

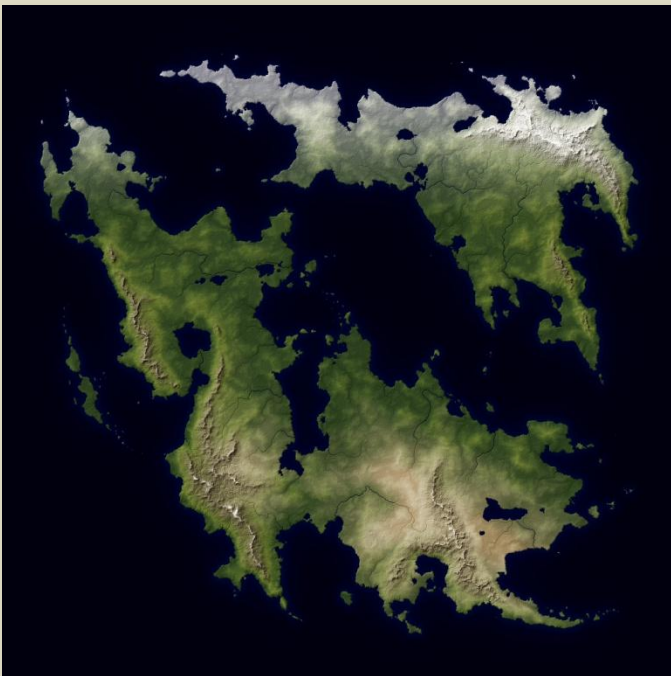
ERIOND: A TUTORIAL FOR GIMP & WILBUR

A Cartography Guild Tutorial by Arsheesh

Contents

Introduction	Page 1
Height Map	Page 2
Wilbur Terrain	Page 5
Bump Map	Page 6
Gradient Map	Page 7

Figure 1: An Eriond Style Map



INTRODUCTION

I've been asked by some members of Deviantart and the Cartographers Guild about the techniques I used to create my map of Eriond. In particular, several people wanted to know about techniques regarding generating terrain in Wilbur. While I am by no means an expert here, this tutorial explains some of the methods that I've borrowed (i.e. stolen!) or discovered.

How to Use this Tutorial

Let me begin by saying that this is an Intermediate/Advanced level tutorial. If you are new to fantasy mapping, this may not be the best tutorial for you to begin with. Many of the techniques discussed herein are difficult and time consuming. Furthermore, I assume that the reader already possesses a grasp of mapping basics such as how to generate a black & white map outline, and thus omit explaining such details.

That said, this tutorial covers the following topics: (1) a method for generating a height map in GIMP; (2) techniques for manipulating the height map in Wilbur to generate terrain; (3) bump map settings in GIMP, and finally; (4) how to make use of GIMP's "gradient map" feature to color the map based on altitude, and create diversified biomes.

Throughout the tutorial I will offer explanatory text describing the methods we are using, followed by highlighted commands and/or key commands which will look like the following:

Image > Canvas Size > Lock Aspect Ration > 100px > Center > Resize

I'll also include screenshot figures illustrating some of the tools and settings that we will be using, as well as the progression of our map. Finally, I've included some "Mapping Tips" windows (look for the 🐱 icon) that serve to highlight pertinent information, and to offer various tips and tricks I've learned.

What You Will Need

I will be using version 2.6.10 of GIMP and version 1.76 (32-bit) of Wilbur for this tutorial. You will also need a black & white outline of the map you want to make. I'll be working with an outline scaled at 2100x2100px and 300dpi (if you are working with a map of different dimensions see the "Sizing up your map" map tips before proceeding). I've also uploaded several gradients to the thread wherein this tutorial is hosted, which you may want to avail yourself of (this tutorial does not include instructions on how to make the gradients).



SIZING UP YOUR MAP

In this tutorial I am working with a 2100x2100px map. If you decide to try this tutorial on a map much larger than this (i.e. one much larger than double this px), here are a few things to be aware of. First, the version of Wilbur that I am using does not run smoothly on maps sized much larger than 4000x4000px at 300dpi. I'm told the 64-bit version does better, but I've experienced difficulties in installing it onto my computer, so I wouldn't know. Second, when you import your height map file into Wilbur (part 3) you will want to use either 4% or 3% noise instead of 5%, as the latter will make your map look grainy when viewing close up. You may also need to add an additional layer of noise and follow this with an additional Fill Basins. In addition, when running the Incise Flow filter you may want to try increasing the Pre Blur to .5.

HEIGHT MAP

Generating Clouds

Like other methods for generating a height map, the Eriond style relies upon cloud patterns. Before discussing these however, let's take care of a preliminary step. You will need a channel of your original map outline. On your "Map Outline" layer, grab the *Select by Color tool* (Threshold 0) and click on the land area.

Layer (Map Outline) > Select by Color (Threshold 0) > Click on Land

Now go to the *Select* menu tab and click on *Save to Channel*; name this channel "Land Mask".

Select > Save to Channel (Name Land Mask)

OK, now that that is taken care of, we can proceed. Create a new white layer above your outline and name it "Clouds 1".

Layer > New Layer > White (Name Clouds 1)

On that layer render a set of *Difference Clouds*. Set the *Detail* to 15 and (assuming a 2100x2100px size) the X and Y Size to 8.

Filter > Render > Clouds > Difference Clouds > Detail 15 ; Size 8

Create a new layer above Clouds 1 and repeat this step, only this time use a different seed for the Clouds. Name the new layer "Clouds 2". Set the layer mode of Clouds 2 to *Difference*.

Layer > New Layer > White (Name Clouds 2) > Layer Mode (Difference)

Filter > Render > Clouds > Difference Clouds > Detail 15 ; Size 8

Right click on the Clouds 2 layer and select *New from Visible* and name the new layer "Difference 1".

Right Click on Clouds 2 > New From Visible (Name Difference 1)

Repeat this process. Create a "Clouds 3" and a "Clouds 4" layer (above the Difference Clouds 1 layer). Set the opacity of Clouds 4 to *Difference* and then create a *New from Visible* layer named "Difference Clouds 2".

Repeat the preceding steps to make Difference 2

Next move the Difference 1 layer up in the dialogue to just below Difference 2.

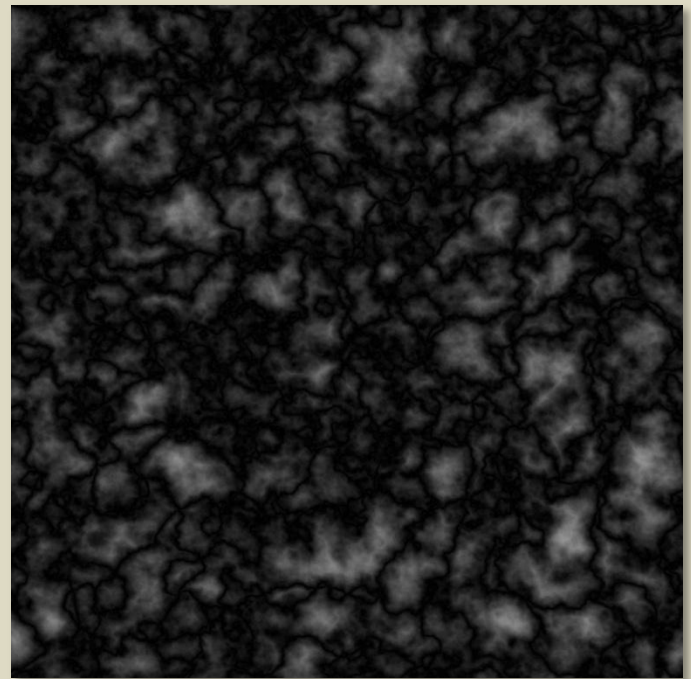
Layer (Difference 1) > Raise layer (to just below Difference 2)

Now set the layer opacity of the Difference 2 layer to *Difference* and then create a *New from Visible* layer right above it named "Land Clouds". As the name implies, this layer will serve as the base clouds layer for our map. Figure 2 below offers an example of what these clouds should look like.

Layer (Difference 2) > Layer Mode (Difference)

Layer (Difference 2) > New from visible (Name Land Clouds)

Figure 2: Land Clouds



Next we are going to generate cloud patterns to be used for mountains. To do so, follow the instructions given below. This should give you a set of clouds similar to that of Figure 3.

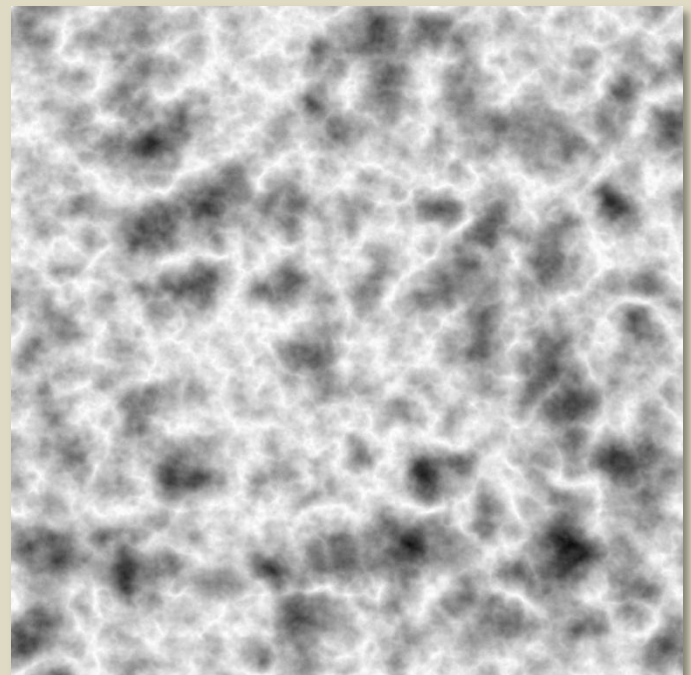
Layer (Land Clouds) > Hide Layer

Layer (Difference Clouds 2) > Layer Mode (Addition)

Right Click on Difference Clouds 2 > New From Visible (Name Mt. Clouds)

Colors > Invert. Set Layer opacity to 90%

Figure 3: Mountain Clouds



Isolating the Land

Now that we have our cloud patterns, the next step is to isolate the land clouds with our map outline channel. Create a new black layer named "Land" and move it to just below the Land Clouds layer. Next, un-hide the Land Clouds layer and then right click on it to add your Map Outline Layer Mask.

Layer > New Layer > Black (Name "Land")


Layer (Land) > Lower Layer (to just below "Land Clouds" layer)

Layer (Land Clouds) > Unhide

Right Click on Land Clouds layer > Add Layer Mask > Channel (Land Mask)

Now your land should be isolated. However, the Land Clouds patterns have far too much contrast. Let's go ahead and change that (but before you do, see Mapping Tips window and change that (but before you do, see Mapping Tips window below). Making sure that the Land Clouds layer is active, go to Colors and select *Brightness-Contrast*. Set the *Contrast* to -25. The result should look like Figure 4.

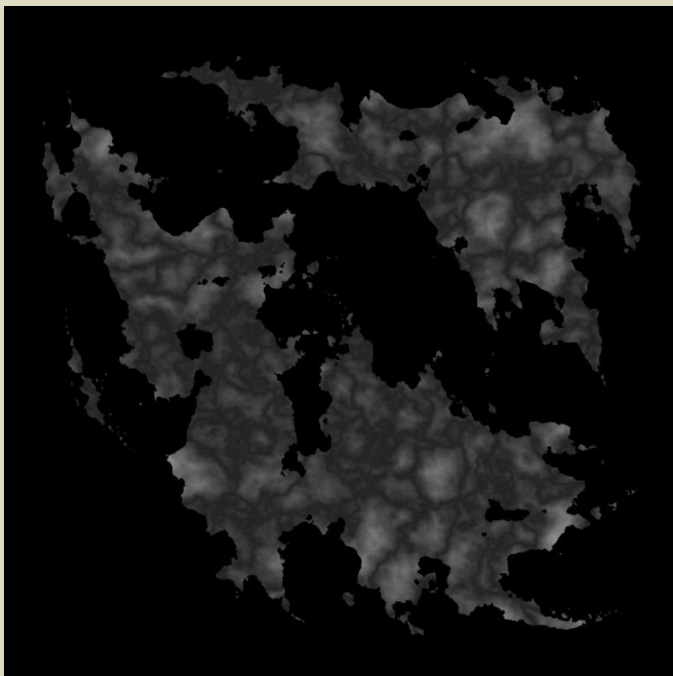
Colors > Brightness-Contrast > Contrast -25



MAKING COPIES

It's a good idea to make copies of important layers (such as the Land Clouds layer) before altering them. That way, if you screw up you have the copy to fall back on.

Figure 4: Isolated Land



Adding Mountains

OK, this is where the pain... "cough", I mean fun starts. There is no way of giving precise instructions here so I will dispense with the highlighted commands for this sub-section and just explain the process itself. Basically I'm using the "Copy, Paste & Airbrush" method for placing and sculpting mountains (and lowering lowland areas) on the map. Here's how it works:

Copy & Paste – First I create two separate layers above the Land Clouds layer (named Mountains 1 and Mountains 2). Then I take my *Free Select* tool and select bits and pieces of interesting looking mountain patterns from the Mountain Clouds Layer. I then copy these, and paste them onto one of the two Mountain layers (rotating and/or resizing them where necessary) to fit them into plausible looking mountain formations (see Figure 5). Make sure that these pieces do not overlap on the same layer, since you will need to erase the edges of these pieces (hence the reason for two mountain layers rather than just one). Next, erase (fade) the edges of these patterns. It's best to use a soft round eraser set to low (e.g. 10%) opacity. See Figures 6).

Figure 5: The Copy & Paste Method

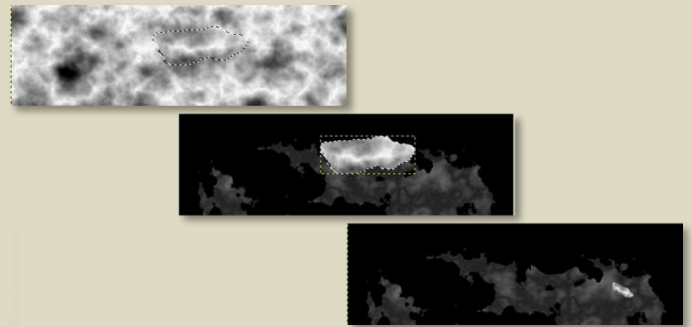
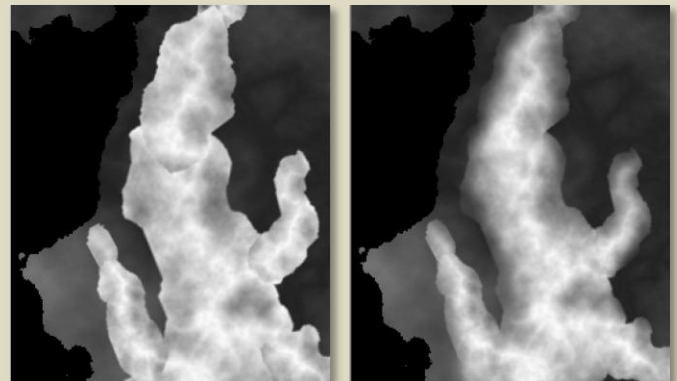
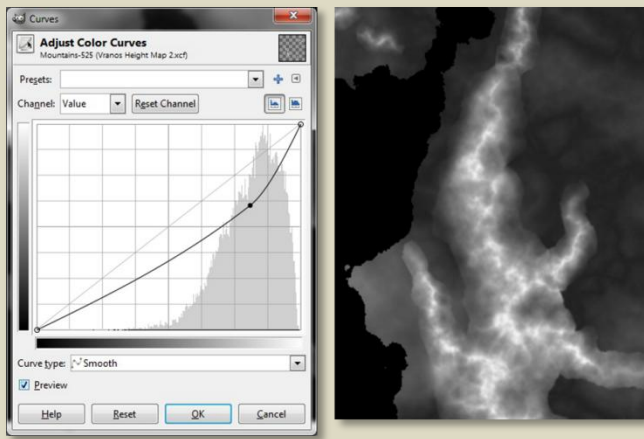


Figure 6: Mt. Clouds Before & After Erasing



At this point the clouds don't look a whole lot like mountains. For one thing, they are too bright. For another, they are lacking in contrast. They just look "blobish". In order to correct for this, once you've finished fading the Mt. edges, go ahead and Merge the Mountain 1 and 2 layers together, and rename the new layer "Mountains". Next, go to the Colors menu on click on Curves. Adjust the color curves according to Figure 7 below.

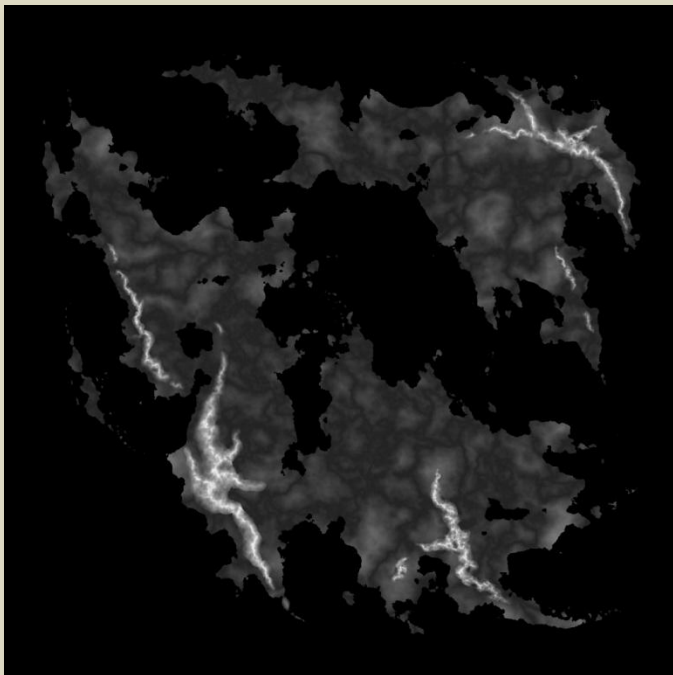
Figure 7: Using Color Curves to Fine Tune Your Mountains




OK, now the clouds are beginning to resemble mountains. However, as you can see, they don't exactly fit seamlessly into their surrounding terrain. So now it's time to break out the airbrush.

Airbrush – Next we are going to sculpt the Land Clouds layer. Take your airbrush tool, set it to a really low opacity (e.g. 3%), and slowly begin to add thin layers of white paint to highland and mountainous areas, and thin layers of black to lowland areas. The goal is to sculpt the surrounding terrain such that the mountains fit in seamlessly. This is a slow and painstaking process. There will be tears. But gradually you will witness the transformation of your height map. You may find that you need to either tinker with the opacity of the Mountains layer, and/or further adjust the Brightness or Contrast of the Land Clouds layer in order to find the right balance. Figure 8 below shows what the map should look like before you begin to go at it with your airbrush, and Figure 11 shows what the finished product should look like. For more advice on fine tuning this process, see the Mapping Tips window on Sculpting below.

Figure 8: Height Map Before Airbrushing

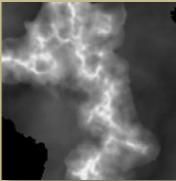
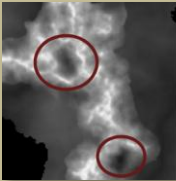




TIPS ON SCULPTING

Getting Rid of Holes - Before sculpting the Land Clouds layer, check to see if there are any gaps in the Mountains layer, such as is shown in Figure 9. You don't want gaps in your mountains because when you run your height map through Wilbur, the program will see these as valleys and will flatten them and place rivers within. To avoid this, paint white over such areas, like what I did below.

Figure 9: Holes are Bad



Seamless Blending – When sculpting the Land Cloud layer here are two things to keep in mind. First, you want to be sure that you airbrush white along the sides of the mountains so as to cover up any hard edges from the Mountains layer. If any hard edges remain, later on when you Bump Map the Height Map these will turn up as weird beveled edges. Second, you want there to be a gradual elevation change from land at or near the sea level to highlands, to mountains. For example, See Figure 10.

Figure 10: Seamless Blending

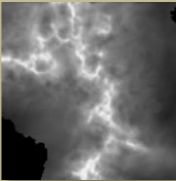
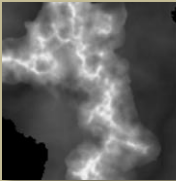
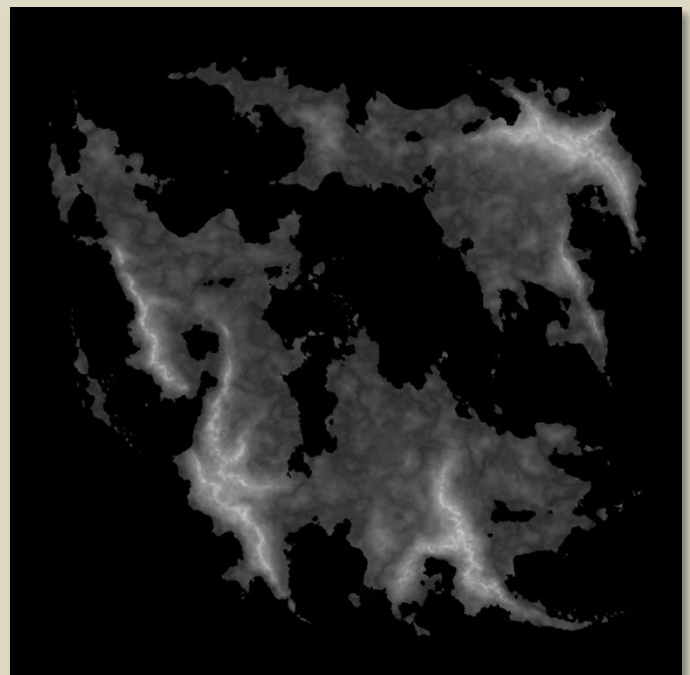


Figure 11: Height Map After Airbrushing



WILBUR TERRAIN

Prepping the Height Map

Now that you've finished sculpting your height map, it's time to edit it within Wilbur. Create a *New from Visible* layer above the Mountains layer named "GHM" (short for GIMP Height Map). Next, save your document, and then flatten it. Then save the new flattened image as "GIMP Height Map" (JPG).

Layer (Mountains) > New from visible (Name GHM)

SAVE YOUR DOCUMENT!

Right Click on the GHM Layer > Flatten Image

File > Save As > JPG > Wilbur Height Map

Wilburfying the Height Map

OK now fire up Wilbur and open your GIMP Height Map within the program. What follows is simply an adaptation of one of Waldronate's tutorials for Wilbur.

Open Wilbur

File > Open > GIMP Height Map

Adjust the map height. In the *Filter* menu select *Mathematical* and then *Span* and set Low to 500 and High to 3500.

Filter > Mathematical > Spans > GIMP Height Map

Next let's add some noise. Go to *Filter* select *Noise* and then *Percentage Noise*, and choose 5%.

Filter > Noise > Percentage Noise > 5%

Now we are going to add some small rivers to the coastline. In the *Filter* menu select *Erosion* and then *Precipiton*. In the pop up window that appears, change *Passes* to 2 (leave the other default settings in place).

Filter > Erosion > Precipiton > Passes > 2

Now add some more noise.

Filter > Noise > Percentage Noise > 5%

Next we are going to fill the basins. In the *Filter* menu select *Fill Basins* and keep the default settings.

Filter > Fill Basins (Default Settings)

Now we need to add some more noise, but there's a problem. Too much noise and your map gets all grainy and unattractive. Not enough noise and your rivers will devolve into jagged lines. Here's a trick I've found. In the *Select* menu go to *From Terrain* and then *Flat Areas*.

Select > From Terrain > Flat Areas

Now that you have only the flat areas selected you are free to add more noise with impunity. So add another 5% Noise.

Filter > Noise > Percentage Noise > 5%

Now turn off the selection clicking *Deselect* in the *Select* menu.

Select > Deselect

Next, fill those basins once more.

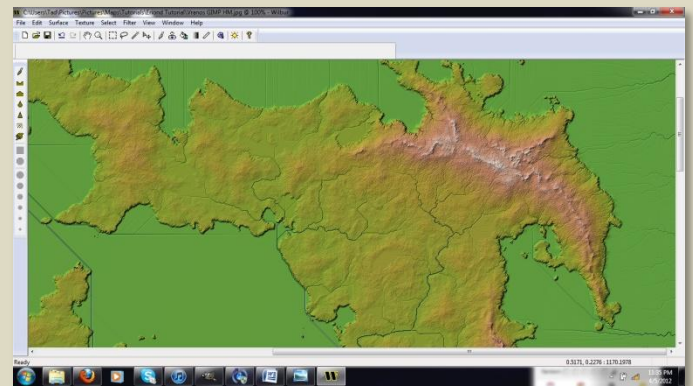
Filter > Fill Basins (Default Settings)

Now we are ready to add those big beautiful rivers. Go to the *Filter* menu, select *Erosion* and then *Incise Flow*. I've used several different settings, but assuming a 2100x2100px map, here are the settings that I recommend: *Amount 2; Flow Exponent 6.5; Effect Blend 2*. If you are using a map much larger than this though you may want to add a .5 Pre Blur in as well (also, you might want to refer back to the "Sizing Up Your Map" Mapping Tips window on page 1 if you are using a larger image, since some of the other Wilbur settings will be different as well).

Filter > Erosion > Incise Flow > Amount 2; Flow Exponent 6.5; Effect Blnd 2

You ought to end up with something like Figure 12 below.

Figure 12: Nice Wilbur Terrain



While Wilbur offers allot more features than what I've covered here, this is all you really need for the Eriond Style map. So let's get the Height Map for our Wilberfied terrain. Go to *Texture* and select *Grey Maps* and then *Height Map*.

Texture > Grey Maps > Height Map

Now save your file. There are a ton of file options, but the one you need is *PNG Texture*. Name this file "Wilbur Height Map".

File > Save As > PNG Texture > Wilbur Height Map

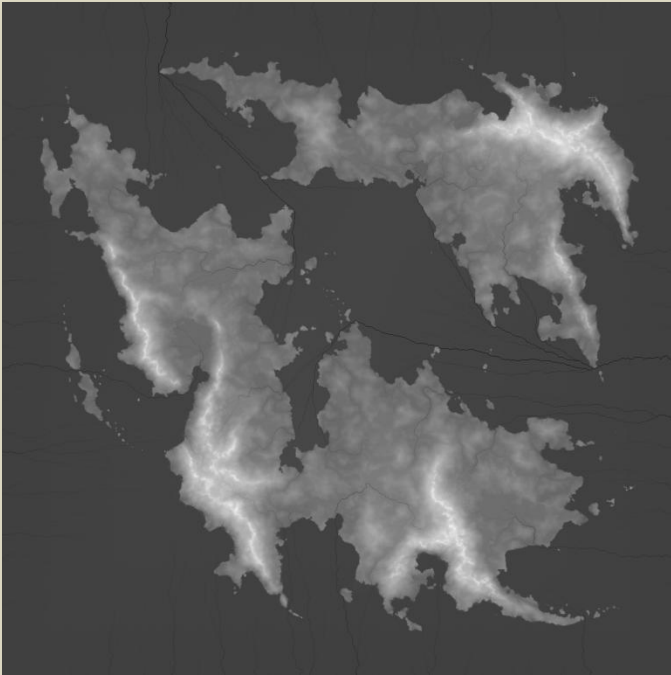
BUMP MAP

Importing the Height Map to GIMP

Now that you've got your new and improved Wilbur Height Map let's import it to your main GIMP file. Go to the File menu and click on *Open as Layers* and then select your Wilbur Height Map file. Rename the file "WHM". The height map should look something like Figure 13 below.

File > Open as Layers > Wilbur Height Map (Name WHM)

Figure 13: Wilbur Height Map



Creating Additional Layer Masks

Next we are going to create two additional layer masks. The first layer mask is simply a new version of our "Land Mask" which has been adjusted to include rivers. In your *Channels* Dialogue click on the Land Mask channel and then click on the *Create Duplicate Channel* icon at the bottom of the Dialogue. Rename the resulting Channel "Rivers Mask".

Channels (Land Mask) > Duplicate Channel (Rename River Mask)

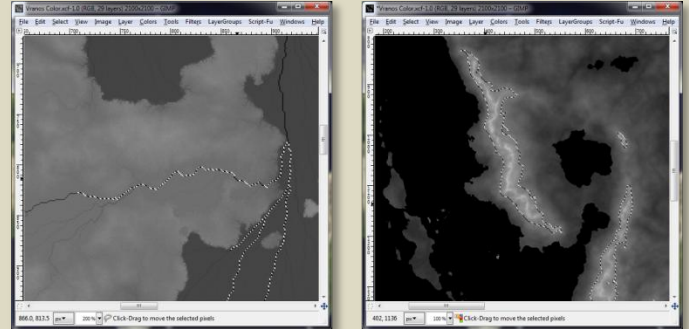
Now switch back over to the *Layers* dialogue and click on the WHM layer. Grab your *Select by Color* tool, set the *Threshold* to 15 and then *Zoom* in to 200% to get a better view of the rivers. Look for a nice fat river and then using your selection tool select the grey pixels inside (see Figure 14). Now switch back over to the *Channels* dialogue and click on your *Rivers Mask* channel. Now use your *Bucket Fill* tool to dump black paint into the channel. Turn off the selection. Your channel now has rivers.

Layers (WHM) > Select by Color > Threshold 15 > Select a large river

Channels (Rivers Mask) > Bucket Fill (Black)

Select > Select None

Figure 14: River and Mountain Selections



The River mask will do some work for us later on when we add color to our map, but for now you will not have to worry about it.

Second, we are going to create a Mountain Mask channel. This will be important in a moment when we Bump Map the Height Map. Grab the *Select by Color* tool again, set *Threshold* to 50, and on the GHM layer select the brightest section of mountains (See Figure 14). Now in the *Select* menu, click on *Feather* and set px to 15. Next, in the *Select* menu click on *Save to Channel* and name the new Channel "Mt Mask".

Layers (GHM) > Select by Color > Threshold 50 > Select whitest Mountains

Select > Feather > 15px

Select > Save to Channel (Name Mt Mask)

Unifying the Oceans

As you can tell by looking at your WHM layer, the sea has these weird rivers running through them. Let's get rid of them shall we. *Duplicate* the WHM layer and Name it "WHM copy". Create a new transparent layer below the WHM copy layer named "Temperate" and *Fill* it with Gray paint (Value 15). Next, add the Land Mask layer mask to the WHM copy layer, *Apply* it, and then *Merge Down* (onto Temperate).

Layers (WHM) > Duplicate Layer (Name WHM Copy)

Right click on WHM Copy > Add Layer Mask > Channel (Land Mask)

Layers > New (Below WHM Copy) > Transparent (Name Temperate)

Layers (Temperate) > Bucket Fill (Grey: Value 15)

Layers (WHM Copy) > Merge down (onto Temperate)

Bump Mapping your Height Map

Next *Duplicate* the Temperate layer and name it "Land Bumps". Now *Duplicate* the "Land Bumps" layer and name it "Mountain Bumps". On the Mountain Bumps layer, go to *Filter*, click on *Map* and then on *Bump Map*. Set the *Azimuth* to 135, the *Elevation* to 30 and the *Depth* to 30. Set the *Layer Mode* of Land Bumps to *Overlay*, and the opacity to 50%. Next add the Mt Mask layer mask to the Mountain Bumps layer. Here's where that Mask comes in! Without it, and the accompanying Mountain Bumps layer, in the Bump Map the mountains would look diminished.

Layer (Temperate) > Duplicate Layer (Rename Land Bumps)

Layer (Land Bumps) > Duplicate Layer (Rename Mountain Bumps)

Filter > Map > Bump Map > Azimuth 135; Elevation 30; Depth 30

Layer (Mountain Bumps) > Layer Mode > Overlay > Opacity > 50%

Right Click on Mountain Bumps > Add Layer Mask > Channel > Mt Mask

Next click on the Land Bumps layer and go to *Filter*, click on *Map* and then on *Bump Map*. Set the *Azimuth* to 135, the *Elevation* to 30 and the *Depth* to 20. Set the *Layer Mode* of Land Bumps to *Overlay*. Next add the Rivers Mask layer mask to the Land Bumps layer (the reason for this will become evident in the next section). The Result should look something like Figure 15.

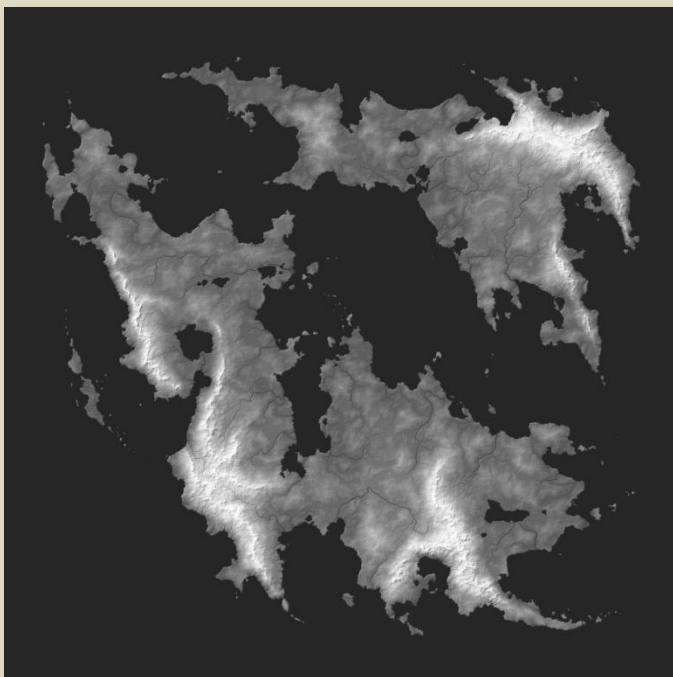
Layer (Land Bumps)

Filter > Map > Bump Map > Azimuth 135; Elevation 30; Depth 20

Layer (Land Bumps) > Layer Mode > Overlay

Right Click on Land Bumps > Add Layer Mask > Channel > River Mask

Figure 15: Bump Map



GRADIENT MAP

Prepping the Gradients

Alright take a deep breath, the end is in sight! There's just one last set of steps, adding color to your map. My preferred method for this is to use Gradient Maps. If you are reading this then you are probably already familiar with gradients, though you may or may not be familiar with how to create or edit them, or how to use the Gradient Map feature. I won't be covering creating and editing gradients in this Tutorial (though see the Mapping Tips window on Gradient Tutorials"). Instead, I have uploaded copies of the gradients I'm using to the thread wherein this tutorial is featured. For ease I'd recommend downloading and installing these gradients, but I will also list below the color codes that I am using for each gradient for anyone keen on constructing their own gradients.

As to the gradient map, what this feature does is use the current gradient (shown in the Brush/Pattern/Gradient area of the Toolbox) to color an active layer. The map filter "uses image color intensities (0 - 255), mapping the darkest pixels to the left end color from the gradient, and the lightest pixels to the right end color from the gradient. Intermediate values are set to the corresponding intermediate colors." (Quote taken from Section 15.8.23 of the GIMP Documentation).

OK, once you've installed the Land Color gradients we should be ready to begin. Click on the Temperate layer, *Duplicate* it and name the new layer "Desert 1". Next *Duplicate* the Desert 1 Layer and name the new layer "Desert 2". Then *Duplicate* the "Desert 2" layer and name it "Arctic 1". Finally, *Duplicate* the Arctic 1 layer and name it "Arctic 2".

Layer (Temperate) > Duplicate Layer (Rename Land Desert 1)

Layer (Desert 1) > Duplicate Layer (Rename Desert 2)

Layer (Desert 2) > Duplicate Layer (Rename Arctic 1)

Layer (Arctic 1) > Duplicate Layer (Rename Arctic 2)

For each of the above layers we are going to apply a different gradient using the Gradient Map filter. As you might have guessed from the names of these layers, the result will be a map whose color range represents that of the climate zones of our own planet. More on that in a moment.



GRADIENT TUTORIALS

For other tutorials on creating, editing and using gradients, I recommend consulting the online GIMP documentation manual which discusses Gradients in several sections. I would also highly recommend checking out Notsonoble's very helpful tutorial on [GIMP Gradient Tool Basics](#) over at the Cartographer's Guild.

Fun with Gradient Mapping

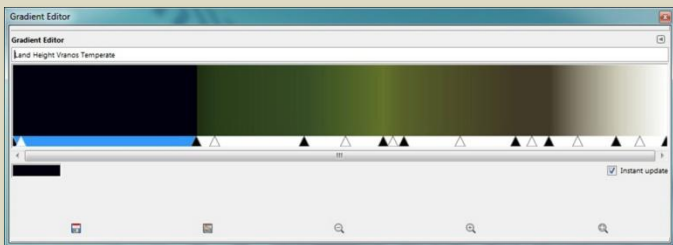
Let's begin with the temperate zones. In the *Toolbox* click on the *Blend* tool and change the default gradient to the *Land Height Temperate* (shown in Figure 16 below). Next *Hide* all the layers (except for the Land and Mountain Bumps layers) above the Temperate layer. Click on the Temperate layer. In the *Colors* menu, select *Map*, then *Gradient Map*, and watch as your grayscale map comes alive with color. Unfortunately the Gradient Map filter in the current GIMP release does not come with a preview window so chances are you won't have gotten the color balance right on the first try. You will likely have to "Undo" the gradient map, adjust the various segments of the color pointer bar, and then gradient map the layer again. I usually have to do this several times before getting it right. In the end, you should have an image similar to Figure 17.

Toolbox > Blend Tool > Gradient (change to Land Height Temperate)

Hide all layers above Temperate (except for Land & Mountain Bumps)

Layers (Temperate) > Colors > Map > Gradient Map

Figure 16: Temperate Gradient



Color Codes: Blue (00000f); Dark Green (1e2f10); Green (374d26); Light Green (64742b); Olive (58612a); Dark Brown (413a28); Gray (ccccab7); White (ffffff).

Figure 17: Temperate Layer



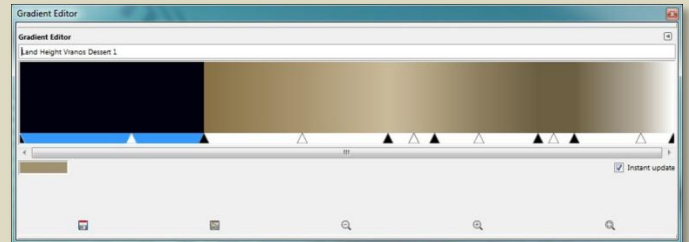
Next, we'll do the desert zones. Click on and unhide the Desert 1 layer. Change the gradient to *Land Height Desert 1*. Now apply a *Gradient Map* (see figures 18 and 19 below).

Layers (Desert 1) > Unhide

Toolbox > Blend Tool > Gradient (change to Land Height Desert 1)

Layers (Desert 1) > Colors > Map > Gradient Map

Figure 18: Desert 1 Gradient



Color Codes: Blue (00000f); Dark Tan (877044); Tan (cabb9c); Light Brown (af9f80); Dark Brown (6d5f41); White (ffffff).

Figure 19: Desert 1 Layer



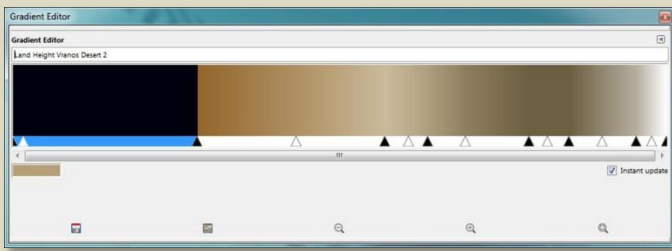
Repeat this process for the Desert 2 layer. Click on and unhide the Desert 2 layer. Change the gradient to *Land Height Desert 2*. Now once again apply a *Gradient Map* (see figures 20 and 21 below). This layer will give us a broader range of desert color.

Layers (Desert 2) > Unhide

Toolbox > Blend Tool > Gradient (change to Land Height Desert 2)

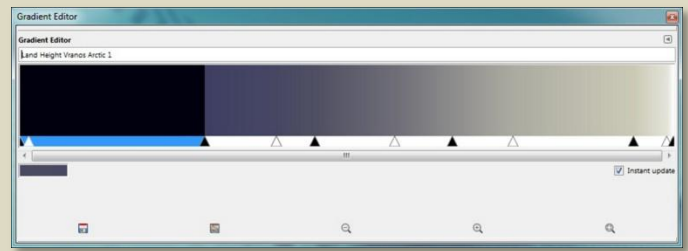
Layers (Desert 2) > Colors > Map > Gradient Map

Figure 20: Desert 2 Gradient



Color Codes: Blue (00000f); Butterscotch (95662c); Tan (cabb9c); Light Brown (af9f80); Dark Brown (6d5f41); White (ffffff).

Figure 22: Arctic 1 Gradient

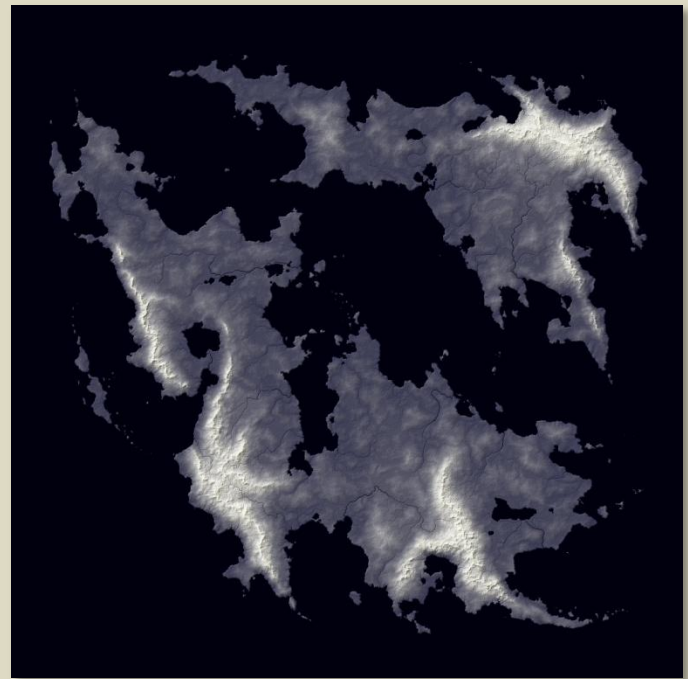


Color Codes: Dark Periwinkle (3f3f64); Periwinkle (505064); Gray (8e8d8e); Light Gray (ccccab7); White (ffffff).

Figure 21: Temperate Layer



Figure 23: Arctic 1 Layer



Next up are the arctic layers. These are going to be a bit trickier: it is difficult to get the color balance right. The goal is to get a bit of color variation between the highlands (which are almost entirely white) and the lowlands without at the same time having the mountains turn washed out with too much white. The best way that I know of to accomplish this is to use two separate arctic gradients and to make use of the Mountain Mask. I'll explain all of this in more detail below, but first let's start with the Arctic 1 layer. Click on and unhide the Arctic 1 layer. Change the gradient to *Land Height Arctic 1*. Now apply a *Gradient Map* (see figures 22 and 23 below).

- Layers (Arctic 1) > Unhide
- Toolbox > Blend Tool > Gradient (change to Land Height Arctic 1)
- Layers (Arctic 1) > Colors > Map > Gradient Map

Color Codes: Light Gray (ccccab7); White (ffffff).

Repeat this process for the Arctic 2 layer. Click on and unhide the Arctic 2 layer. Change the gradient to *Land Height Arctic 2*. Now apply a *Gradient Map* (see figures 24 and 25 below).

- Layers (Desert 2) > Unhide
- Toolbox > Blend Tool > Gradient (change to Land Height Desert 2)
- Layers (Desert 2) > Colors > Map > Gradient Map

Figure 24: Arctic 2 Gradient

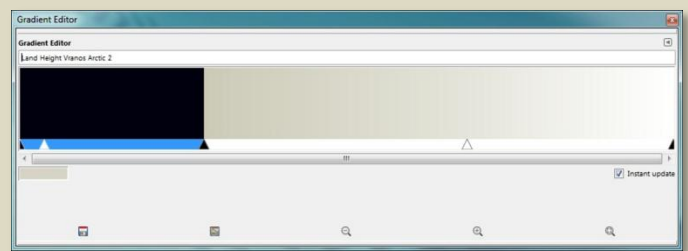


Figure 25: Arctic 2 Layer



Layer (Arctic 2) > Opacity 50%; Layer Mode > Overlay

Layer (Arctic 2) > Duplicate (Name Arctic 3)

Layer (Arctic 3) > Layer Mask > Channel > Mt Mask > Invert

Layer (Arctic 3) > Duplicate (Name Arctic 4)

Layer (Desert 2) > New from Visible (Name Arctic)

Layer (Arctic) > Layer Mask > Channel > River Mask

Layers (Arctic 1-4) > Hide

Defining the Climate Zones

Once you have completed these gradient maps, it's time to combine them into logical climate zones. An easy method for doing this is to add a Black layer mask to the desert and arctic layers and then, use your *Airbrush* tool (set to 10% opacity) to airbrush white over the portions of the layer masks for these layers where you want the associated climate zones to show up (though for the arctic regions I usually use a black & white gradient instead). See Figure 27 below.

Layers (Desert 1, Desert 2 and Arctic) > Add Layer Mask > Black

Layer Mask (Desert 1) > Airbrush in Deserts (Opacity 10%)

Layer Mask (Desert 2) > Airbrush in Desert highlights (Opacity 10%)

Layer Mask (Arctic) > Airbrush in Arctic regions (Opacity 10%)

Figure 26: Arctic Layer

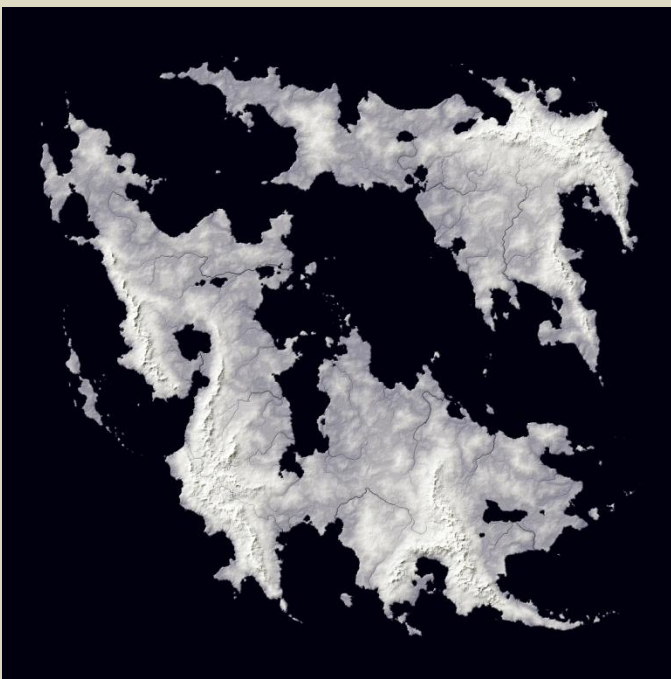
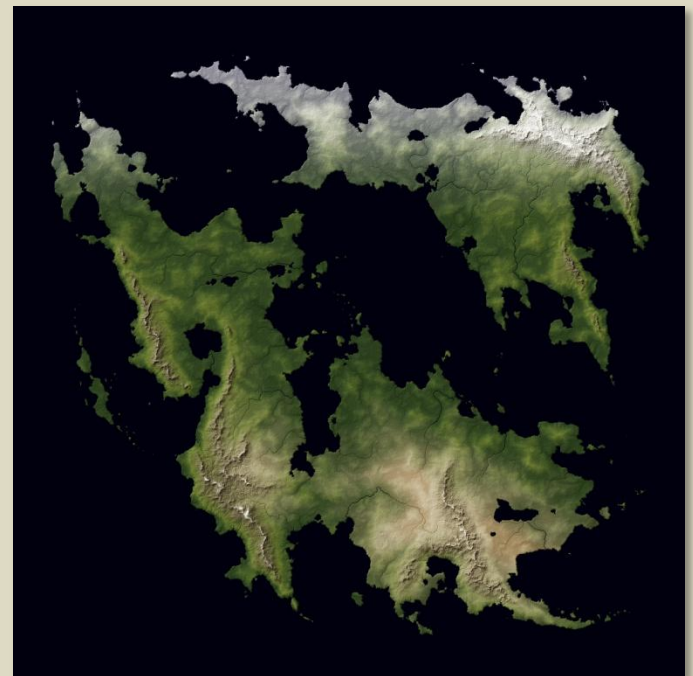


Figure 27: Temperate Zones



Set the *Layer Opacity* of the Arctic 2 layer to 50% (you may have to adjust this), and the *Layer Mode* to overlay. *Duplicate* this layer and name the duplicate "Arctic 3". Add the Mt Mask layer mask (and tick the box that says "invert") to this layer. *Duplicate* the layer again and name this duplicate "Arctic 4". The result should look like Figure 26 (if too much gray-purple is showing, add another adjustment layer. If the image is too white, then lessen the opacity of the Adjustment layers). Next Create a *New From Visible* layer named "Arctic" above the Desert 2 layer and then *Hide* all of the other arctic layers. Add the Rivers Mask layer mask to the Arctic layer.

Adding Land Glow

The last step is to add shallow water surrounding the coastline. There are different ways of doing this, some more involved than others. Here I will present a simple way. Create a *New Layer* above the Arctic layer called "Land Glow". In the Channels section click on the River Mask channel and then click on the *Replace Selection with this Channel* icon. Click back onto the Land Glow layer and then use your *Bucket* tool to dump blue (01062e) into the selection. Turn off the selection and then go to the Filter menu, select *Blur*, and then *Gaussian Blur* and change the *Amount* to 15 px. Next go back to the Channels dialogue, click on the River mask and once more click on the *Replace Selection with this Channel* icon. Hit *Delete*. Select none. You should now have a faint tint of blue surrounding the land.

Layers (Arctic) > New Layer (Named Land Glow)

Channels (River Mask) > Replace Selection with this Channel

Layers (Land Glow) > Toolbox > Bucket Fill > Blue (01062e)

Select > Select None

Filter > Blur > Gaussian Blur > 15%

Channels (River Mask) > Replace Selection with this Channel

Layers (Land Glow) > Delete

Select > Select None

Next, *Duplicate* the Land Glow layer and apply another *Gaussian Blur* to the layer, this time set to 35%. Use your River Mask as the *Channel Selection*, and then hit *Delete*, and then turn off your selection. Repeat this process again, *Duplicating* the layer, applying a *Gaussian Blur* to it, this time set to 100%. Use the River Mask as the *Channel Selection* and then hit *Delete*. *Merge* all of the Land Glow layers together, and then *Duplicate* the merged Land Glow layer once more. By now you should have a larger more gradual land glow. You may want to either duplicate one these layers again, or conversely lighten the opacity of one of the layers in order to suite your taste. The final map should look something like Figure 28. That's it, you're finished! Hope you have enjoyed this tutorial.

Filter > Blur > Gaussian Blur > 35%

Channels (River Mask) > Replace Selection with this Channel

Layers (Land Glow#1) > Delete

Select > Select None

Layer (Land Glow#1) > Duplicate Layer

Filter > Blur > Gaussian Blur > 100%

Channels (River Mask) > Replace Selection with this Channel

Layers (Land Glow#2) > Delete

Select > Select None

Layers (Land Glow#1 & Land Glow#2) > Merge Down

Layers (Land Glow) > Duplicate Layer

Figure 28: Final Map

