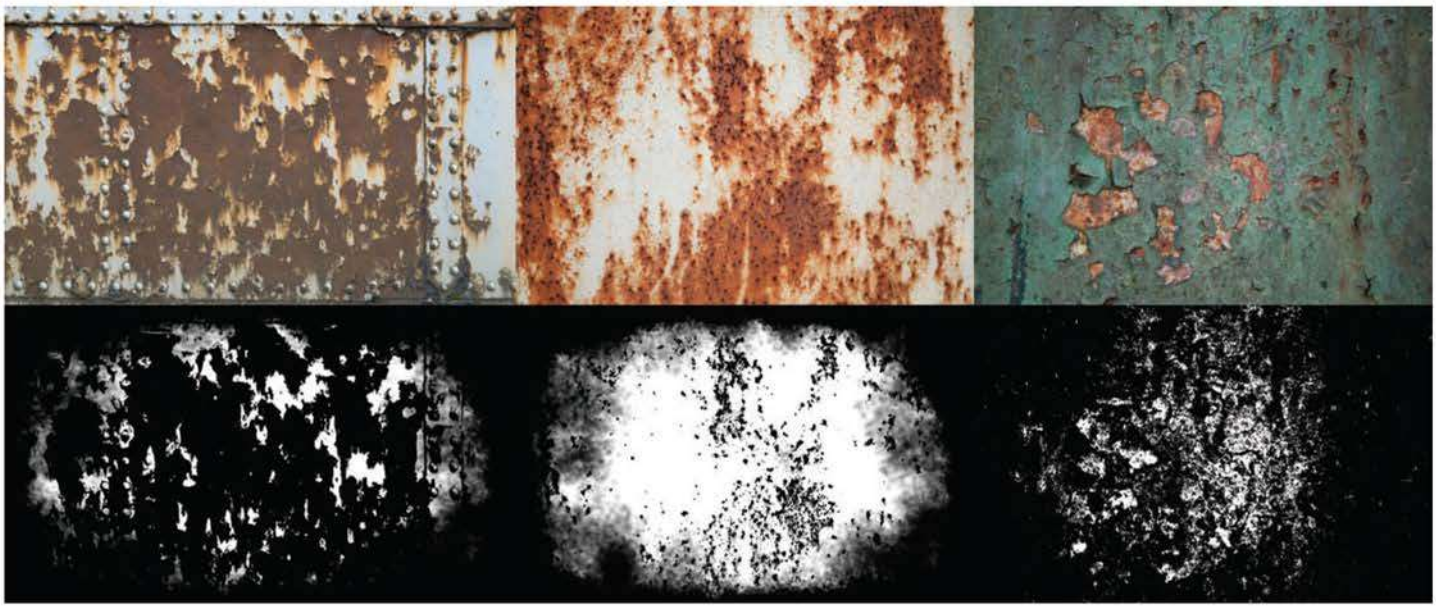
A lot of fun was had creating and designing a ton of crazy fish-related signs that were used around the town.

Sometimes it's just easier and quicker to use stock images like these ones used for splashes.

Stock images used for bubbles. Also, custom bubble brushes were created in Photoshop and bubble trails painted.

CREATING TEXTURES AND MAPS

ZBrush was used for all organic and boat texturing, exporting the diffuse, normals and displacement maps to be then used in VRay. The obvious effect was to create a weathered, aged feel to both the town assets and the underwater elements. We gathered a whole heap of grunge textures and reference photography for how stuff ages underwater, particularly metal. It was quite fun finding old sunken boats and trying to replicate that effect. When the geometry on a model was too complex to unwrap properly we exported PUV tiled maps. These are actually very efficient maps as they used most of the 8000 * 8000 square space possible. ZBrush creates texture co-ordinates for every square of the model so it remembers where each section goes.

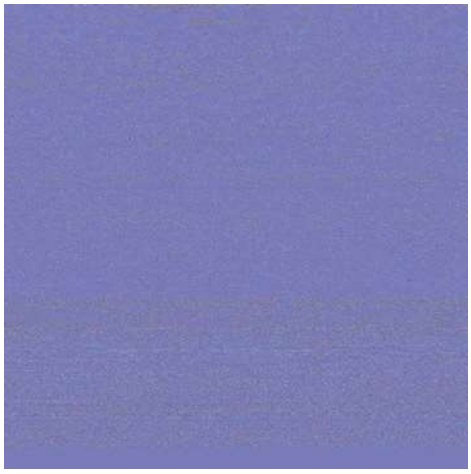


These were some of the textures used to map the boats. A mask was created from the map to paint displacement at the same time.

These ragged cloth fragments are an exported, unwrapped texture map of the sails.

The same item, this time it's an exported opacity map for the sails that has been painted separately.

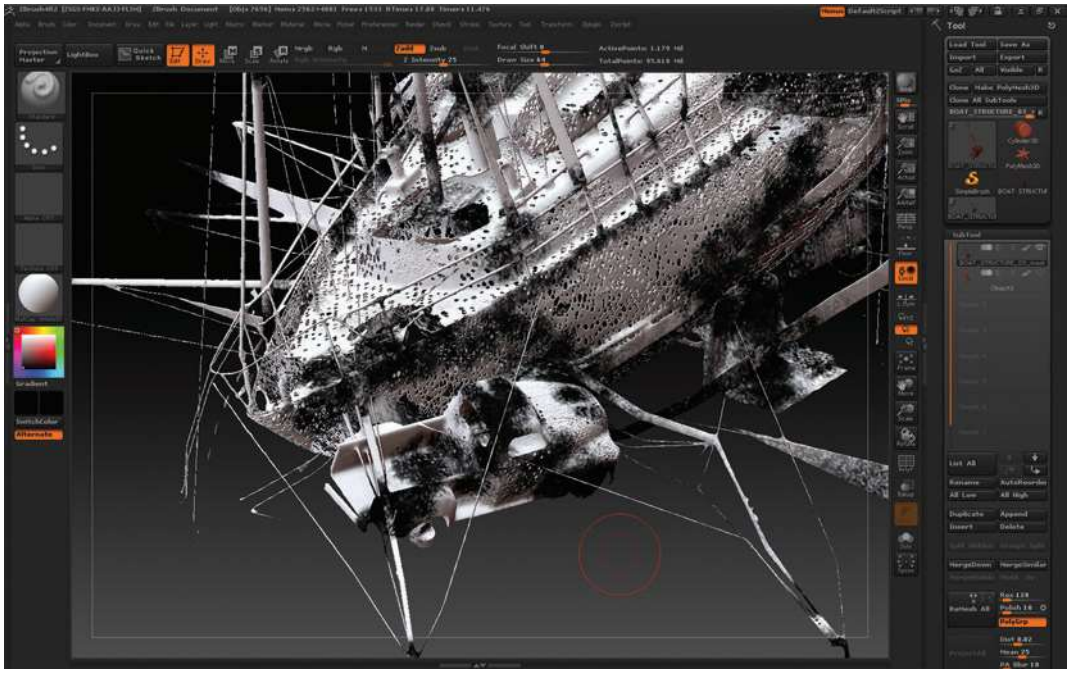
Here's an exported map for a smaller boat. Unlike the big objects these are relatively straightforward to unwrap.



Exported PUV Tiled map. This kind of map is exported when the geometry is too complex to unwrap properly.

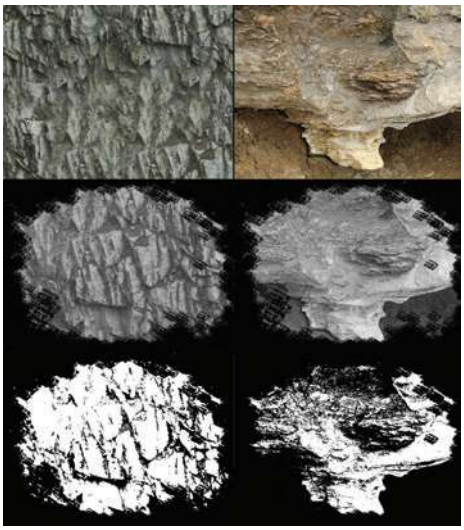
A normal map which was created to be used as a bump map in 3ds Max to add some surface relief detail.

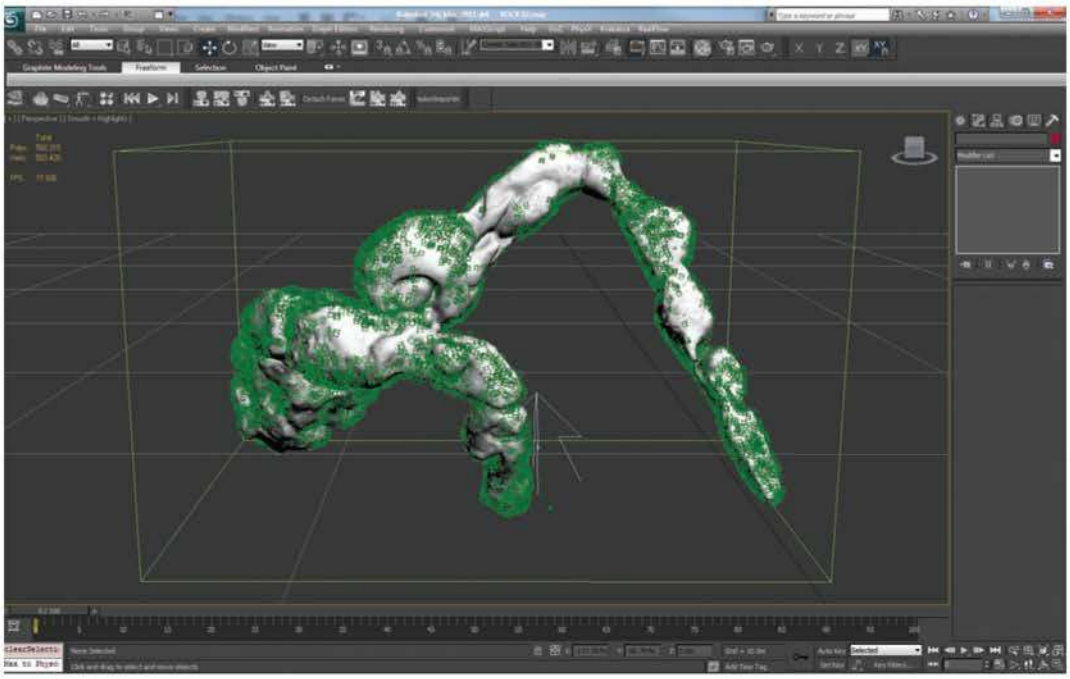
I wanted to scatter both coral and grasses onto the models so I painted a separate black and white mask to be used by multi-scatter.



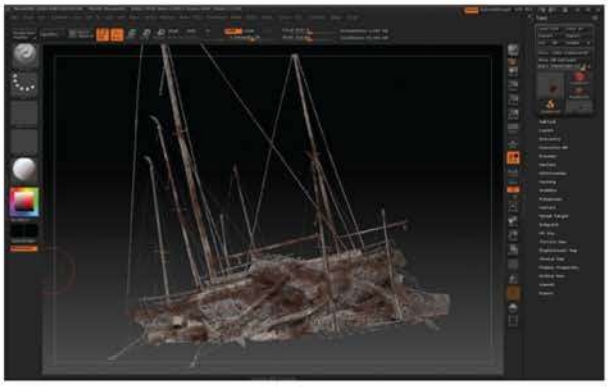
The result of the multi-scattered grass on the textured boat. It made for an effective technique for adding underwater detail.

This is where we created brushes in ZBrush by importing Texture maps to paint with.

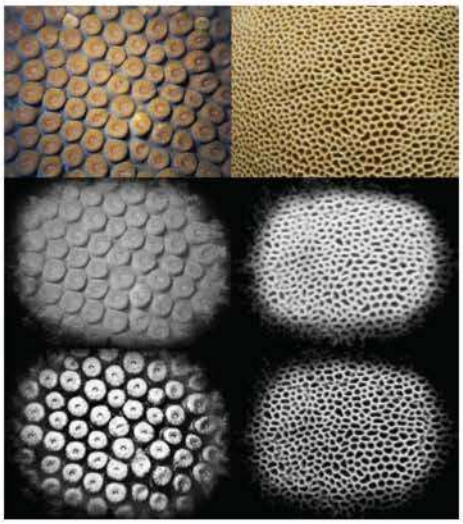




One of the strands of coral. This shows how Multiscatter was used to scatter grass and coral along rocks using the painted mask.



This is the final, textured, boat in ZBrush complete with rust, holes and debris.



Having modelled the coral trees, these were some of the textures used to map them.

Not some kind of alien, but the unwrapped texture of one of the coral models.

This map was painted in Photoshop and then used with the Multiscatter function as a template for where the rubbish should be scattered.

LIGHTING THE UNDERWATER

As this image uses two completely different environments seen in cross-section through the water, four different lighting setups were needed. There's one for the town, one for the water, one for the rubbish under the water's surface and one for the bottom of the sea. Each setup had a dome light with a HDRI and a sun light roughly in the right place as the hotspot of the HDRI.

We got our HDRIs from the CGSkies website which has simply the best resource for HDRIs on the net. We bought an underwater HDRI collection for lighting the underwater. The artwork for this project was created in the spring of 2012, we then went to Zanzibar in June to actually shoot the short film with a small crew and we captured our own HDRIs in all the locations we shot in. We are using these for the visual effects in the movie, which we are currently finishing.

In some scenes I actually created a water surface above the model to create natural caustics and in others I used the caustics generator (http://www.dualheights.se/caustics/) to project the effect through a light. In most cases I just used the basic underwater HDRI for the underwater part.

RENDERING AND COMPOSITING

All of the render setups were set as true linear workflow gamma 2.2, rendered in VRay using irradiance map and light caches as the Global Illumination and Linear Multiply for the colour mapping. The displacement settings were optimised using the VRay displacement modifier and the usual passes were rendered out. Everything was rendered separately and composited in a huge 10k comp in Photoshop.

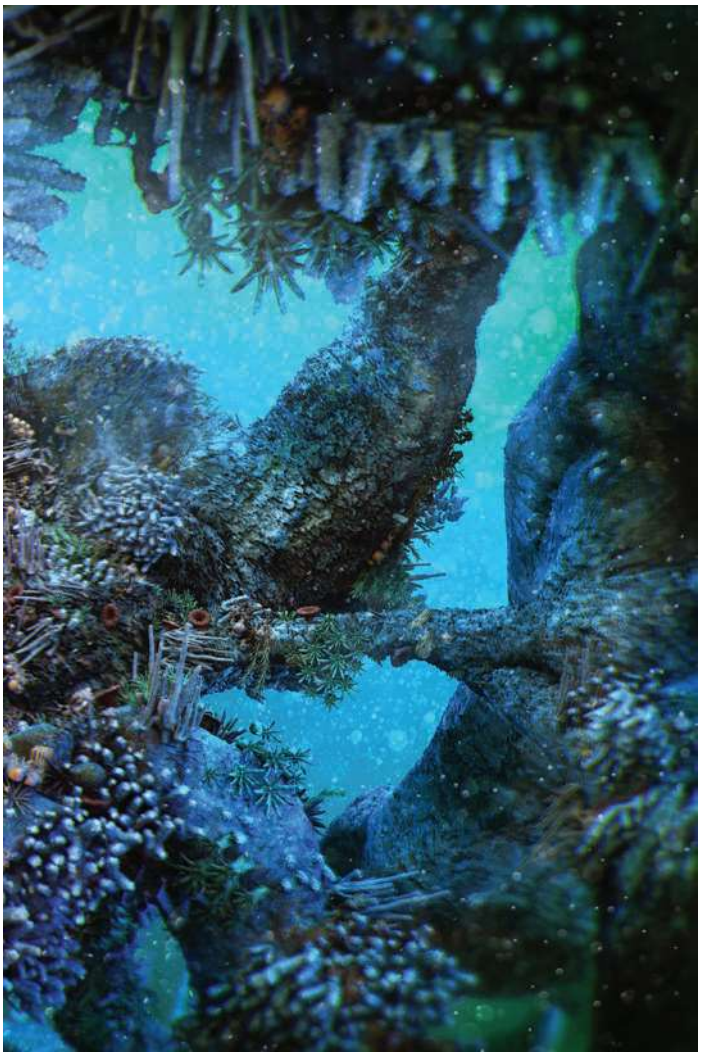
Firstly all the underwater elements were added together and colour corrected. Then the above-water items were added and the original sky from the reference photo was replaced. The tacky sign-filled town was added near the end. The raw render was actually made for a separate image of the town but it was quicker to incorporate into this image rather than re-positioning and rendering again. I cloned and changed the render to fit the panorama later on.

This was a typical underwater HDRI that was used for lighting the scene.

Raw render of the sunken boats and rock structures, surrounded by sunken rubbish.

A section of what the rubbish looked like after rendering and post work was finished.

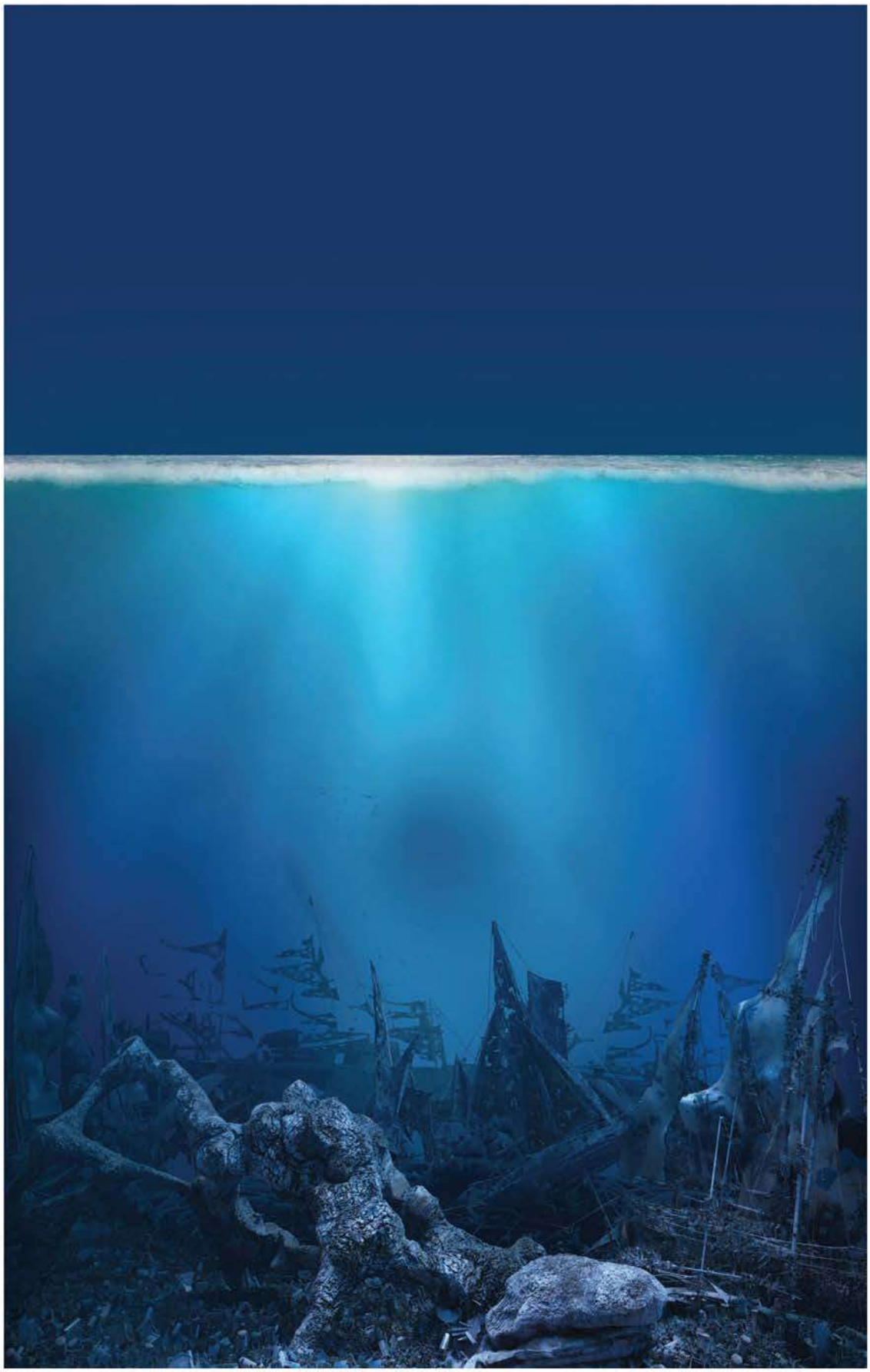
A section of render for the scattered grass after post production. The undersea effect is quite pronounced now.



Here's the scattered coral over some of the rocks after all the post production editing.

Here's the bottom of the sea render with ZDepth integration for depth-of-field effects.

At this point colour correction has been applied and this is the composition of the layers so far.



The base photograph of the existing area in Stonetown (Zanzibar) added for reference of tone and water.

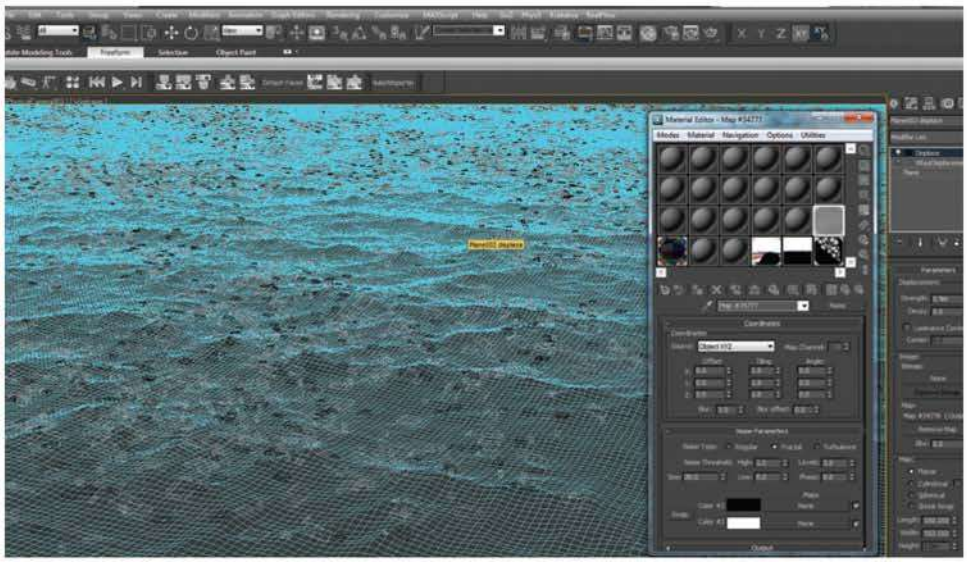
Here the flat, lifeless sky has been replaced with one with more colour and tone.

Some animated models of the future signs that were designed using Max, and p-flow, Frost and Krakatoa.

Rather than recreate the wheel, lots of the elements in the city were copied and cloned to fill out the skyline

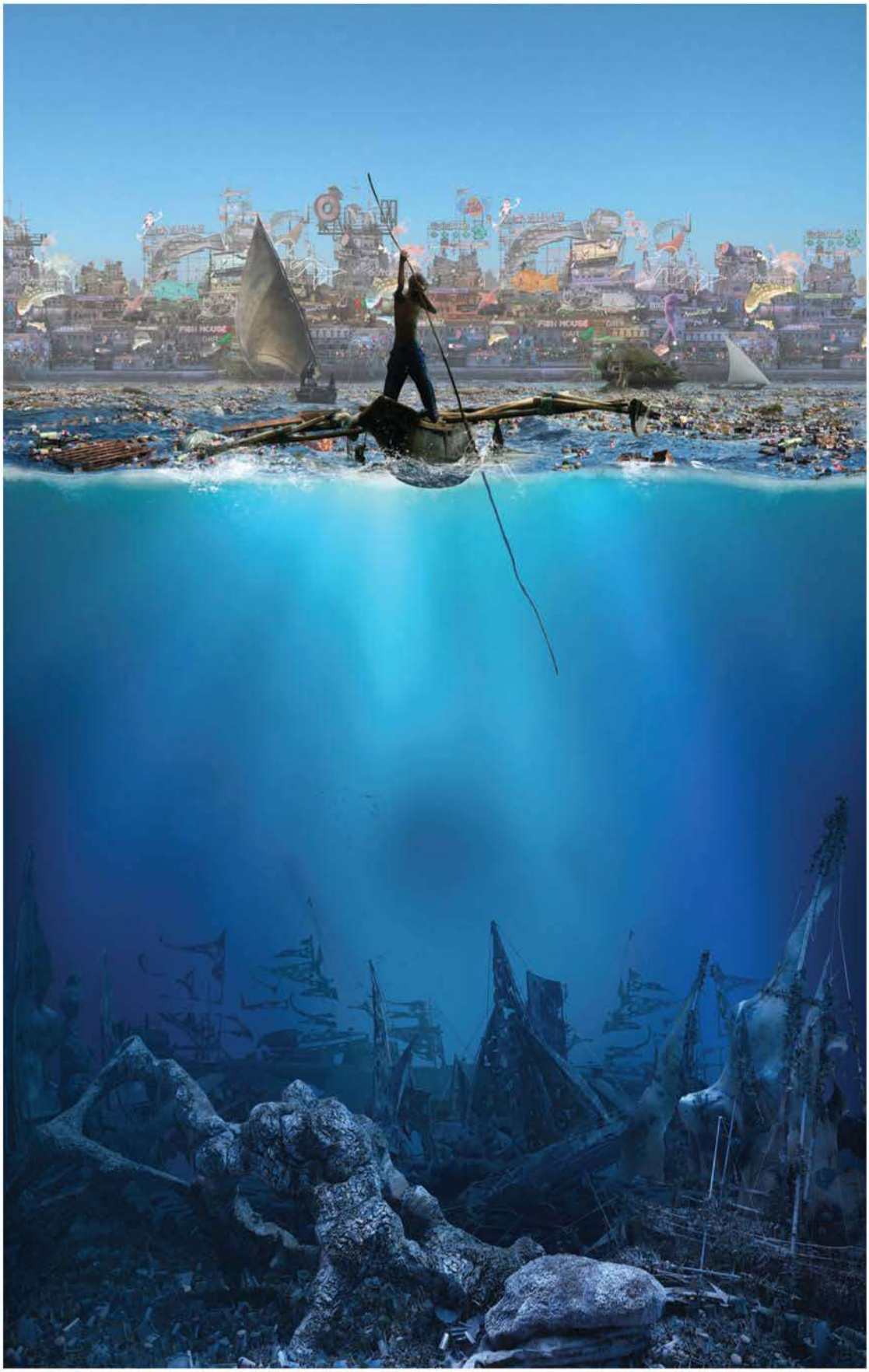
Now the rendering of the sea and rubbish on the surface were added to the scene.

Sea created with a blended water material and displacement using fractal noise.

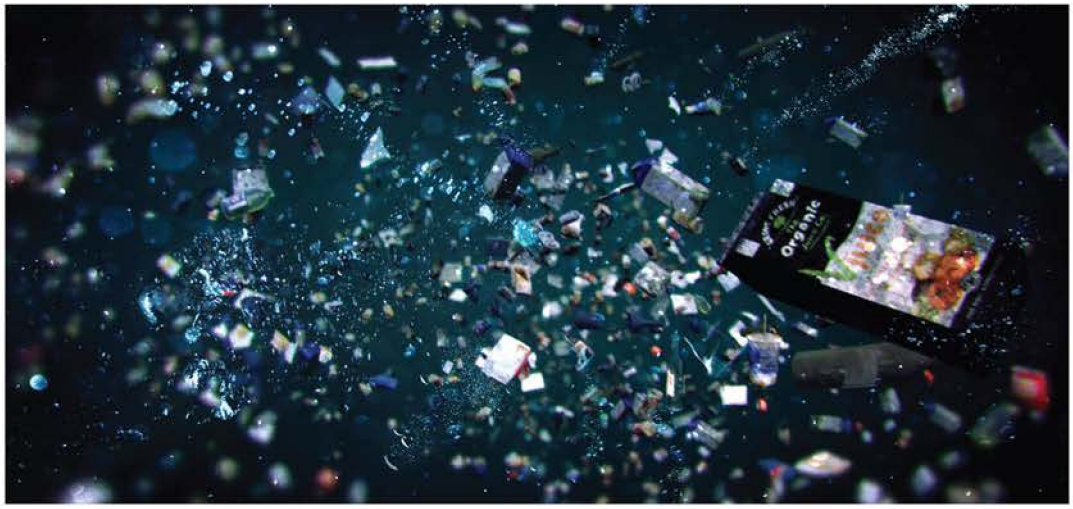


Once set up, the sea surface was given a render test with rubbish floating around.

It started to come together when photos of the main character and lots of other boats were added.



At this point all the main elements are there in the composition, just the underwater chaos was next.

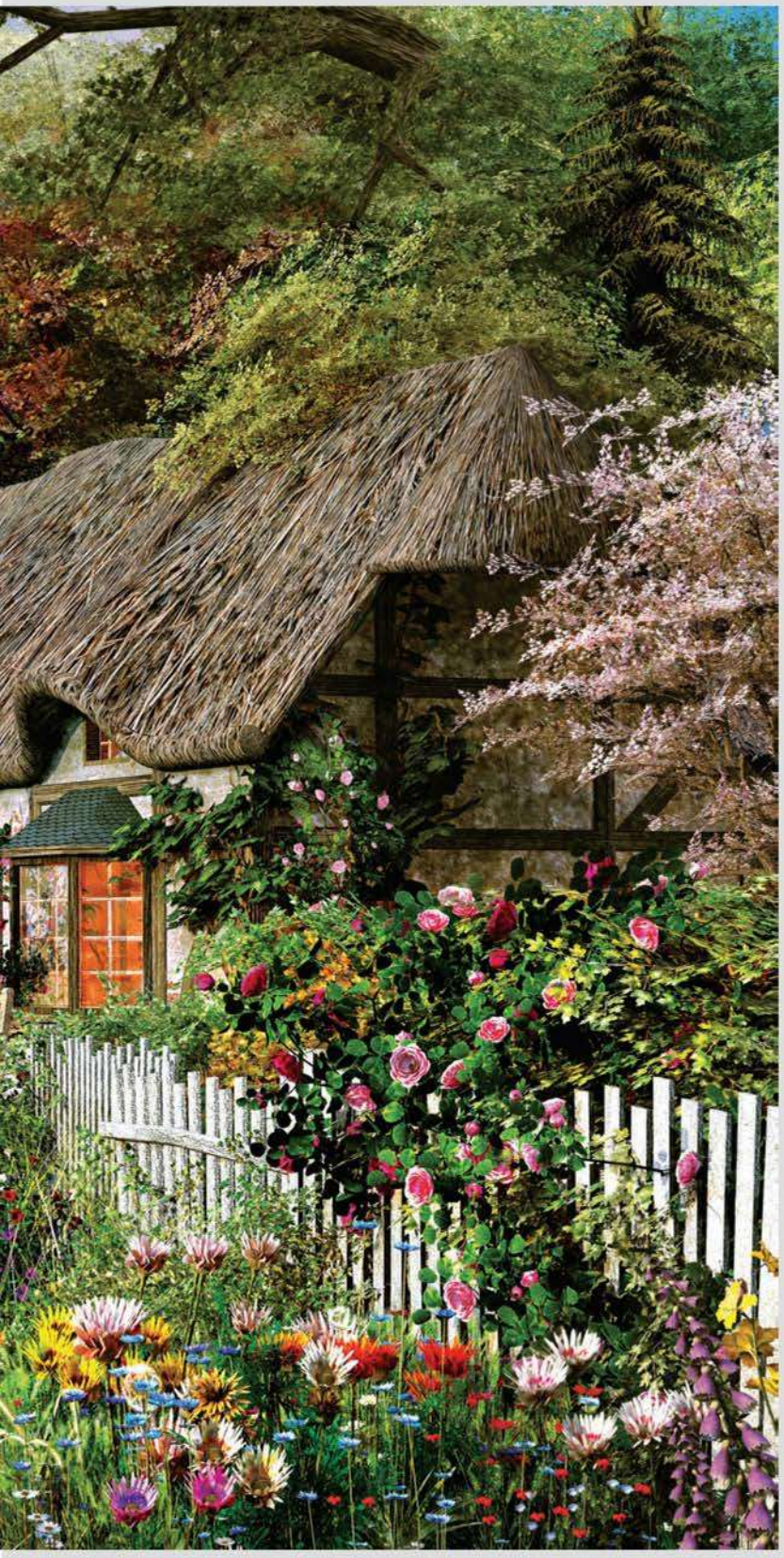


Next is a render test for simulating the underwater scattering of the rubbish using PhysX.

The image was almost finished when dropped rubbish was added to the main underwater area.

JONAH BY PAUL NICHOLLS, FACTORY FIFTEEN

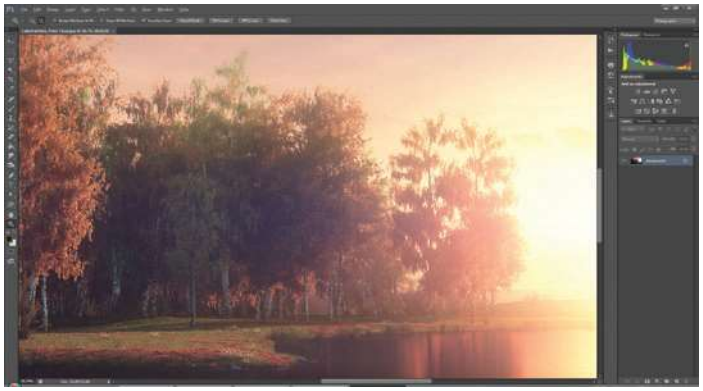
3DS MAX, ZBRUSH VARIOUS COMPOSITED PASSES



This scene continues a series of images featuring rural and country environments. It was created specifically for a jigsaw / puzzle company, and required as much detail as possible. That meant gathering together around 50 different 3D models, in particular plant and flower objects. Initially it included a small garden instead of a small lake, but the water added a nice reflection of the sky and so was used instead.

PROJECT	COTTAGE BY THE DALES
SOFTWARE USED	VUE 9 ESPRIT
RENDERING TIME	8 HOURS
ARTIST	DOMINIC DAVISON
COUNTRY	UNITED KINGDOM

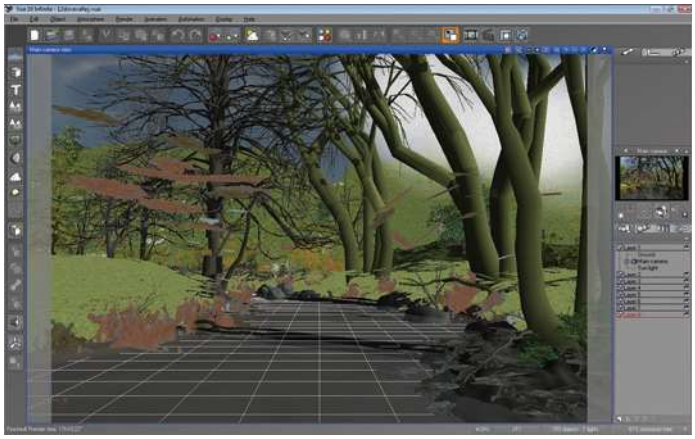
"This piece is a revision of a commercial work I did. I wanted to push the colour and atmosphere into the realm of the surreal. I really enjoy working on natural scenes in 3D. Something about the challenge of recreating nature with the generally rigid tools of 3D art is fun to me."

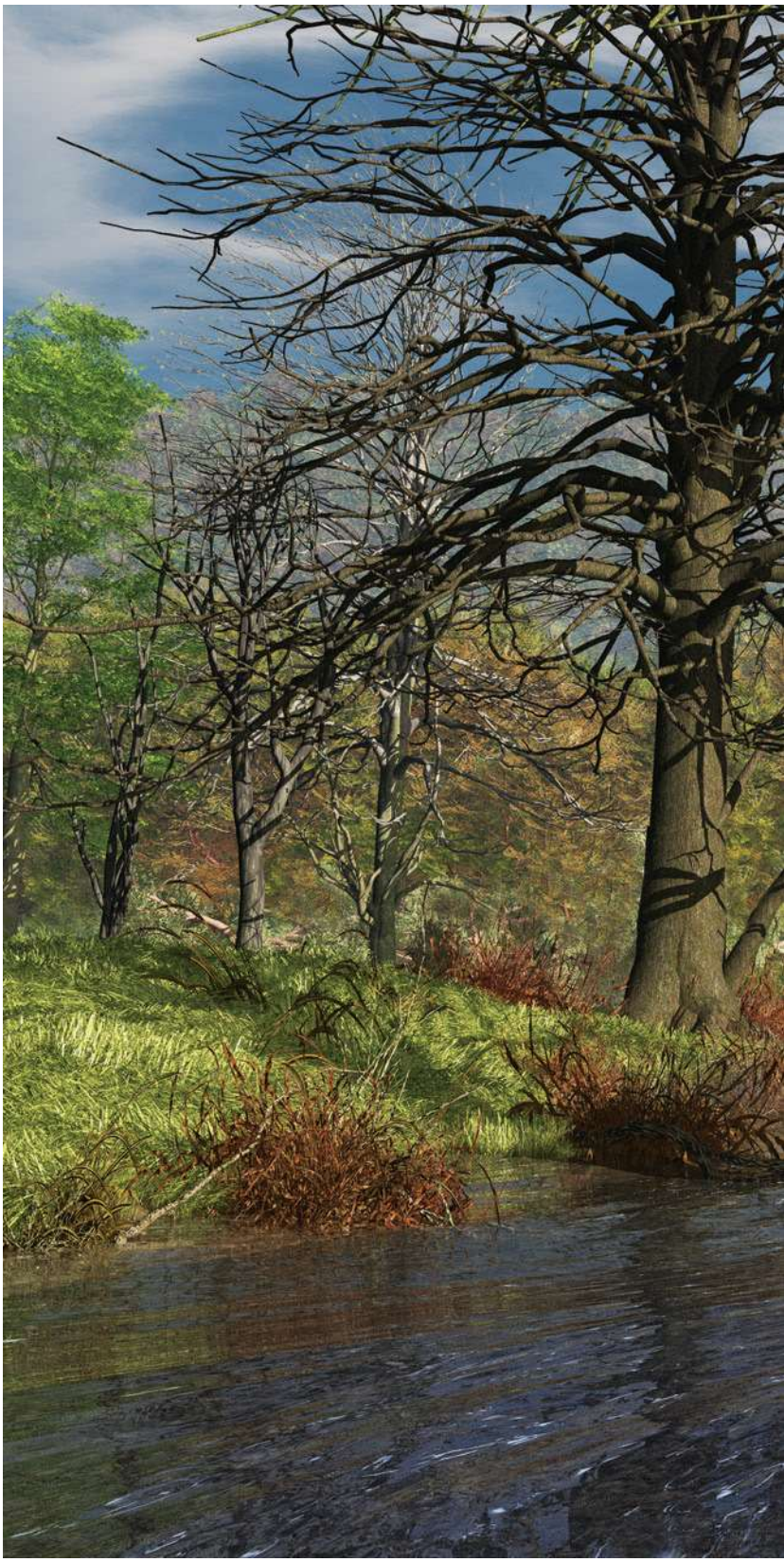


PROJECT	MYSTIC LAKE
SOFTWARE USED	3DS MAX 2012, VRAY 2, PHOTOSHOP, FOREST PACK PRO
RENDERING TIME	12 HOURS
ARTIST	JONNY ALLEN
COUNTRY	UNITED STATES

"The Dove Valley and Dovedale in Derbyshire, England is one of the most beautiful places I've been to. I used one of my photographs as inspiration and reference for this image. The photo was taken on a crisp winter's day and I wanted to recreate that feeling, which I think I pretty much managed to do. Very little post work was required. Just a little overlay to make the water bluer and some adjustment to the levels."

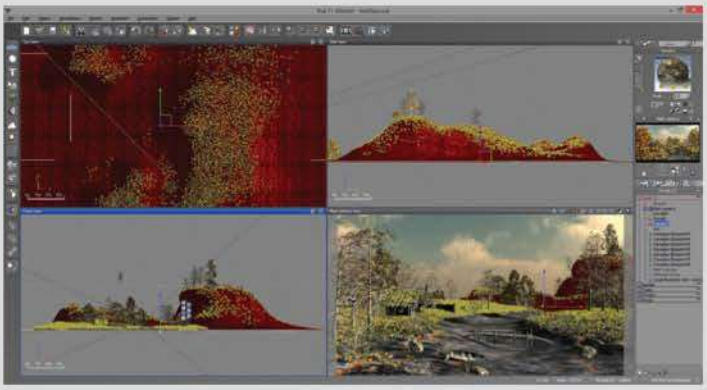
PROJECT	DOVEDALE
SOFTWARE USED	VUE 10 INFINITE, PHOTOSHOP
RENDERING TIME	17H 10M 22S
ARTIST	GILL BROOKS
COUNTRY	ENGLAND





PROJECT	AUTUMN'S REDEMPTION
SOFTWARE USED	VUE XSTREAM 11, PHOTOSHOP CS6, FILTER FORGE 3
RENDERING TIME	86 HOURS ON INTEL CORE I7 (3930MHZ, 12 CORES)
ARTIST	VLADIMIR CHOPINE
COUNTRY	USA

> The inspiration for Autumn's Redemption was the beauty of autumn in Russia and the lovely ruins of an old country style of life being reclaimed by nature rather than urban sprawl. Also, I love fall colours. The biggest challenge in this project was that it was created for video tutorials. As a result it couldn't contain complicated techniques and had to be easy to follow by other artists.



YOUR GUIDE TO LAKES AND STILL WATERS

Daniel Seebacher reveals the secrets behind creating a scene with large expanses of water and a dramatic sky

BACKGROUND INFO

Daniel is a huge fan of calm, serene landscapes which feature water prominently. With Departure he wanted to create a scene that conveyed a sense of endlessness and the possible beginning of a long journey. He aimed for a photographic yet dreamlike look which is something that Vue does very well. The biggest asset to using Vue though is the Ecosystem which allows millions of polygons to be used as instanced objects, without crashing the software. The introduction of Spectral Atmospheres 3 in Vue 8 also helped to achieve a distinct lighting of the sky. Departure was originally set up and rendered in Vue 8 Infinite, but it was revisited and tweaked then re-rendered with Vue 10 Infinite.

The kind of colouring in a sunset that Daniel was aiming for in his image

A typical still water lake scene of the type that inspired the 3D image

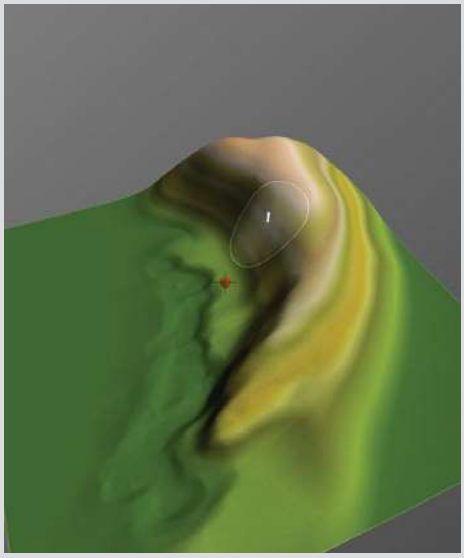
Finished image

PROJECT	DEPARTURE
SOFTWARE USED	VUE 10.5 INFINITE, PHOTOSHOP CS6 EXTENDED
RENDERING TIME	98 HOURS
ARTIST	DANIEL SEEBACHER
COUNTRY	GERMANY

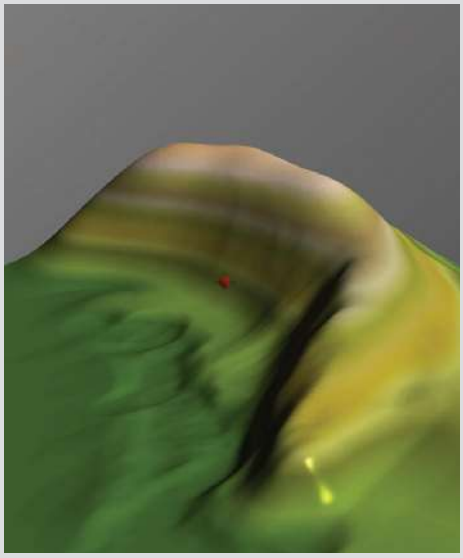
MODELLING THE TERRAINS

The scene was composed of one foreground terrain and three background terrains which together made up the island with the castle. Speaking of the latter, five different models were used for this image which are all available at Cornucopia3D.com: the Weathered Rowboats ($5.60 locked/$8.00 unlocked), the Medium Length Pier ($0.75), the Wharf Light #1 ($0.95) and the Tyrol Castle ($14.95 locked/$22.13 unlocked).

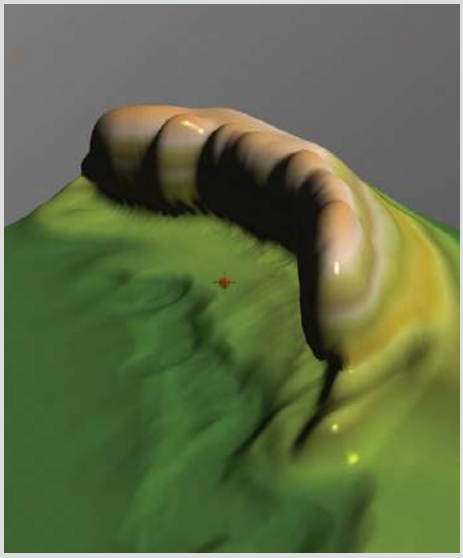
The process started by creating a standard terrain in Vue in a new and empty scene then opening it in the terrain editor by double-clicking on it. The Reset button was used to create a flat terrain, rather than the default mountainous one. The Raise brush was selected and used to create a mound which started in the upper right corner and slowly curved about halfway to the left. Since most of the terrain was going to be covered by water and plants the terrain resolution did not need to be increased. Then, the shoreline was created by painting with a low flow along the edges of the mound. The brush was inverted to lower the shoreline at several places to make the height look more random. This ensured that the ecosystems wouldn't be at exactly the same height later on when the terrain was populated.



This is what the general terrain shape is supposed to look like



The same terrain as above viewed from a different perspective before

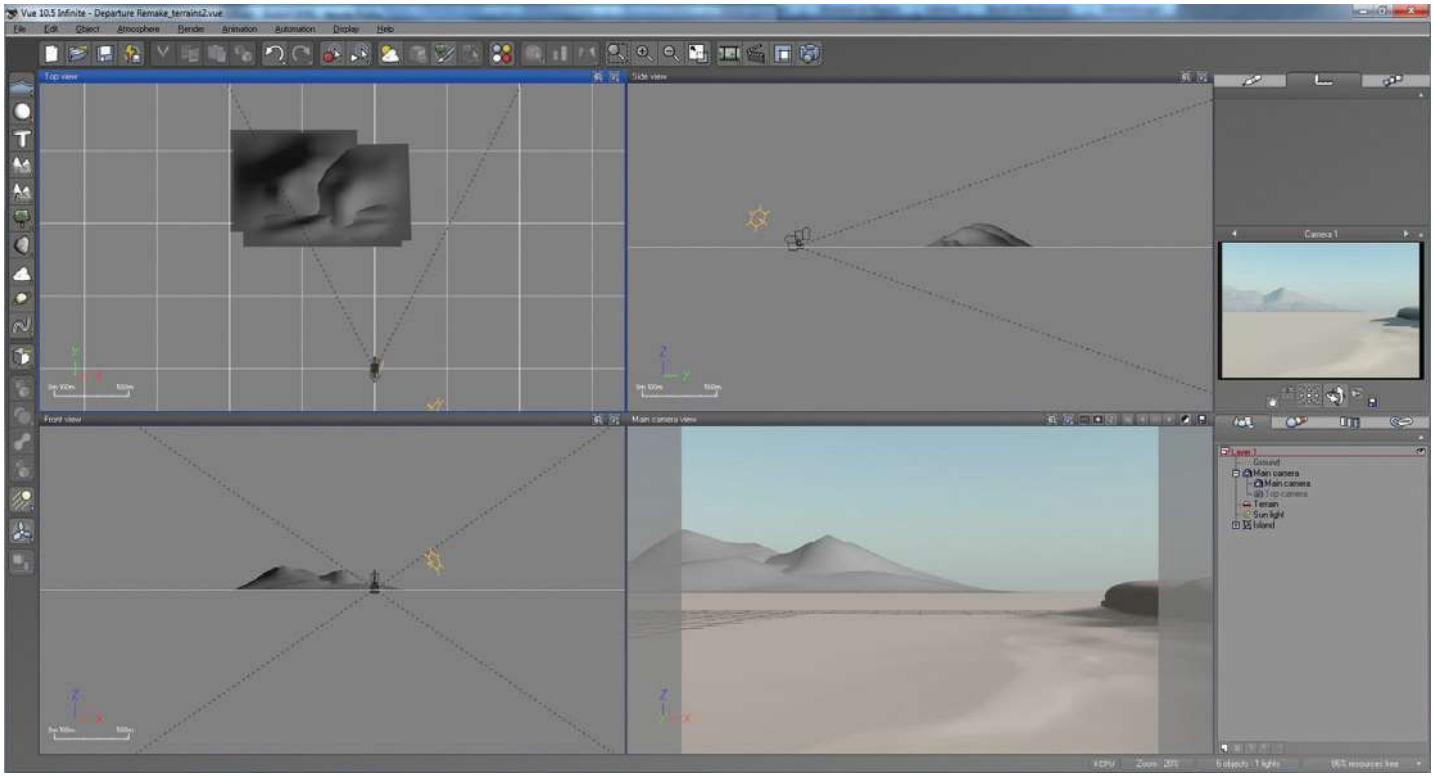


Now after the ridge has had 3D sculpting so that there's a more defined shape and the overhang

The next stage was to introduce some overhangs with the 3D sculpt brush. Freeform was checked in the Brush Editor Palette so that the terrain could be freely sculpted in any possible direction. The brush was then used to change the upper edge of the mount into an overhang. It didn't matter if the proportions appeared stretched or squashed after modelling as the terrain was going to be resized anyway.

KEEPING AN EYE ON THE POLYGON COUNT

When sculpting with 3D brushes in Vue, the software adaptively decides how many polygons are necessary for the newly sculpted geometry in order to maintain enough detail. This means that smaller brush sizes automatically create more polygons because smaller sculpted details require more subdivisions than larger ones, so keep that in mind when sculpting with 3D brushes.



The scene with the correctly placed foreground terrain showing the ridge and the sweep down to the water

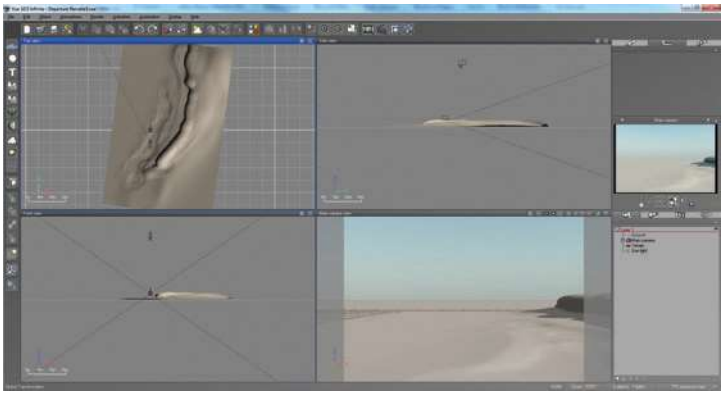
Too many polygons can slow down the entire software significantly and even make the OS hang up if the computer is not powerful enough to handle the scene. As this terrain would be covered fully with plants it didn't need a high polygon count. So, a large brush size was used for sculpting to keep the polygon count reasonably low. At the last count, this scene used 131,000 3D polygons which wouldn't pose a problem on most computers.

That was all for modelling in the terrain editor, so it was closed and the terrain in the scene itself was selected. This was resized to about 90 * 90 meters. Then it was stretched along the Y-axis, squashed down on the Z-axis and place it about halfway below the camera with a slight rotation to the right. The camera was raised to about two meters. The screengrabs show the correct terrain proportions and placements.

The proportions of the terrain

The final placement of the terrains to create an island in the background

For the background terrains three standard terrains were added to our scene then stretched, resized and rotated until they made a pleasing formation. They were placed in the background and grouped together to create the distant island.

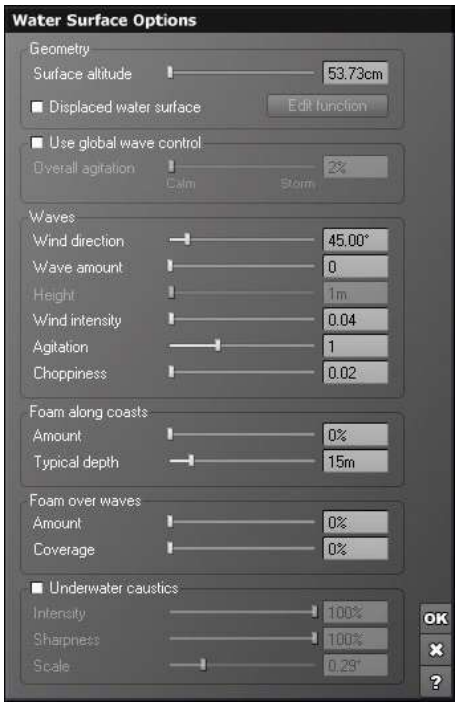


This is the scene as it stood with the basic layout and the objects. Then it was time to add materials and Ecosystems

PLACING THE MODELS

Now that the scene setup was complete it was time to add objects to it. All the models mentioned at the beginning were used. The castle was placed in the middle of the island, the wharf light at the top of the mound, the pier to the right and the boat right next to it. Notice that the wharf light loads with a ready-made spotlight. The boat and oars were rotated to a more natural position. Vue itself comes with a couple of fence models so one of these was placed along the edge of the mount. At the end, a sea plane was added to the scene and the shoreline was raised slightly to show a little more of it. Then it was time to do a test render to see how it was all looking.

USING MATERIALS AND THE ECOSYTEM



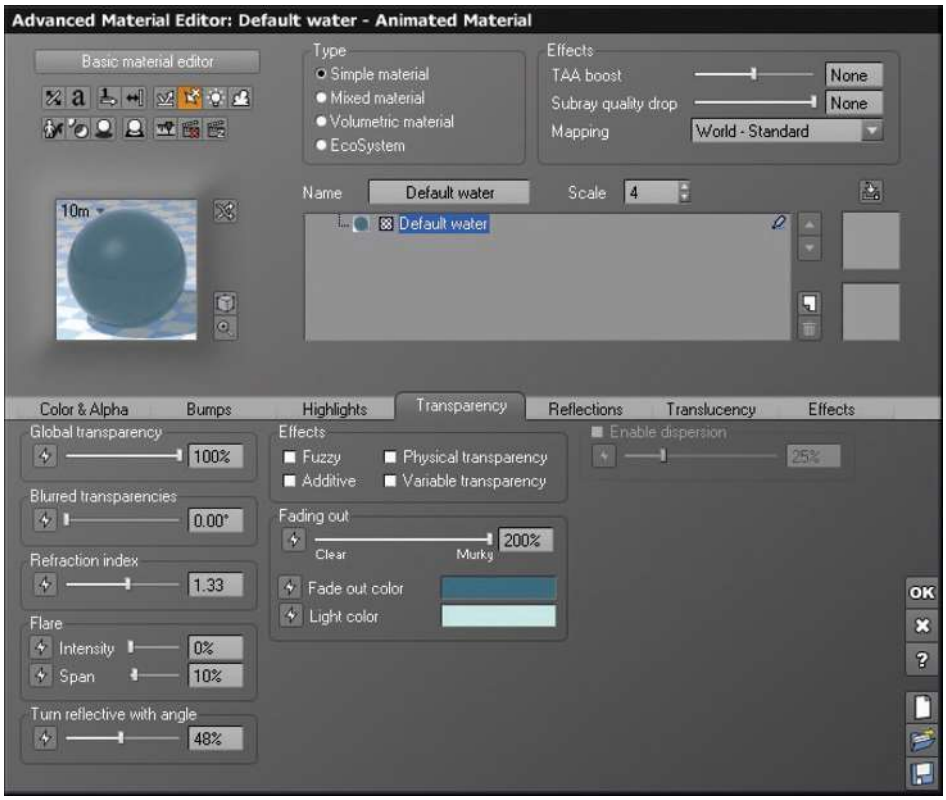
The first area to tackle was the water. This was opened by double clicking on the water pane and removing almost all the waves so it became very flat and still. The Foam sliders were reduced all the way down to 0% to remove any foam. The foam layer can also be removed in the material editor as well.

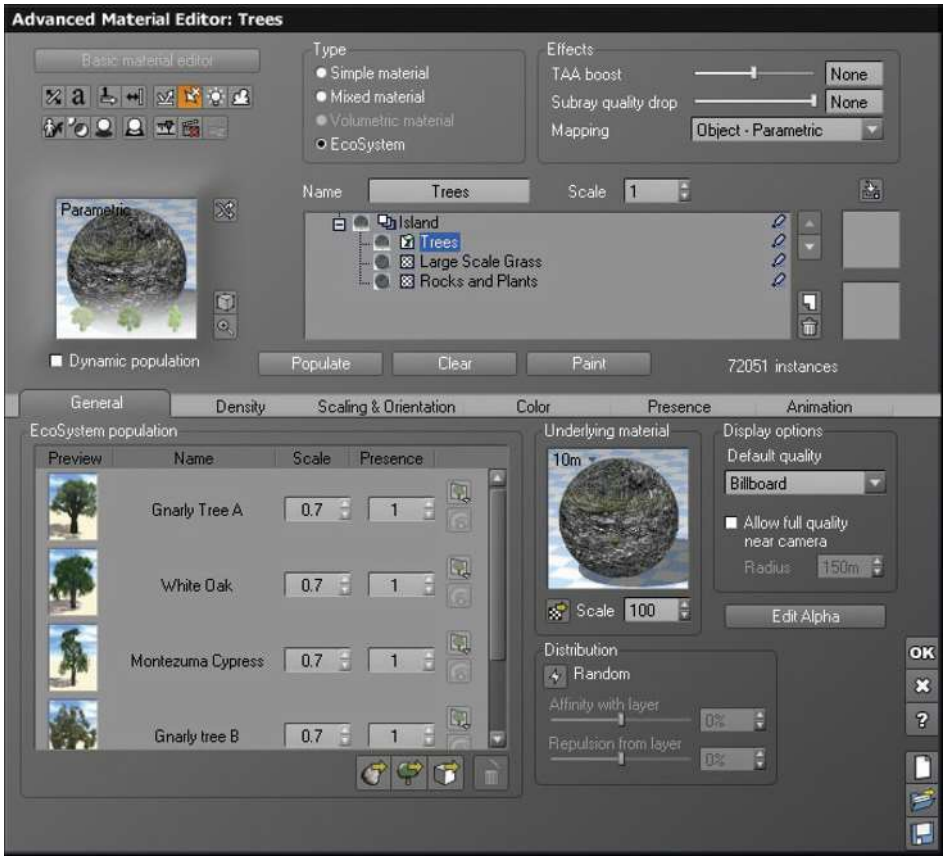
In Vue 10 e-on Software added a new water model called physical transparency that gave excellent results in scenes with very transparent water. However, it increased the render time quite a bit. Since the water in this scene needs to be reflective, not transparent, that model was unnecessary. So the material editor was opened, the default water layer selected and in the materials tab the box next to Physical transparency was unchecked to deselect it. The water was made completely murky by typing in a value of 200% and the Turn reflective with angle parameter was increased slightly.

The terrain materials didn't need to be very complex as they were going to be covered by the vegetation anyway. For the island one of the default rock materials that comes with Vue was used and a large-scale grass layer was applied to it. Remember that rock materials should be scaled to fit in with larger terrains. The Ecosystem was composed of some bigger SolidGrowth trees, mostly the Gnarly ones. Some trees were added as a new Ecosystem layer and then scaled down a little.

The water editor settings show the waves and foam have been reduced down to nothing

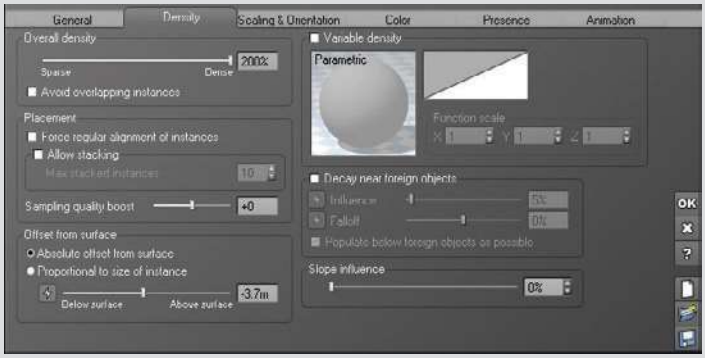
In order to hide some of the underlying material's imperfections and repetitive areas, the tree population needed to be set to a high density. In the density tab, a value of 200% was entered for the density value. The instances were moved some meters below the surface to hide some of the tree trunks below the terrain to enhance the feeling of density.



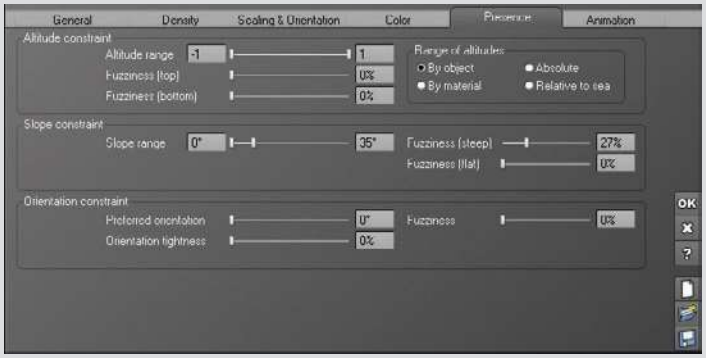


Various tree types in the Ecosystem prior to painting on the terrain itself

To get a more random looking tree growth, the size variations in the Scaling & Orientation tab were increased significantly. However, this made the trees exponentially bigger so to compensate for that, the overall scaling had to be turned way down.



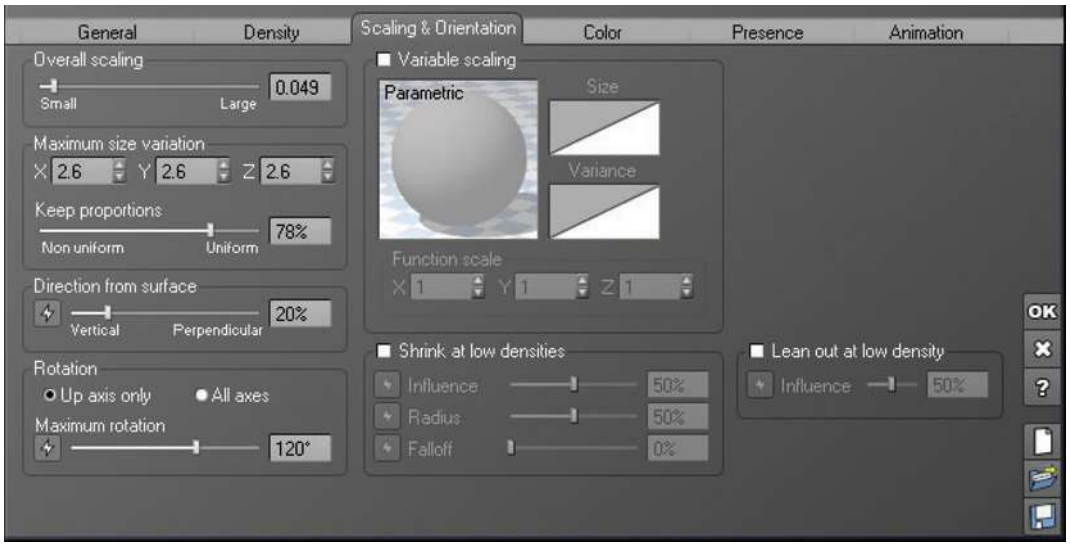
Defining the population density and moving the trees below the ground



Using the slope constraint function to prevent trees from appearing in certain areas when painting with the Ecosystem

TOP TIP – EASY BUSHES

Lowering trees below the terrain surface can also simulate bushes very well since all you can see are the tops of the branches and leaves.



Irregular tree scaling can be used to stop everything looking too uniform and make it look more realistic

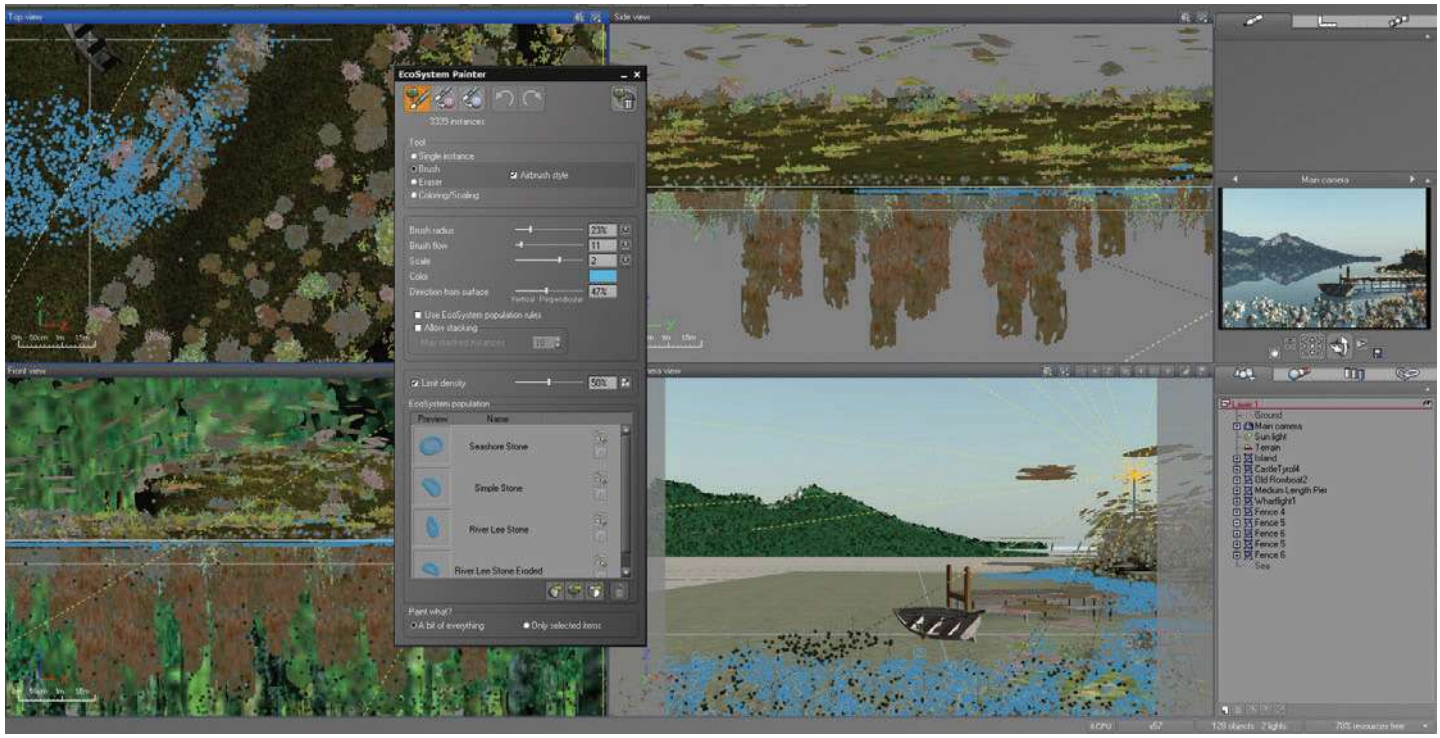
The idea wasn't to cover the entire area with trees and handily there's a function in Vue that can be used to limit where the trees appear. This was the slope constraint function under the Presence tab.

After populating the terrains, this is what the scene looked like.

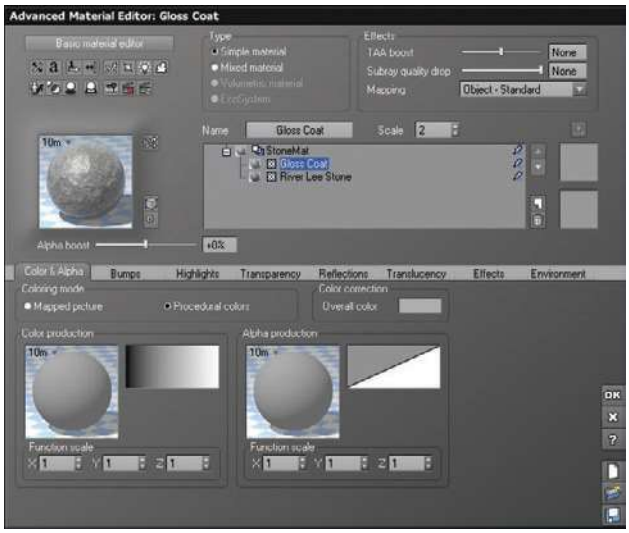
TOP TIP – REDUCING SATURATION

In many cases the default Vue tree colour is too saturated. Desaturate the Overall colour setting on the Colour tab to get a better colour distribution throughout the population.

For the foreground detail the image used a number of Ecosystem layers. It's easier to create a separate layer for each Ecosytem type. Here there were five different Ecosystems that were painted onto the terrain. One layer was created for each for grass, weeds, reeds and flowers and a variety of plants you like. Some dry autumn grass was also added to the scene. The fifth layer was used for adding stones. Vue 10 ships with a huge library of dynamic rocks which are a vast improvement over the standard rock object in previous versions. One final task with the materials was to make the rocks appear wet. To do this the preset Gloss Coat material was added to the rock layer. The final stage of producing this image was the lighting and atmosphere which is detailed next.



Painting the Ecosystem on the foreground using separate layers for each item type



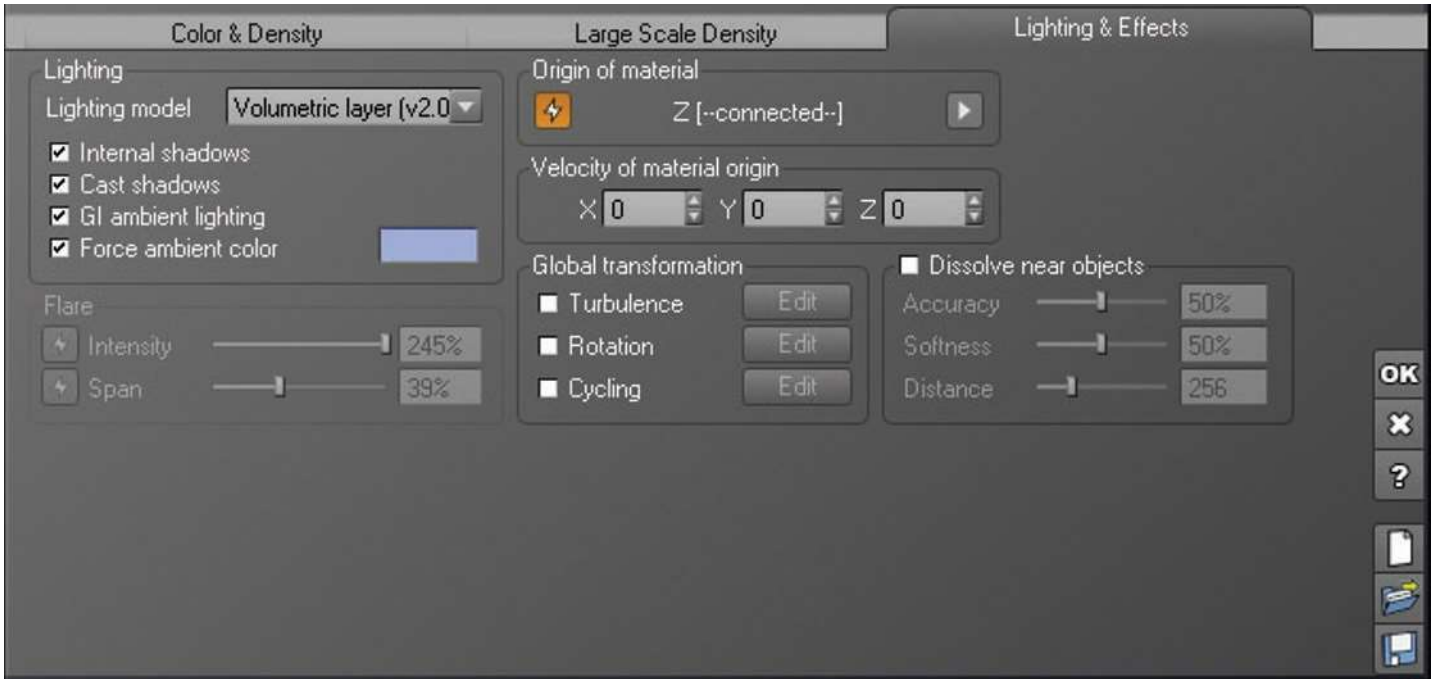
Adding a wet look to the rocks by using a gloss coat material layer

The fully populated scene with multiple Ecoystem layers and all the terrains and objects in place

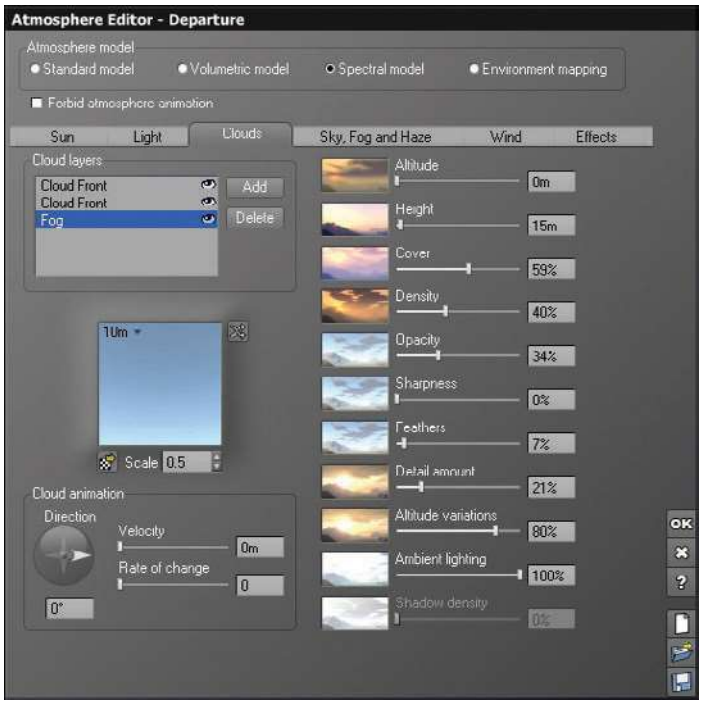
SETTING UP LIGHTING AND ATMOSPHERE

There's one thing that needs addressing before tackling the atmosphere editor and that's the spotlight intensity of the wharf light's spotlight because it is much too strong. Changing this to a power of five and a softness of 45° did the trick. So to the atmosphere then, and this was composed of two identical cloud layer presets that cast shadows onto each other. The shadow density was increased quite a bit to get more contrast both in the sky and in the scene. To get more colour in the sky, both cloud layer materials featured a blueish ambient colour. A low-placed cloud layer with a reduced density served as fog above the water. Next the sun was set very low in front of the camera, slightly outside the framed area. In the sunlight properties, the sun was given a softness value of 0.50°.

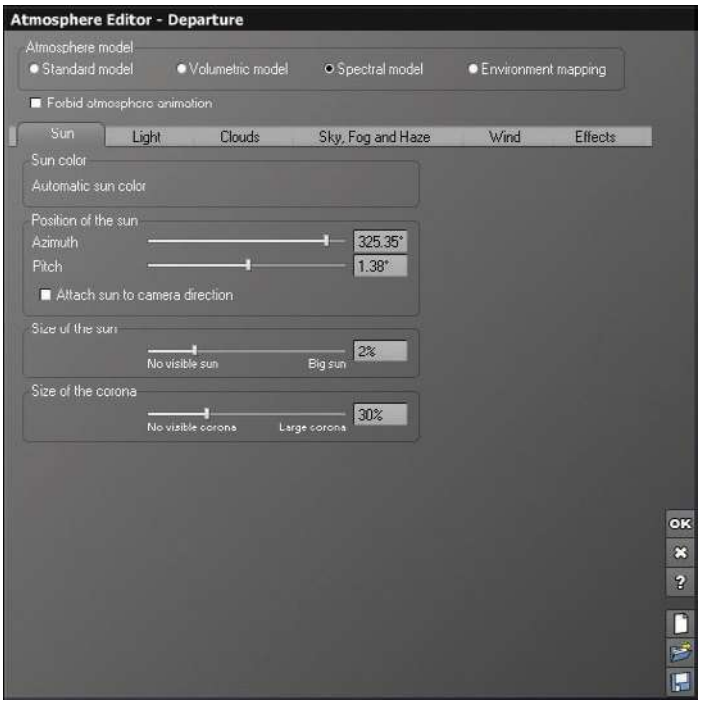
The main cloud layer settings shows lots of cover and quite a dense setting



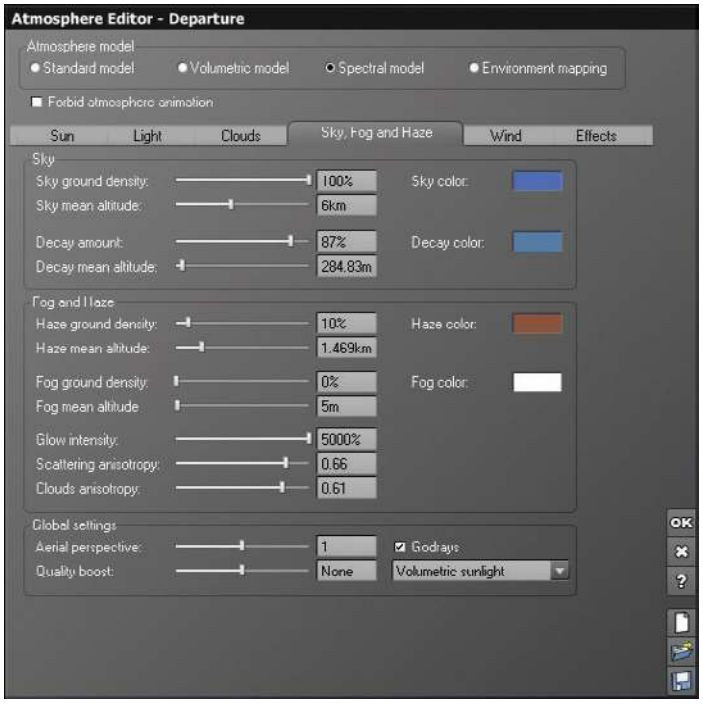
The settings for the cloud lay show internal shadows and are forced to use a specific colour



↑ **The fog layer is set right down at ground level and covers most of the water area**



↑ **The sun's position in the scene plus some tweaks to the size and the corona around it**



↑ **Here the sky gets its colouring whereas the fog aspect is turned off because of using a cloud layer previously**

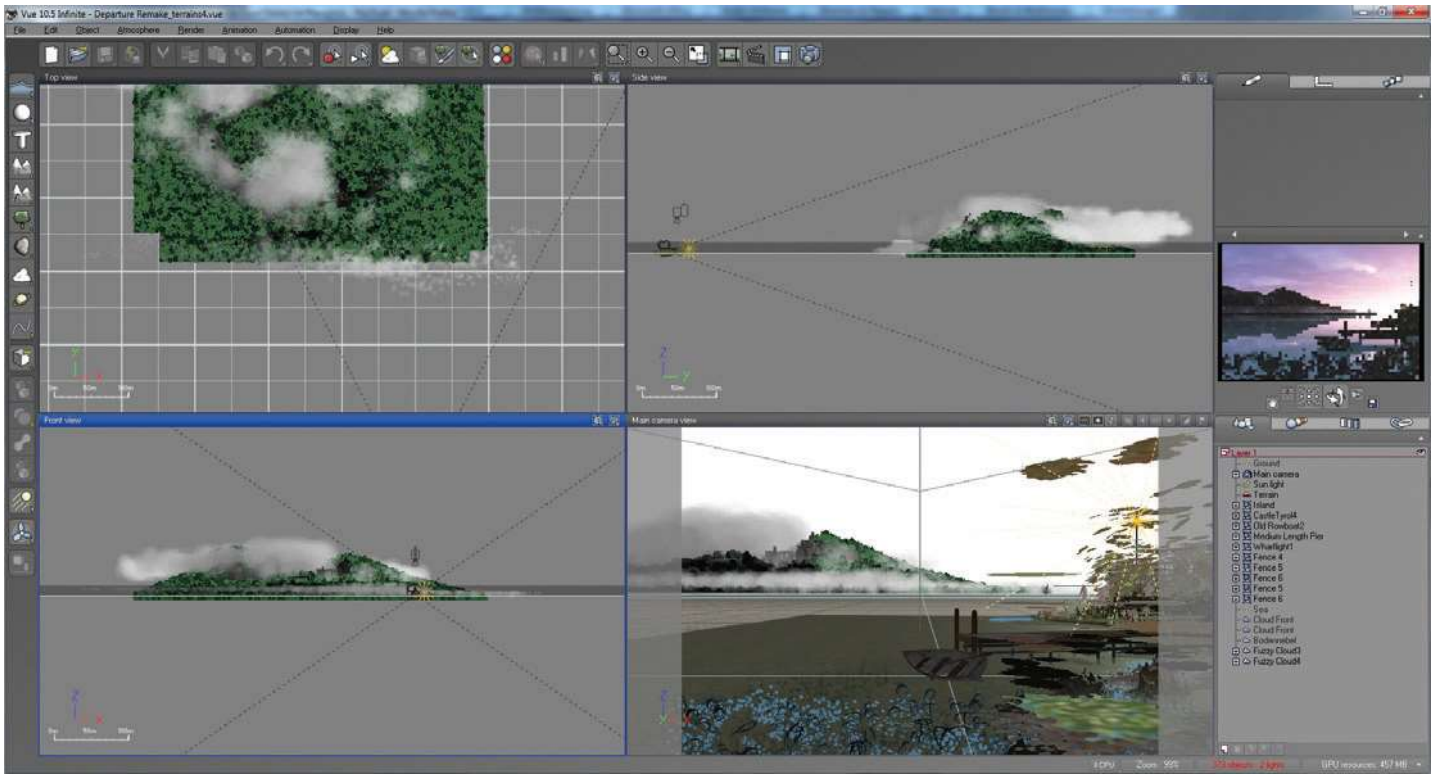
A good way to introduce additional colours into the atmosphere is to not only colour the haze, but also the decay amount with strong colors. Using a high amount would have covered the scene in blue lighting so the Decay mean altitude was kept very low. The same went for the Haze mean altitude. To compensate for the low sun angle and the total coverage of the sky an extremely high glow value and a lowered scattering anisotropy, which increases the glowing area, were used. Volumetric lighting was checked so that the clouds and sky could generate more colours in the atmosphere.

Going into the Lighting tab for the Atmosphere Editor the balance was set almost completely towards the sun for a dramatic effect. The Global Radiosity lighting model distributes some reflected light in the shadows and unlit parts of the scene so that it doesn't appear completely dark. It's also the slowest system to use when coming to render the image. The new Indirect atmospherics in the latest version of Vue take the reflected light that's coming from the sky and clouds into account. In addition to the cloud layers in the atmosphere, some fuzzy Metaclouds with a low density were added around the island.

The advanced camera options show that the current gamma for this scene was 1.80

Before moving on to the render, there was one last parameter to check. In Vue 8.5 Linear Workflow was introduced. In basic terms, computer monitors are not able to display all the available brightness and colours in a picture and as a result a picture appears much too dark. This is what linear workflow is used for. By increasing the global gamma value of a scene, the whole image is brightened up and retains the full range of colour and brightness values. The downside to this is that the image can highlights can be blown out. There are two ways to fix this: You can either apply a specific gamma value to every material that appears too bright while leaving untouched those materials that are correctly lit. The second and easier method involves a simple curves correction in Photoshop or any similar image editing package. For this image a default Linear Workflow Gamma of 1.8 was used with recourse to Photoshop if needed. Remember that it's always easier to darken a picture that is too bright than to brighten a picture that is too dark. You can check and change the value for Linear Workflow by double-clicking on your current camera. Also, on the subject of the camera, some lens glare was added for a soft and dreamy look. At this point the scene was ready for rendering considerations.

The scene was ready for rendering. Here you can see what the final scene looked like in the editor views



RENDERING THE IMAGE

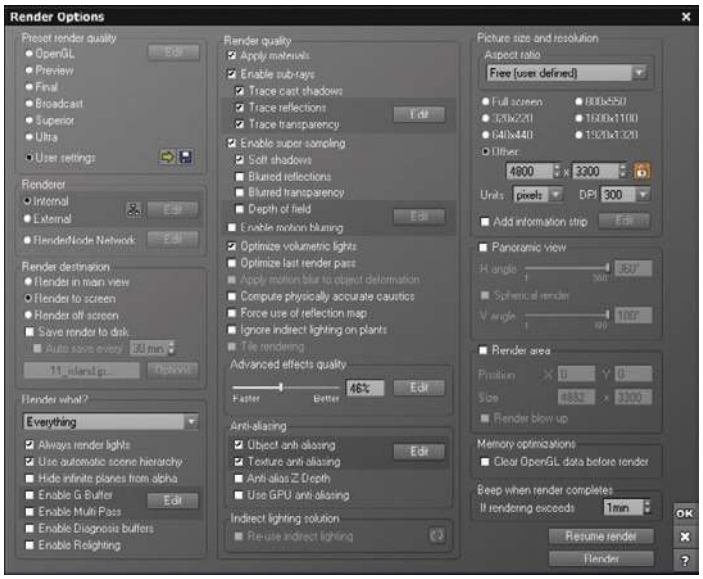
Rendering the scene would have taken quite a while regardless of the render quality, since it deals with multiple low-density cloud layers and metaclouds, highly reflective water and volumetric sunlight. Still, there are some settings that can be checked to save a little time.

In the render settings, Blurred reflections, Blurred transparency, Motion blurring and Depth of field were all disabled since the scene exhibited none of those features. The Soft shadows box was ticked because they were needed for both the shadows from the spotlight and the sunlight. The volumetric lights were also optimised, without any noticeable hit in quality.

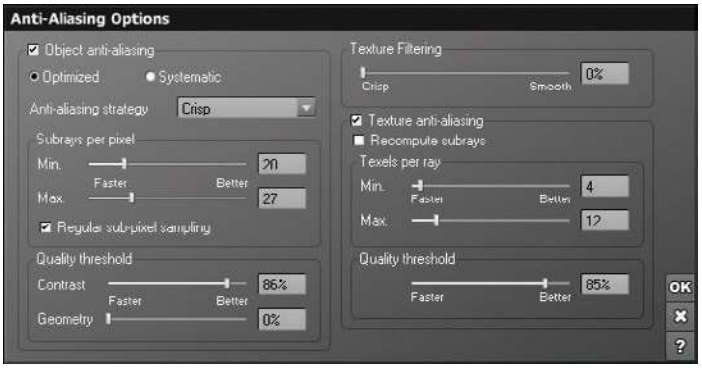
As there were a lot of reflections in the scene it was not advisable to go lower than 5/5 in the Trace reflections options. Decreasing the min and max trace level can introduce visible artefacts. The Advanced Effects slider should be kept around 40–50% as it influences the lighting quality of volumetric lights.

In the Anti-Aliasing options, Crisp was selected as the Anti-Aliasing strategy. Other strategies produced artefacts when combined with lens glare option set previously.

The Subrays per pixel value tells the render engine how many rays of light are sent into the scene per pixel of the image, both regarding the minimum amount and the maximum amount of rays. The maximum amount of rays is only used when the render engine decides that the pixel is still too jaggy. The Quality threshold decides the accuracy on which the render engine bases this decision. Increasing the min and max values seldom results in a much improved render quality. The Quality threshold can make a huge difference, but it also increases the render time significantly. This scene had a lot of very tiny details in the foreground vegetation, so it needed a high Quality threshold or the thinner lines and the grass blades would have been lost in the rendering process. The final image was colour-corrected in Photoshop CS6 and an unwanted glowing spot in the clouds was removed.



The main render settings set the quality of the render but the better it is, the longer the render time

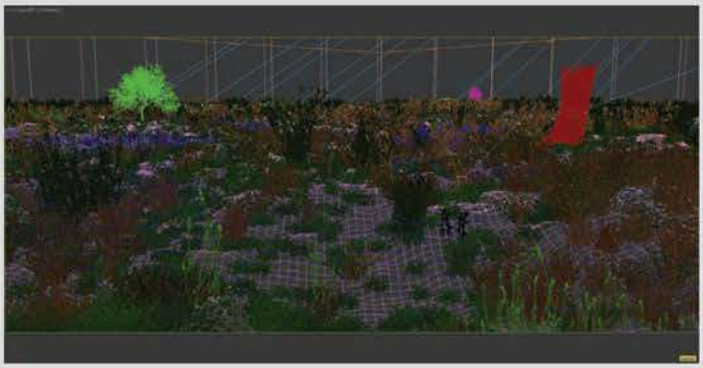


The Anti-Aliasing settings ensured that there were no unwanted artefacts and that the quality was good enough

DEPARTURE BY DANIEL SEEBACHER

98 HOURS ON A CORE I7 920 AT 2.6GHZ

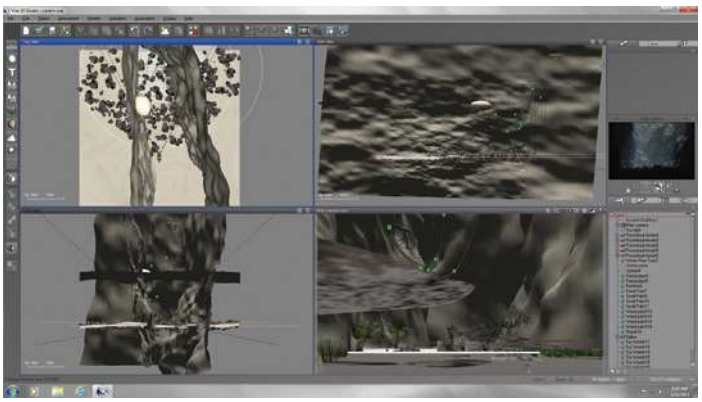
"The image was made in preparation for some bigger projects. The main idea was to try out and learn the different aspects of giving a variety of plants a natural and realistic look. A very important factor is the amount of reflectivity and the overall lighting to bring landscape shots to life. Another important thing to remember is the balance between chaotic scattering and subtle adjustments in the positioning of plants. The stump in the right half of the image proved to be a good addition to the overall composition."



PROJECT	MARSHES
SOFTWARE USED	3DS MAX 2012, FORESTPACK, GROWFX, VRAY
RENDERING TIME	4 HOURS
ARTIST	MARTIN GEUPEL
COUNTRY	GERMANY

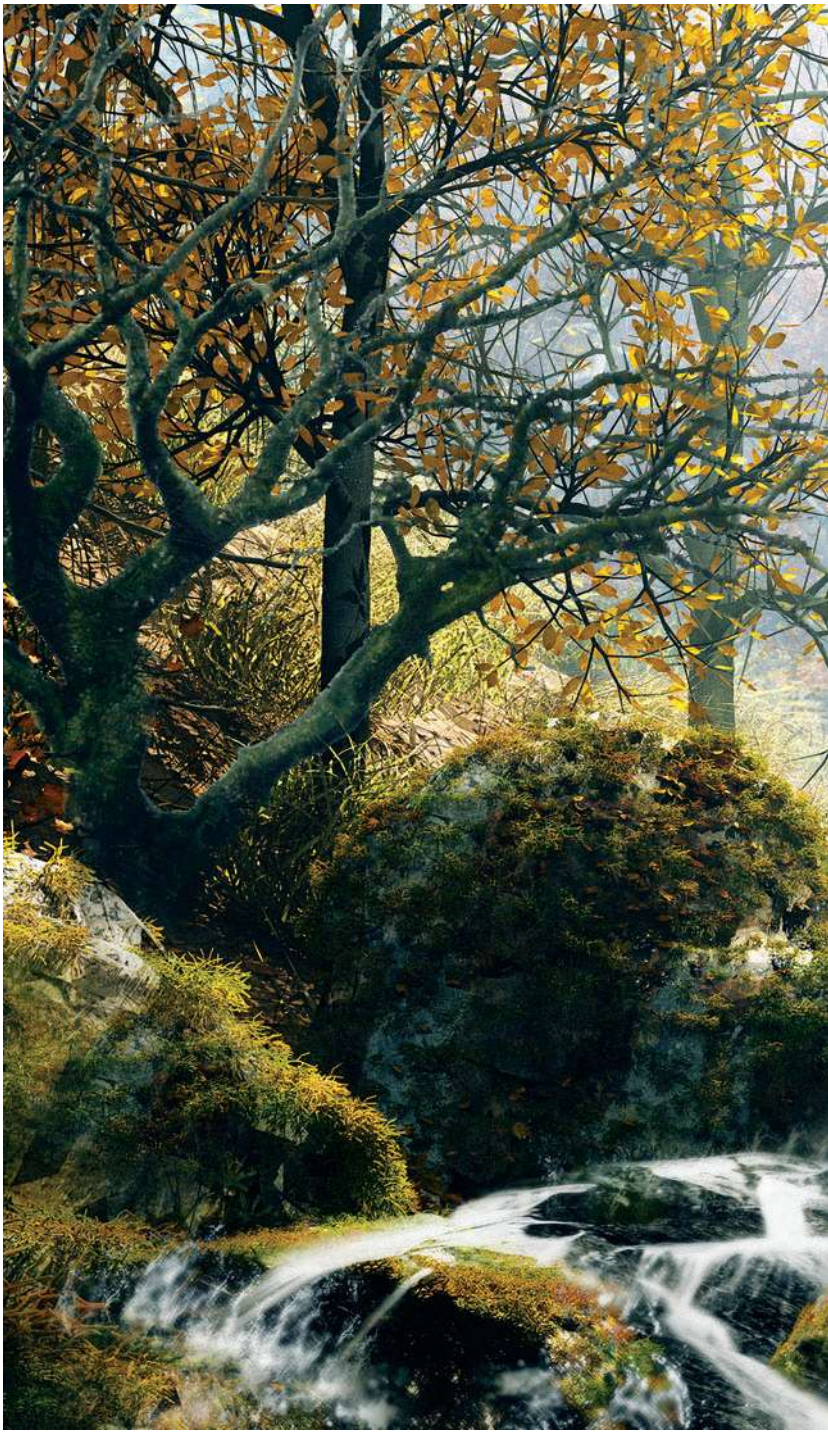
I really wanted to create a canyon with a more realistic look to it and spent some time on the lighting looking for some subtle rays to try and realise that goal. I also liked the idea of crafting an isolated environment where my imagination was the only boundary. I used the Spline tool in Vue to hang the vines and applied some sparse vegetation to add a little texture. Once the scene was built there was an obvious place to support a waterfall. This I hand painted in Photoshop using the simple, default brushes. Some bird models were added to complete the project.

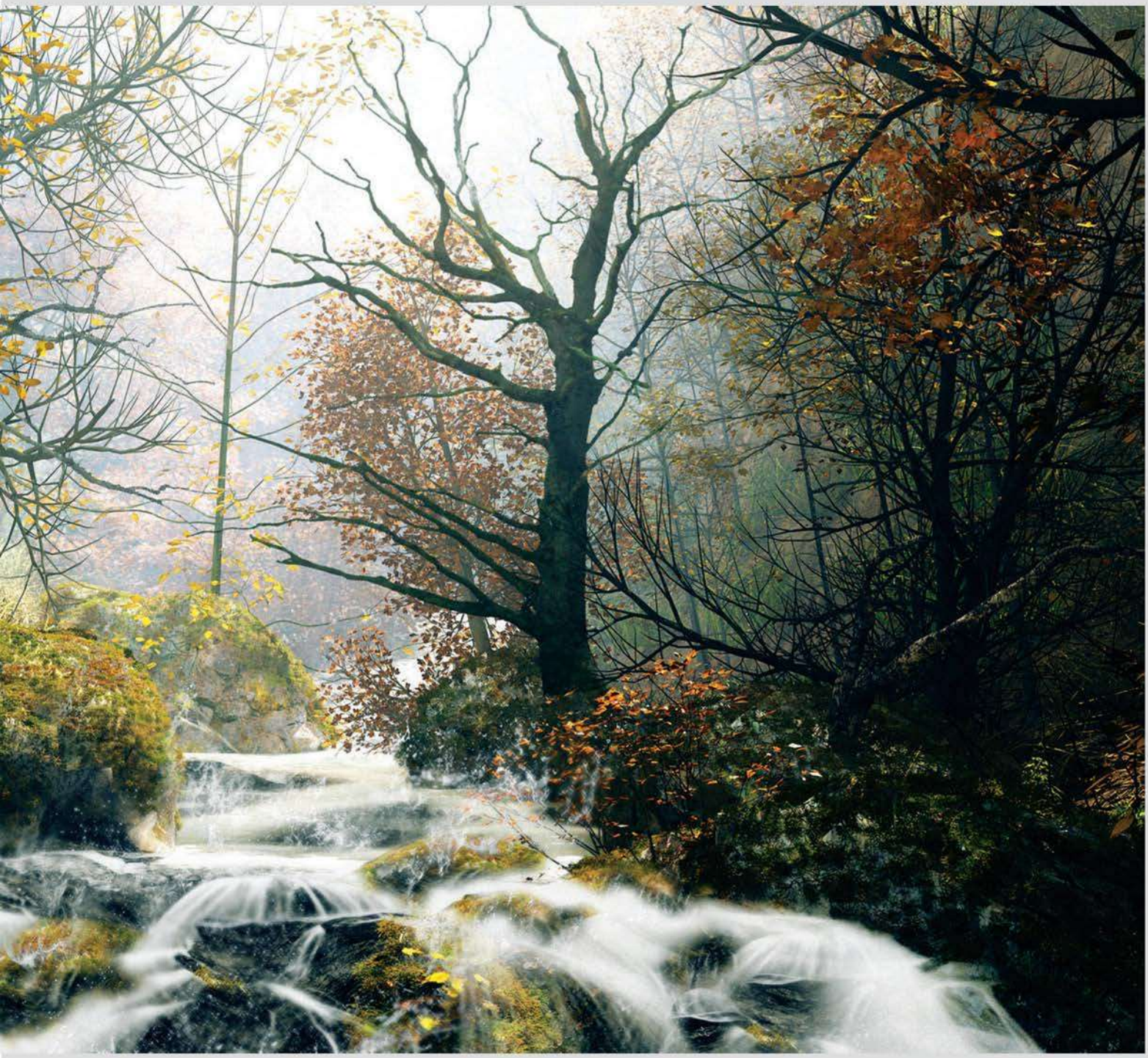
PROJECT	DEEP CANYON
SOFTWARE USED	VUE 10 STUDIO
RENDERING TIME	8 HOURS
ARTIST	SEAN FLYNN
COUNTRY	USA



"My first idea for this image was to make a forest, which is my favourite theme. I found it interesting to add a technical challenge with a waterfall. To achieve this the landscape plane had to be angled to create a drop and Vue's physical water used to get it to flow. The long exposure effect was created in post production."

PROJECT	H2O
SOFTWARE USED	VUE10 INFINITE
RENDERING TIME	6 HOURS
ARTIST	DANIEL RESPAUD
COUNTRY	FRANCE





LANDSCAPES WITH WATER FEATURES

Po Andersson explains how to create a landscape with a central, water-based feature and surrounding wildlife.

ORIGINAL DESIGN IDEAS

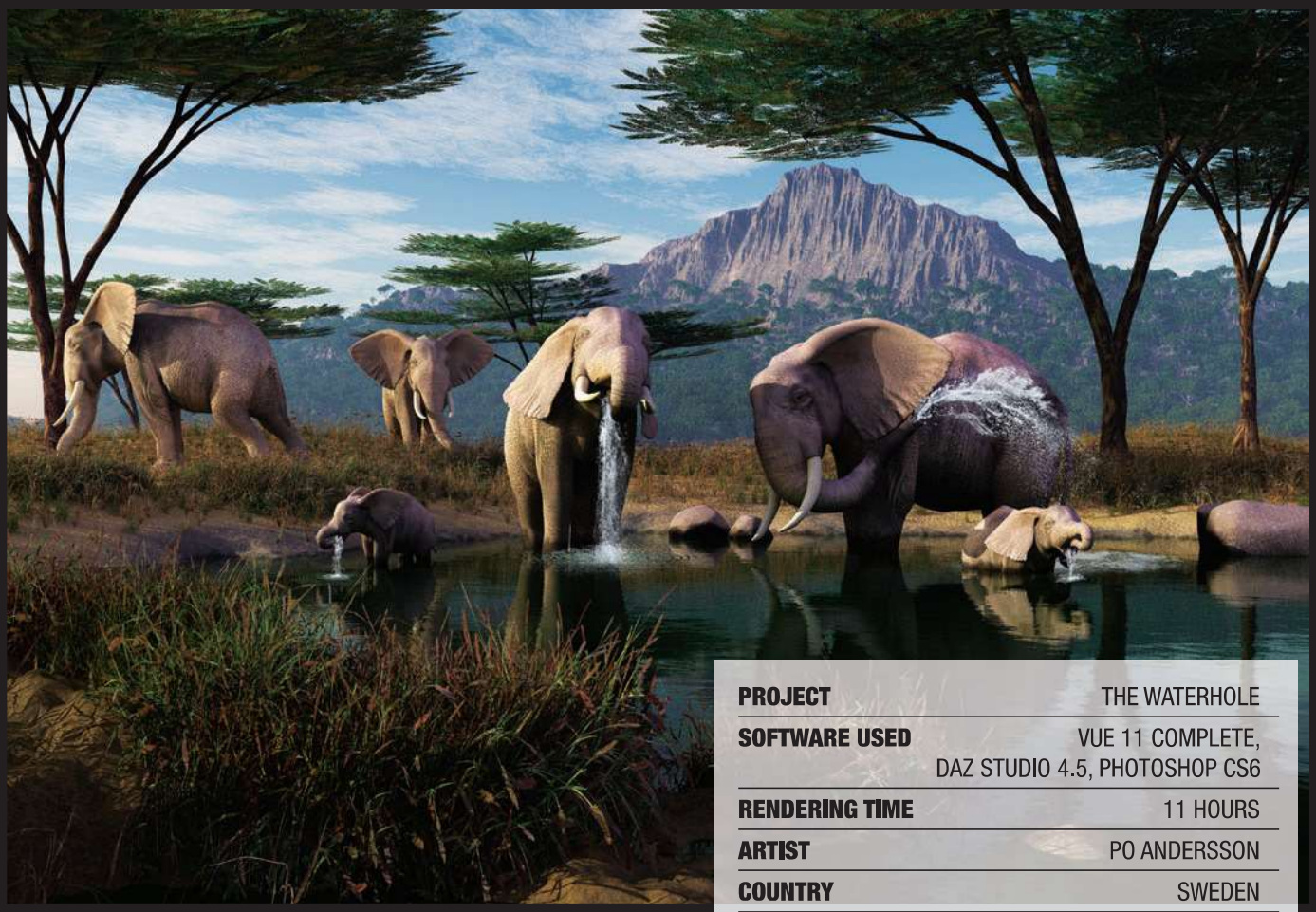
I was working on a series of scenes of wildlife some time ago and realised that I wanted to do some from Africa. I have always liked elephants so it was natural that I would create one that featured them. The important point was how to feature them. A typical scene would be in a herd but I decided I would go for a more fun image with them playing around a waterhole. This is one of a series I created around this concept. Unlike many artists, I don't sketch out ideas, I just form them in my head and try to work them out in practice. I used a couple of reference photos of elephants playing at waterholes, just to get an idea of actions and the setting, but mostly the ideas were self-generated.

Some original photos of elephants playing and drinking at waterholes and rivers.

TOP TIP – LIGHTING SCHEMES

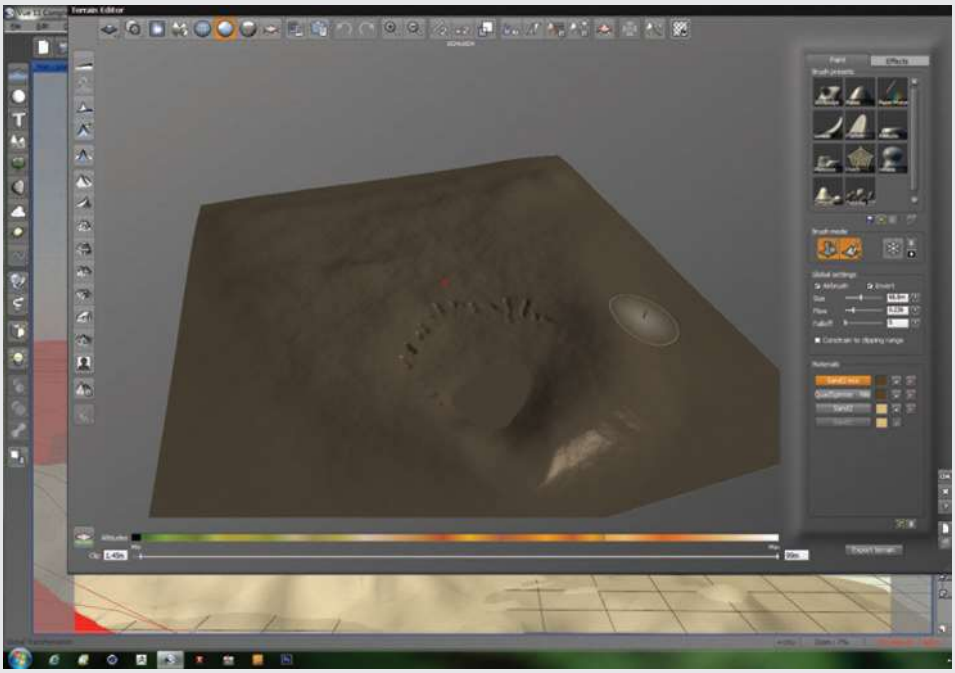
If your scene is taking a long time to render because it has a high polygon count, and is high resolution, then one way to cut the time down is to use a less demanding lighting scheme if it doesn't require sophisticated shadow detail.

FINAL IMAGE – THE WATERHOLE BY PO ANDERSSON



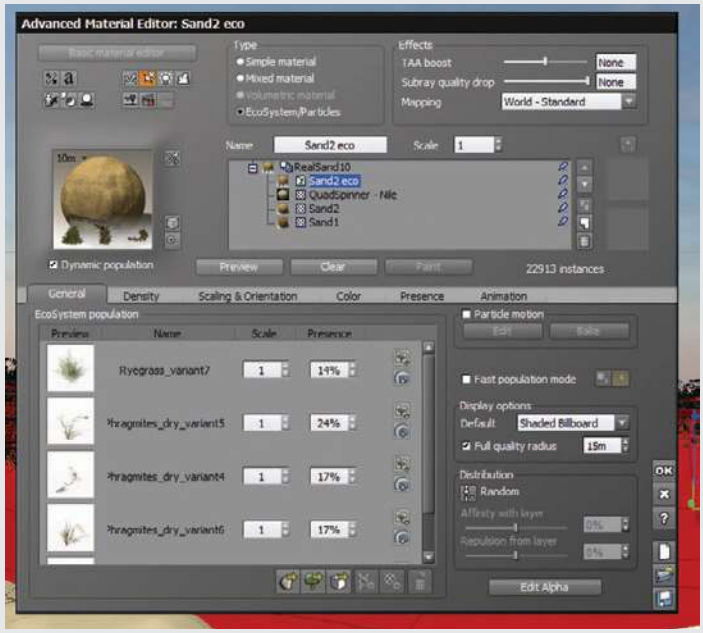
PROJECT	THE WATERHOLE
SOFTWARE USED	VUE 11 COMPLETE, DAZ STUDIO 4.5, PHOTOSHOP CS6
RENDERING TIME	11 HOURS
ARTIST	PO ANDERSSON
COUNTRY	SWEDEN

STEP 1 CREATING THE INITIAL FOREGROUND The first thing to do was to create a landscape terrain at 1024 * 1024 resolution. The ground was then built up from the beginning with landscape brushes. Some unevenness was added to the edge of the water hole and new material was painted in at the edge.

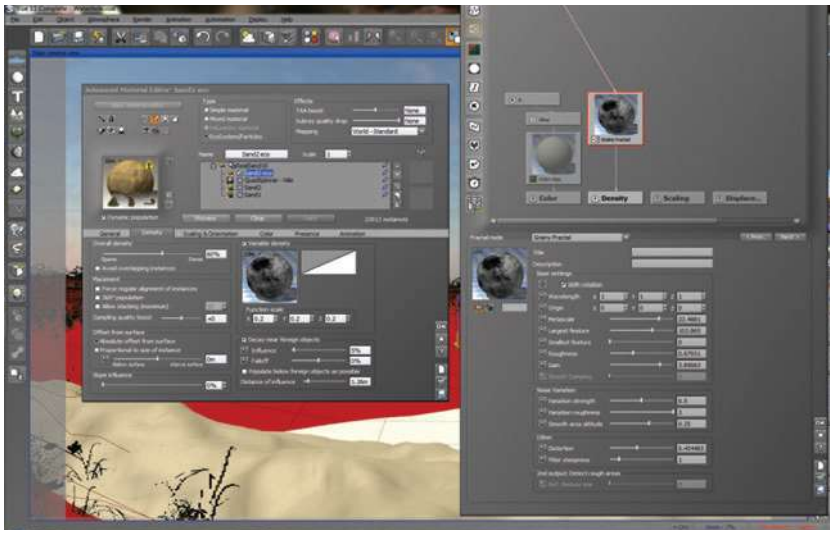


TOP TIP – POSING OBJECTS

For animals and human figures, it's much easier to pose them in apps like DAZ3D and Poser because the figures come ready-rigged. All you need to do is get the pose right and export as compatible format.



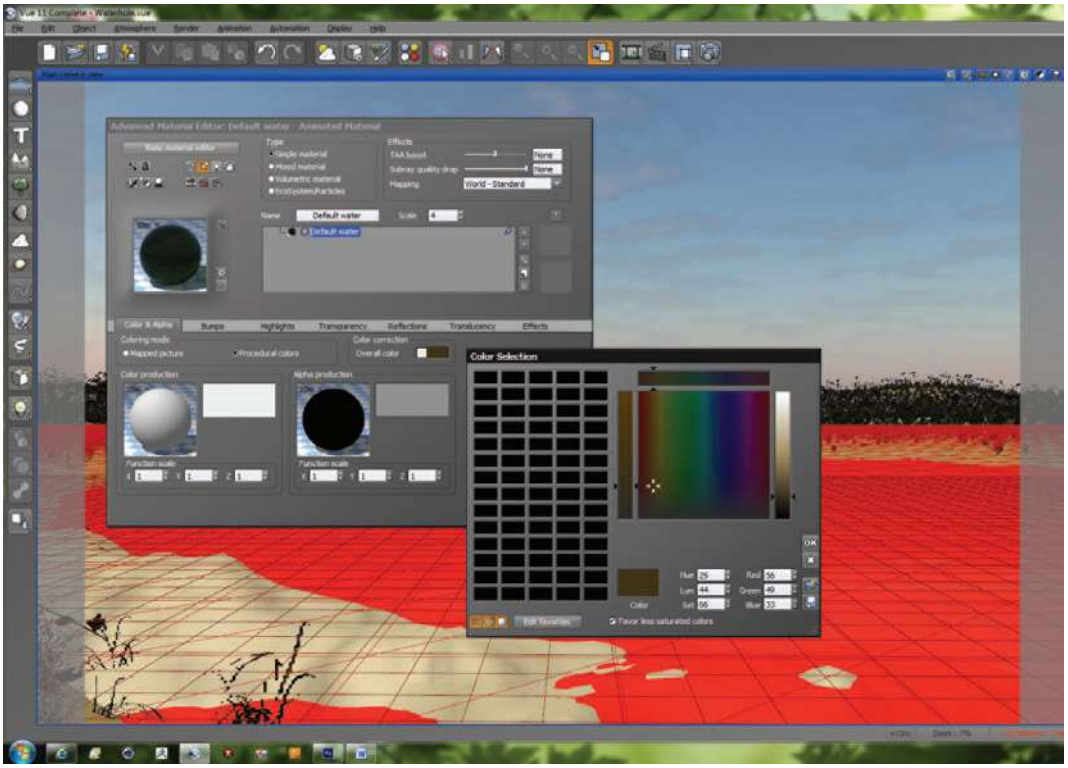
STEP 2 SELECTING MATERIALS The materials chosen for this scene were Real Sand 10 and, in the Vue Ecosystem, grass from Silva 3D, Ryegrass and Phragmites in different varieties were used.



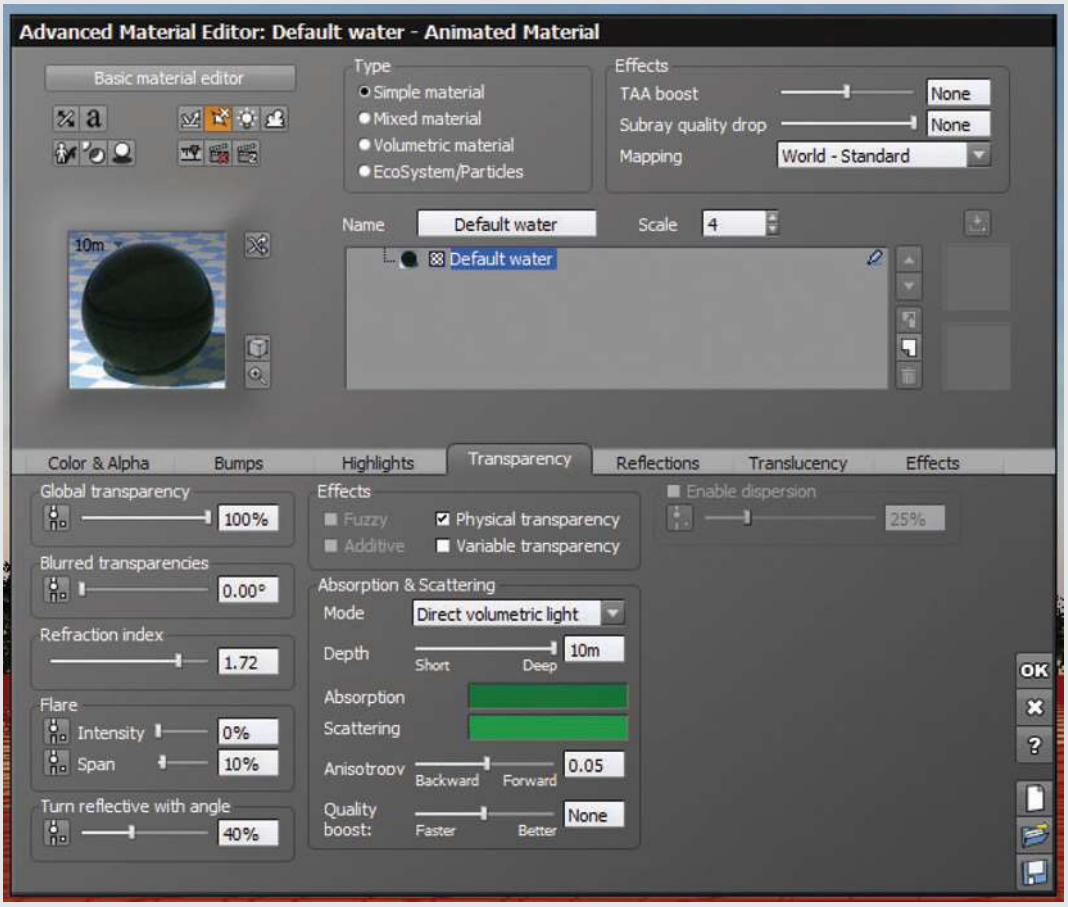
STEP 3 EDITING DENSITY FUNCTIONS The Advanced Material Editor for the Real Sand 10 material was launched and the density set to 60%. The Function Editor was used to set a variable density and the Grainy Fractal procedure was selected to generate the random distribution of material.

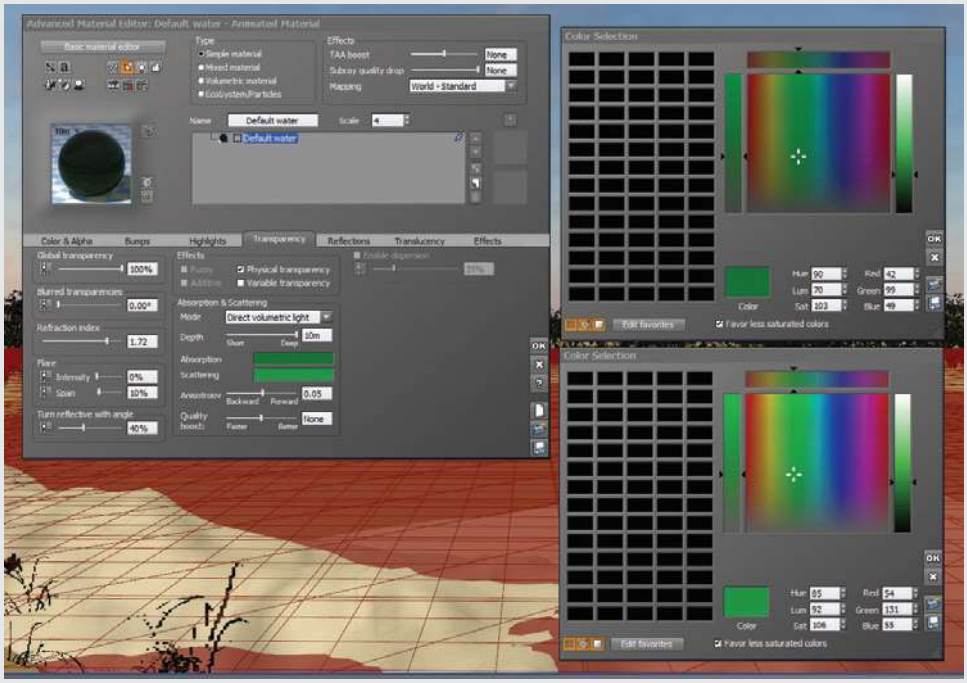
STEP 4 SCALING THE MATERIAL The overall scaling for the material was set to Large 15, because such a large terrain was used. The basic scale of the material was also changed to 2.8 to suit the size of the terrain.

STEP 5 CONFIGURING THE WATER The water in the waterhole itself was simply the Vue default but the colour was changed to a browner version that more represents the kind of muddied water you would find in real life.



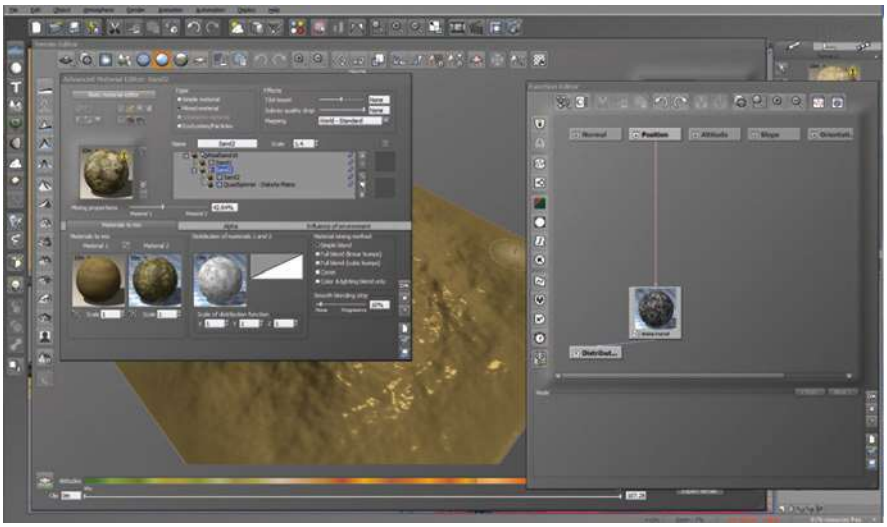
STEP 6 TWEAKING THE WATER Aside from making the water browner the depth was set to 10m. The water had standard features like Physical transparency and used direct volumetric light to scatter the light rays around in the muddy depths.

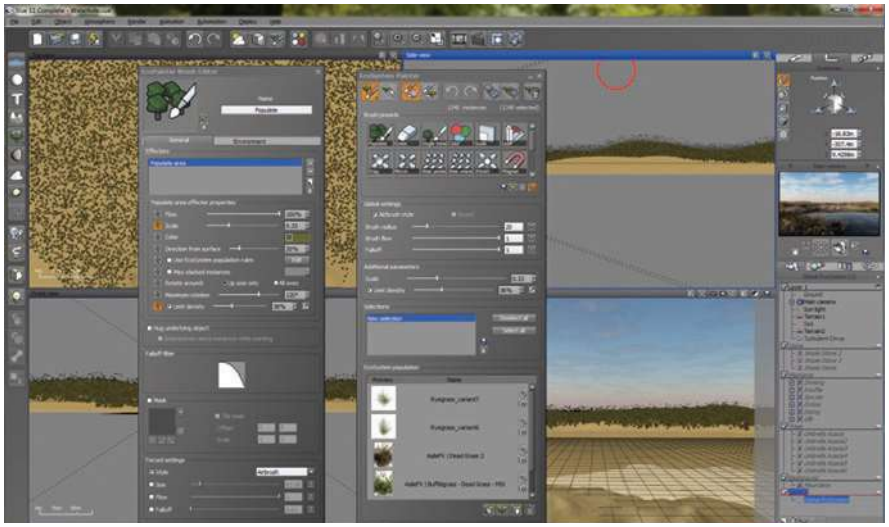




STEP 7 COLOUR OF ABSORPTION In the Transparency tab the Refraction index was set to 1.72 and the colour of Absorption and Scattering to green. This was to make the underwater colouring have more of a vegetation-feel to it, rather than just being plain mud.

STEP 8 THE FOREGROUND TERRAIN The next step was to add the foreground. The terrain was a standard one that was scaled down to fit. Here two materials were mixed together. In the Function Editor the Grainy Fractal procedure was used to distribute the materials. These were Real Sand 10 and Dakota Plains (from Quad Spinner).

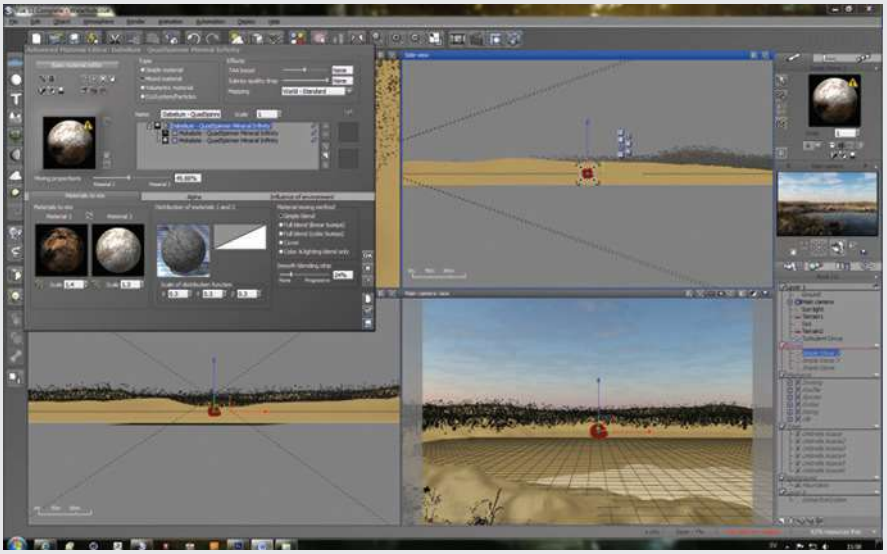




STEP 9 FOREGROUND ECOSYSTEM In the foreground terrain the Ecosystem Painter was used with AsileFX and Silva 3D grasses. The scale was set to 0.33 and the density to 36% to make sure it would populate the area without overloading it or becoming too dense.

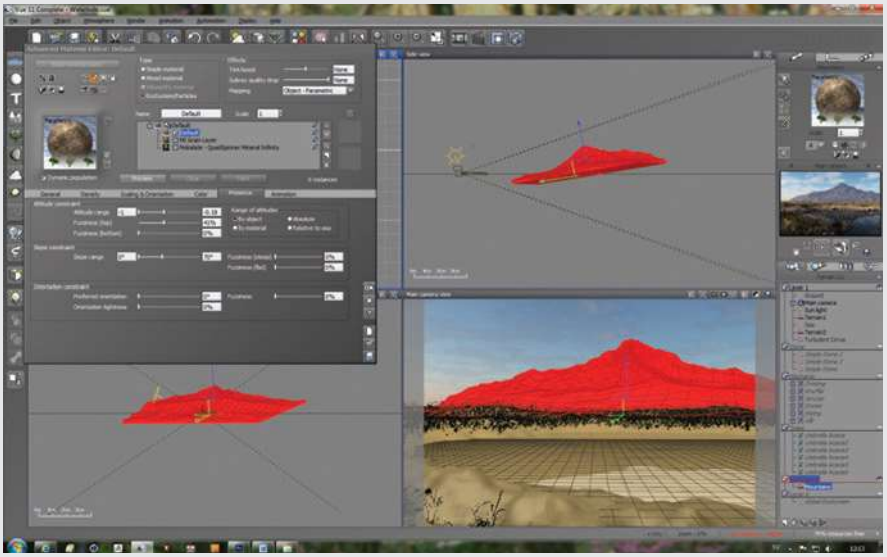
STEP 10 ADDING THE BACKGROUND MOUNTAIN

Some rocks and stones were positioned around the scene using the Vue Simple Stone. The material for them, though, was changed to Mokalate from Quad Spinner Mineral Infinity. The materials were mixed up and changed so that the top were light and the bottom were dark to represent sitting on a wet surface. To make the wet part of the rocks more visible they were scaled up.



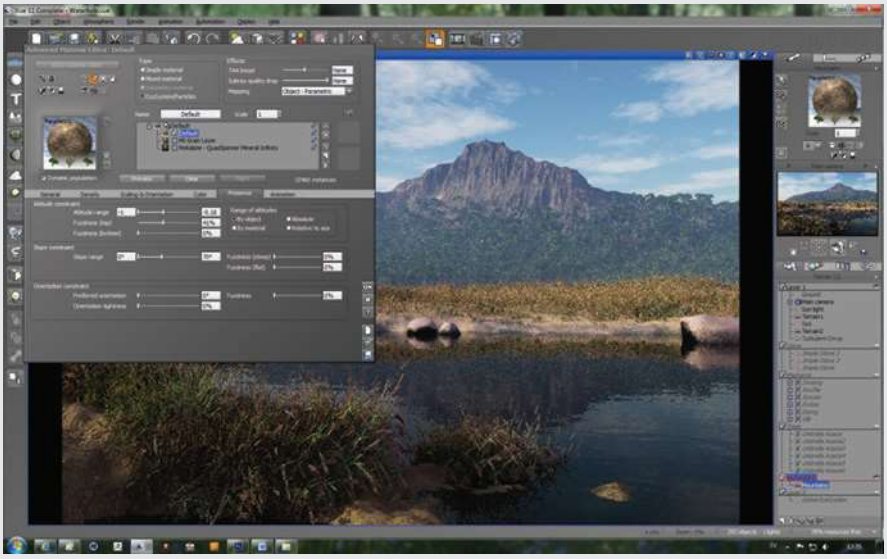
STEP 11 ADDING THE BACKGROUND MOUNTAIN

Then it was time to add the background mountain. Here a mountain that I have as a vob object in my object collection was used. The material was changed to the Mokalate material – the same as the stones – but without changing the colour. The mountain covered 10km * 10km and was about 2km high.



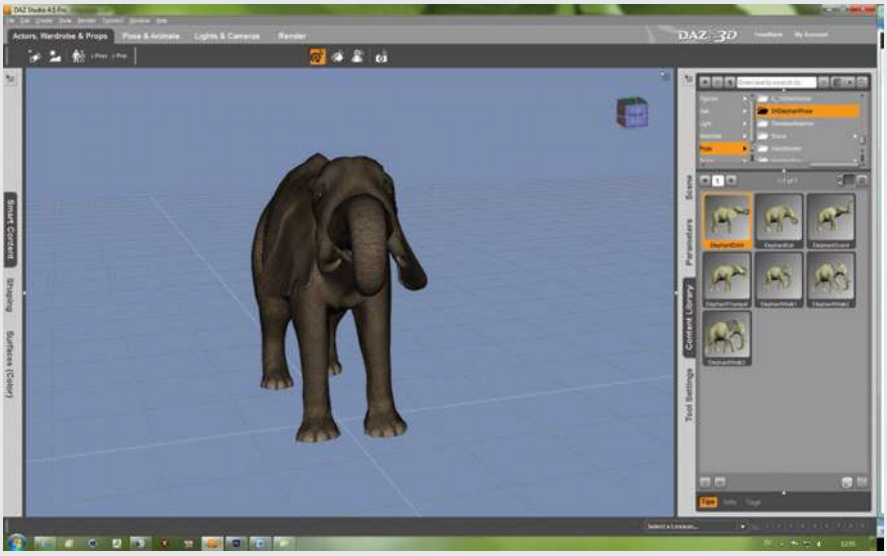
STEP 12 BACKGROUND MOUNTAIN VEGETATION

In the Ecosystem for the background there was Old Eucalyptus Tree and Rural Maple Tree. The density was set to 74% and Scaling to 3. Altitude range was set to -1 to -0.18 with fuzziness (top) at 41%. This gave a fairly thick coverage.

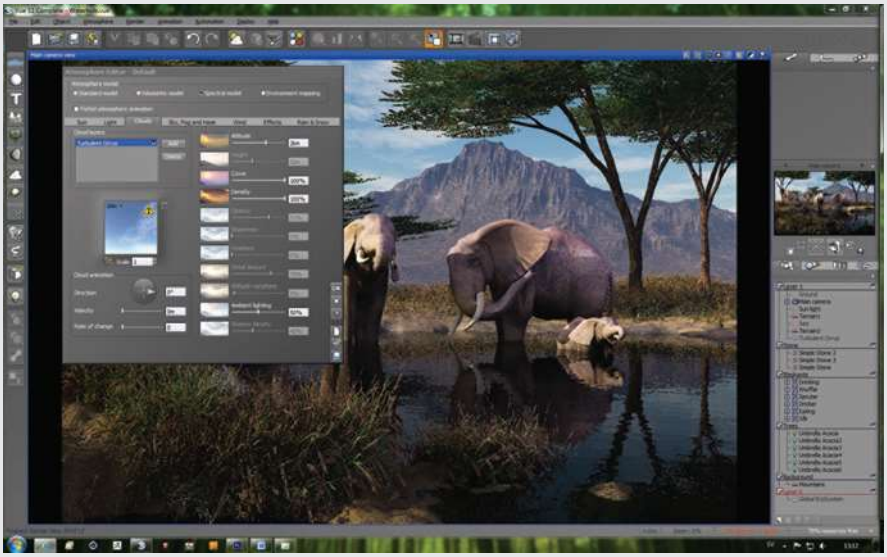


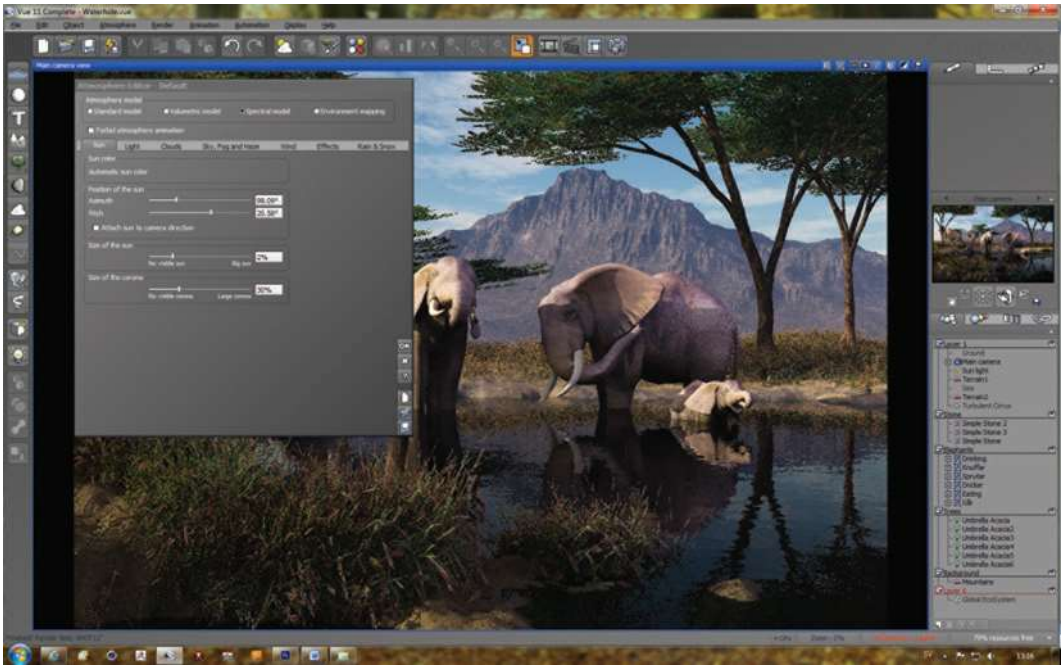
STEP 13 PLACING OF TREES At this point it was time to place some trees. The Umbrella Acacias, which are included in Vue, were used, with five of them placed into the background where they could be seen. There's also one to the left which casts a shadow into the scene.

STEP 14 THE ELEPHANTS So now it was the turn of the stars of the scene – the African elephants. These were posed using DAZ 3D Studio. To make it easy for myself I simply used the preset poses that come with these figures, with a few little tweaks. There were six elephants used in the scene, with adults drinking, pushing, spraying and walking. There was also a baby elephant eating and drinking.



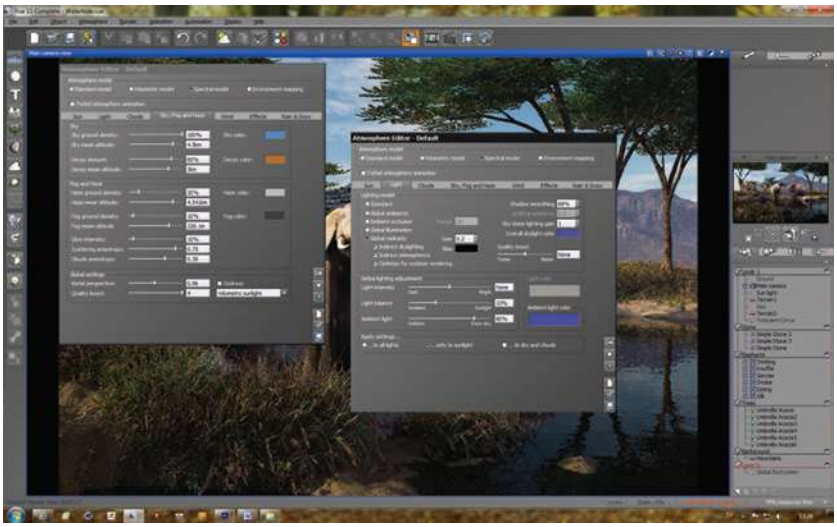
STEP 15 ADDING ATMOSPHERE With this scene being an African waterhole, it was important to create a bright, glaring day with thin atmosphere. To achieve this the position of the sun was moved and some Turbulent Cirrus clouds were added with an Altitude of 2km, Ambient lightning: 50%, Cover and Density: 100%.

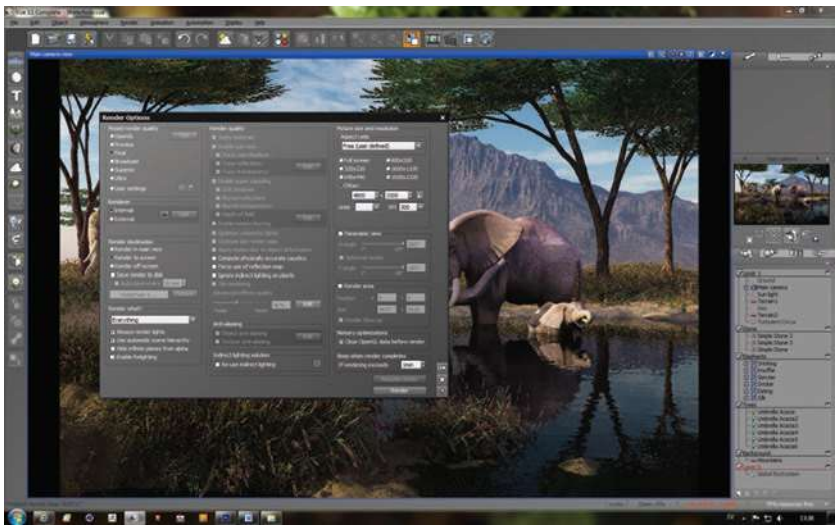




STEP 16 THE SUN To get the sun into the right position it was set with the azimuth at 98.09 degrees and the pitch at 20:58 degrees. Remember to untick the Attach sun to camera direction option to get it positioned properly. The sun itself isn't visible in this lighting setup.

STEP 17 LIGHT AND SKY, FOG AND HAZE Using the Atmosphere Editor the lighting mode was set to Global Radiosity with Sky dome lighting set to Gain 1 and Gain 0.2. GR lighting is the most complex but also the most realistic. Additional global lighting adjustments included Balance: 33%, Light and Ambient Light: 80%. On the Sky, Fog and Haze menu the Quality Boost was increased to 4 with volumetric sunlight for extra quality.

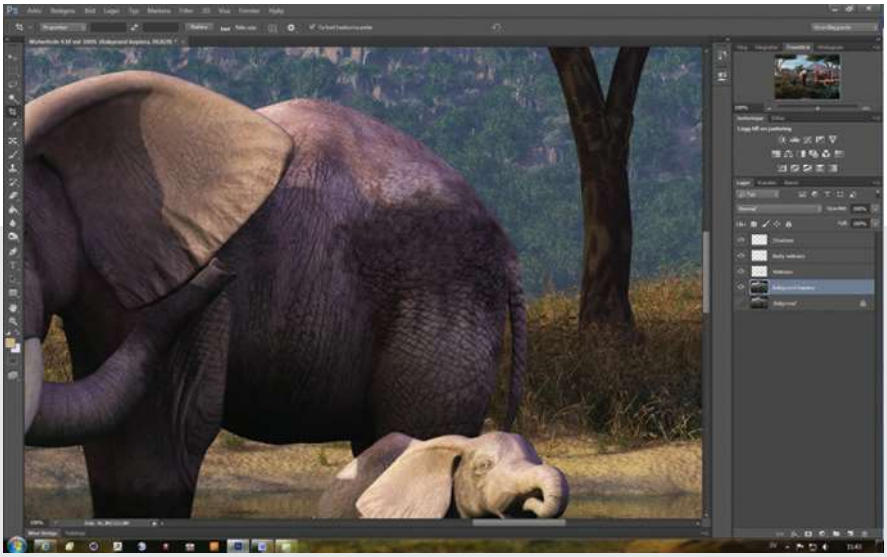




STEP 18 THE FINAL RENDER Now that the scene was pretty much finished it was time to render it out at 4800px wide and 3300px high. Thanks to the complex lighting model the render time was a fairly hefty 11 hours.

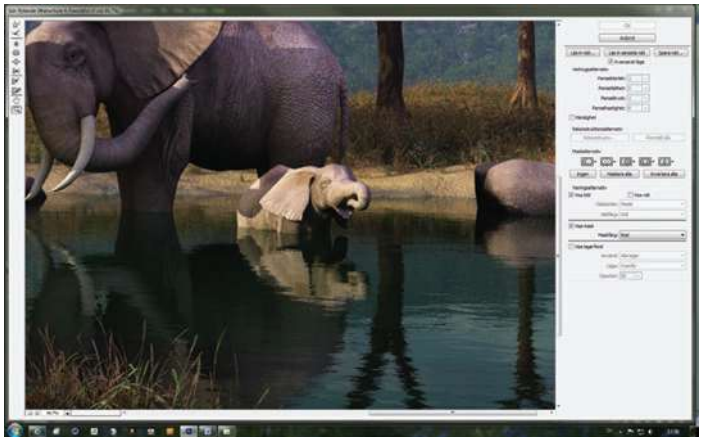
STEP 19 POST WORK IN PHOTOSHOP
There were quite a few post production touches, starting with making the elephant legs look a little wet. The brush tool was used in the Colour blend mode to paint a darker colour up the legs and on some on the bodies of the baby elephants.

STEP 20 ADULT ELEPHANT In order to create more realism the spraying elephant also needed patches of damp and wet skin. These were painted all over the torso and the trunk as well. A separate layer was created for this alone.



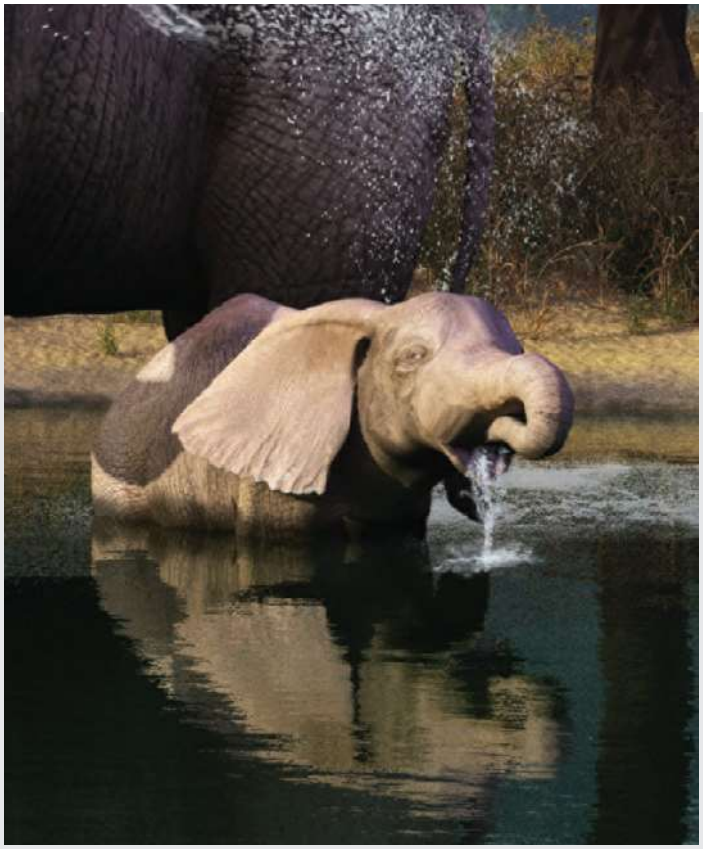
STEP 21 BREAKING UP THE SHADOWS The next step was to break up the outline of the shadow from the elephant. The brush was used in Normal mode and dark and light areas were painted in so that the shadow had a more natural look. A new layer was created for this as well.

STEP 22 BANK SHADOWS It's one of the weaknesses of Vue that shadows can often be far too rigid when falling onto a moving surface. After adjusting the one on the water from the elephant the same process was used for the shadows falling onto the bank, to break them up and look more natural. A brush in Normal mode was used at Opacity: 20% for this.

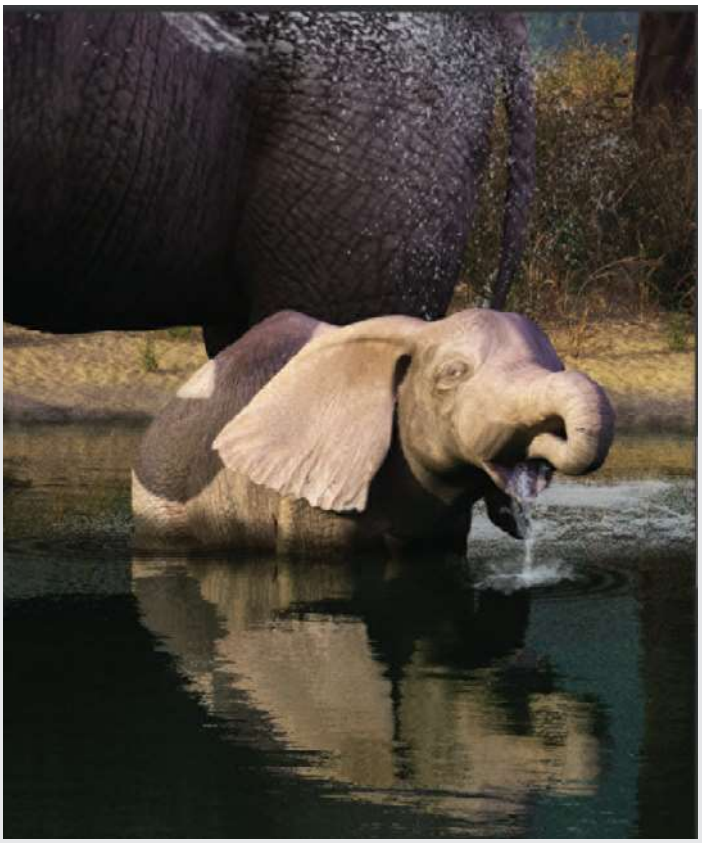


STEP 23 MAKING EDGES NATURAL The models for the elephants are quite good but you still end up with sharp angles and no protruding hair which you would find on a real animal. The Liquefy filter was used to make the edges less uniform. The edge of the elephants' ears in particular needed attention. The aim was simply to give them rounded or uneven edges that didn't look like 3D models.

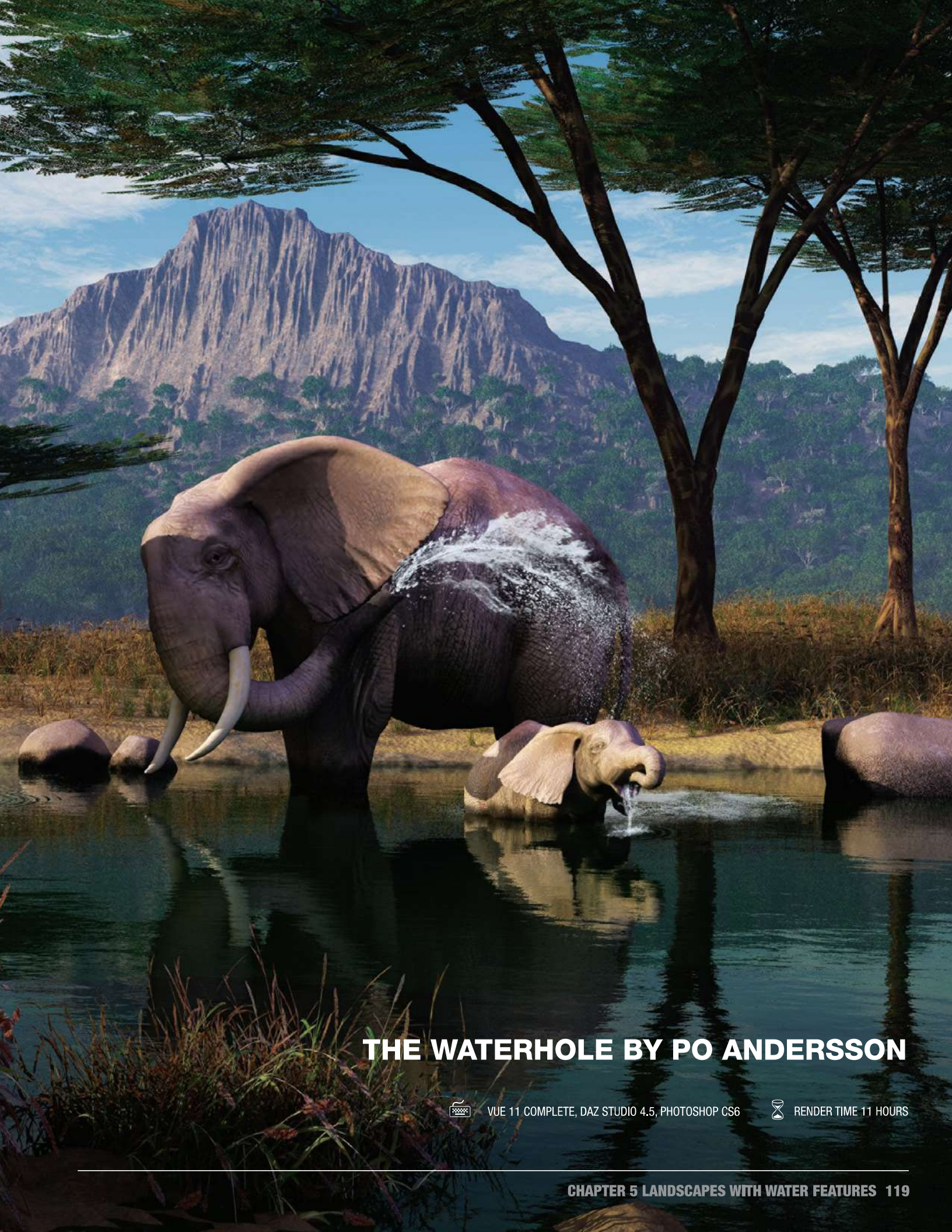
STEP 24 WATER SPRAY As the elephants were playing and drinking in water the image needed water spray and water itself running from their mouths. Different brushes were used with water effects that were placed on separate layers so anything which didn't look realistic could be redone or removed. For the first layer of spray a custom brush set called Ron's Splashes was used.



STEP 25 WARPING THE WATER I continued using brushes from Ron's Splashes to add the water that flows from the mouths of the elephants. The water was adjusted using the Transform warp. As this was done using a number of layers the individual opacity of each was reduced so the effects would blend together more naturally.



STEP 26 WATER RIPPLES The final effect to add was concentric water ripples from where the water from the elephants fell back into the waterhole. Then the colour and contrast were tweaked and all the layers merged down to complete the image.



THE WATERHOLE BY PO ANDERSSON

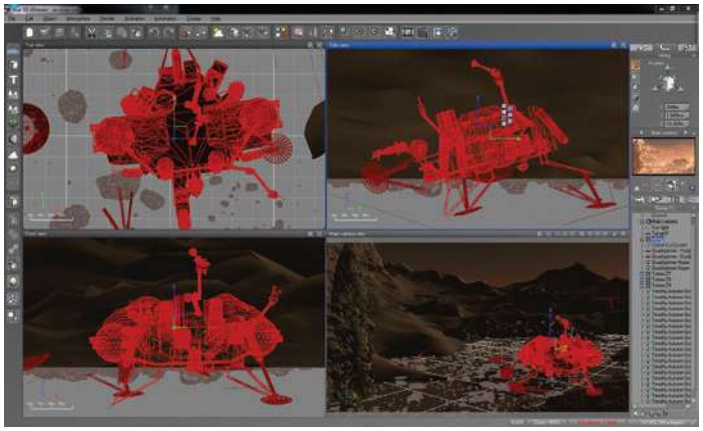
VUE 11 COMPLETE, DAZ STUDIO 4.5, PHOTOSHOP CS6

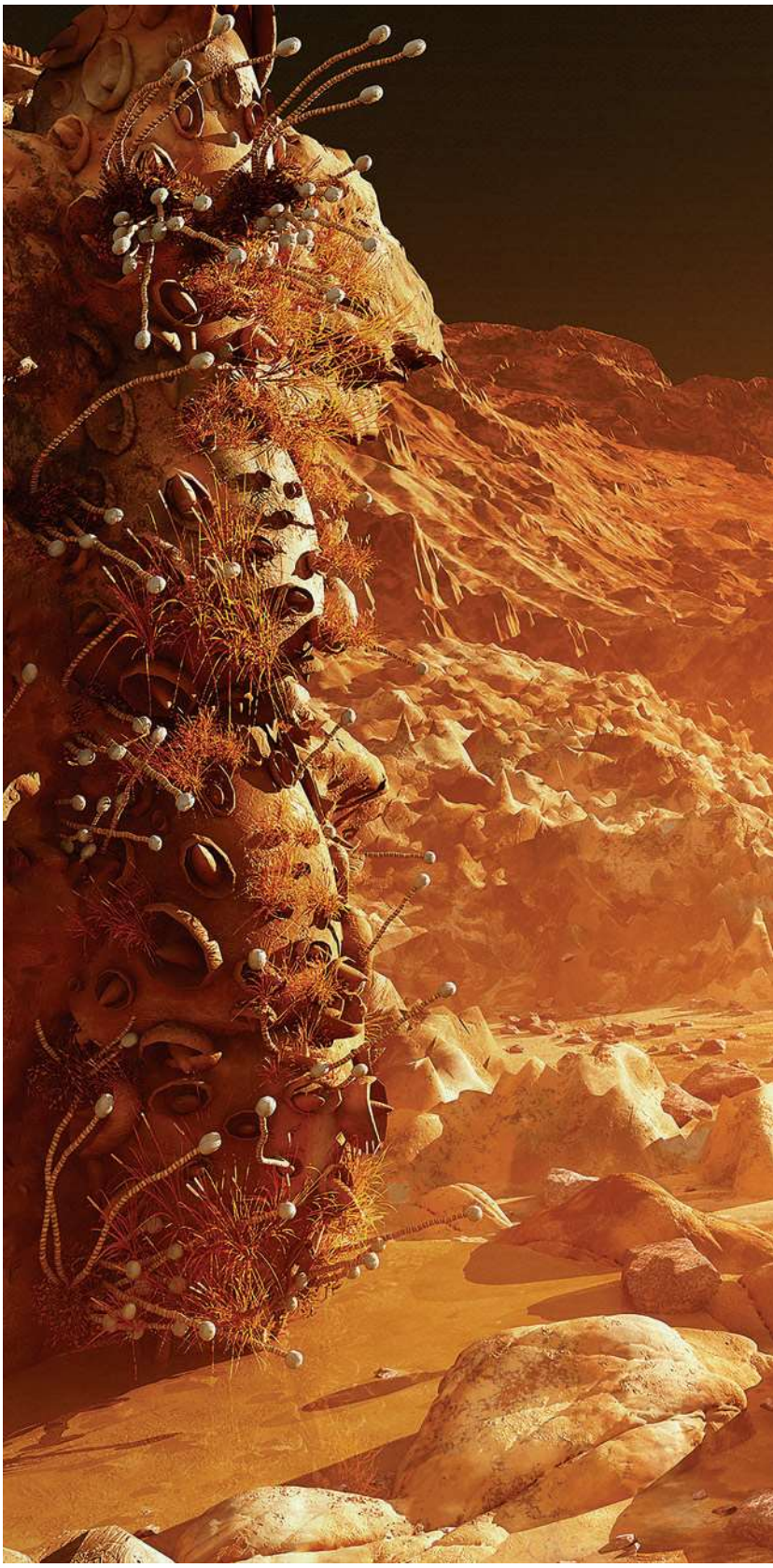
RENDER TIME 11 HOURS

"Viking 1 was the first of two spacecraft sent to Mars as part of NASA's Viking program. I created this image because I always wondered what happened to this craft which was never heard from again. So I created this rocky and dusty scene to create a story for what happened.

I used ZBrush for rocks, some sci-fi plants, the model came free from the NASA website and World Machine 2 was used for the background hills and a sci-fi atmosphere. There were a lot of adjustments just to get the dust and sun effect right. I spent two hours just on this aspect."

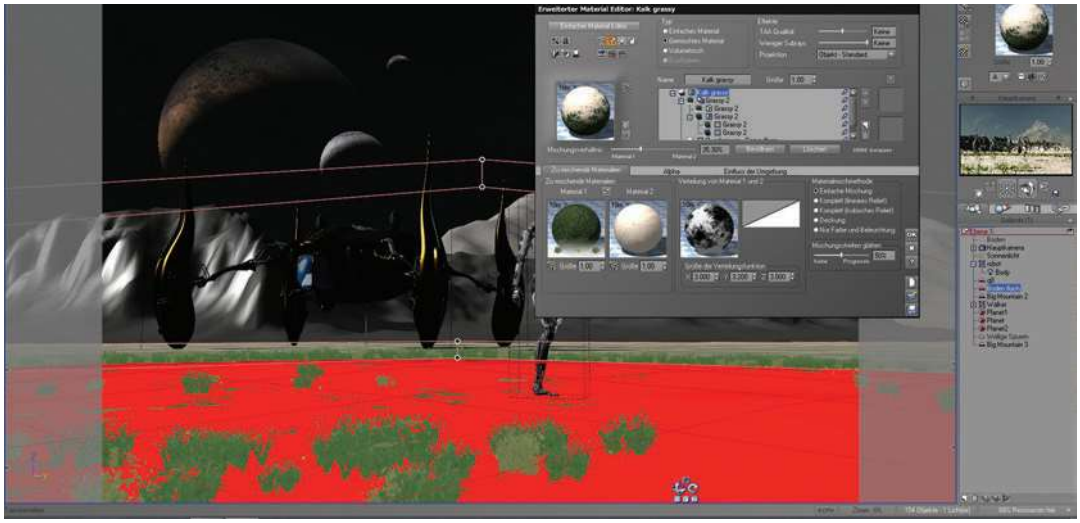
PROJECT	SO CLOSE
SOFTWARE USED	VUE 10 XSTREAM, ZBRUSH 4, PHOTOSHOP, WORLD MACHINE 2
RENDERING TIME	4 HOURS ON AN INTEL QUAD 4, 8GB RAM MACHINE
ARTIST	SHANE PERRY
COUNTRY	NEW ZEALAND

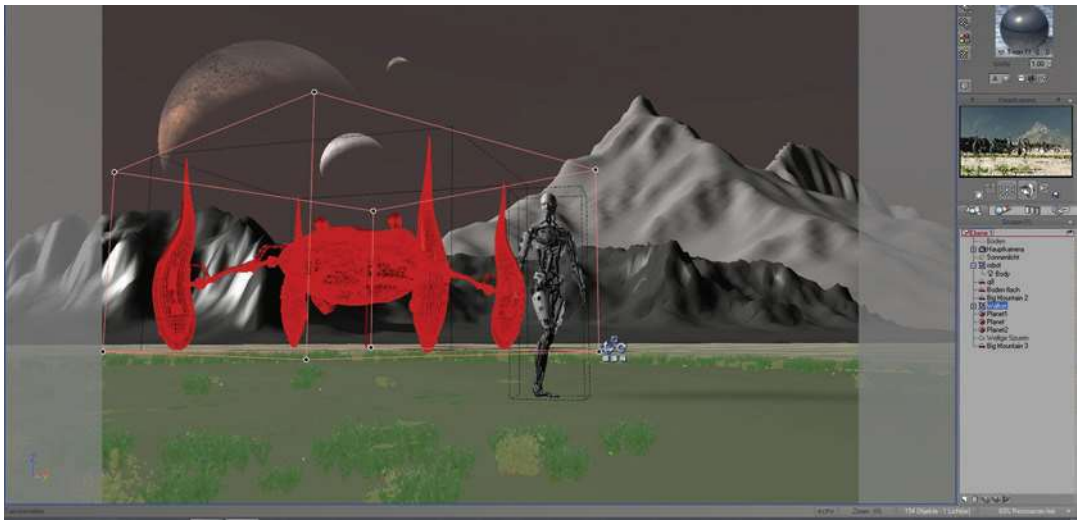


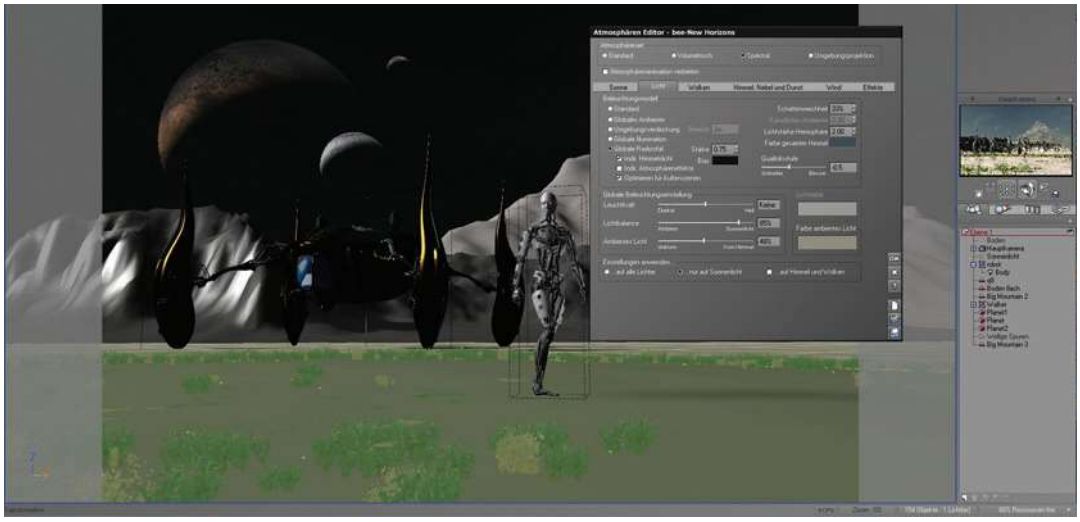


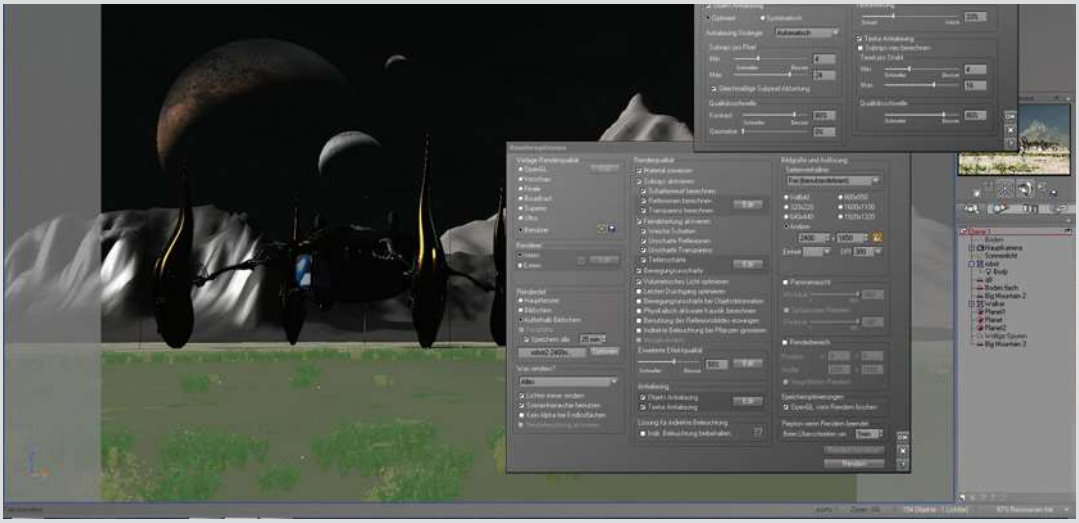
"As I browsed through the catalogue of models at DAZ3D, I discovered by chance a humanoid robot who looked like the one from the Will Smith movie, *I, Robot*. The film was about a robot with its own awareness. As a result I came up with the idea of making a picture with a robot who has developed self-awareness, and with it has the desire to explore new worlds with his spaceship. The desert is a mixture of sand material with patches of light grasses. The escarpment and mountains are separate landscape terrains arranged in the background."

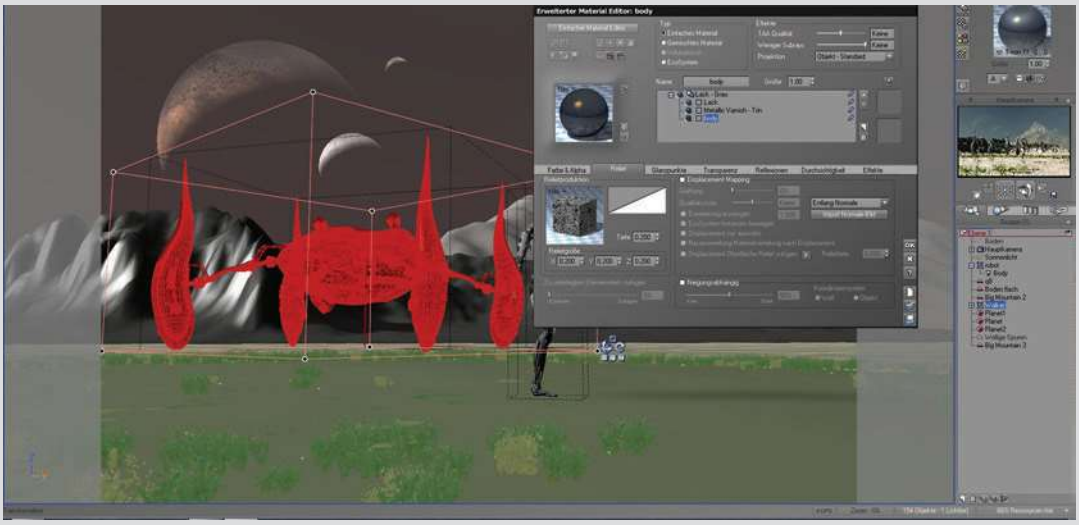
PROJECT	CUM SARCINULIS
SOFTWARE USED	VUE 10 COMPLETE
RENDERING TIME	159 HOURS 6 MINUTES
ARTIST	WOLFGANG KEIM
COUNTRY	GERMANY

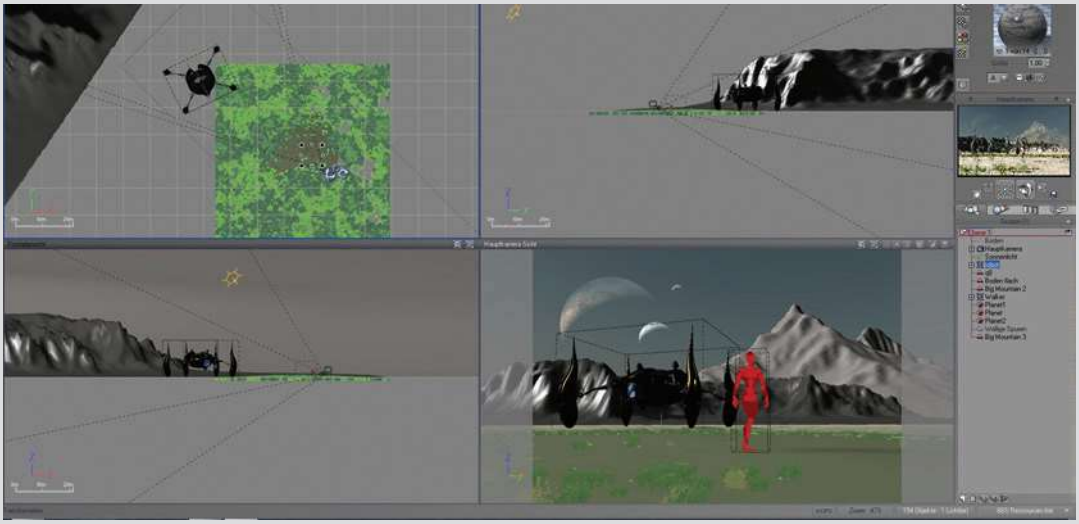

Erweiterter Material Editor: Kalk grassy




Atmosphären Editor - bee-New Horizons




Erweiterter Material Editor: body



THE SECRETS TO A PERFECT BEACH

Iliya Atanasov reveals the workflow used in creating his incredible Malaysia Dream image.

BACKGROUND

I was inspired by the beauty of Malaysia when I was on vacation there this winter. Diving in the islands of east Borneo I found a small island with a local village on it. The people were very poor with no water and electricity, but it was a very clean and nice place. Personally, I come from a small mountain city so I have been always attracted to well-organised living places. In this Mali village with nine to ten streets, you can find a lot of charm and beauty. The streets are kept clean, the houses are made from wood planks, roofs from palm tree leaves – only natural materials. Everything is closer to nature. Because of that the people are very friendly and, even though poor, they invite you in for a cup of tea and some dry fruits. I was very excited by these people and their place, so I decided to capture this moment in a computer generated image. I wanted to give it a more dreamy feel, like somewhere surreal, with strong saturated colours and glowing highlights. The island was at water level with no high mountains on it but, for the sake of better composition, I decided to add one.

MALAYSIA DREAM BY ILIYA ASTANASOV

Here you can see some of the real references of the islands, sky, houses from the location itself. When I looked from a distance there were so many elements that it was impossible to remember everything at once. So, I took a number of photos and examined the details house by house, tree by tree, to organise them in my mind. The number of objects that I would see and that were going to go into the 3D landscape was a challenge. I started by exploring the photos one by one to decide what should go into the artwork.

MODELLING THE ELEMENTS

I started with modelling simple objects such as different houses, boats, elements, fruits, leaves, junk, clothes and so on. I used Maya paint effects for the roofs of the huts using combinations of straw covers and dead palm leaves. I had a lot of real references, so I could explore different designs of the huts. After that the rough assembly and composition of the scene continued. I wanted a low angle with the camera at eye level, using a 32mm lens. This is the same angle I saw the village from on the boat. The idea was to see some part of the water plus the small houses, the beach, the boats, to capture the exotic feel of the place. The water was very important being bright blue and turquoise, a typical colour for this kind of place. The houses had millions of small details and elements hanging on them, so I tried to add as many as I could remember. There was a feeling of chaos from observing the actual scene, that's why more small objects were thrown all over the place.

Local villagers spend the whole day on or in water, mainly fishing, that's why it was important to have lots of boats. The whole beach was covered with old boats. I tried to model and duplicate as many as I could, again in a chaotic way, scattered everywhere on the beach. Some of the boats had engines, most didn't.

After that I started on the foliage process. I used Maya paint effects for trees and plants, and also some of xfrog trees I have collected over the years. Some of the palm trees were high over the huts, some of them were literally going inside the windows. People were using them to hang objects and clothes, even to pull objects via wires from window to window. Most of the houses had lots of gaps in the walls which came in handy: with the high temperature and humidity, the holes acted as a natural fan for the occupants.

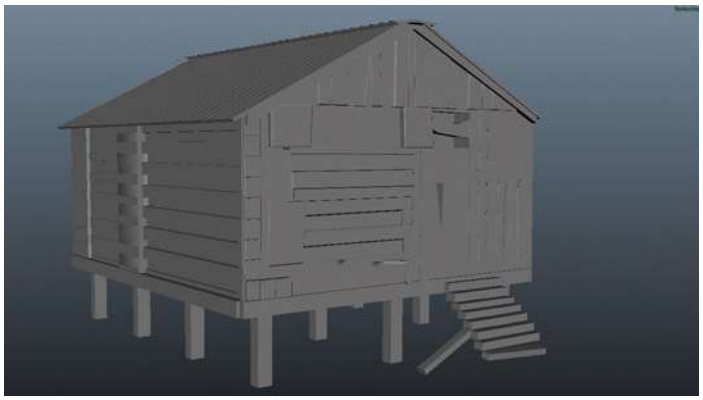
Later I decided to add some mountains in the far background, because the composition lacked depth. Here the program Vue came in handy, because duplicating hundreds of trees became too difficult for Maya to handle. The two programs have a bridge between them so it was easier to export the camera from Maya to Vue and vice versa. In Vue I used a procedural terrain with a noise modifier. Later I saw that the two mountain peaks looked very similar. They weren't duplicated, it's all one mesh – it just happened like that. For the modelling techniques I used polygonal modelling from simple objects such as spheres and squares, following the source pictures I had. Boxes were extruded to make the walls, cylinders for the water tanks and sometimes the polygon tool was used to build the cloth objects. I used curves for some of the boat exterior hulls and the loft function between them to make the shape. Some of them are just extruded boxes. Extrude, split and cut were the main instruments used. I added ropes, bolts and hanging stuff to help hide some of the low-poly feeling of some of them.

The sandy beach was a plane with noise modifier to make small sand waves on it. Later, displacement was added as well as the materials. The actual beach was much dirtier and more full of rubbish than the one I made but I decided it would look nicer and be quicker not to include all the junk.

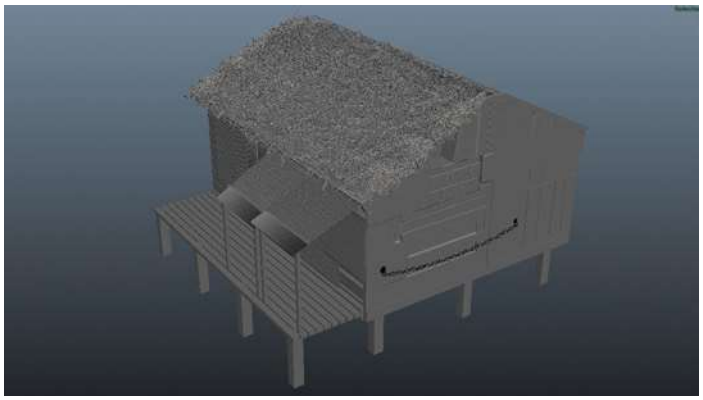
The water was a simple plane again, with displacement added later to the shader. Overall I spent two or three days modelling and preparing the objects for the scene.

TOP TIP – INSPIRATION BEFORE PERSPIRATION

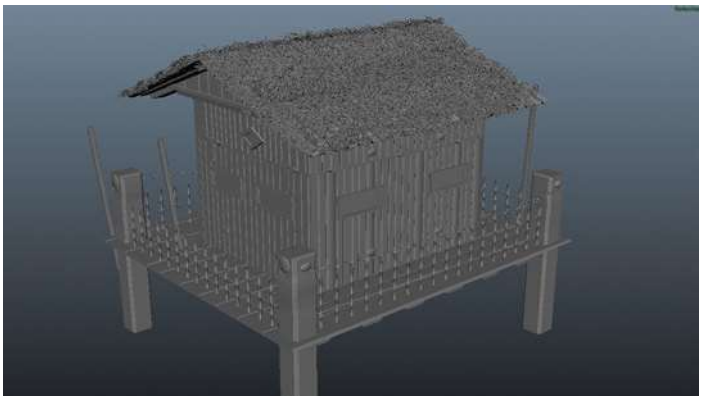
For me the most important thing is the inspiration. If you are inspired by something you can create art. Everything around gives me this inspiration. Nature surrounding us is so beautiful and rich that I can find millions of ideas for recreating it in my own way. Observe, feel and be creative! Art direction first, the technical work follows after.



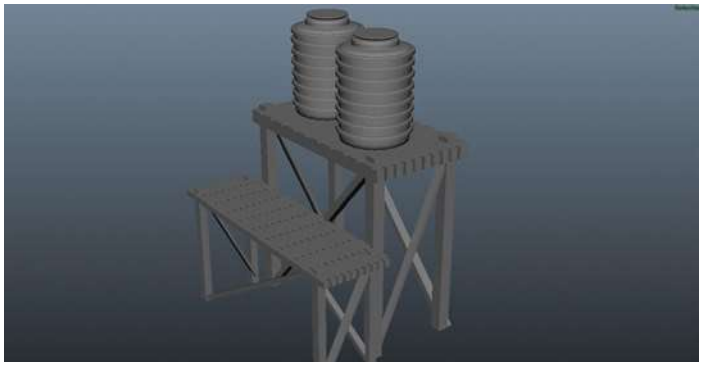
Black and white shaded models of some elements in the scene.



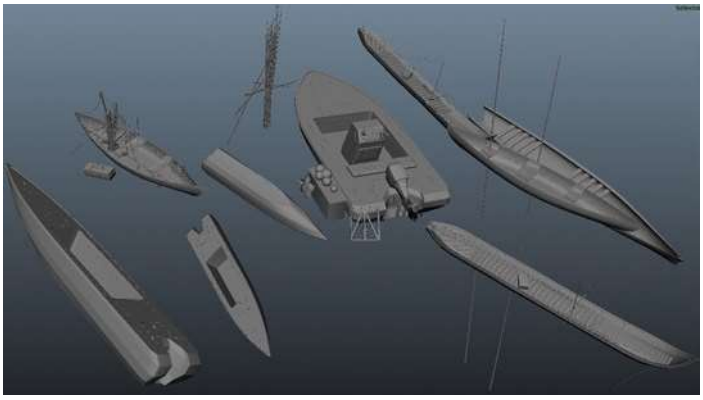
The beach huts used a paint effect for the straw roof material.



The simple poly-modelling technique was used for all walls, roofs and elements



Here's one of the smaller elements in the scene – some water containers.

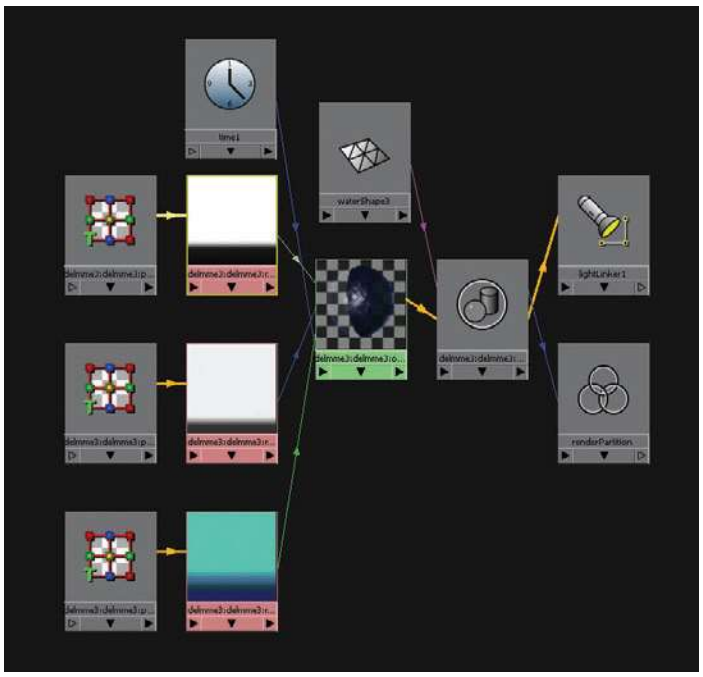


Lots of different types of boat and boat hull were created to populate the shoreline.

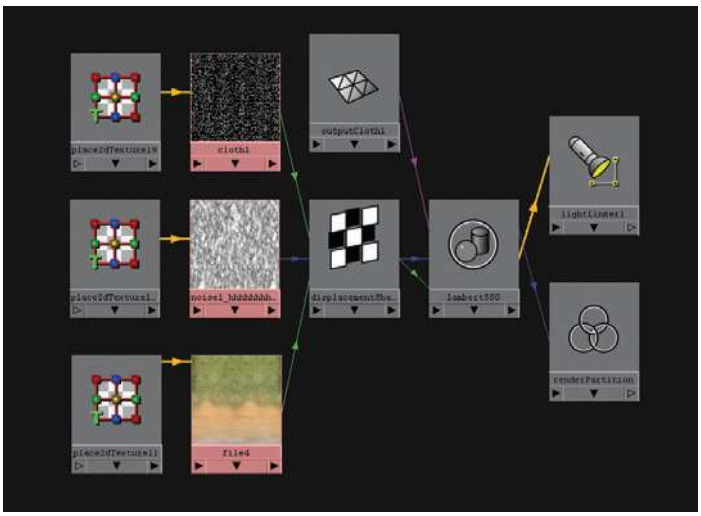
ADDING TEXTURES AND MATERIALS

All the textures were used from the real photo references I shot with the camera while I was there. With the help of Photoshop I made different files with the UV coordinates from the different objects. All the materials were simple Maya and Mental Ray shaders. Blinn and Phongs were used for some small objects like fruits, containers and hanging cloth items. For bigger objects like the houses themselves I used MIA Material X shaders. They spread the light much better than the Phong materials. For the channels of the materials I used colour, bump and some specular attributes connected in most cases. There were reflections on the wood materials, but very blurred. I experimented with the SSS shader for the leaves of the trees, but with the high number of polygons in the scene, the render just became too long, so I used a translucent attribute instead. This made the leaves bright, but lost the depth in the tree. I corrected that later by adding an ambient occlusion pass. I had a hard time with the sand material because it didn't work the way I expected. After while playing around, I came up with something very easy – normal blinn material with procedural noise for the displacement and procedural cloth node for the incandescent.

For the ocean I had been using Maya ocean shader with ocean displacement, ramps for the transparency and reflectivity. I also experimented with a couple of materials to see how they looked. In the end I decided not to use a refraction blur on the material, as in the real life, again because of rendering time issues. The texturing process took up the majority of the time on the project, along with the modelling.



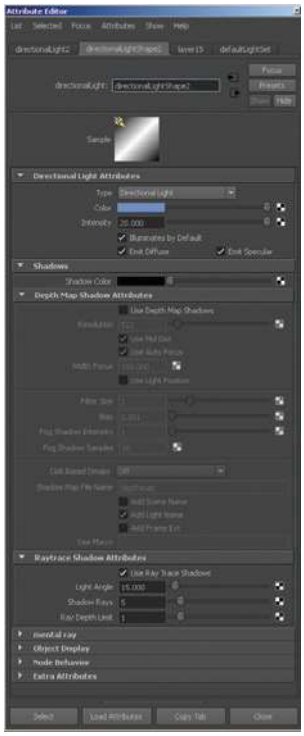
Graph of ocean shader. Some gradients were used to achieve a more transparent look closer to the shore and darker going inside. Another gradient was used for colouring the water.



Graph of sand shader. Normal blinn material was used with procedural noise displacement on it. Procedural cloth node was placed in incandescence node to give the feeling of very bright sand particles on it. Manual mapped texture was used for the colour – greenish on the top where the houses are and pure sand on the bottom where the water is.

Examples of the colour textures for some of the objects. All the objects using one type of material were placed in one file. This made the working process a little faster and easier.

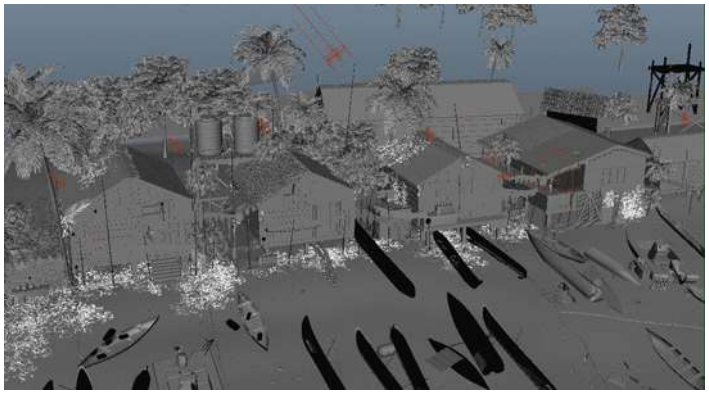
INTRODUCING THE LIGHTING



For the lighting model I used Mental Ray physical sky and sun. For outdoor lighting I find this technique works pretty well and is very fast for rendering. The createNode mip_rayswitch_environment node was added in combination with createNode mib_color_alpha with factor 0 to kill the natural colour of the Maya sky to make compositing in Digital Fusion easier, later. An additional directional light was placed opposite the sun direction with bluish tint to fill the shadows better. For the dreamy feel it's crucial to have a strong separation of the main and fill light colours, so if the sun is bright yellow and orange, the fill light must be more saturated blue. Also another 10–13 spots lights were used to light small sections of some of the elements such as over the house roofs and trees, for additional control of the specularity and diffuse effects. Some of these lights are reflected in the water.

I wanted the lighting to be more like at early morning. I chose to place the sun on the left hand side to light the bay more. Because of this the front parts of the houses are more in the shadow than lit. I did it this way on purpose to create the feeling that nature is much stronger than all of us, and that human actions and inventions are a very small part of everything all around. The scene lets you focus not only on the houses but the surroundings as well.

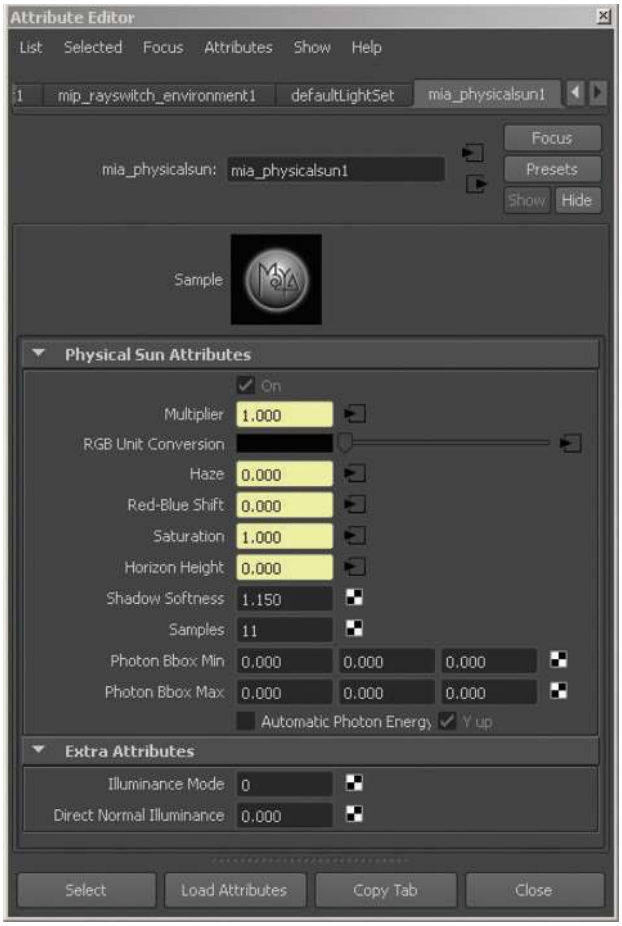
I decided to leave the water clean with no underwater rocks, fish, corals and so on, even though this area is one of the top 10 diving sites in the world and the underwater scenery is very rich, starting almost immediately from the shoreline. The focus of the image was the houses and scenery and a rich underwater element would have distracted from them. For obtaining better specularities on it, I used some of the lights to light the camera, so that the bright spots of the water waves can be seen better. This is a cheat, because the actual sun is on left hand side, not in front of the camera, but I decided that the image would look better this way.



Positions and number of the lights in the scene. One directional light for the sun, one opposite for the fill light, many spot lights to highlight certain corners of the houses and trees.

The light settings of the fill light also use ray traced shadows.

The physical sun settings use mainly defaults, beside bigger shadow softness and larger amount of samples to smooth the shadows better.



RENDERING IT ALL OUT

I started this project with an idea to test Vray for Maya. Unfortunately while actually creating this project I realised that it takes much more time to render than with Mental Ray, especially when more and more polygons are involved in the scene. Overall the scene reached 28 million polygons for the Maya part of the image. The background mountains were rendered in Vue. I rendered different passes which I composited together in Digital Fusion later to achieve the final result. The separate passes were required to give better individual results for each element and to control the final mood of the piece.

The rendering of the ocean took a couple of passes, render with and without global illumination, water with displacement and only with reflections and bump. Finally, I used all of them to assemble the final look. In the rendering settings I popped up the Anti-Aliasing a little higher than usual, with an idea to capture some small details in all of the elements in the background. The final gather was turned on, but with only modest accuracy because there aren't too many light sources and there weren't a lot of reflective and refractive objects in the scene other than the ocean.

The separate elements from Vue were rendered out with lighting to match the Maya scene so I used them for final assembly of the image. All the passes were rendered with z-depth channel, so I could put additional blur and fog in the compositing later. The machine I worked on was a Dual Xeon processor, with 24GB of RAM. The rendering of the beauty pass took around two hours at 4500 * 2532 pixels resolution. The completion of the whole project took about one full week of work. It was made for fun, so I was working at different times of the day.

Some of the rendered elements used in the scene – trees, clouds, far mountains.

This is an ambient occlusion pass. Used later in Multiply mode to compose with the colour pass.

TOP TIP – PLANNING IT OUT

Always, when making artworks, think through all the stages at the same time. Otherwise you end up remodelling, relighting, changing textures and all the other stuff later. Of course, this isn't possible every time, and some last-minute ideas can always be worked in, but if you plan all the elements out first, it will save time in the long run.

This is a dirt pass – I used it to add some variation and darker places in some of the objects later in compositing. I used polygon tools to separate different parts of this image to be shown with different opacity over the colour pass.

This is the fog pass. I used on screen mode over the colour pass to achieve stronger depth in the picture.

This is a diffuse pass again, but with a different ocean. I mixed both of them to achieve the final look.

This is a shadow pass. I used it for better control over the shadows in the picture. With the layer using Multiply mode, I made some areas darker than others

This is the specular pass. I used it to highlight certain points of the colour pass – some leaves, bright side of the boats and so on.

These are the render settings I used with Maya sun and sky, final gather turned on with an accuracy of 155 and filter put to 2.

SA-859/5/E

MALAYSIA DREAM BY ILIYA ASTANASOV

MAYA, VUE, DIGITAL FUSION

AROUND 2 HOURS

"I wanted to create a photorealistic, nature-based environment. I was inspired by a Bertil Harstrom design for the nest house. I like volumetric light effects and thought they would be very effective in a woodland setting, so I checked some reference images over the internet."

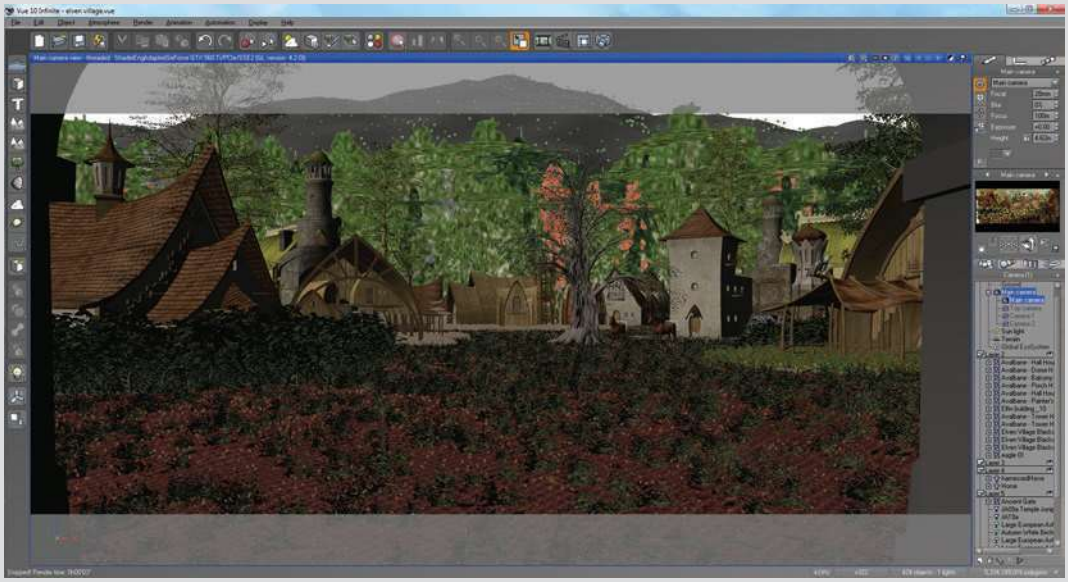
PROJECT	MIST FOREST
SOFTWARE USED	3DS MAX 2011, VRAY 2.30, ADOBE PHOTOSHOP
RENDERING TIME	MORE THAN 20 HOURS ON QUAD CORE PC
ARTIST	VASIL KIROV
COUNTRY	BULGARIA

"This image combined a number of concepts including the mountain ranges and tree population for them in the background. The Alpine cottage is the focal point, which caused some problems with shadows on the wall being too grainy but these were mainly cleaned up. The foreground is a collection of flowers for an Alpine meadow, but with a shallow depth-of-field, these are out of focus."

PROJECT	PYRENEAN COTTAGE
SOFTWARE USED	VUE 10
RENDERING TIME	4 HOURS
ARTIST	MASSIMO VERONA
COUNTRY	THE NETHERLANDS

"I always wanted to make a deep forest scene. I picked an Elven setting, surrounded by lots of trees. I used the FFF metanode from Barry Marshall to create all the flying leaves. The trees came from xfrog and there are over 424 models in this scene. The lighting model used was radiosity for a realism while the polygon count reached 5,334,189,016: that's over five billion."

PROJECT	ELVEN VILLAGE
SOFTWARE USED	VUE 10 INFINITE, POSER 2012 PRO, XFROG
RENDERING TIME	37 HOURS
ARTIST	MICHEL RONDBERG
COUNTRY	THE NETHERLANDS



MAKING A RIVERSIDE FOREST IN WINTER

Britta Jacobs reveals the techniques required to construct a winter woodland scene, complete with snow.

SCENES OF INSPIRATION

Inspired by a documentary on television about the Spreewald landscape southeast of Berlin, Germany, I began to search the net for photos about Spreewald in winter to get more impressions about this wonderful place. The very flat landscape with little canals built by the river Spree with lots of old trees almost looks like a fairy-tale – and it is nearly unbelievable you can find such a quiet and somehow back-in-time place just a few kilometres outside a buzzing metropolis. These fairy-tale looks were what made me think of doing a render. As I love to do winter images, winter was the season I chose to create an impression of this type of landscape. That meant a certain choice and creation of materials and creating a special atmosphere for this render.

One of the photos I found with Google inserting just 'Spreewand' and 'winter' was the inspiration for creating the overall composition of my render. The photo was taken by Ypsi and can be found here:

http://www.flickr.com/photos/39008346@N00/3167236852/

Before I start a project I always look for more information and details about the theme or location. Browsing pictures is my friend here, because I gain other perspectives and the picture of a special landscape gets more complete, more details added, although – in most cases – I have never been there in person.

Other typical woodland in winter scenes that formed part of the inspiration for the overall scene.

RIVERSIDE FOREST IN WINTER BY BRITTA JACOBS

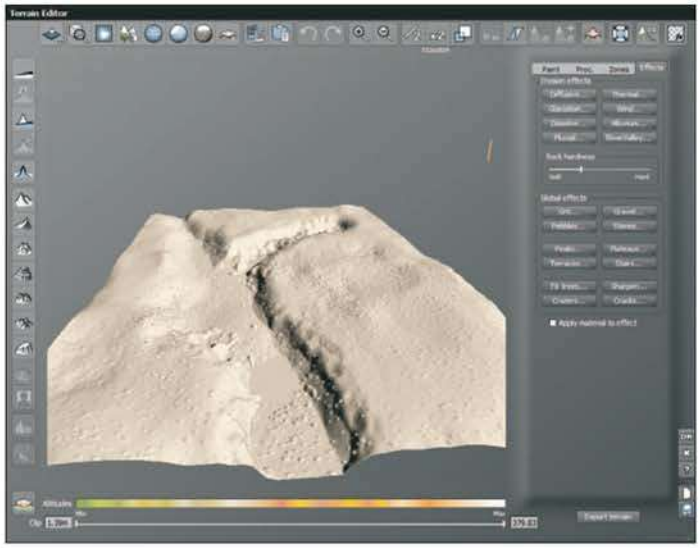
VUE 11 INFINITE

3 HRS 40 MINS

CREATING AND POPULATING THE TERRAIN

Setting up the render format from the beginning is always the first step. Vue comes with widescreen set as default, but for some renders Ultra-Panavision or A4 vertical might be better. In this case widescreen was just right.

The first modelling task was the terrain near the camera with a small canal coming in from the left side. I chose a procedural terrain, which is grown from a fractal and has a lot of detail near the camera – a lot more than a standard heightfield terrain. I changed the standard cubic size to 512 * 1024. Using the altitude modelling tool I created a flat landscape and modelled the little canal by sculpting it out. I added gravel and diffused it a bit to give the terrain the final look.



The material editor with the completed terrain, sculpted and gravel added.

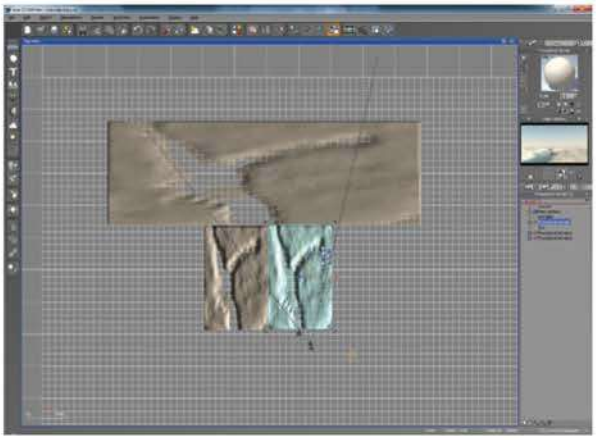
TOP TIP – INTERESTING DETAILS IN TERRAINS

In terrain creation for such a close-up render it definitely pays to take a procedural terrain (which has more detail) and to add some interesting details to the surface with the effects you have at hand in the terrain editor. The material you add can only do so much. In nature you will find a very smooth surface only in rare conditions.

A first pre-render shows the terrain without material and ecosystem layers in a frontal position.

The next step was adjusting the camera and adding and levelling a water plane. As the camera angle was set up now it was obvious that even with trees on the terrain and a fairly diffuse winter atmosphere other terrains needed to be in the background to give the impression of depth. So I simply copied my terrain twice to cover the side and resized one of the copies for putting it in the background.

Pre-render with the camera adjusted to a different angle and the water plane added.



This is how the arrangement of terrains looks from the top view, showing that you can re-use elements without causing obvious duplication.

As this was a winter scene it was important to get the right kind of look from the start. So, I added a winter material to the terrain to make the water look more like how it appears in winter. It also changed the atmosphere for the first time. The material used for the terrain was called 'Snowdrift' and comes from the Winter materials mini-package by Gill Brooks, which is available at www.cornucopia3d.com. This contains six materials, three for land and three for water. I can only say this is well worth spending $1.99 on for your winter scenes in Vue.

Snow material added and atmosphere changed to get a first wintry impression.

The next step is adding plants on the terrains, especially the trees. The photos of the landscape showed it had a nice sort of sleek, leafless tree terrain and I found one fine prototype in my collection: The leafless tree – old & dead – which comes with Vue Infinite and can be bought on Cornucopia 3D at $9.95 for an alternative version. This is one of my favourite leafless trees because it is so versatile, especially if you have the Botanica module in Vue, which the professional versions have, and which can be bought for the more entry-level, Artists versions of Vue. The tree looks very nice as it is, but for my scene I had to change it a bit in appearance and material.

The tree has nicely defined root, several trunks and normally a heavy broad build. For my landscape I needed it to be slender and with a more wintry appearance.

Vue has the nice feature in which you can safely change a model and save as a new species, and thus will have another model in your collection for populating your ecosystems – this was just what I did for this render.

TOP TIP – CREATING YOUR OWN SPECIES OF PLANTS

Creating your own species of plants is really fun and you have a whole additional wealth of possibilities not only by changing the subsets in their settings but also by giving them new, more detailed or different material for the bark or creating your own leaf, and saving the new tree, bush, grass or alien plant as a new species.

The Botanica Plant editor showing how the chosen leafless tree, old & dead, looks normally.

The leafless tree now changed to a slender-looking appearance, looking slightly covered in snow.

Populating the foreground terrain took a little time. The most natural-looking Ecosystem would, in most cases, be one painted by hand. But it's quicker, and it gives good results as well, to use the Ecosystem painter to rapidly populate a scene. Here I used the Ecosystem painter and experimented with the settings. The density ended up being 62%, decay near foreign objects was set to 3% and the proportions of the tree itself were set 86% to uniform. A grainy fractal in the density variation slot works very nicely to get a more natural looking population overall. It takes a bit of time and several pre-renders to get the look you want this way but it makes for a quicker workflow to get the forest background done. You can always refine the scene by creating and posing some 'hero' trees by hand.

At this point the tree population looked very regular so some different tree models were needed to give the scene some points of interest. I created another new single tree from the leafless model – this time a gnarled one – and placed it on the left side of the canal pointing to the other side with the branches.

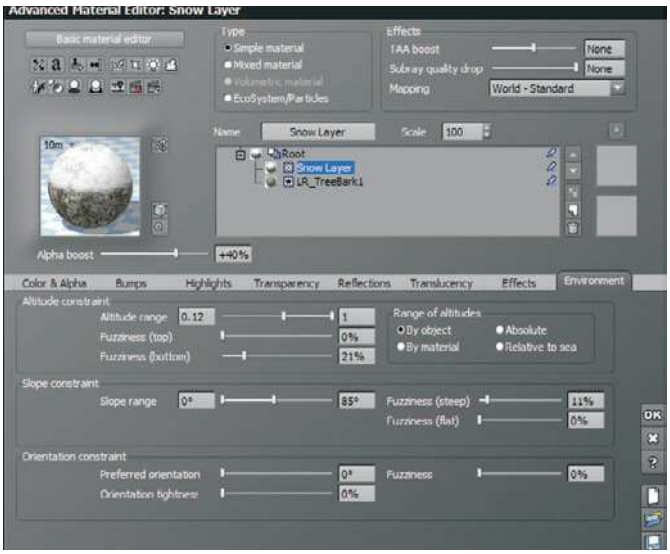
A pre-render with the first population experiments with the newly created slender leafless tree.

The gnarled tree model created in the plant editor from the original leafless tree, old & dead.

Another model which fitted in nicely here, especially as a highlight for close up, was the Poseable tree trunk by Laurent Rodriguez, a very detailed, ivy-covered tree trunk – available for $10.95 at Cornucopia 3D – again a very good choice for your renders. Two of these trunks were placed in the scene as points of interest. One was right in front to get the highly detailed textures to show and another, resized one, in the back, on the right hand side, was used to give a break into the similar-looking forest trees.

The Poseable tree trunk came as a highly detailed summer version which did not fit in my winter image so I changed the materials by altering the overall colour and adding a snow layer.

Pre-render of the foreground terrain with the different tree choices – this time without a general population.



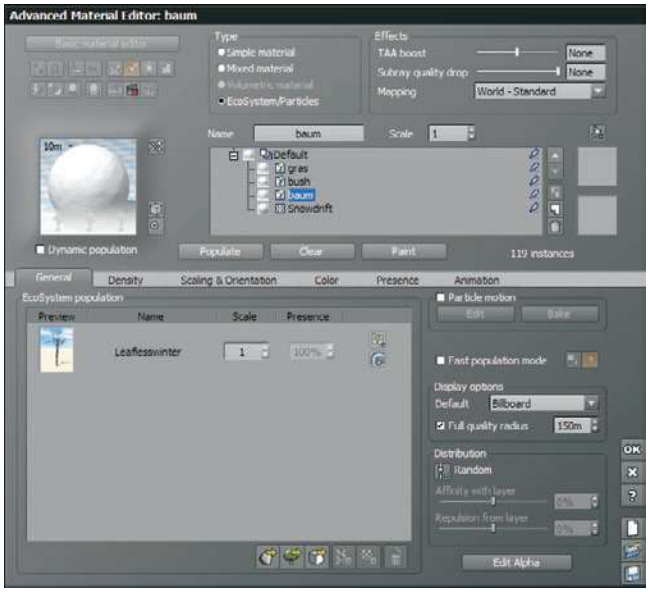
The setting for the added snow layer on the bark of the Poseable tree trunk.

On the right side of the screenshot the colour change for the ivy leaf by just changing the overall colour is visible.

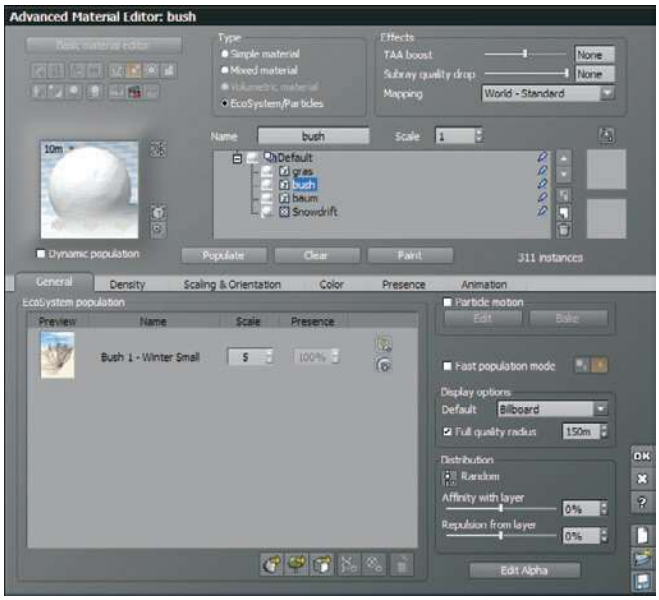
TEXTURES AND MATERIALS

With the tree for the Ecosystem created and chosen the terrains were populated with a first Ecosystem layer. The foreground terrain got some more Ecosystem layers to add to the natural look so another layer for bushes and a third one for grasses were added.

The tree layer worked well with the newly created species of the slender leafless tree with the density set to 62% and a grainy fractal guiding the population and making it look natural.



Material editor for the foreground terrain showing the three Ecosystem layers for trees, bushes and grass.



The second Ecosystem layer with bushes showing the settings in the Material editor.

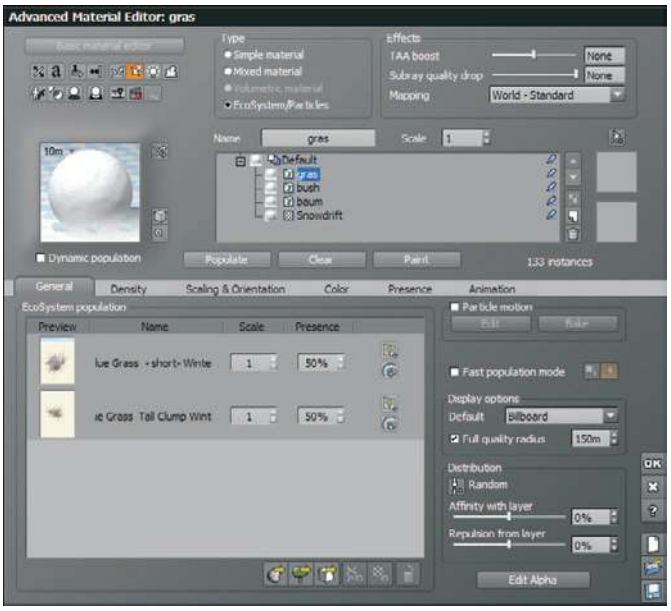
TOP TIP – NATURAL-LOOKING ECOSYSTEMS

Populating an Ecosystem has many possibilities. The most natural-looking Ecosystems are created by hand painting them. However, you can get very nice and natural-looking Ecosystems, especially for large scale landscapes, by populating them with a fractal (grainy fractal or Perlin noises) co-efficient driving the density.

The second layer to the terrain was populated with the small winter bush which comes with Vue. Here I changed the size to 5 to make it higher and fit in with the trees. The population density was set to 50.

The third Ecosystem layer was the grass. The ones used were Blue grass short white and Blue grass, tall clump, winter from the Winter Grasslands Megabundle by Martin Frost (available for $13.99 at Cornucopia 3D).

Again the size for the grass was changed to be roughly 8 so it would fit in nicely with the trees and bushes. The population density was set to 98% which still left some clear spaces around it.



The Material editor showing the third layer of the foreground terrain using grasses for population.

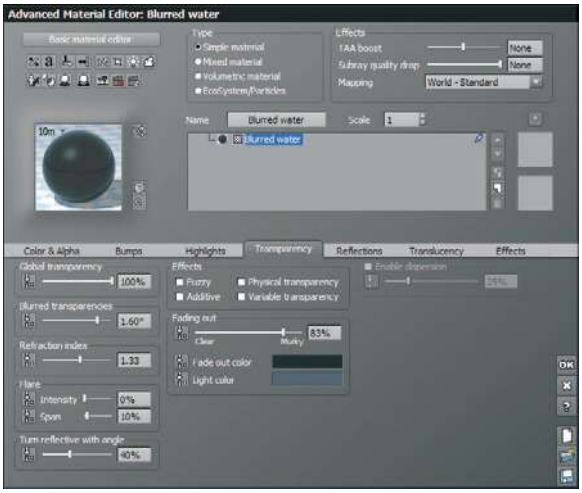
TOP TIP – HARMONY IN SIZE

As sizes may vary a lot in the models you use for your Ecosystems, try them out on the terrain nearest to you with a single plant and render a crop to screen to get a feeling for the harmony of sizes. Thus you can adjust everything to fit in neatly before starting to populate for real.

Now the foreground terrain was neatly populated and only needed some details to finish the composition. The background terrains were then populated with the same materials by copying and pasting the same Ecosystem layers. The third layer of grass was deleted as it wasn't visible anyway and doing so reduced the polygon count. To save even more polygons and get a faster render the population method on the background terrains was set to automatic, but with dynamic population so only those parts of the terrain that were in the view of the cameras were populated.

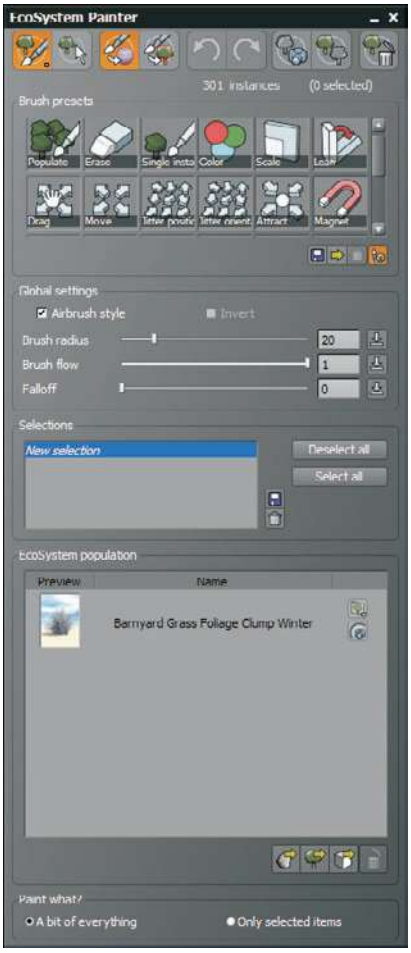
The foreground and background terrains now populated with trees, bushes and grass and some individual trees added.

For the river I changed the water material to reflecting dark water, which added to the impression of cold weather in this render. The blurred water from the liquids material folder, which comes with Vue, was selected and changed to my liking. To get the dark, but relatively clear, impression of winter water the fade out and light colour in the Transparency tab were changed to make it quite murky. To get the very calm surface the bump map was almost erased with a setting of 0.005.



The Material editor showing the water plane and the colour settings in the fade out and light colour of the water's transparency.

For finishing and adding some more details in the right places another Ecosystem was created. This time it was a global one so it could be painted on all the terrains. The Barnyard grass, foliage clump, winter selection was chosen from the aforementioned Winter Grasslands collection by Martin Frost to paint in at those places where they would complete the natural look. Another three winter rocks were added to the sides of the river. These were rocks from Laurent Rodriguez second collection of sculpted rocks, available from Cornucopia for $11.



General ecosystem settings to add some more details with a bit of different grass.

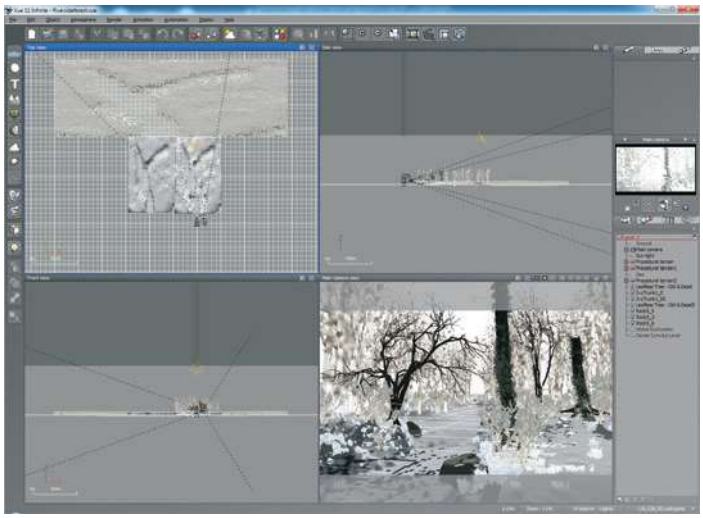
TOP TIP – ADDING DETAILS EASILY

Creating an additional general Ecosystem for painting in gaps or adding more details in the overall look is a really good idea in addition to what you do with Ecosystems on your terrains.

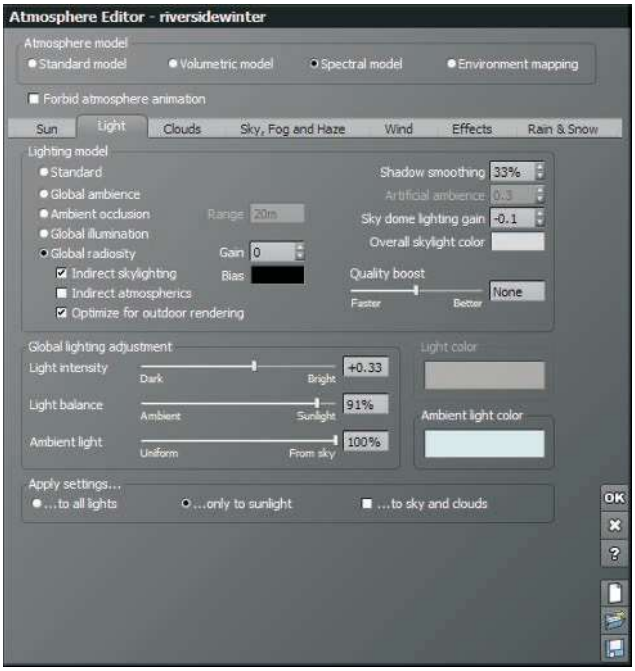
LIGHTING AND ATMOSPHERE

Lighting in this render was only done with the sunlight so no additional lights were used. The atmosphere was a greyish-looking cloudy atmosphere I had already created. The atmosphere parameters were changed to get the cold and slightly foggy-winter look.

The sun position for this render was just below the clouds and the light came from slightly right of the middle opposing the camera. The sun was positioned so it could not be seen in the render itself, but just gave some diffuse light from the front. To get the soft impression the sunlight itself has the softness set to 2.00 in the Material tab. For outside renders I nearly always set the light settings to Global Radiosity, as this is the most perfect imitation of real outside lighting. It does take longer to render though.



Overview from four directions where the sun was positioned.



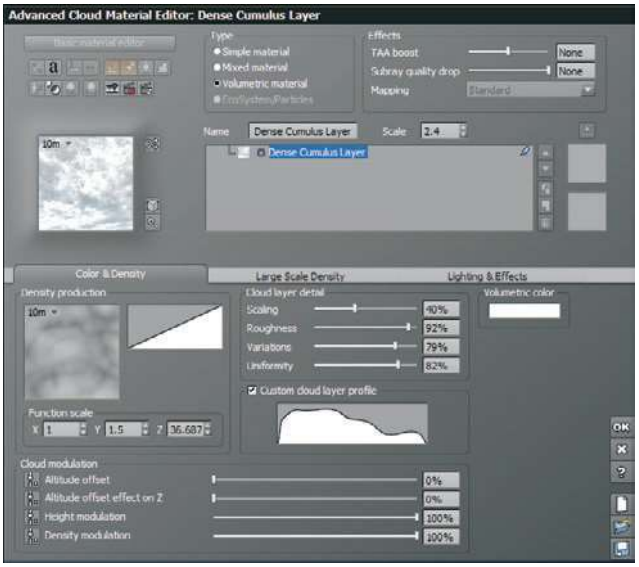
An atmosphere editor screenshot showing the settings in the light tab.

The ambient light and light balance were set to Sunlight and From Sky to get the very white, reflected light you have in winter. As these settings would normally result in some very harsh shadows the shadow smoothing was set to 33% and a dense cumulus layer was added in the Sky, Fog and Haze tab. This blended out any harsh shadows with the light, haze and fog all mixing together.

The cumulus cloud layer which was added had preset values that needed to be changed a lot for this render. First, the altitude was increased from 300m to 1km and the height of the layer itself was also altered, from 500m to 2km. The Density was lowered from 500% to 95% and the Opacity went from 41% to 82%. The Sharpness and Feather setting were nearly doubled and the rest of the settings left unchanged except the scale of the material which went up from 0.005 to 2.4. In the Advanced Cloud Material editor there were some minor tweaks as well.

Changing the function scale z value from 12 to 36 gave the clouds a long stretched form. The other two main changes were raising the uniformity from 15% to 85% and giving the clouds a custom layer profile which changed the density inside the clouds themselves to being dense at the bottom and thinner at the top.

The Atmosphere editor showing the settings for the dense cumulus layer.



Advanced cloud material editor for the cloud material showing the altered settings.

The Haze and Fog and the glowing settings were the main ingredients for the mood of this atmosphere. The sky colour and decay colour added up to an overall greyish white sky colour. The haze was set up at 48% which, with a mean altitude at over 3km, gave this grey a slight bluish touch. Adding the low fog gave a depth and darkness above the ground. The fairly high glow gave this setting a colour change to a more shiny white, which is more typical for winter.

Added to this was the clouds' anisotropy which let 14% of the light penetrate through the clouds which then got scattered to 41% to give a wonderful, puffy white mood.

The final element here was a slightly visible snow fall, which is a new feature in Vue 11. This gave another, barely noticeable, winter touch to this image. The main change here was not only the snow falling but also the added fog boost which does change the overall impression of the atmosphere.

Sky, fog and haze settings of the Riverside Forest atmosphere.

Atmosphere editor showing the new rain and snow feature tab which adds another change of appearance to the atmosphere.