Introduction to Photoshop

Layer & Channel Masks

Conventions

Keyboard command sequences will be within <[ and ]>.
Keyboard command sequences will mix both Mac and PC,
for example <[Command/Control+j]> means:
On a Mac do <[Command+j]>
On a PC do <[Control+j]>

The purpose of masks in Photoshop is, in general, to hide or reveal content on a layer in a non-destructive manner by adjusting what can or can not be seen, from completely transparent to completely opaque, and levels of transparency between. Layer masks are masks that are connected to a layer that they effect. With channel masks, we delve deeper into how Photoshop sees an image and various image modes that are available in Photoshop. While a layer masks only affects the layer it is connected to, channel masks can affect all, or no, layers.

***** SLIDE 3 References

Scott Kelby, How Do I Do That In Photoshop, Chapter 5
Robin Whalley, Essential Photoshop, Chapter 9
Robin Whalley, Photoshop Layers, Chapter 5

***** SLIDE 4 Layer Masks

A layer mask is a mask that is attached to a layer and it adjusts the transparency of the layer - note that this is different that the more global Fill or Opacity layer options.

The layer mask does not affect either the fill or the opacity of the layer, you can have a layer that is 100% filled and opaque, yet because of the layer mask it can be 100% transparent.

Masks work in black, white, and 254 shades of gray. The mantra for working with masks, layer or channel, is the same: white reveals, black conceals - white will reveal the layer content, while black will hide the layer content.

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A layer mask will appear next to the icon of the layer image in the Layers panel. A small chain symbol between the layer mask and the layer icon indicates that the two are linked together, so that any movement of the contents of the layer (using the Move tool, for example) will cause a corresponding move in the layer mask.

When the layer mask is selected there will be a bounding box to indicate in which element you are working in - the layer or the layer mask. Pay attention to where you're working! It is very easy to forget where you're at and begin painting on the layer and not in the layer mask - happens all the time.

You have several options available with the layer mask. Here you see that the layer mask is disabled (a red X over the icon). A right mouse click over the layer mask icon (a control click for Macs) will bring up a contextual menu with the layer mask options. Of these options, the apply layer mask is a destructive edit; it will apply the layer mask to the layer, altering the pixel information and, in the process, the layer mask is removed. You should never apply the layer mask.

***** SLIDE 6 Layer Masks

There are several ways to create a layer mask in Photoshop.

From the Layer menu item, under the Layer Mask entry you select Reveal All or Hide All (Reveal All = white layer mask, Hide All = black layer mask). You will also see other options: Delete (deletes the layer mask), Apply (talked about this already), Disable (disables but does not delete or apply the layer mask), and Unlink (disconnects the layer mask from the layer, both can be independently moved around).

At the bottom of the Layer panel there is a circle in a rectangle - this will create a layer mask on the currently active layer.

Another way is to either move or copy a layer mask that already exists. Remember that all adjustment layers come with a layer mask. You can simply select and move the layer mask from the adjustment layer to another layer or, if the adjustment layer mask has content you want to copy, hold down the <[Option / Alt]> key and then select and drag - this will duplicate the content of the layer mask.

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The contextual menu for the layer mask has several options. In addition to the ones already mentioned, there are the following:

- Add Mask To Selection: if you have an active selection, you can add it to the mask.

- Subtract Mask From Selection: if you have an active selection, you can use it to clear (turn white) where the selection overlaps with the mask.

- Intersect Mask With Selection: honestly, I've never used this, so I haven't had experience with it; however, like the intersection option, I suspect that where the mask and selection intersects will be affected.

- Refine Mask: if you have content in a layer mask you can use the refine mask options to, well, refine the mask such as feather the edges or alter mask density

- Mask Options: this allows you to change the default color of the mask from 50% red to another color, such as 50% blue if the layer you're working on is predominantly red.

***** SLIDE 8 Layer Masks

You can edit the layer mask in several ways:

- Use the brush tool to paint in black, white, and shades of gray to selectively hide, reveal, or alter transparency of the layer.
-- If you're using the brush tool, use the brush at no more than 20% opacity and build up the mask slowly.

- Use the gradient tool to fill the layer mask with a gradient that goes from black to white (or white to black) or white / black to gray.

- <[Option / Alt]> and click on the layer mask to reveal the layer mask itself.

***** Intermission *****

Before we begin to work with Channels and Channel Masks, we need to cover a little bit of color theory and how Photoshop

actually views images when they are loaded into the program.

First, if you ever have an afternoon to waste, go to Wikipedia and look up color theory. It is a fascinating subject and the links there will send you many places. As Confucius once said, "The path of a thousand web sites begins with a single link."

Because Photoshop was designed to work with images from cameras, Photoshop also sees images how the camera sees them. The camera sees images in only three colors: red, green, and blue. All colors in the world that you see are some combination of red, green, and blue. Human color perception is roughly 10 million distinct colors. Roughly 10% of the male population is color blind.

What we describe as color has three values: hue, saturation, and brightness (sometimes also described as value or luminosity). So you should start thinking of color as being three dimensional and occupying a space.

What we typically call color is the hue: this is the red, green, blue, brown, purple, yellow, orange, red-violet, indigo, etc. Hue is based on a circle where red is 0 degrees and the other hues on the spectrum correspond to another degree value back to 359 degrees which is almost pure red. Why a circle? Blame Issac Newton who, when he described his famous experiment with white light and the prism, laid the colors out in a wheel. It's all his fault.

Then there is the amount of hue that you have, this is saturation. You can have a hue of red at 100% saturation, which would be very red, or at 0% saturation which would appear white - it's still red, but with no red in it.

The third value is brightness / value / luminosity. How bright is the hue and saturation. If you have a hue of red at 100% brightness, it is very red; at 0% brightness it appears black - it's still red, but you can't see the red color.

Cameras see the world in three colors: red, green, and blue. So when Photoshop opens an image, it will default to these same three channels of red, green, and blue. If you look at the individual channels in Photoshop, you will notice that they are gray images. Each channel contains the color information for only that hue (pure red, green, or blue) at

different saturation and brightness values. When these channels interact with each other do you get "color".

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Now that we've discussed color theory a little, Photoshop has default image modes that allow you to modify the mode, or channels, available. These modes are found under the Image menu.

- Grayscale: this mode has no color data. You go to grayscale in order to get to Duotones (Tritones / Quadtones) - this will be covered more in the Black and White Conversion module later this semester.

- Indexed color: this mode is for GIF images where color values have a name, such as Antique White, Dodge Blue, Scarlet, etc. There are only around 250 available named colors, plus a transparent color.

- RGB: this is the default mode in Photoshop (red, green, blue channels); it is also the color space for JPEG and Adobe.

- CYMK: this is the mode if you're working in four color offset printing; CMYK stands for the four color inks used: C = Cyan, M = Magenta, Y = Yellow, B = Black.

- L*a*b (also known as Lab): this mode deals with colors slightly differently, L*a*b stands for the three channels of L = Luminosity data (shadows, midtones, and highlights), channel a = blue to yellow colors, and channel b = green to magenta colors. Lab mode is a great mode to go into in order to get some saturated colors, especially reds, yellows, oranges, and golds, without doing major color shifting in the greens, blues, and purple range.

Some of the above modes have a bit depth, specifically RGB. The bit depths that Photoshop uses are:

8 bit: this is the default color space for JPEG images and the Internet. 8 bit RGB color has 256 red values, 256 green values, 256 blue values for a total of around 16.7 million colors. This color space is known as sRGB and is also the default color space for most inkjet printers.

16 bit: this is the color space known as AdobeRGB or

Adobe1998. It is a larger color space with 65,536 values of red, green, and blue for a total of 281,474,976,710,656 potential colors. Cameras that can shoot in RAW mode use this color space and typically have a 12 to 14 bit color depth.

32 bit: this is the color space known as ProPhoto, developed by Kodak and used on high end medium format cameras. This color space is very large and contains colors that are mathematically defined but lie outside of human perceptual color range. Each channel has 4.3 billion shades for a total of 7.9 * 10^28 possible colors. ProPhoto is the native color space for Photoshop.

To put this slightly more into perspective:

sRGB color space is a 20 oz bottle of water.
AdobeRGB color space is the size of a building.
ProPhoto color space encompasses the orbit of Jupiter

Why so large?

Color shifts tend to be multiplicative in nature and can rapidly create color errors. Where would you rather have a color error happen:

In sRBG where there are relatively few shades between colors, or out in ProPhoto space where for every single "color" in sRGB there are millions of shades in ProPhoto. If I have a color error out in the orbit of Mars, you're not going to see it in your bottle of water.

***** SLIDE 10 Channel Masks

A channel mask is special to the image in that it resides in the channels as an alpha mask - alpha in Photoshop speak means luminosity, so channel masks deal with luminosity data.

Channel masks are also used to keep selections; in fact, if you are having a hard time making a selection using the selection tools because there is not enough contrast between the subject and the background, switch over to your channels and work there to make the selection.

You work in channel masks like you do layer masks.

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In the default image mode in Photoshop (RGB 8-bit) there are four channels: the composite RGB image channel and the three channels that hold the color data (red, green, blue). You can duplicate any of these channels (other than the composite RGB) to use as your basis for the selection, or you can create a new alpha channel to work in.

You can have many alpha channels - the limit is 64K.

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The icons at the bottom work similar to ones that you have seen before. From left to right:

- Create A Selection: you drag the channel mask you want to use as a selection over this icon to create a selection. This selection, which is luminosity data, used black and grays to make the selection (white is not used).

- Quick Mask Mode: edit the channel in Quick Mask mode.

- New / Duplicate Channel: click to create a new alpha channel or drag an existing channel over to duplicate it.

- Delete Channel: drag channel over to delete it. Warning that you can delete one of your primary channels!

***** SLIDE 13 Channel Mask

Note that the alpha channel defaults to black, which is just the opposite of the default of the layer mask. You can edit the alpha channel like you would a layer mask.

If you have duplicated a channel to use to make a selection, the selection tools work in the channel just like you would work in a layer. If you are having issues making a selection due to contrast, find the channel that has the most contrast and duplicate it to make your selection. If you need to, you can use a levels adjustment to shift the contrast of the image to make it easier to get the edges to have a higher contrast. Everything that is black in this channel will be used to make the selection, so when done you want a selection channel that is pure black and white, no gray.

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Once you have your selection channel made, you use it to create a selection:

- With the selection channel active, click on the Load A Selection icon (the dotted circle); alternatively, drag the channel selection over the icon.

- Make sure that the RGB composite channel is visible

- Click on the Layers tab to go back to your layers panel

- Select the layer you want to make the selection on and make a new layer via copy <[ Command / Ctrl + j ]>

***** SLIDE 15 Channel Masks

You can create some special effects in channel masks easier then would otherwise be difficult to create. One thing you can create is pseudo-lightning using the following recipe.

1. Create an alpha channel and run the Clouds filter on it (Menu item Filter - Render - Clouds)

2. Run the Difference Clouds filter on this channel an odd number of times; first do a Filter - Render - Difference Clouds once, then <[ Command / Ctrl + f ]> to re-run the Difference clouds filter again.

3. Do a <[ Command / Ctrl + l ]> to bring up the Levels adjustment; move the right slider to the left a bit, the left slider to the right a bit, and the center slider to either the left or right slightly.

4. Load this channel as a selection, make the RGB composite visible, go back to Layers, create a new layer and then fill the selection with a light blue color.