Color Management

How to make your prints look like your monitor in Photoshop

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Color management is one of the most difficult issues in Photoshop. However, if you expect to get prints that match your monitor, color management is very important to understand. I will attempt to show how color management is used in Photoshop and why. I will go through the steps from bringing an image into the program and then to make it ready for print.

**Monitor Calibration**

The first step is to have a calibrated monitor. If your monitor doesn’t project colors properly, how can you expect to have any idea what a print should look like? There are several utilities for sale these days that are quite affordable. Greytag MacBeth offers its One Eye, Monaco has the Optix, and ColorVision uses the Spyder 2. These 3 are very affordable, (about $200), and well worth the money. Once your monitor is calibrated, then you are ready to deal with Photoshop.

**Opening Images**

Images are usually brought into Photoshop from a scanner or a digital camera. They may come in with a profile or not, but as soon as we import them, we assign them a profile. Cameras, especially non-SLR cameras, are usually set to shoot with a profile of sRGB. SLR cameras often have the choice of sRGB or Adobe 1998. If you have the choice, shoot in Adobe RGB (1998). It is a much larger color space.
Open the image in Photoshop. Depending on how you have your color settings set, (we will discuss this in chapter 5), you may get a dialogue box asking you what to do with the image; whether to leave it as is (don’t color manage), convert to a profile or keep the embedded profiles. Choose the first option, “don’t color manage”. That is what we are going to do next, choose a profile for the image.

**Assign Profiles**

The first thing you do after you open the image is to go to image>mode>assign profile.

This dialogue box is very important. It resembles the one we were just shown, when the image opened, but it is different because it is “assigning “ a profile, not converting it. Also we get to see the image and how the different profiles make the image look. Check the third option, profile, and in the drop down menu, compare the different choices. The ones to consider are Adobe RGB (1998), Colormatch, and sRGB. Your image probably will look very different with each of these. Here you have to make a subjective call, but understanding the color spaces will help. Often Adobe RGB 1998 is used for images that are more saturated, and Colormatch for people. It is a bit gentler on the skin tones. I would avoid sRGB, and will explain a bit later.
Working spaces

See the differences in choosing the 3 color spaces in the assign profile dialogue box.
There are 4 color spaces that we deal with in the RGB world. I will attempt to show how they are different. Once you understand them, you will be able to make more intelligent choices about which one to use.

**sRGB**

This color space was designed for low end consumer color scanners, digital cameras, and ink jet printers. It is also the color space that Windows systems are based on. It is the smallest color space and should never be used for high quality color production. In the words of Michael Kieran”, If you’re at all concerned about image quality, never use sRGB for any image that will ever be printed”. The blue-green part of the spectrum will be clipped. However, to be fair, this is what Microsoft has to say: “sRGB is as close as you’ll come to a truly universal color space. SRGB was developed to match the color space of a typical computer monitor. Its use is widespread.” Some think this is the best color space to be in, because since it represents fewer colors, it will more closely match a printer. However, the color it represents don’t usually match the printer’s color spaces.

**Adobe RGB 1998**

This profile is a good choice for many images. It has a gamut that is large enough to match most printers, and is device independent. The downside is that it also includes more unprintable colors (that is, colors that are outside the CMYK gamut). Often, however, the images
are overly saturated. It seems to be the space of choice for many these days, since higher end digital cameras can shoot in this space.

**ColorMatch**

This color space is not an available option on any point-and-shoot or digital SLR camera, but, it does serve as an excellent alternative to both sRGB and Adobe RGB for viewing pictures shot in these color spaces. Its color space is wider than sRGB, but not as broad as Adobe RGB, and it features a gamma of 1.8. All color spaces definitions include a gamma value, which in turn affects how bright a photo’s midtones will appear in that color space. A gamma of 1.8 vs. 2.2 for sRGB and Adobe RGB means that if you are looking at a photo that’s too dark and murky in the midtones, switching to ColorMatch RGB can be a simple and effective way to brighten the photo. In addition, it can also help control runaway saturation in photos shot in Adobe RGB. It could safely be called a safe choice for print work.

**Prophoto**

Prophoto has the largest gamut of colors available, however, unless you are working with software, such as Image Print software, by Colorbyte, that can print 16 bit files, it is an unrealistic colorspace for most printers. It can be defined from the Photoshop RAW format dialogue box.
Chapter Three

Convert to CMYK

After doing all your work on the image in Photoshop, you now decide where the image will go. If it is to be printed on your home printer, leave the image in RGB and go to the print with preview dialogue box. Skip this chapter on converting to CMYK. However, if you will have the image converted to CMYK, for higher end printing, or to bring the image into InDesign, follow these instructions.

Now is the time to “Convert to Profile”, in Photoshop. Instead of just going to Image>Mode>CMYK, you have much more control if you go to Image>Mode>Convert to Profile. You have the advantage of selecting a rendering intent, and visually seeing the differences.
The destination space will be the working CMYK profile which has been set up in the color settings dialogue box. We will talk about how to set this up in chapter 5.

First let’s talk about the 4 different rendering intents. Their purpose is to decide what to do with the out of gamut colors when converting to CMYK, since it has such a much smaller gamut that RGB. This can greatly affect how your image looks in print.

**Relative**

Colors outside the printers gamut will be pushed inside the gamut, thereby making them look less saturated. The image will lose detail, because there won't be as many colors. For example, blades of grass will not be as distinct from one another.

**Absolute**

This intent is pretty much the same as relative, but the colors out of gamut will be clipped, or dropped out.

**Perceptual**

The out of gamut colors are also pushed into gamut, however the inside colors also shift. The relativeness of the colors is preserved but all the colors change. The blades of grass will be in more detail, but the greens might not be the same as you started with.

**Saturation**

This intent is used for pie charts or images of solid blocks of color. The saturation is preserved, but the colors may shift, usually not a problem in pie chart graphics.

You must make the choice of accurate colors or what is pleasing to you, when you decide on the rendering intent. This method provides much more control in how your images will look in print, rather than just changing the mode to CMYK.
If you are going to your ink jet printer, you must use the “Print with Preview” dialogue box. Make sure the “show more options” box is checked and color management is showing in the pull down menu. In the print space menu, look for your printer and the paper you will be using. These profiles should have been installed when you installed your printer software. If not, you can go to the manufacturers’ website and download them and install them yourself. Then hit print, and in the print dialogue box, under print settings, again choose the paper you will be using. Then, and this is very important, under color management, choose no color adjustment.

This allows Photoshop to control the color management, does not allow the printer software to control it. If color management isn’t turned off, the print is double color managed, and often results in prints looking very magenta.

If you don’t have the profiles of the specific printer and papers, make sure the profile chosen in the original “Print with Preview” box is set to “same as source”, which allows the printer to manages the color and not Photoshop. You just do not want to double color manage!!
Having your color setting set correctly in Photoshop is very important. And you want these settings to be consistent across all the programs you will use, including InDesign and Illustrator. The Creative Suite 2 has made this consistency much easier. This is what I recommend.
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