

Haze Line

Haze is important to give a landscape scene some depth. This works usually quite fine but there is a moment when the summits of a landscape with the preferred camera position are below the distant horizon.

Preamble

Haze starts at sea level, i.e. $Y=0$ BU. It stretches upwards and fades away towards the zenith. But there is no haze below the horizon; it stops at the default ground plane. If it is removed, the view is unobscured down into the abyss.

Whenever haze is enabled and even if the controls are set very low, there is a distinct thin bright line at the horizon, getting thicker as the controls are moved up. This is natural, after all haze emulates the more or less humid air.

However, if camera position and terrain height stay below the far horizon, haze below the Bryce horizon is missing and the thin line annoying. No haze is no valid option.

Sometimes, giving the ground plane a material like fields or water can be an option. Other possibilities that can work is giving the ground plane the same colour as the haze or making it fully reflective, though it may happen that clouds from the sky are reflected and that looks odd.

Haze

Perhaps it is good to remember how haze works in Bryce. In the *Sky Lab Atmosphere* tab there are five haze controls.

The colour swatch lets you set the colour of the haze. The colour values are 0 to 255. There is also a colour swatch on the main GUI when set to *Sky & Fog*; it is below the second thumbnail from left.

Density is the overall moisture in the haze. It is thickest at the ground and thinning towards the *Cumulus Cloud Height*. Therefore it is important how the *Cumulus Cloud Height* is set, even if the *Cumulus Clouds* are disabled.

In the main GUI, *Density* is called *Intensity* and by positioning the mouse into the second thumbnail from left, moving the mouse with the left mouse button (LMB) held down left and right haze density can be adjusted.

The cloud height can also be adjusted in the main GUI. Position the mouse into the fifth thumbnail from left and move the mouse with the LMB pushed left and right to change the height of the clouds. Even if *Stratus* and *Cumulus* clouds are disabled, both cloud types move up or down and stay enabled. They can be disabled in the *Sky Lab Cloud Cover* tab or by the down arrow below the sky saving dots in the main GUI at right.

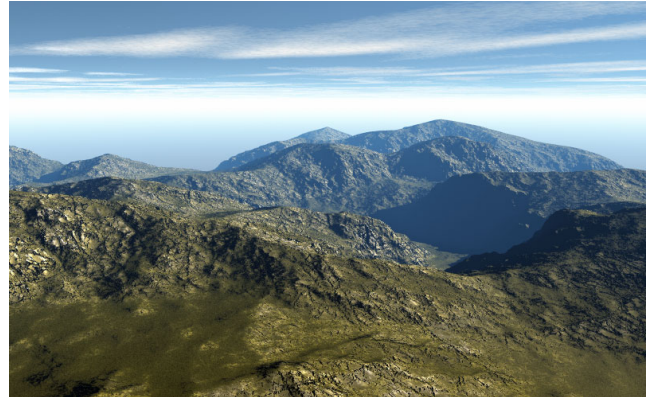
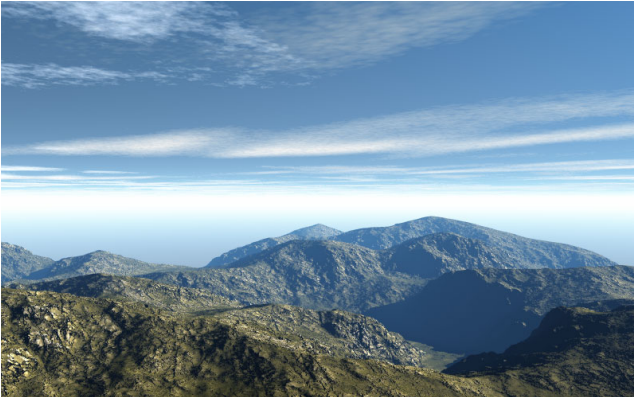
Thickness determines how much haze affects the visibility of distant objects. The higher it is set, the faster haze increases with distance from the camera. If it is set high, also the near foreground can get hazy.

Base Height is the overall density of the haze and hence fills the foreground fast.

Color Perspective adds colour into the haze and it gets thicker. The colour values are not 0 to 255 but 0% to 100%. The haze in the distance gets a blue hue as it happens in nature. This can be changed with *Color Perspective*. *Density* and *Thickness* may have to be reduced.

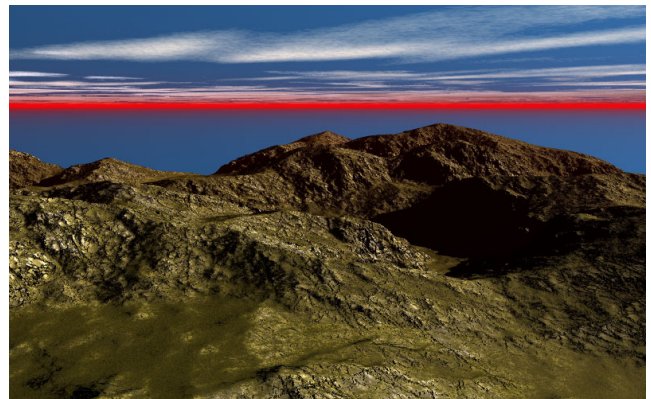
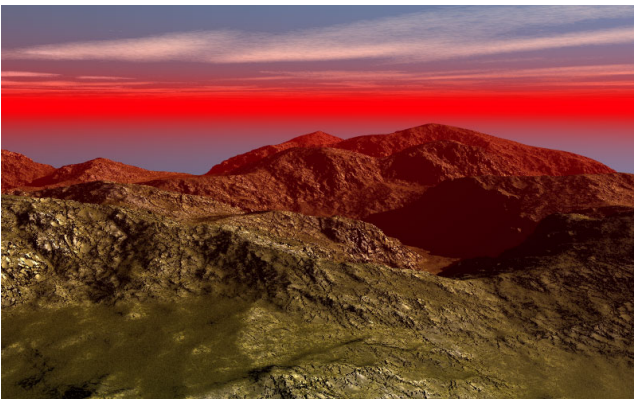
Rotating the Terrain

The scene at left was set up as an example. The terrain is 4000 x 4000 BU and 500 BU high set at the ground level. With the camera height, the mountain tops stay below the far horizon.



At right, the camera was set to look down by 10° to get more of the foreground. The terrain moved up. But so did the horizon. I want this scene, no sea in the distance or fields, neither a higher mountain range farther away. Everything should just fade into the distance.

Below at left the ground plane is hidden and the haze set to red. The haze moves up above the horizon but not down.

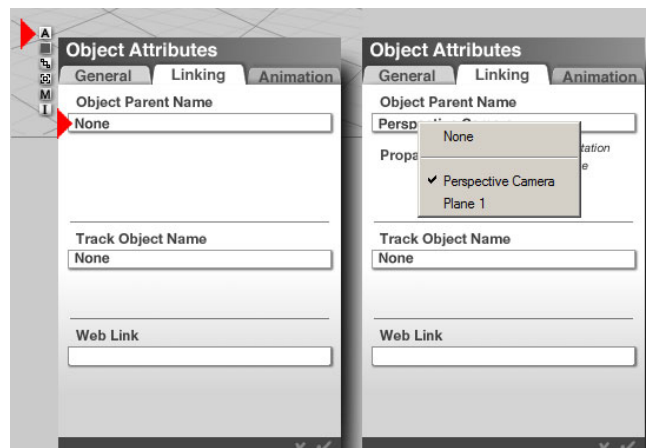


Lowering the *Density* shows the horizon line at right. Obviously, the terrain needs to be higher up to cover the horizon but moving the terrain up also means moving the camera up and we are back to where we began.

The terrain can be tilted so that the part farther away is higher than the part near the camera and then the camera can be adjusted. This is tedious and fiddly.

If there is more than one object in the scene, group them all together and parent this group to the camera: *Object Attributes*, *Linking*, click in the *Object Parent Name* field and select *Perspective Camera*.

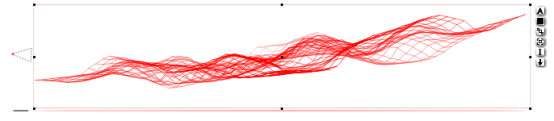
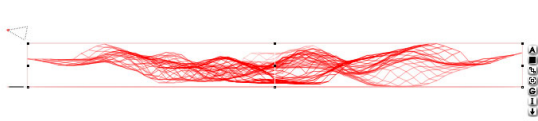
The picture at right show how this is done. In the example, only the terrain is selected.



Then move the camera up so that the horizon is covered by the terrain. The camera was originally set to look by 10° downwards (Rotate X=10), below at left I set it to 3° to show that the horizon is about to disappear behind the mountains.



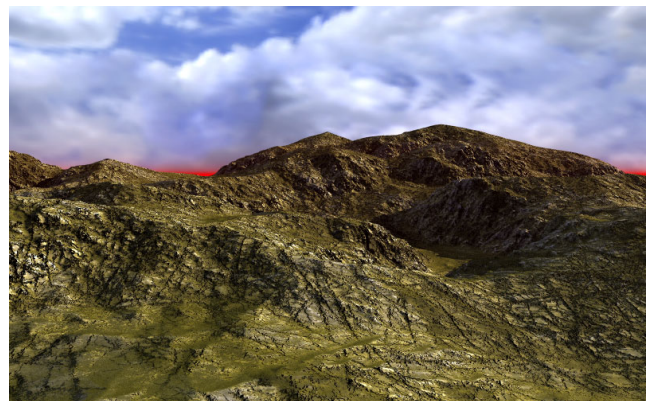
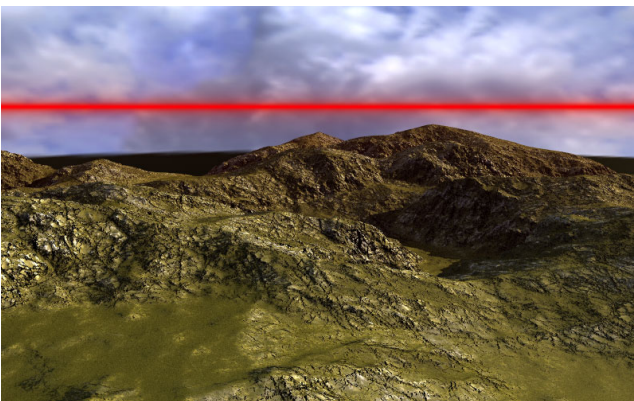
At right, I brought back the initial haze settings. The linking to the camera of the terrain (or group of objects) can now be broken by selecting *None* and the group ungrouped.



The view from the side shows at left the terrain horizontal below the far horizon and at right the tilted one that covers the far horizon.

HDRI as backdrop

What if you have an HDRI? Here is *ErmClouds04* sky dome and the sky descends (unnaturally) 5° below the horizon. This is where the dark part starts. The HDRI is positioned Yaw 270°, Pitch 90° and Roll 0° both default setting.



Well, like the sky, also the horizon of the HDRI gets obscured by the terrain as shown at right. The cloud pattern changes, of course, because the camera is looking less down, which is up.

Summary

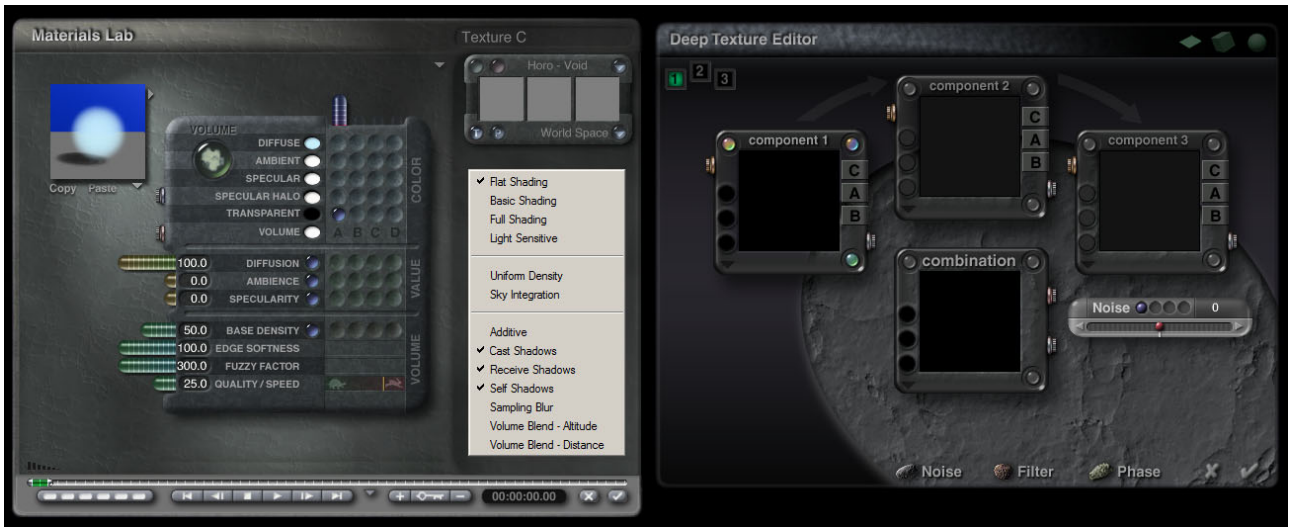
Haze is built in, quite straight forward to adjust and gives pleasing results. Grouping the whole scene temporarily and link it to the camera, which is then appropriately adjusted, the link of the group to the camera broken and the elements in the scene ungrouped seems an efficient way to bring the bright horizon line behind the terrain.

Adding a Haze Object

Instead of tilting the terrain, haze could be completely disabled and part or the whole scene packed into a haze cube. The cube or another object like a cylinder with a volumetric haze material can be put at the far end of the terrain and mixed with the Sky Haze.

Haze Material

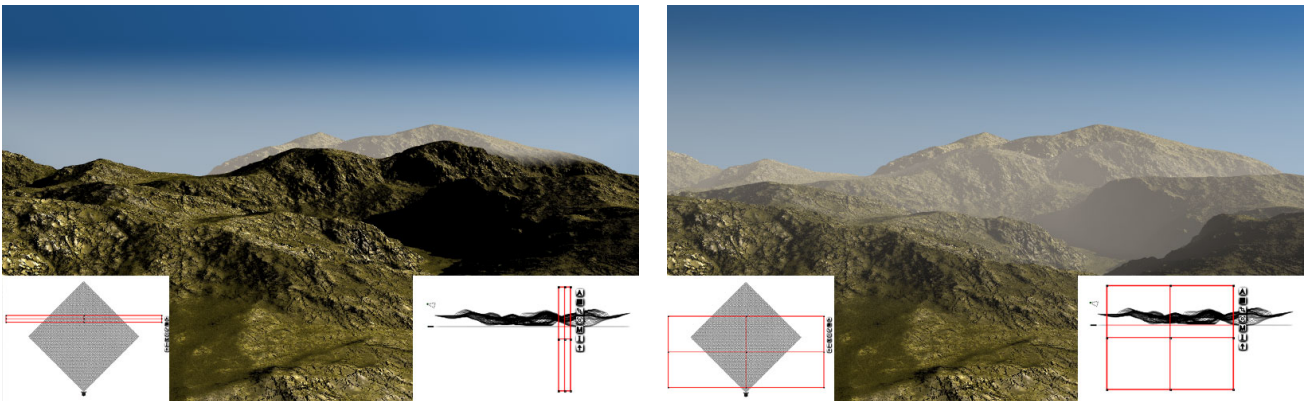
The haze material is very simple as shown below. It needs to be *Volume*, not *Surface*, and a texture of nothing for *Transparent*. Any texture can be used, just disable Colour, Ambient and Bump as shown below at right.



Diffuse colour is usually white but it can be adjusted as desired. With *Diffusion* the brightness can be reduced and, unsurprisingly, with *Base Density* how dense the haze will be.

Haze Cube Example without Sky Haze

This is a bit difficult to adjust and since a good haze cube uses volume material, takes a bit longer to render. The haze effect can be adjusted with the position and size of the haze cube and with the *Base Density* of the volumetric material.



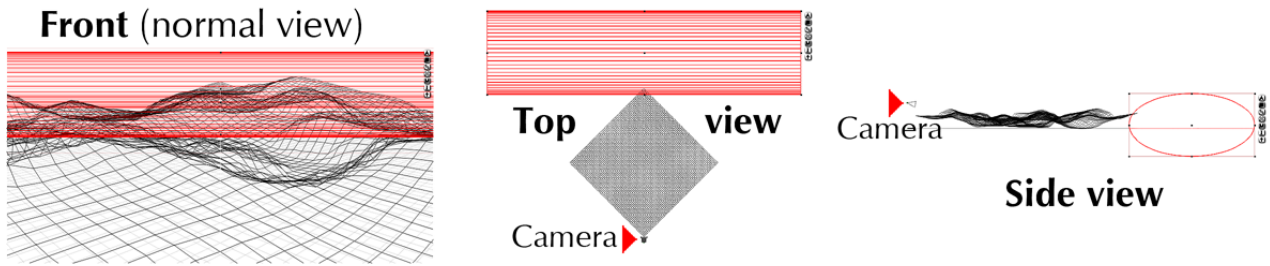
The inset at left shows the terrain and the haze cube from above. The camera is at the lower corner of the terrain. The inset at right shows the haze cube from the side with the camera to the left. Note how far below the cube extends. This is also a means to adjust how the haze fades upwards (there is no ground plane).

Haze Cylinder combined with Sky Haze

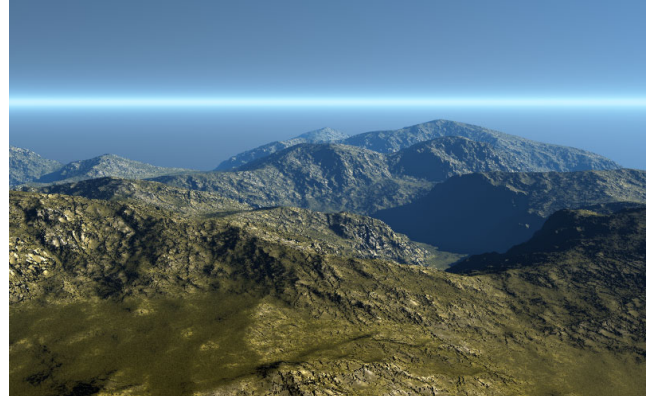
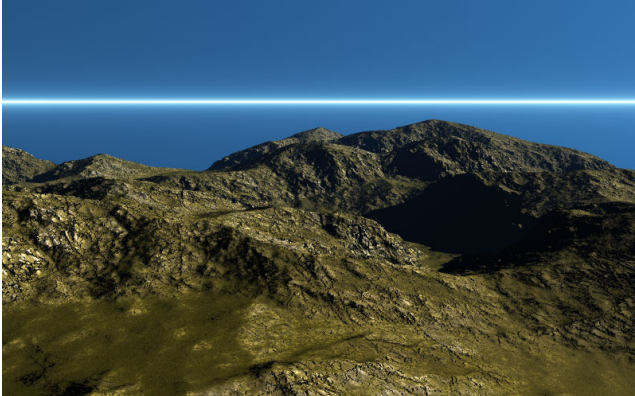
There are advantages and disadvantages in using a haze cube instead of the normal haze. If the issue is only the horizon that is above the terrain, an object beyond the terrain that fills in the haze below the horizon is often the simpler method.

In this case, the object does not touch the terrain and can be mixed with the haze. This is the preferred method if an HDRI for the sky is used, and if the HDRI is a sky dome only variant, the lower part must be covered.

Bryce 7.1 Pro — Haze Line

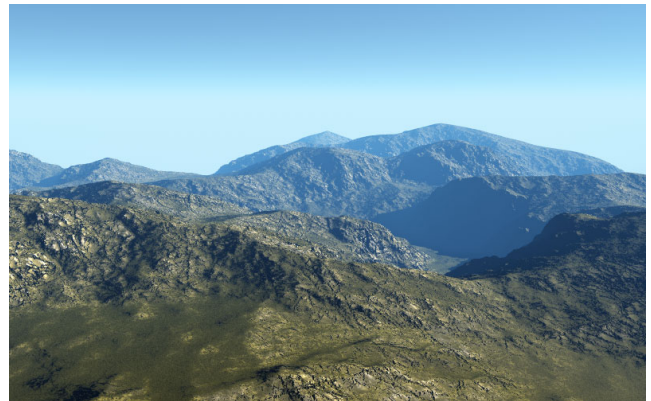
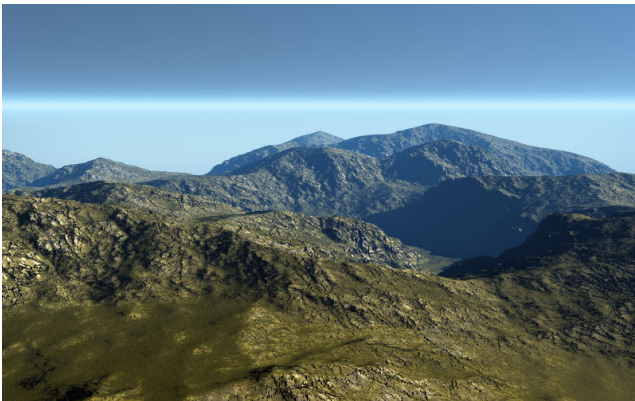


A long flat cylinder suggests itself for this application. A cube can also be used but with a sphere the left and right side often do not have the same haze density as the centre. The image above shows a suitable arrangement of a cylinder in the scene.



At left the haze line marks the horizon that is well above the terrain. Haze *Density* is at a low 8; at right it is higher at 75. If there is really a sea in the distance, this may look acceptable.

Below at left the same setting like above at right but with a haze cylinder like shown on top of this page. The haze line is still visible and it does not look natural how the haze abruptly stops.



At right, haze *Thickness* was increased from 4 to 6 and *Cumulus* cloud height moved up to 50 without having them activated. This looks acceptable.

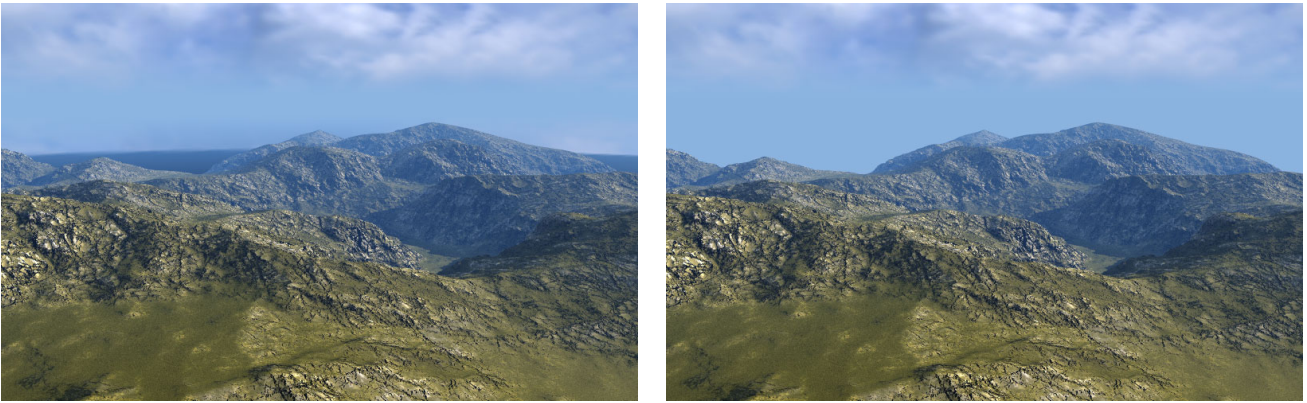
Fine adjustments can be made by flattening the cylinder more or less, move it lower down or up and, of course, with the *Base Density* control for the haze material and also *Cumulus* height as well as with haze *Density* and *Thickness*.

Sometimes, haze *Base Height* can be used but this often gives the foreground too much haze that looks a bit like fog.

HDRI Backdrop

The example below uses a sky dome HDRI like on page 3. On the left side, the dark part of the HDRI below the horizon is annoyingly visible (it descends 5° below the horizon).

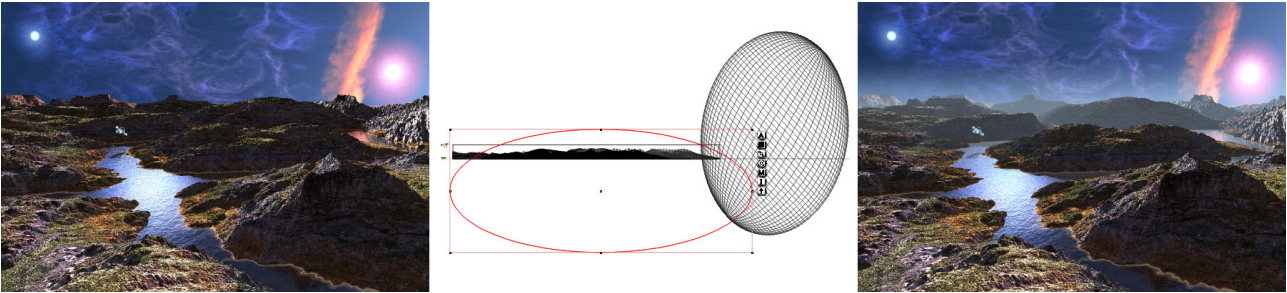
Bryce 7.1 Pro — Haze Line



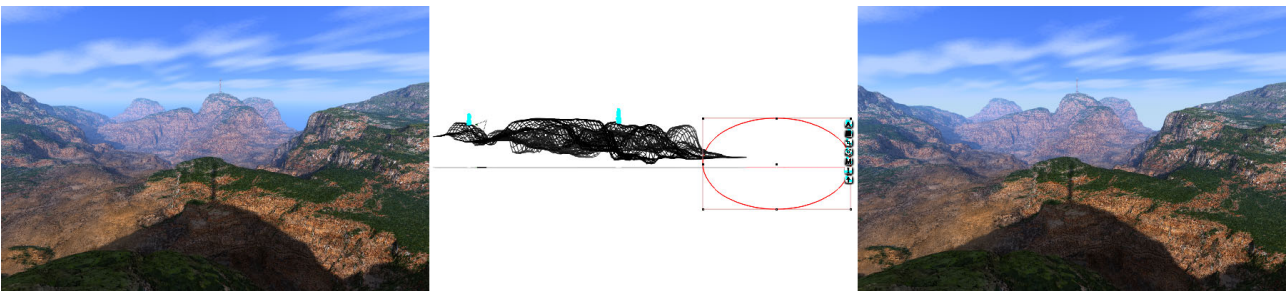
For the right render, exactly the same haze and cumulus cloud settings were used like for the left one, but a cylinder with a haze material was added.

Two Examples

The first example *Two Suns* has the haze disabled. At right, there is an extended cylinder with the haze material, the only haze in the scene. There is less thick haze in the foreground and more in the distance.



The second example is *Pathless* and there is haze at left and at right additionally a cylinder with the haze material to cover the part below the horizon, which is visible in the distance at right.



Wrap Up

If the horizon is visible above the terrain in the distance, which depends on the camera height above ground, the terrains and all the objects on the terrains can be temporarily grouped, parented to the camera and the camera rotated so that the terrain in the distance covers the horizon, then ungrouped. As an alternative, an object with a volume haze material in the distance can be used to cover the horizon that is too high up. This may be the preferred method if an HDRI is used as sky backdrop.