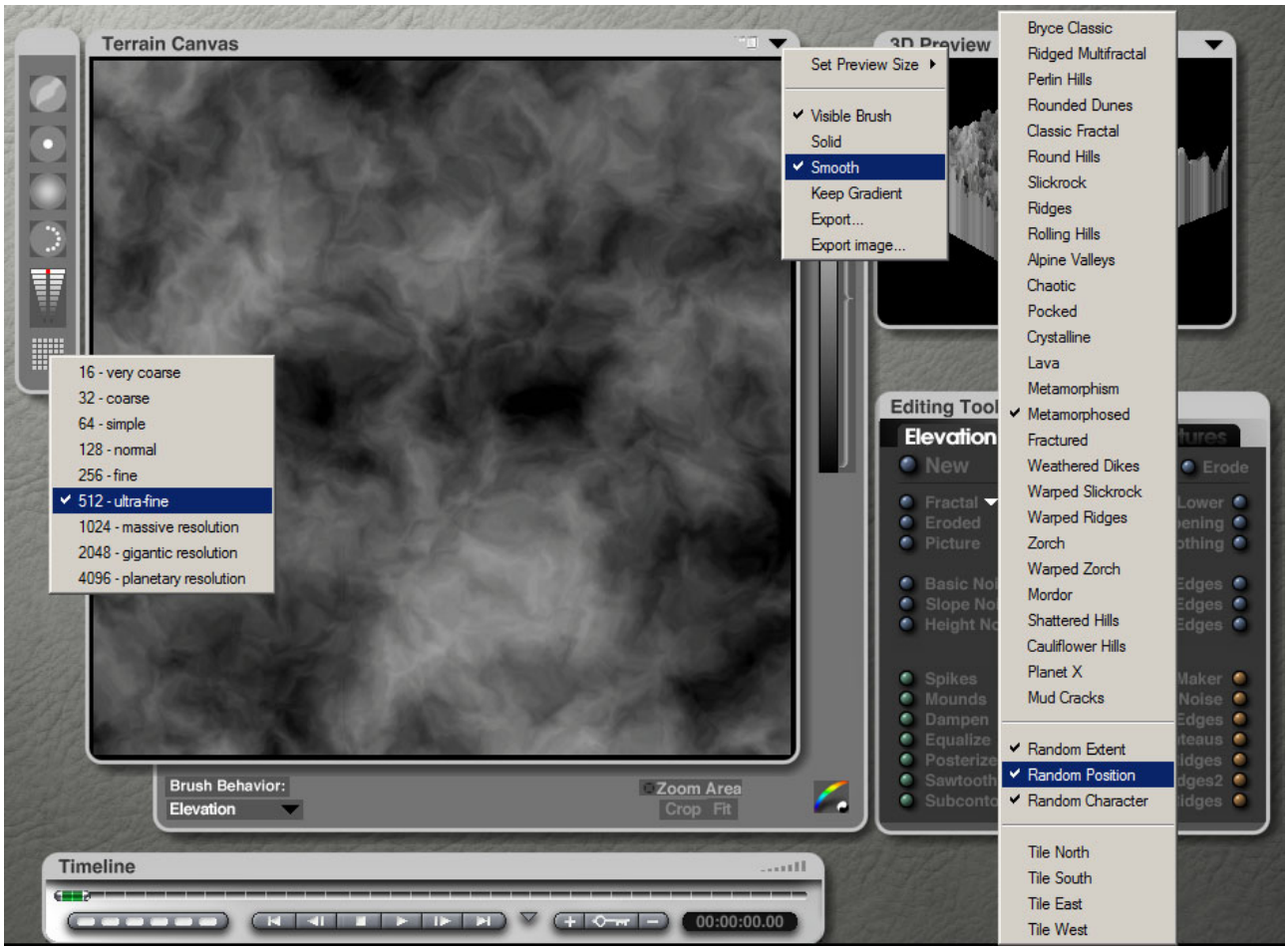
Smooth Terrains

Bryce terrains can be smoothed — or not. A smoothed terrain loses resolution and makes some hard edged parts round. On the other hand, a terrain is a mesh and if unsmoothed the hard edges of the mesh become visible but Bump can hide them — or not.

Terrain Editor (TE)

Bryce uses a height map, which is a greyscale image, for a terrain: black is low and white high. From this height map a mesh for the terrain is created. This mesh can be scaled, rotated and warped without changing the height map, which is always the base for the terrain.

In the *Terrain Editor* (TE) the resolution of the terrain can be set from very coarse to very fine. This setting does not only determine how detailed the height map is generated but also how detailed the mesh will be created.

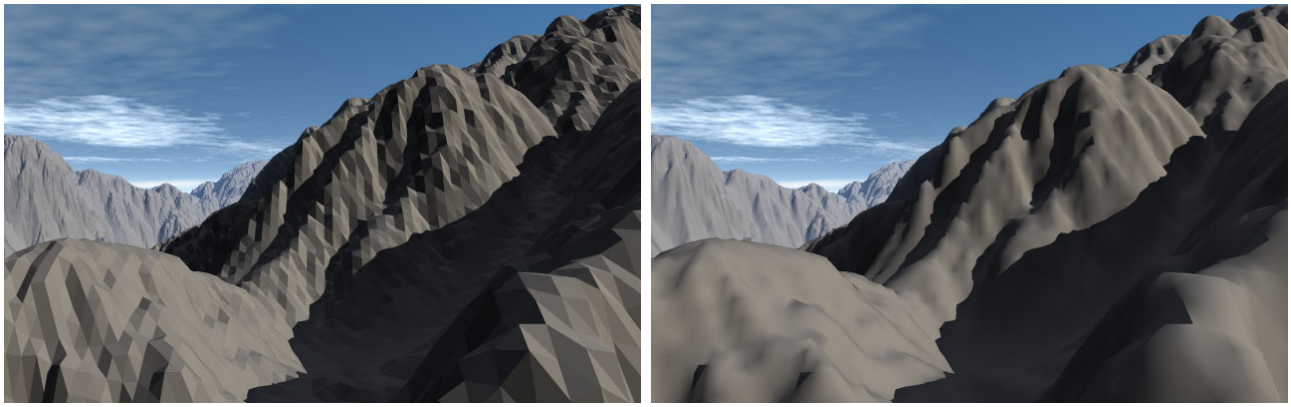


Generating a terrain in the TE with a moderate resolution and then changing to a finer one will create a finer mesh but from a lower resolution height map and the result is not better than the generated terrain. The terrain must be generated anew with the desired resolution. However, a different height map is generated because the random seed number is changed every time you click on *Fractal*. In order to get the same terrain with a higher resolution, *Random Extent*, *Position* and *Character* must be disabled. To do so click on the down arrow right of *Fractal*, move the mouse over one of the three *Random* options; hold down the [Shift]-key and click the left mouse button. This disables all three options in one go. When clicking on *Fractal* the same terrain is generated anew with the newly set resolution.

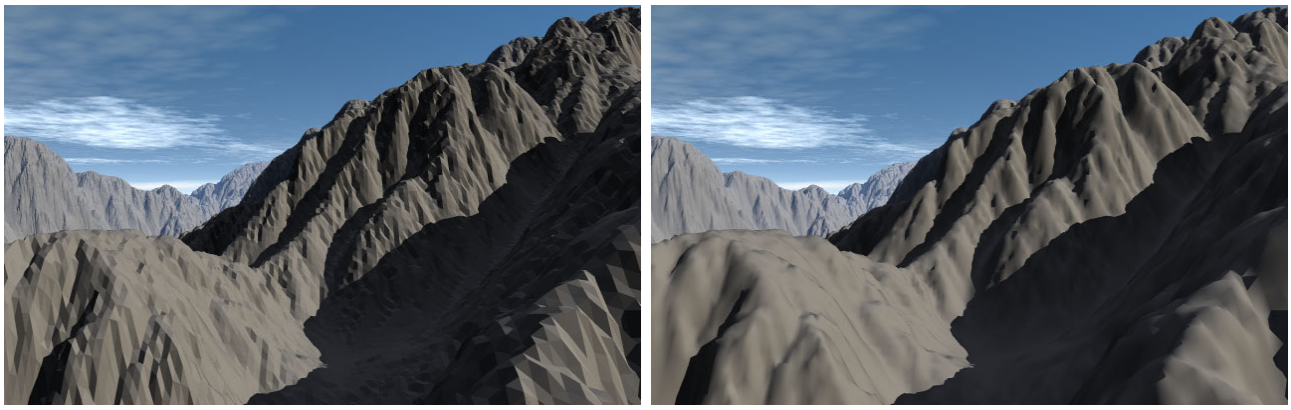
If a height map made outside the TE is to be imported into the TE, make sure the resolution is set to match the one of the height map to be loaded. The *Terrain Canvas* cannot show the resolution accurately; besides, a height map is always a bit difficult to interpret how the final terrain will look like.

Terrain Mesh Visibility

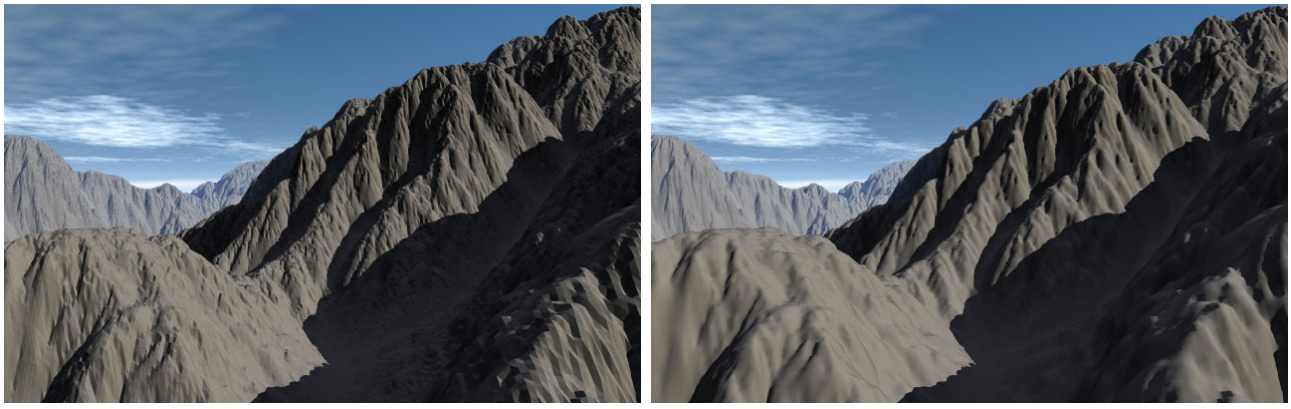
If a terrain is far away from the camera, even a lower resolution terrain can look good whether smoothed or not. Care must be taken if a part of a terrain is shown close-up.



Terrain resolution 1024 at left unsmoothed and at right smoothed.

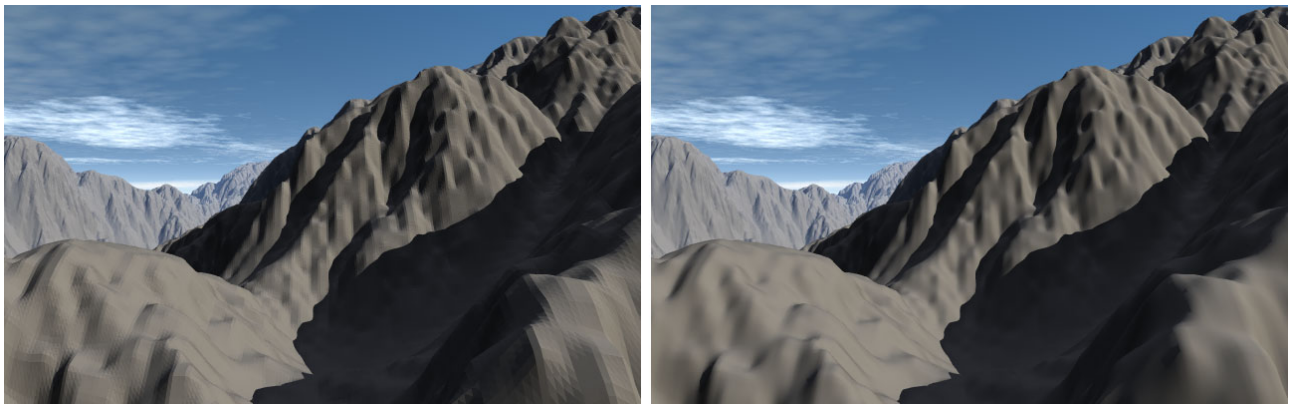


Terrain resolution 2048 at left unsmoothed and at right smoothed.



Terrain resolution 4096 at left unsmoothed and at right smoothed.

The parts of the terrain in the distance look good in all three resolutions, smoothed or not. It is the parts near the camera that can become an issue. Below, the 1024 terrain was set to 4096 without re-generating it and then rendered without and with smoothing.



Terrain resolution 1024 set to 4096 at left unsmoothed and at right smoothed.

The mesh does not look good but the smoothed version is better, better than the originally generated 1024 terrain. The price is that the file size increased from 2 MB to 29 MB.

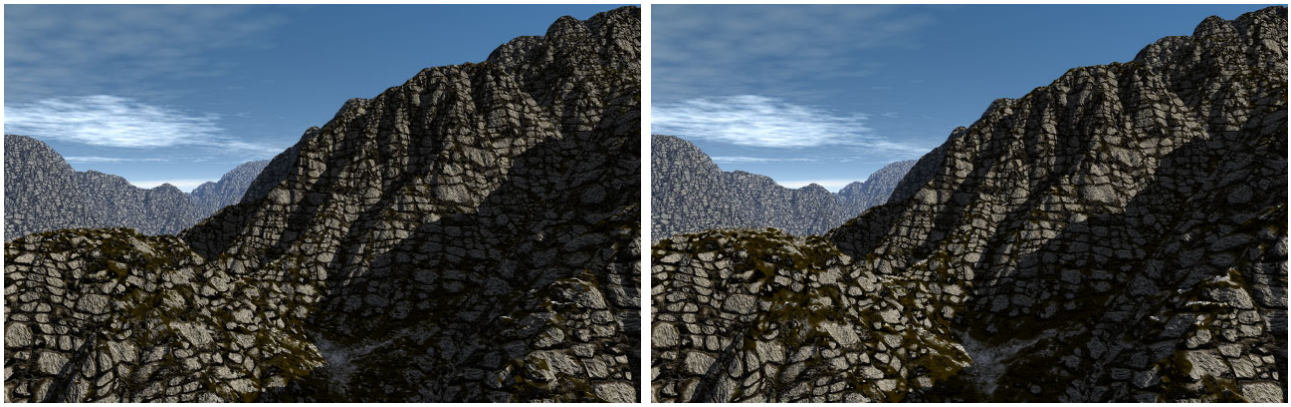
Using Bump

Bump modifies how a terrain appears. In the 1024 examples the low resolution mesh is most prominent. Applying the material *Canyon Companion* (row 2, column 3) from *Terrains* in the *Pro Materials* hides the mesh almost completely.

Terrain resolution 1024 at left unsmoothed and at right smoothed.

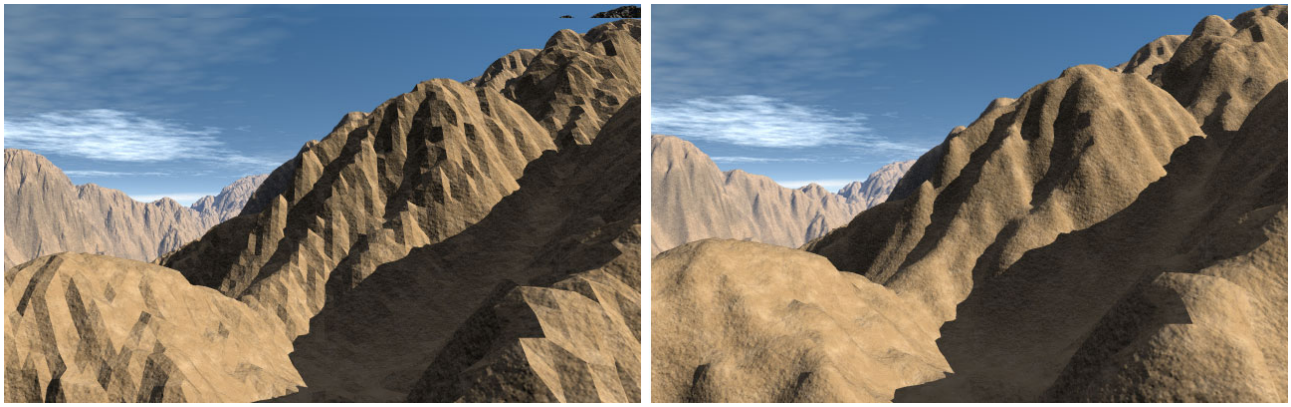
The unsmoothed version looks perhaps a bit better and although there are a few spots where the mesh can be detected, the viewer of a finished artwork most probably will not notice.

Using such a rough material on true 4096 terrain as shown below is a bit of a waste. It is not very much better than the lower resolution terrain above. There is only a small difference between the smoothed and unsmoothed version.



Terrain resolution 4096 at left unsmoothed and at right smoothed.

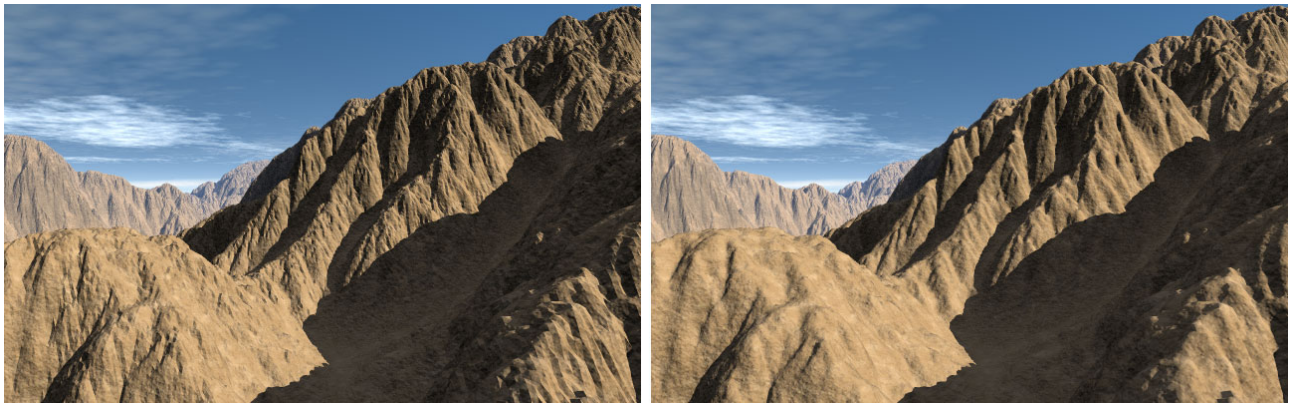
Things look quite differently if we use the material *Beach* (row 1, column 4) from *Terrains* in the *Pro Materials*.



Terrain resolution 1024 at left unsmoothed and at right smoothed.

The mesh is very obviously visible above and smoothing is mandatory if looking at it at close range. In fact, 1024 resolution is unsatisfactory even if smoothed.

Below the 4096 terrain is almost perfect unsmoothed and without flaw smoothed. But the smoothed version loses quite a bit of the fine terrain details.



Terrain resolution 4096 at left unsmoothed and at right smoothed.

Conclusion

Smoothing a terrain grinds out the hard edges of the mesh but also softens — even ironing out — the fine details in the geometry of the terrain and thus making it blunt. It seems to be a good idea to start with an unsmoothed terrain and see how it looks in the scene at work, also scrutinise an enlarged critical part.

There is more than the form how a terrain looks: the material applied to it is crucial. Care should be taken in the amount and size of bump used. Bump can make a dull terrain geometry looking great and appear detailed but it can also spoil the beautifully fine details.

If a strongly and coarse bumped material like the one used on the previous page is the best choice for the artwork in mind, a lower resolution smoothed terrain may be good enough. However, if a very detailed close-up landscape is to be rendered, use a higher resolution terrain without smoothing if possible and apply a material with finely detailed bump at a low setting in order to keep the geometry of the terrain mostly intact.

There is no fit it all method.