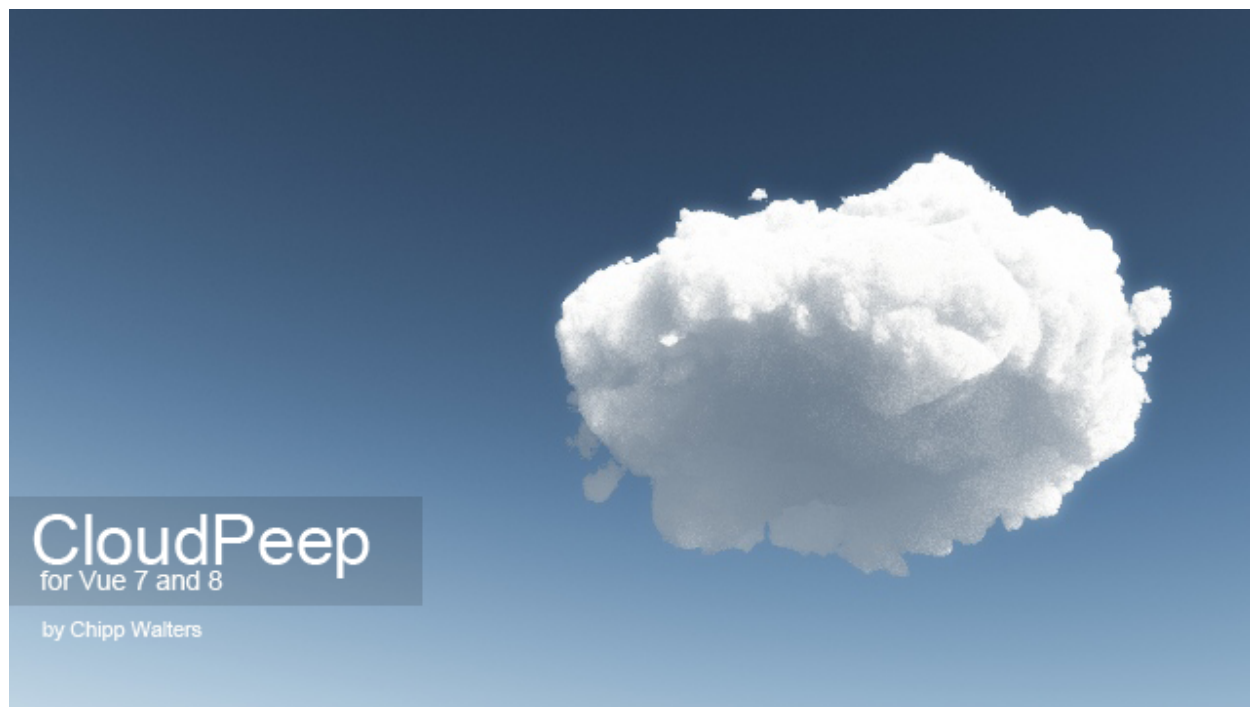




**Atmosphere settings for Cumulus clouds
for Vue 7 and 8**

CloudPeep

Atmosphere settings for Cumulus clouds for Vue 7 and 8

by Chipp Walters

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Introduction

Recently, I was involved in creating a product focused on Cumulus clouds code-named, "CloudPak." Because of some unforeseen problems, it appears that product won't end up making it to market. But, a lot of work was completed and I thought I'd share some of the information I've learned while working on the project. So, while this isn't a full blown "CloudPak" project, it can be considered a work-in-progress and hopefully will lend insight into how one might go about creating their own cloudscape atmospheres.

The approach is fairly simple. Create different cloud layers for different kinds of clouds, then adjust them accordingly. This document describes some of the basic technique and controls used for sculpting a single cloud. A single spherical cloud is used so it is easy to test the controls settings and see the result.

The purpose of this document is to teach others how the controls in the Atmosphere Editor affect a clouds shape. This information is valuable no matter what type of cloud layer you are using. I hope you find this document helpful.

Sculpting Clouds

A great way to arrive at single perfect, real cumulus cloud, is by manually sculpting it. Let's begin by showing how quickly you can sculpt a cloud, using Vue's basic tools, without ever having to go into the Function Editor. Once you understand how all this works, you'll be able to manufacture your own clouds!

Clouds Tab in the Atmosphere Editor

Vue has many settings for customizing clouds. The first settings to notice are the various sliders in the **Clouds** tab of the **Atmosphere Editor**. You should know, we are working with a slightly flattened perfect sphere cloud layer (Fig 1:1), so that it is clearly evident what settings affect what features of the cloud. This cloud layer scene (Sphere.vue) is included here so you can load it and play around with the different settings to see the various combinations of effects on the cloud.

The First Six Controls

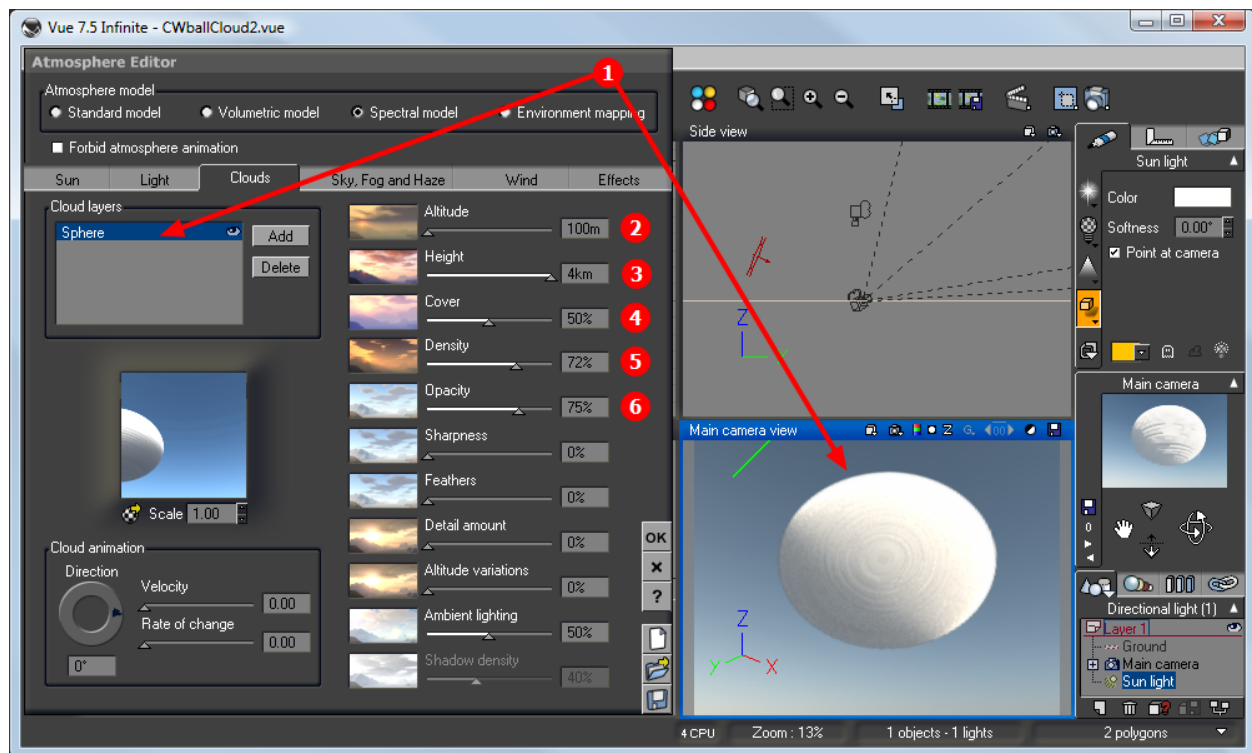


Fig 1. Atmosphere Editor settings: Clouds tab

The **Altitude** is set low at 100m, just like a real cumulus cloud would be (Fig 1:2). The **Height** is set much higher, at 4km (2), but the actual cloud goes nowhere near that height. It is just a max setting and can be

left alone for this cloud. If we set it lower, for instance 2km as shown in Fig 2 (1) it will create a ceiling for the cloud.

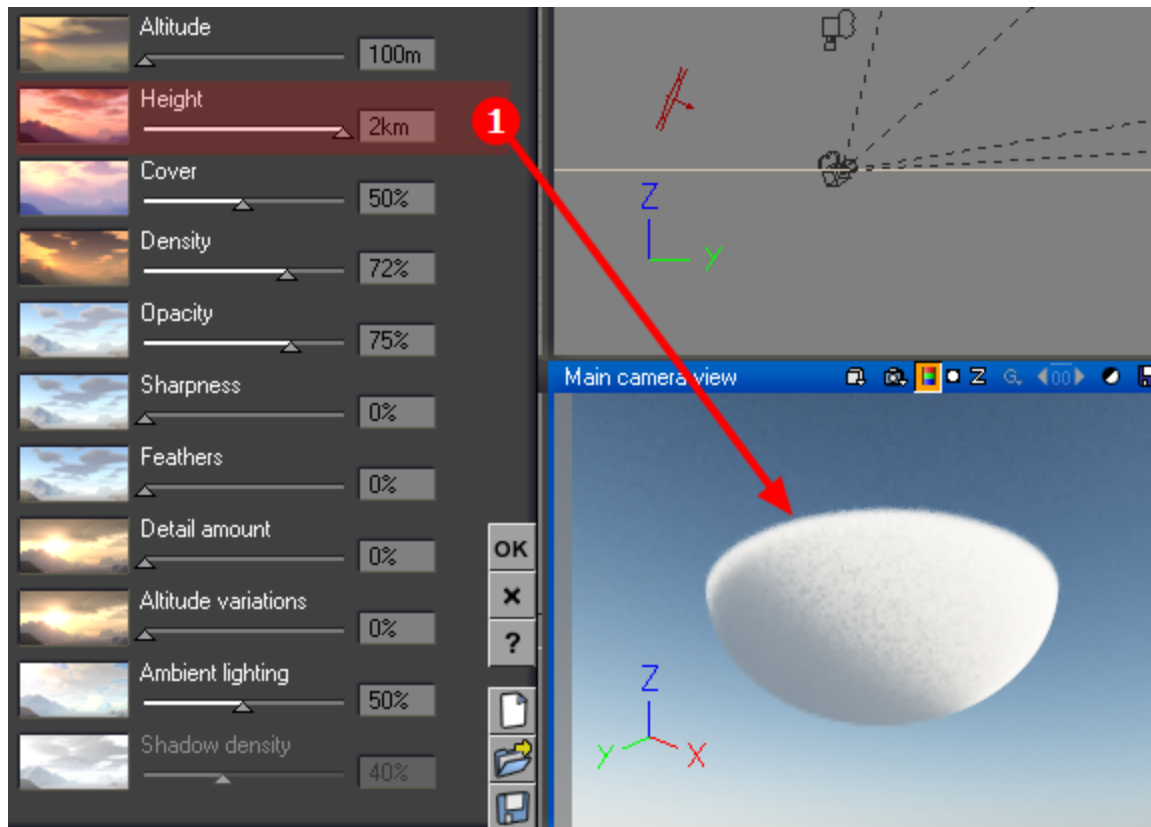


Fig 2: Ceiling for cloud set using Height slider

Changing the **Cover** setting will make this sphere cloud larger or smaller (Fig 1:4). Higher than 64% makes it too large to view in the preview window. **Density** (Fig 1:5) and **Opacity** (Fig 1:6) affect how solid and transparent the cloud is. The less dense the cloud the farther light will travel through the cloud. The opacity controls how far you can see objects through the cloud.

Detail

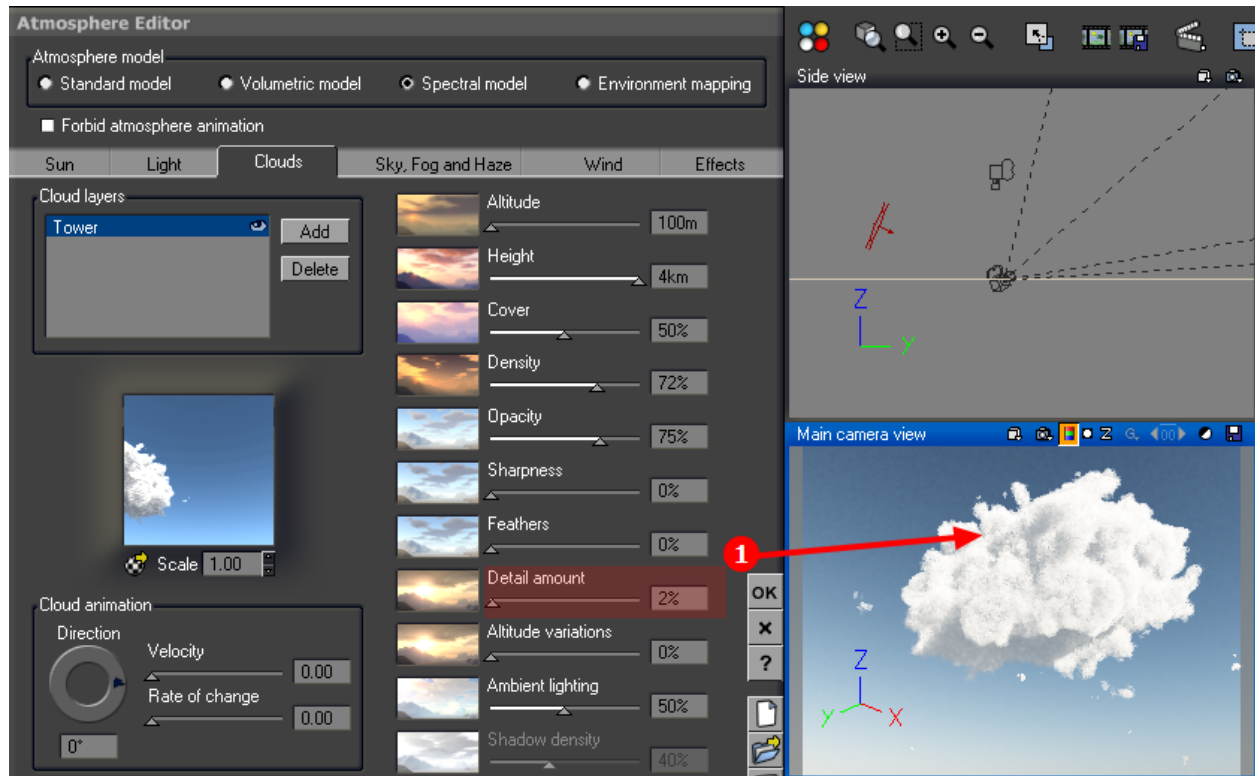


Fig 3. Detail amount

The next three sliders are very important for creating realistic clouds. Let's start with the last one first. According to the Vue documentation the **Detail amount** "controls the amplitude of the cloud detail. High values will create clouds with a lot of inner density variations, while low values will keep the cloud smooth and compact." Notice how a very small adjustment in detail amount from 0% (Fig 1) to 2% (Fig 3) has a huge effect on the overall cloud shape. It looks like it exploded! This is an important feature to note. This type of cloud tends to use very small detail settings so they can use the Function Editor to more closely control the shape of clouds.

Sharpness

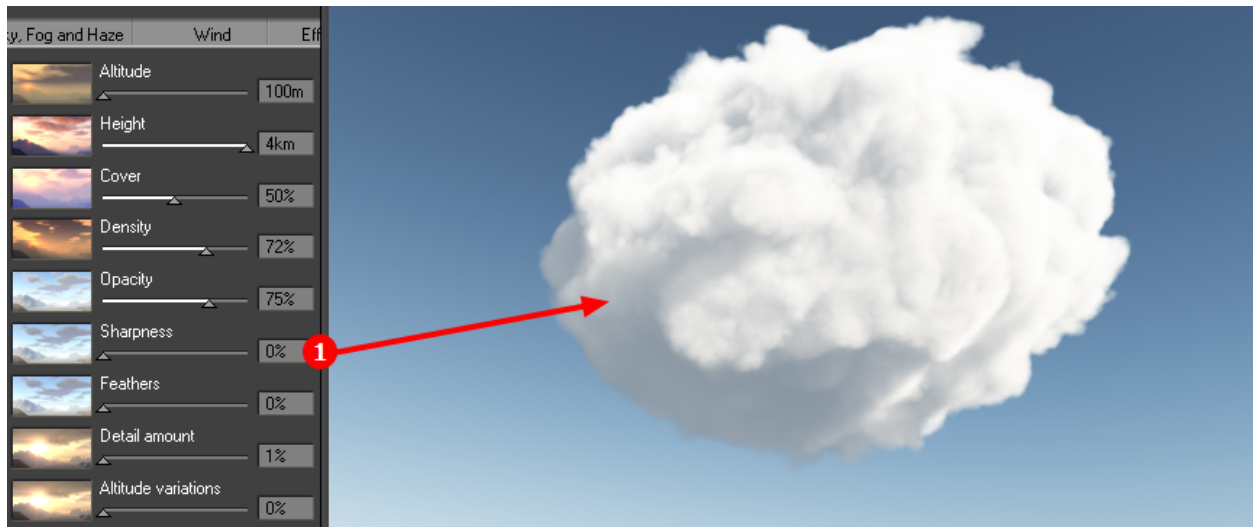


Fig 4. Sharpness: 0

Sharpness is another significant variable in cloud creation. In the above render (Fig 4:1) the **Detail** amount is set at 1% and the Sharpness at 0%. The overall crispness of the edges in the cloud are very soft, which could represent a cloud fairly close to the viewer.

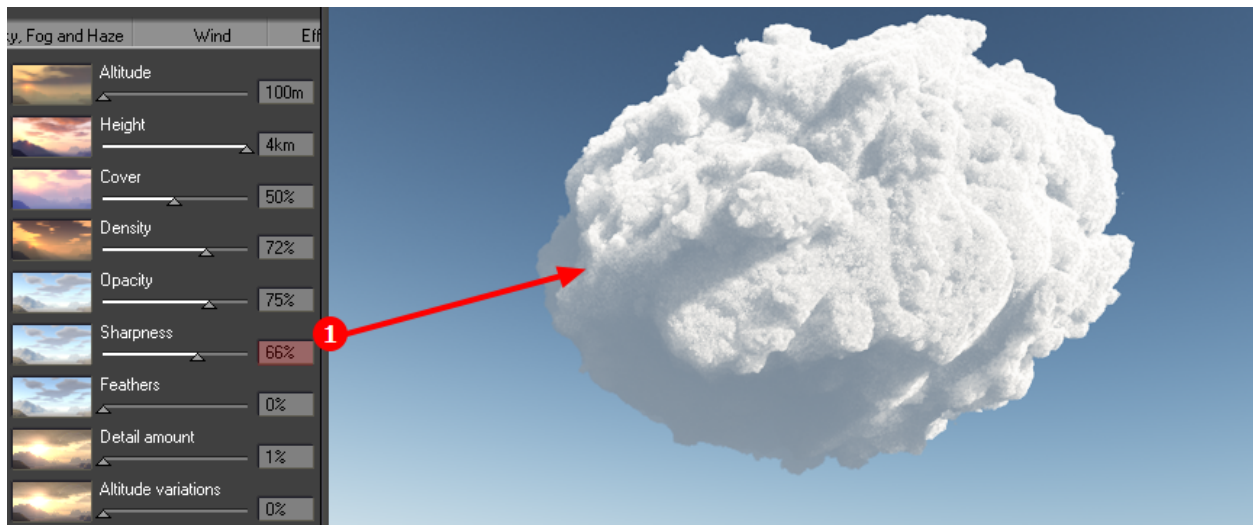


Fig 5. Sharpness: 66

Here (Fig 5:1) is the same cloud with **Sharpness** set to a much higher number. You can see the increase in details. Cumulus clouds in the distance would exhibit such greater detail.

Feathers

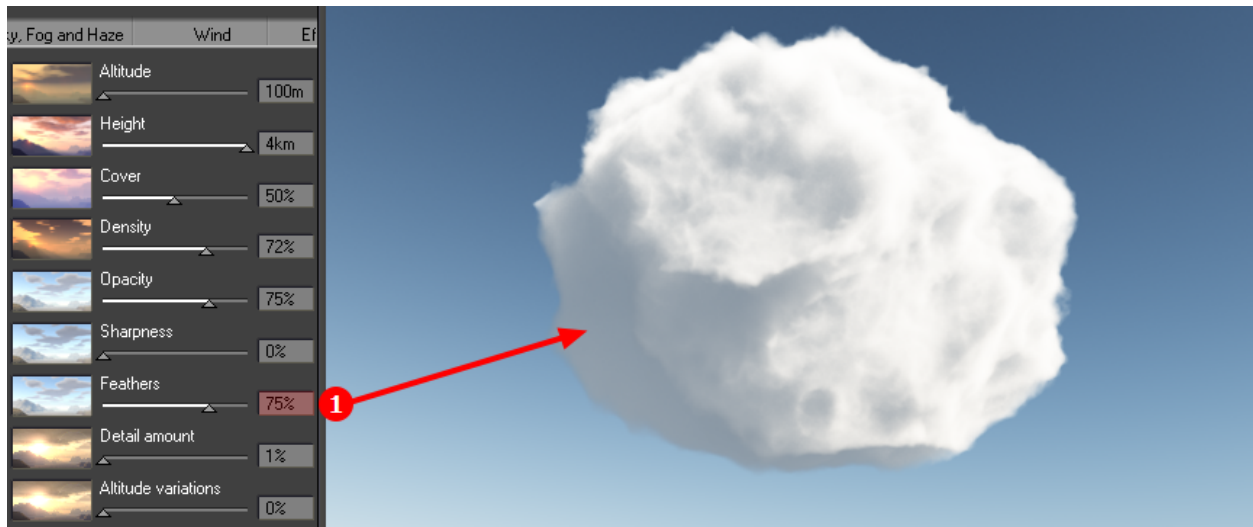


Fig 6. Feathers: 75

Cranking up the **Feathers** settings adjust the edge softness and how 'feathered' the clouds look (Fig 6:1). This is somewhat antithetical to the typical Cumulus clouds, but can be used in a second layer with the crisper clouds on top and the more feathered ones on the bottom.

The Last Three Controls

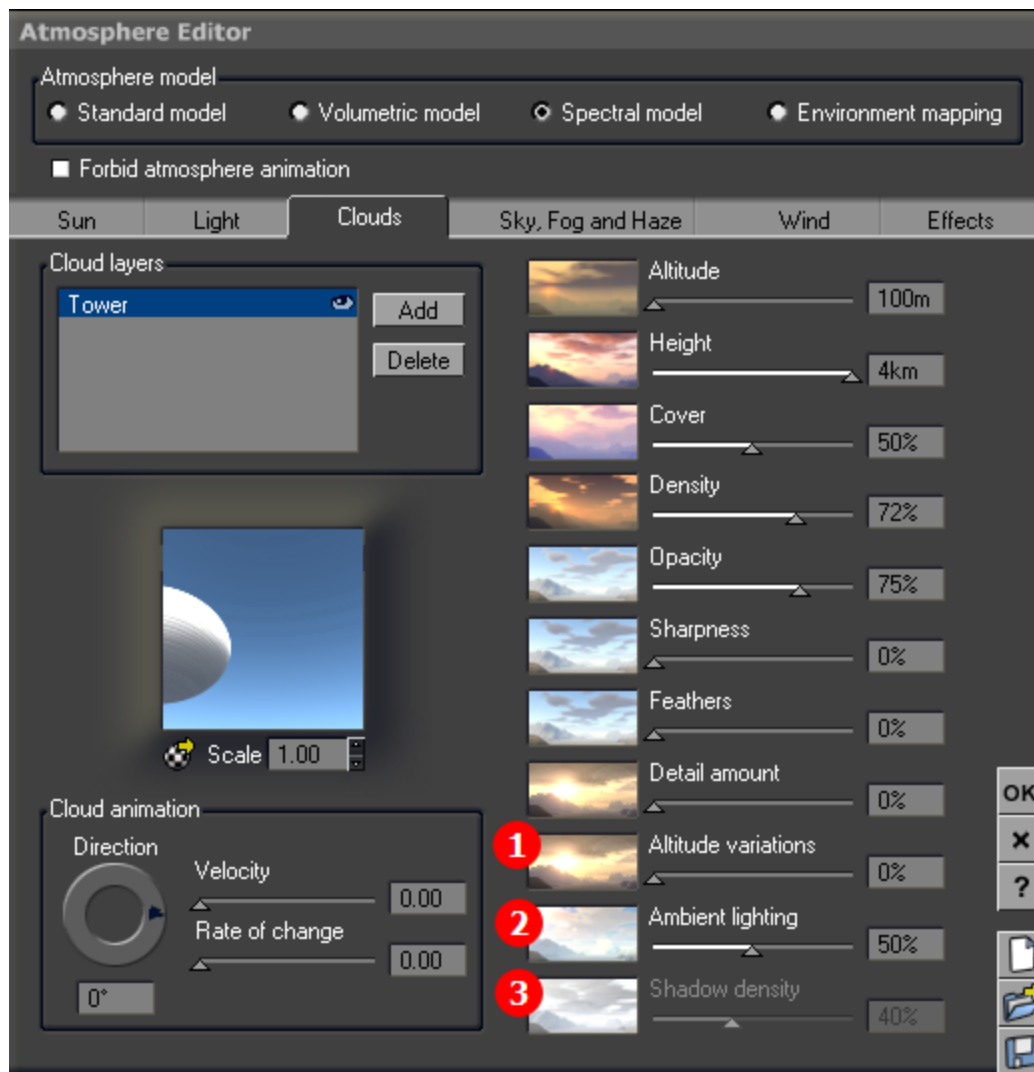


Fig 7.

Altitude variations (Fig 7:1) affect the cloud layer on a large scale, and since our spherical cloud is a fairly small, singular cloud, it has no noticeable effect. **Ambient lighting** (Fig 7:2) controls the amount of ambient light inside a cloud. The higher the number the more ambient light, and the lighter the cloud will be. Too much ambient light won't properly allow for the sun to model the cloud, and makes it appear washed out. **Shadow density** is only editable when **Cast shadows** is checked in the **Lighting and Effects** tab of the **Advanced Cloud Material Editor**. It provides a settings as to the darkness of the shadows cast by the clouds.

Advanced Cloud Material Editor

Double-clicking on the Cloud material preview opens the **Advanced Cloud Material Editor**. There are a number of settings here which significantly affect clouds. There are three tabs in this dialog, of which we will only concern ourselves with the first, **Color & Density** and the third, **Lighting & Effects**.

Scaling

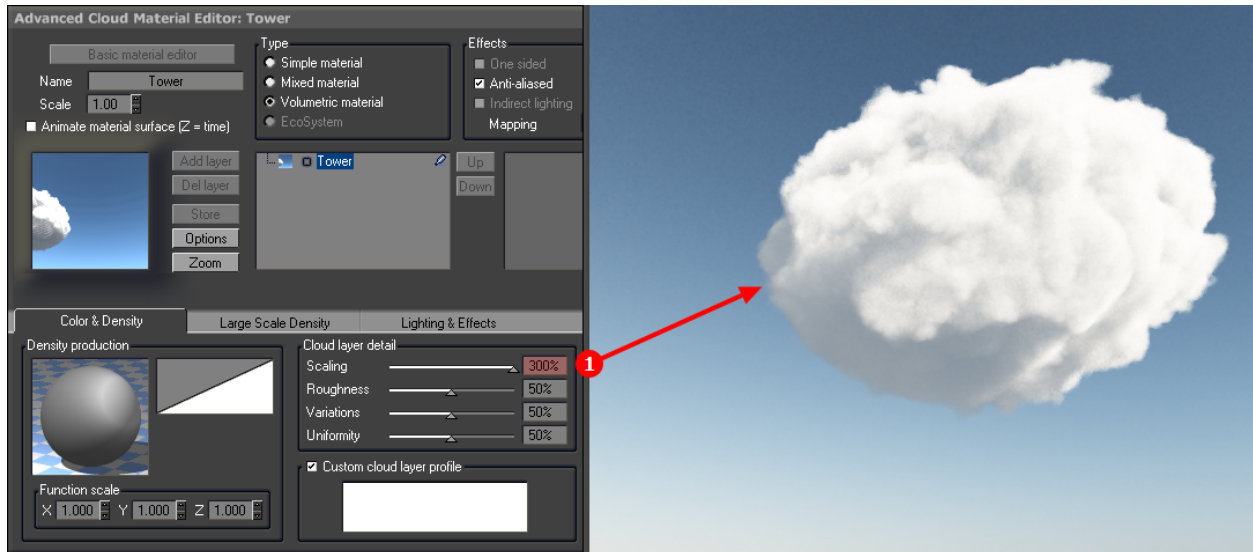


Fig 8. Scaling: 300

This cloud render (Fig 8:1) is the same as a previous render (Fig 4:1). It uses a **Scaling** of 300%. Notice the slider only goes to 100%, so you have to manually enter in the 300. The **Detail** setting on the **Atmosphere Editor / Clouds tab** is at 1%.

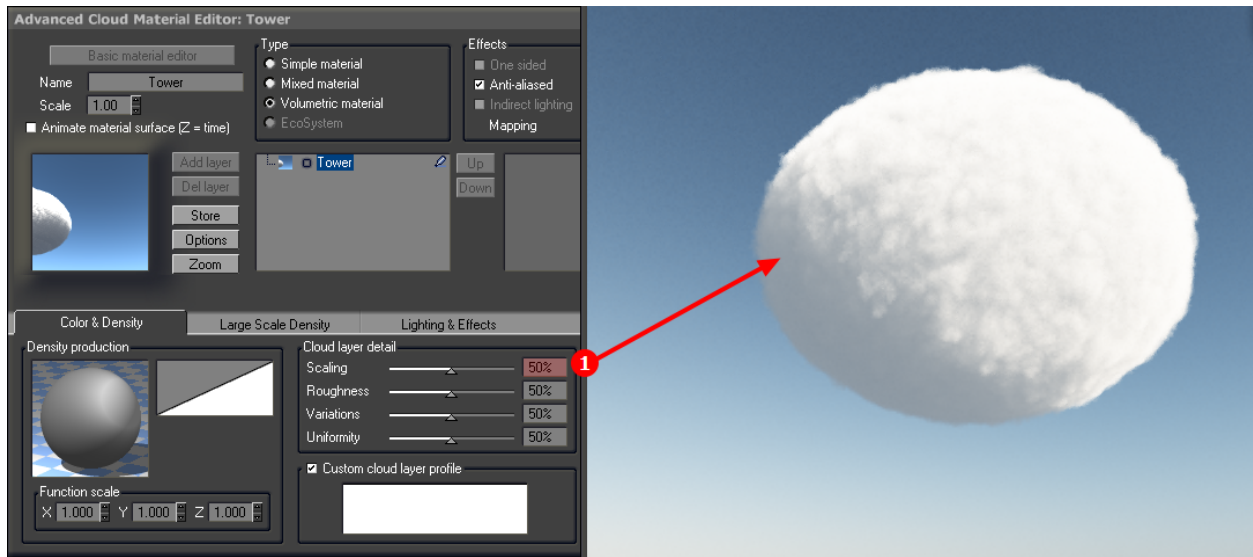


Fig 9: Scaling: 50

Here is the exact same cloud, but with a **Scaling** setting of only 50%. You can see the scaling setting relates directly to the Detail settings, the higher the setting, the more detail. You can use the **Scaling** setting as sort of a fine adjustment for the **Details** setting.

Roughness

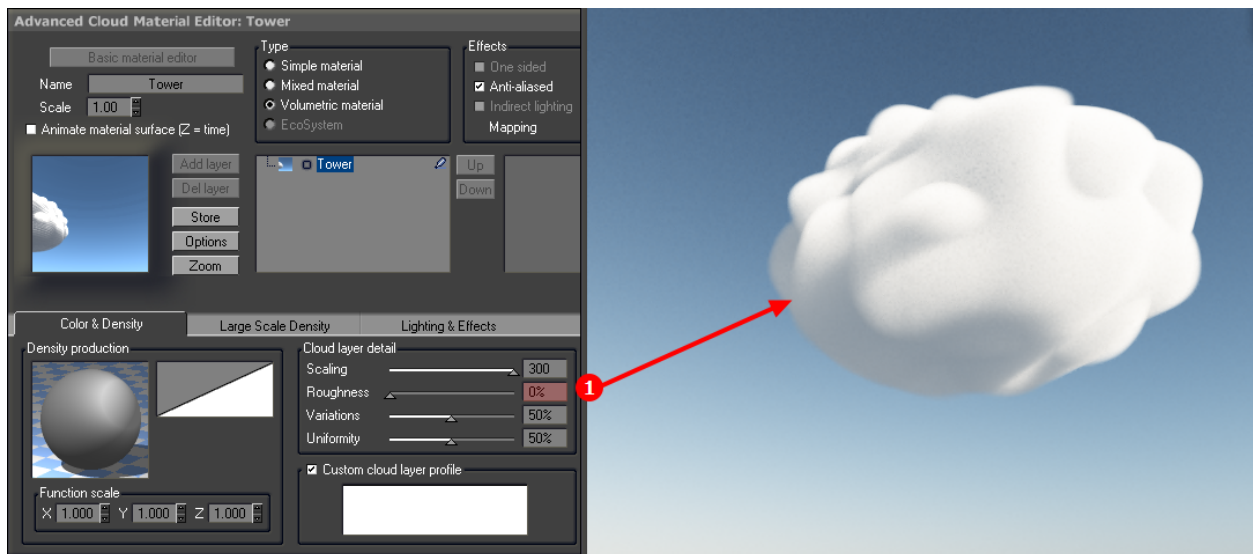


Fig 10. Roughness: 0

The **Roughness** setting tells how much feathering detail is applied to the surface of the cloud. A value of 0, as shown above applies no feather detail whatsoever, creating a very unrealistic cloud.

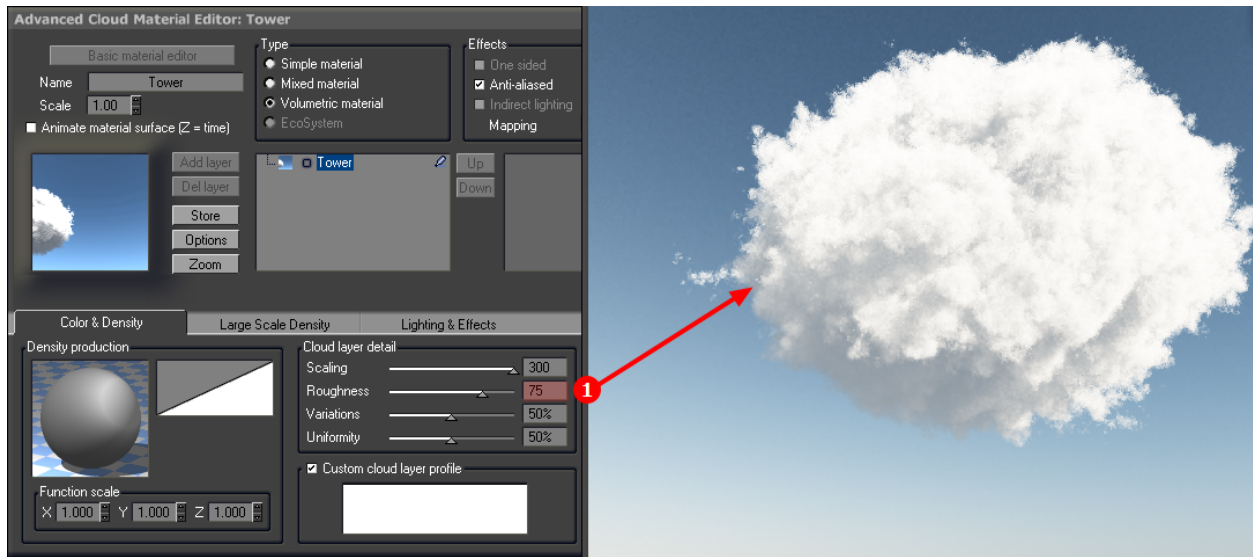


Fig 11. Roughness: 75

On the other hand, a setting of 75 adds too much feathering details and the cloud no longer looks much like a cumulus cloud. Typically, a setting of around 50 works best.

The other two sliders in this section, **Variations** and **Uniformity**, don't have much affect on a cloud this size, so keeping them set at around 50 works best.

Custom cloud layer profile

For perfect round shaped clouds, this profile is set to it's highest value (a straight across the top of the filter graph). In this case, other parameters within the Function Editor can be used to control the shape of the cloud.

Here are some examples of custom profiles:

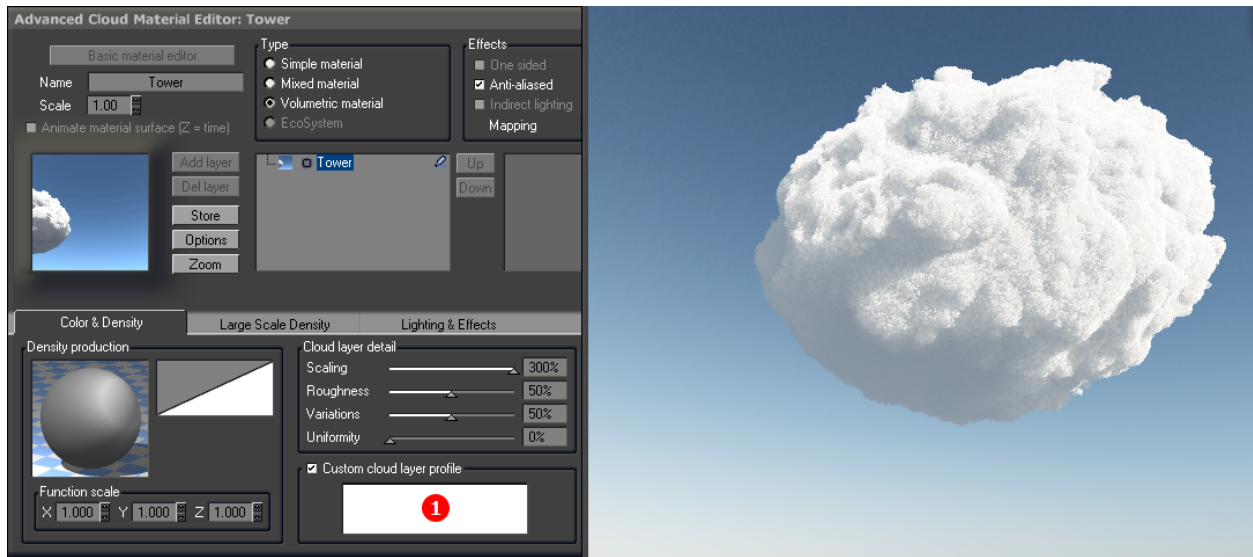


Fig 12. Cloud profile

Here the custom profile set at it's highest value, with **Detail** set at 1 and **Sharpness** at 30. The overall sphere shape is still symmetrical.

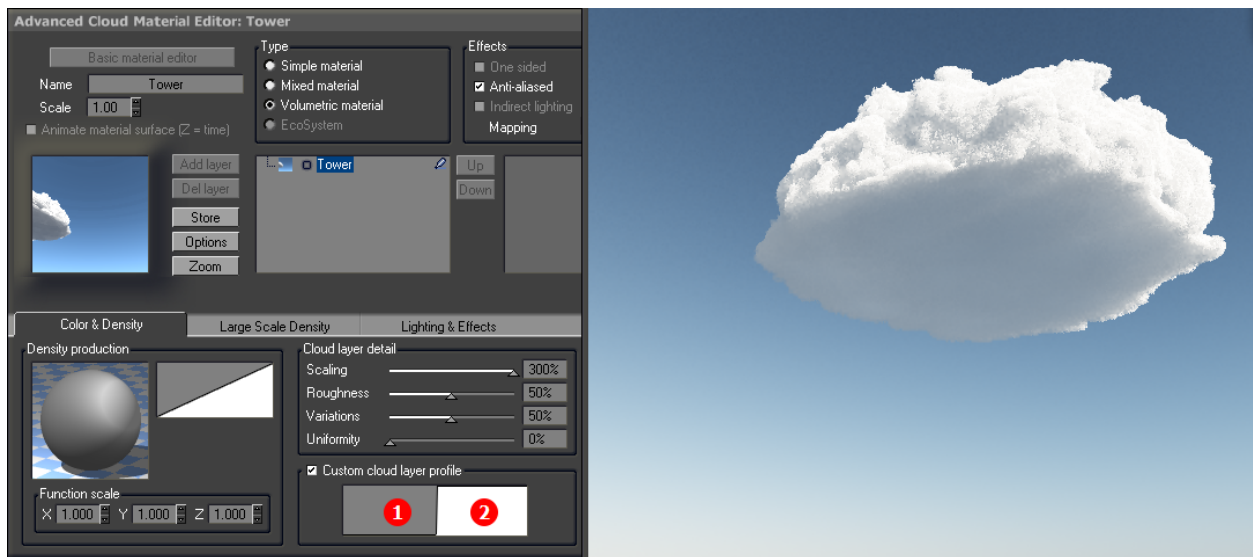


Fig 13. Custom profile

Adding a different, and more extreme profile, we now see the bottom of the cloud shape is totally flat, sort of like a real cloud, but a bit too harsh. You can see the left of the graph has zero values (Fig 13:1) and the right is maxed out (Fig 13:2). So, the bottom of the cloud is trimmed flat while the top is allowed to stay spherical.

Think of turning this graph 90 degrees counterclockwise and it may help you visualize the effect.

This works great when shaping a single sphere cloud, but may not work as well for more complex configurations. So, for our newly sculpted cloud, we'll use a profile somewhere in-between. (Fig. 13a)

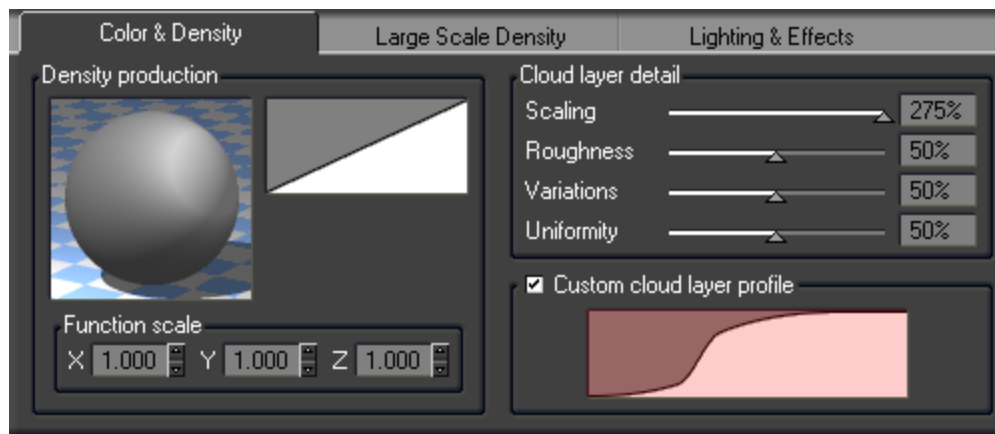


Fig 13a.

Lighting & Effects tab

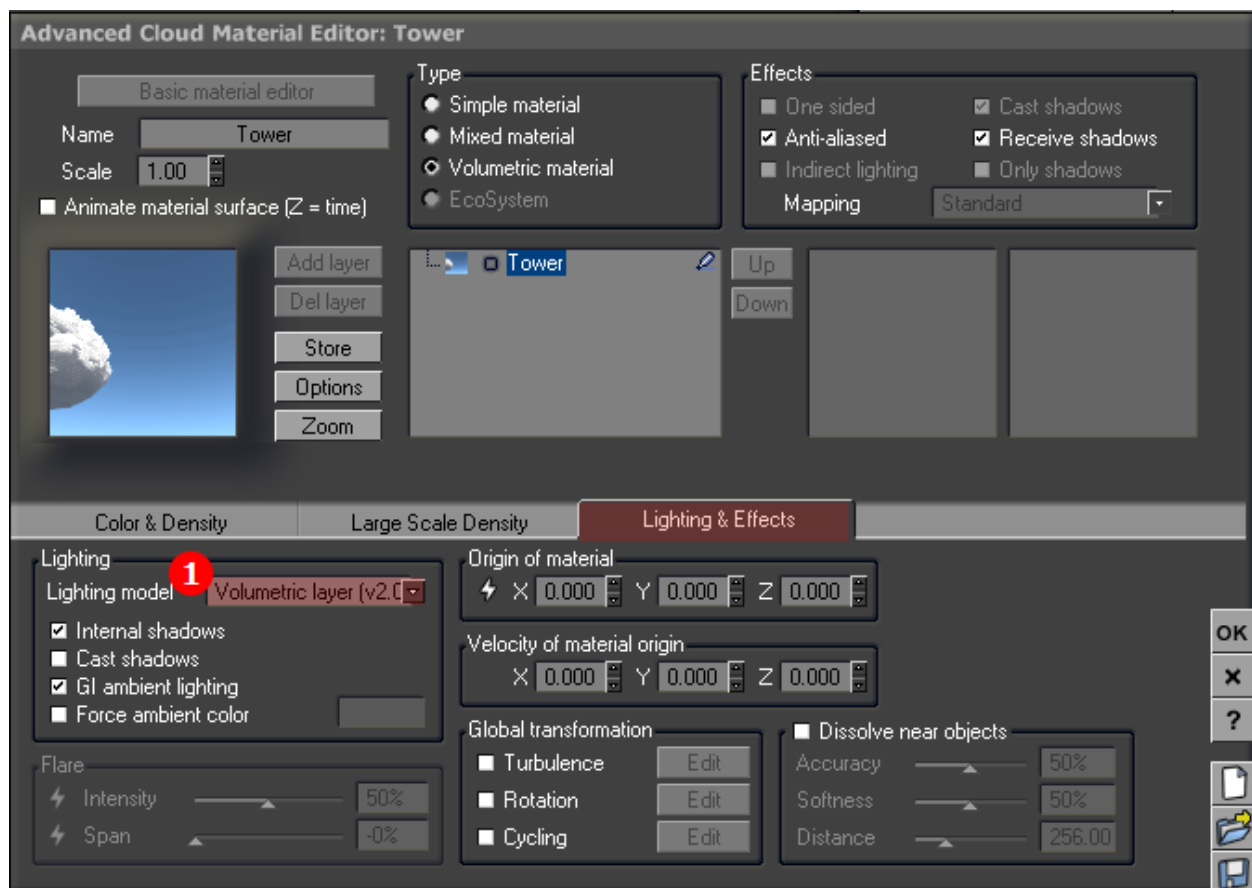


Fig 14.

The only thing of real note in this tab, is the **Lighting Model** setting (Fig 14:1) which for all cumulus clouds is always set at Volumetric layer (v2.0). If you intend to cast shadows or have Godrays, you'll need to be sure and enable the **Cast Shadows** checkbox.

And here's our finished single cumulus cloud.



Fig 15.

So, by tweaking the above settings: Detail: 1, Sharpness: 50, Scaling: 275, and our newly created Custom Profile (Fig 13a), we can create this solitary cumulus cloud from a simple sphere cloud. And...these are the basic building blocks and techniques of how building a cumulus cloud landscape works.

Epilogue

This proof of concept technique shows how to create a single cloud. Adding more cloud layers for individual clouds is very processor intensive and is probably not a good idea. The purpose of this exercise was to better understand the Atmosphere settings and controls. I hope you enjoyed it. :-)

-Chipp Walters