What Causes Wonky Colors

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In this lesson, I'd like to talk about an issue that I commonly hear about and is related to color. It happens when you save an image and then open it somewhere else, only to find that the colors do not look the way they did when you saved it. There is one setting that usually causes this and we're going to cover where it's found and what you should do in order to fix it.

Embed Color Profile (Timestamp 2:20)

When you are saving an image using the "Save As" command (found under the File menu), there will be a check box at the bottom of the dialog, called "Embed Color Profile." I absolutely always turn this on. If you do not turn this on, there is a very good chance that your image is not going to look good elsewhere.

Color Profiles Every image that you open in Photoshop is made out of red, green and blue behind the scenes. (This is true as long as the image is in RGB mode.) The words red, green and blue are not enough to describe the actual colors though.

RGB is known as the document's color space and there are several versions of this color space. The most common color spaces are sRGB, Adobe RGB and Pro-Photo RGB and they all use different versions of the same colors.

"Embed Color Profile" in Save As dialog When you turn on the "Embed Color Profile" check box in the Save As dialog, that color space will be included with your file. When another program attempts to display that image, it knows which colors of red, green and blue the image is made from and it therefore knows how to properly display the image.

If the "Embed Color Profile" check box is turned off, then you are saving the numbers that describe the colors in the image (the RGB numbers) without telling it what color of red, green and blue the image is made from. When the image is then displayed somewhere else, it's going to assume that the image is made out of sRGB colors. The "s" in sRBG stands for standard.
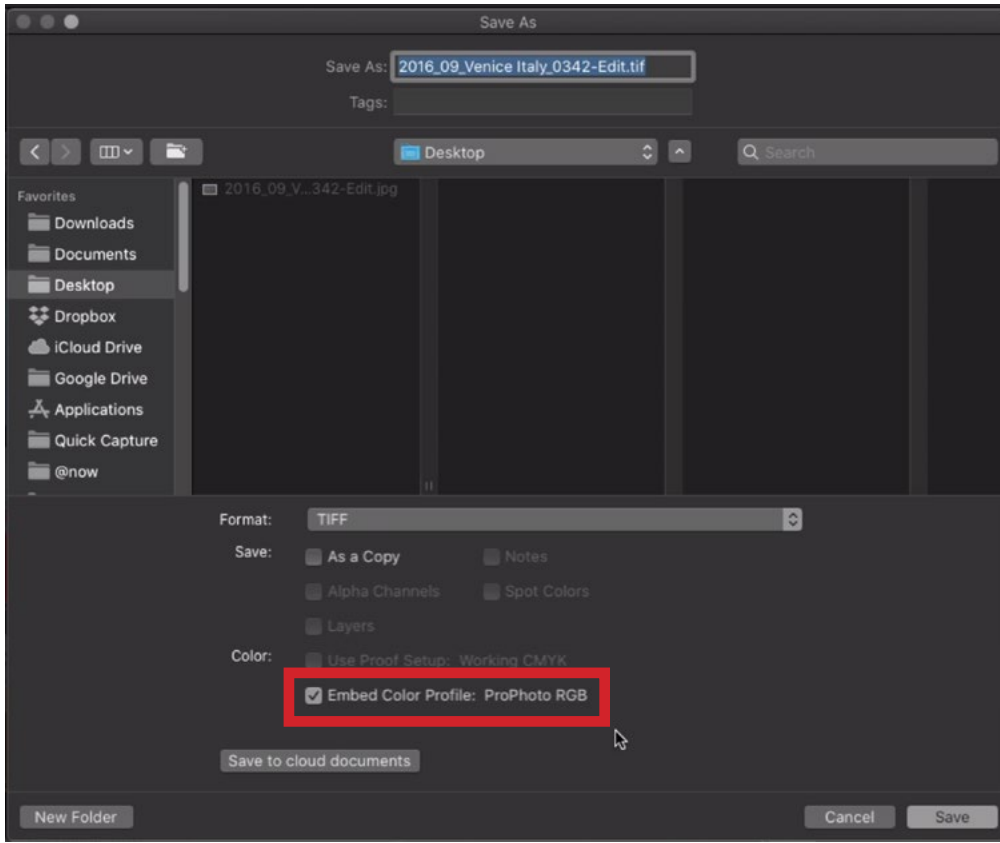
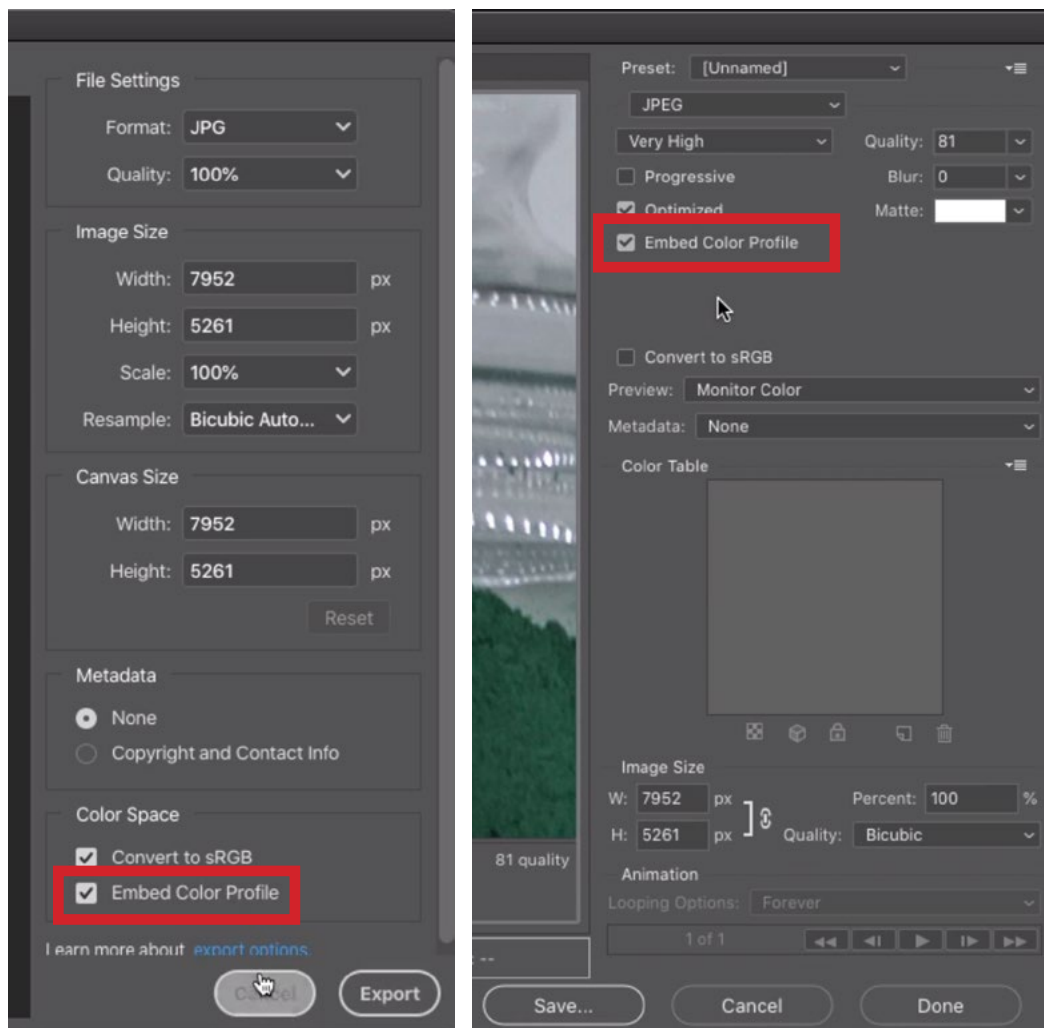The Embed Color Profile check box can be found at the bottom of the Save As dialog.

LEFT: Here is a colorful image using the ProPhoto RGB color space in Photoshop. RIGHT: The image was saved, without embedding the profile, and then opened in a different program. You can see that the colors are much more dull.

If an image does not contain a profile, it will always be assumed to be sRGB.

If you ALWAYS use the sRGB color space, then you won't really need to worry about this setting. If you ever use other color spaces, this "Embed Color Profile" setting becomes much more critical.

"Embed Color Profile" in other dialogs The "Embed Color Profile" check box will also be available within the settings for some of the other save/export methods. If you use the Export As setting (found by clicking on the File menu and choosing Export), the "Embed Color Profile" check box will appear in the bottom right corner of the dialog. If you choose the Save For Web option (File > Export), the "Embed Color Profile" setting will appear near the top right corner of the Save window.


FAR LEFT: The Embed Color Profile check box is located in the bottom right corner of the Export As dialog.

DIRECTLY LEFT: In the Save for Web dialog, it's located in the upper right.

Sticky setting The "Embed Color Profile" setting is what's known as being "sticky." This means that Photoshop will remember if the setting was turned on or off the next time you save your image. If you had the setting on the last time you saved an image, then the check box will automatically be turned on the next time you save an image. I have found that the checkbox can sometimes get turned off when Photoshop is updated. That's just something to be aware of when upgrading to a new version of Photoshop.

How to Tell if There is an Embedded Color Profile in Bridge (6:59)

After you've saved an image, there are a couple of ways to tell whether or not that "Embed Color Profile" check box was turned on. You can view the image in Bridge and open the Metadata Panel on the right side of the interface. In the Metadata Panel, expand the settings for File Properties. This will display a list of information about the file and, at the bottom of the list, is an item called Color Profile. If the color profile was embedded, it will be listed here.
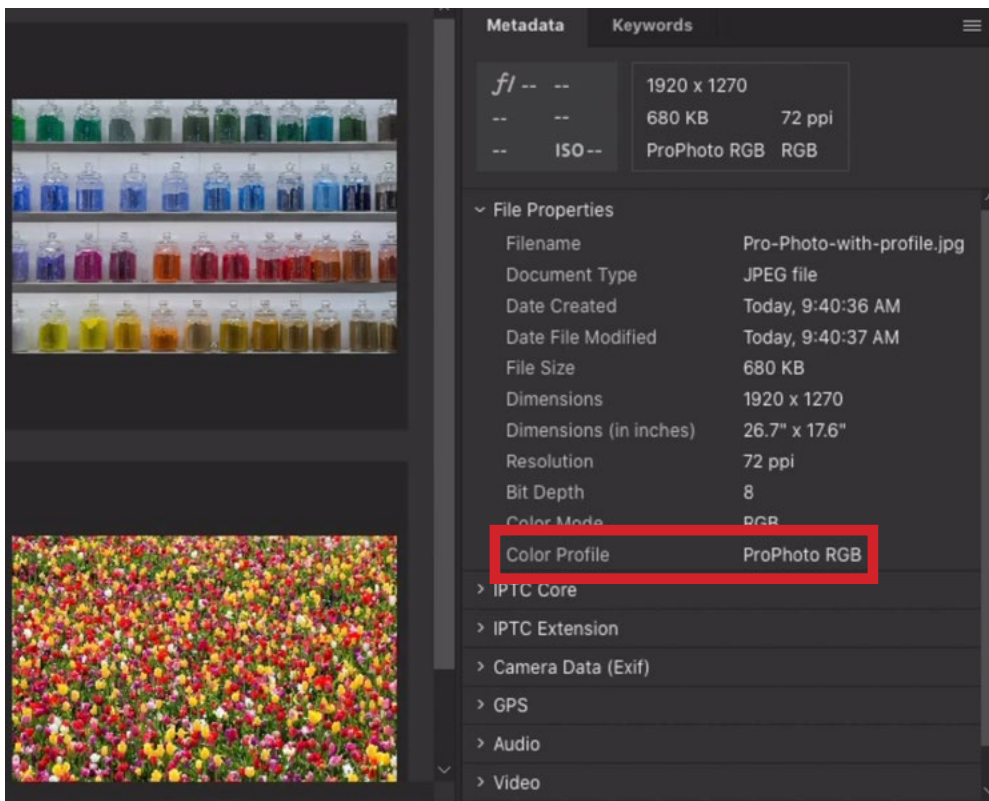
In Bridge, you can tell if the active image has an embedded color profile by looking in the Metadata Panel. If there is a profile, it will be listed in the File Properties category.

In the lesson video, I show three tulip pictures being viewed in Bridge. These three images looked identical when I had them open in Photoshop. Here, in Bridge, they all look different and that's because their color profile is untagged. You can see that in the Metadata Panel. The one that looks the dullest was using the ProPhoto RGB mode. This mode uses the most vivid colors of red, green and blue, so when displayed as sRBG (which is what happens when an image is untagged), there is the biggest deviation in appearance.
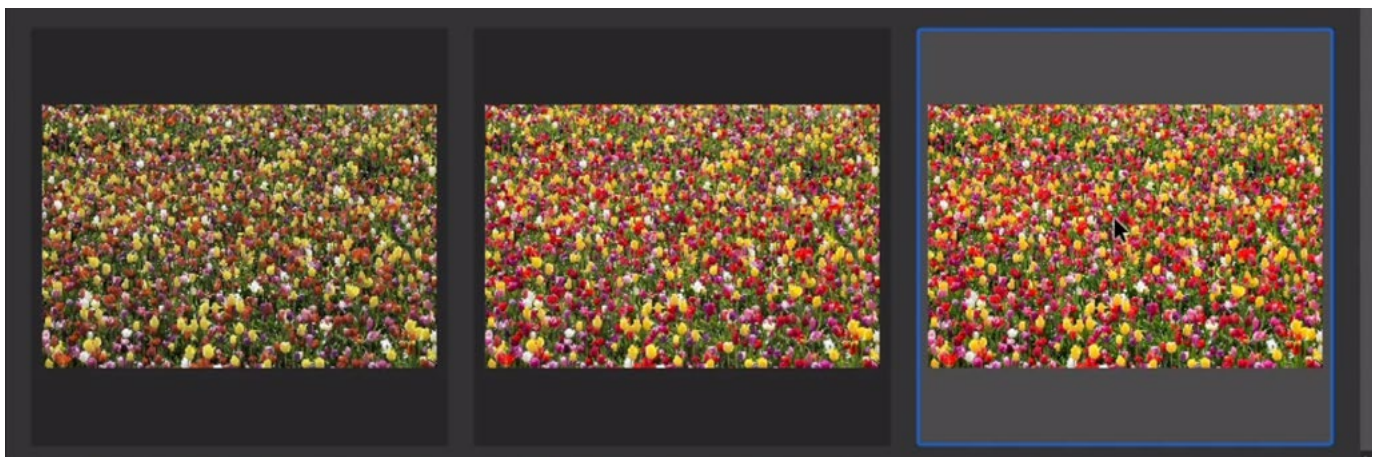
These are three different versions of the exact same image, being shown in Bridge. The only difference is that they used three different color spaces. They look different because the "Embed Color Profile" check box was turned off upon saving.

## How to Tell if There's an Embedded Profile in Photoshop (11:32)

There are two areas within Photoshop that you can look at to determine whether an image has a color profile embedded. The first is in the bottom left corner of the interface, where there is a small line of text. This text will display the document profile by default. If that was ever changed, however, you can click on the little arrow to the right of the text and a pop-up menu will appear. Choose the Document Profile option. If the document does not have an embedded profile, the text will read "Untagged RGB."
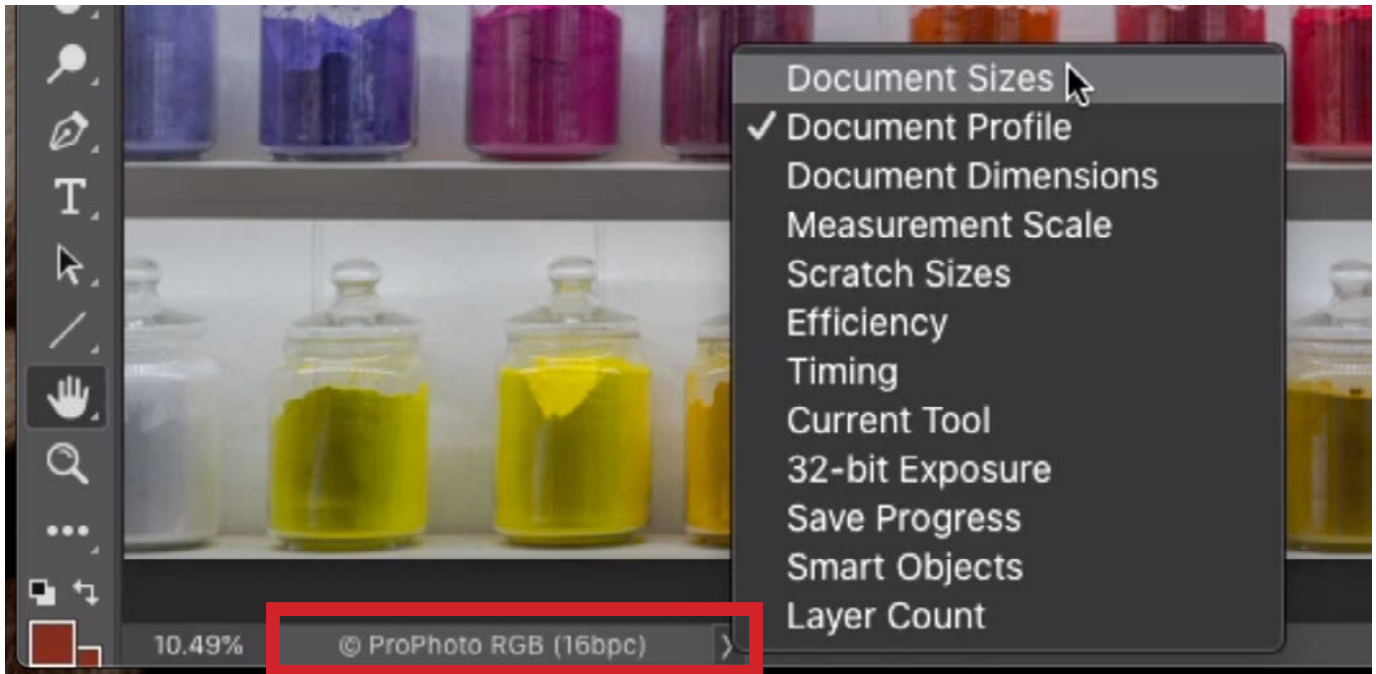
If the document profile is not listed in the lower left corner of the interface, you can use this menu to select what info should appear there.

The other area you can look at to determine whether an image has an embedded profile is the Info Panel. If this panel is not already open on your screen, you can open it by clicking on the Window menu and choosing Info. The Info Panel will show the red, green and blue values for a particular area, and it can also display a wide variety of other information. Click on the little menu in the top right corner of the panel and choose Panel Options.

A dialog will appear, containing a series of check boxes. These determine what info is displayed in the panel.
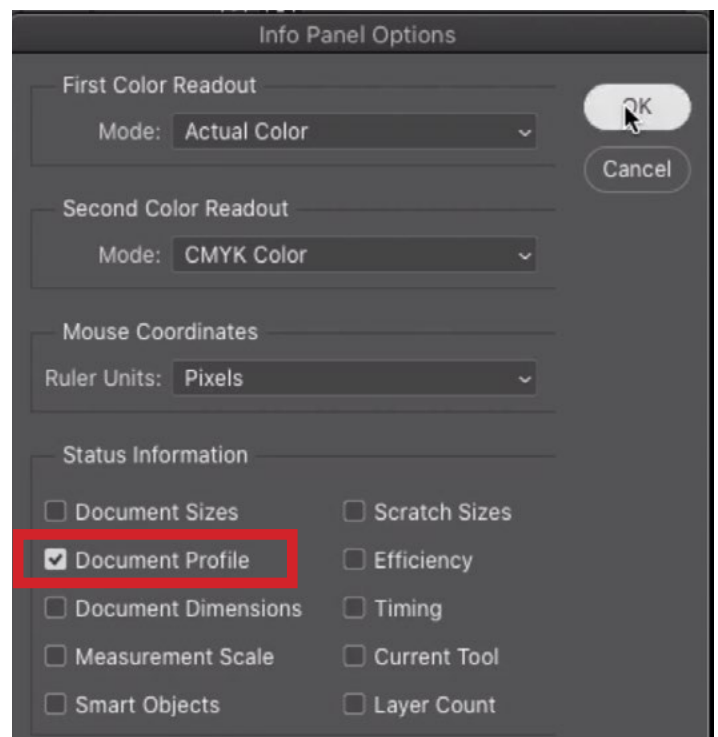
You can specify what information should appear within the Info Panel Options.

I, personally, like my panel to be clean, so I keep all of these check boxes turned off EXCEPT for the "Document Profile" check box. Make sure this is turned on and then click OK. Now, the Info Panel will display the color space for the active document.
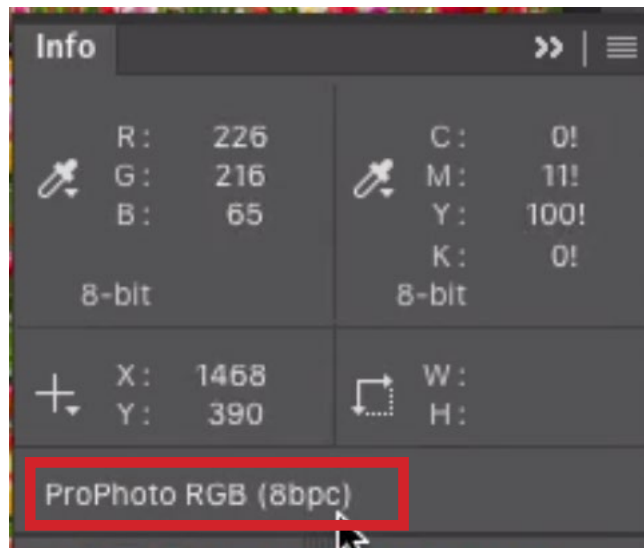
**You can choose to have the document profile show up in the Info Panel.**

Assign Profile & Convert to Profile (12:24)

If you open an image that has no embedded profile and you feel that the image looks rather dull, that's probably because the image was originally set to a color mode other than sRGB. If this is the case, there are a couple of things you can do to correct it.

Assign Profile There are two useful settings within the Edit menu at the top of the screen: Assign Profile and Convert to Profile. We would use the "Assign" option in two instances:

- If the profile for the image is missing

- If the profile for the image is wrong

If the profile field reads "Untagged RGB," it means the profile is missing. Click on the Edit menu and choose Assign Profile. The dialog that appears will contain a Profile setting. Make sure this Profile setting is active (there should be a little tic mark in the circle to the left of its name) and then use the menu to switch between sRGB, Adobe RGB and ProPhoto RGB. The image will look different for each of these three settings. Choose which of the profiles you think looks most appropriate and then click the OK button to exit the dialog.
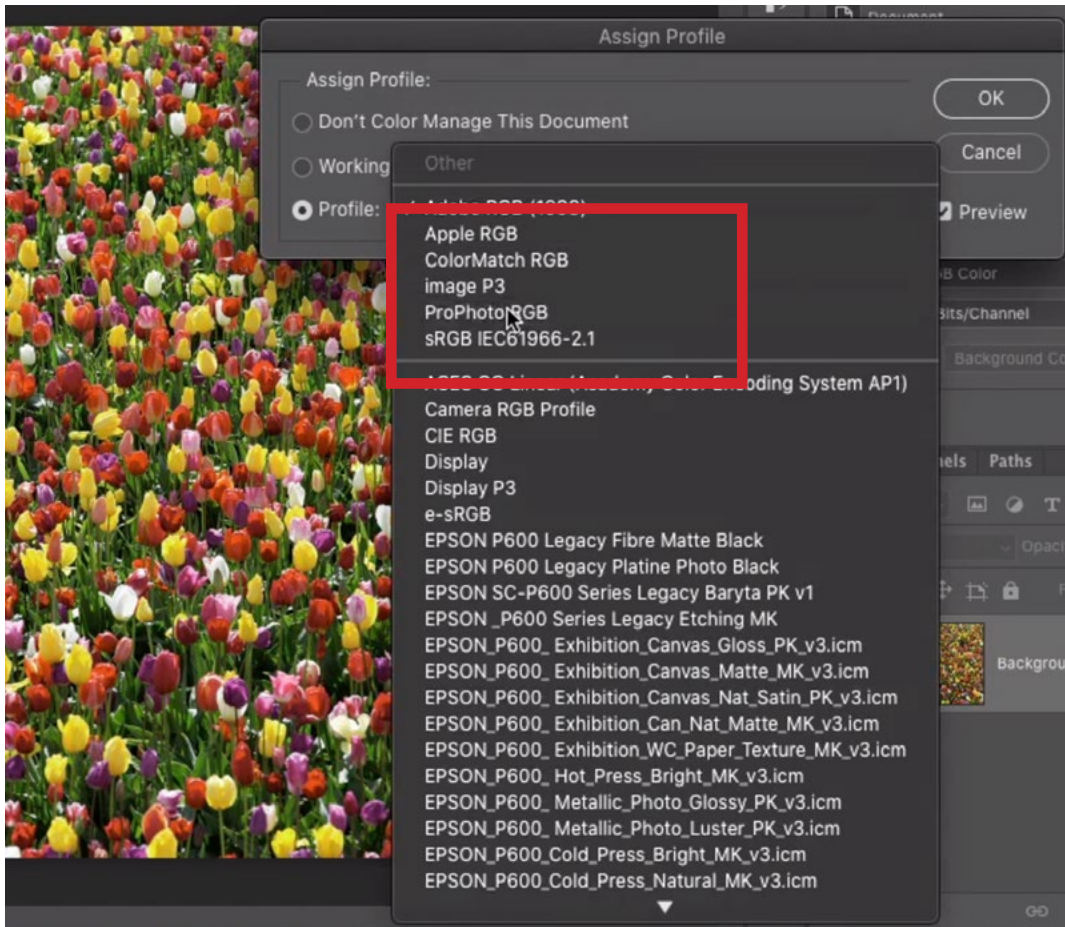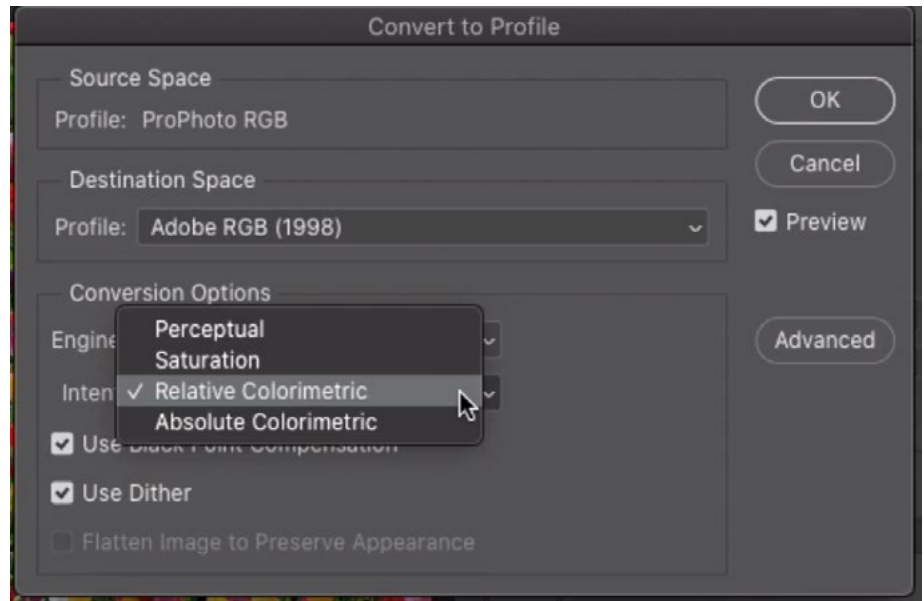
In the Assign Profile dialog, the Profile menu is being used to switch between Adobe RGB, sRGB and ProPhoto RGB in order to determine which looks best on this particular image.

Convert to Profile You would use this setting (under the Edit menu) if you have an image that is using one profile but you want it to be using another profile. Using this setting can be compared to converting between different systems of measurement, from feet to meters, for instance. You have an item that doesn't change size, but you're describing it in meters instead of feet. When it comes to Photoshop, we will be attempting to describe the same color using different versions of red, green and blue.

In the Convert to Profile dialog, there is an area called Destination Space. This is where you choose which color space you want the image to use. When choosing, keep the following in mind. Since ProPhoto RGB has the most vivid versions of red, green and blue, there will be colors that can be created in ProPhoto RGB that can not be created in sRGB, which has a much more limited color range.

Within the Conversion Options area, there are settings where you tell Photoshop how it should make the conversion. Use the Intent menu to cycle between the different options. You don't need to know what the words mean. Just look to see how each option affects the picture and decide on the one that looks the best. This setting could have a very large or very small effect. It just depends on the image. Click OK to exit the Convert to Profile dialog.


In the Convert to Profile dialog, set the profile using the Profile menu and then cycle between the Intent menu options to find which looks best on the image.

LAB Values for Accurate Color Descriptions (20:55)

There is a way of accurately describing a color without providing the color space and that is by using the LAB values. You can find these within the Color Picker. The Color Picker can be accessed from many of Photoshop's features, but the easiest way is by clicking on the foreground color swatch at the bottom of the Toolbar.

In the Color Picker, it shows different sets of values for the chosen color. The LAB values are shown on the right side of the dialog. If you would like to reproduce this exact color somewhere else or if you would like to describe the color so someone else can create it (without providing the color space), use these values. These numbers are color space-independent. That means the LAB numbers will always produce the same color, regardless of what color space you're using.
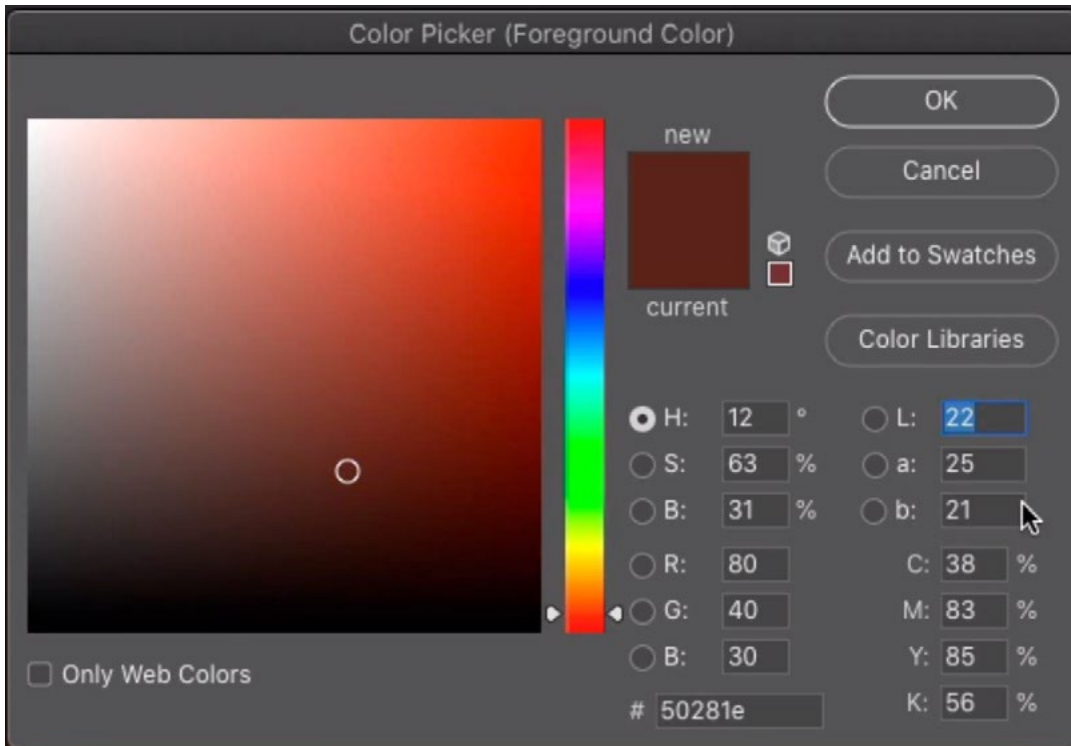

You can find the LAB values on the right side of the color picker. These values will create the same results, regardless of which color space is being used.

RGB Color Setting (25:04)

If an image is untagged (containing no embedded color profile), it may not be displayed correctly on your screen. That can be due to a particular setting.

Click on the Edit menu and choose Color Settings. This dialog will show you all sorts of settings, but we're only going to focus on the RGB menu near the upper left corner. If an image does not have a profile assigned to it, it's going to use whatever this menu is set to. It's set to sRGB by default, which is why untagged images will be displayed like sRGB.

If, however, this menu got changed, it could cause colors to look odd on screen. This could even cause your screen shots to look wrong. On-screen applications like the sRGB color space. If you took a screen shot and then opened it in Photoshop, it would display the image in whatever other color space was chosen within the Color Settings. If that color space happened to be ProPhoto RGB, the colors in the image will look very wrong.
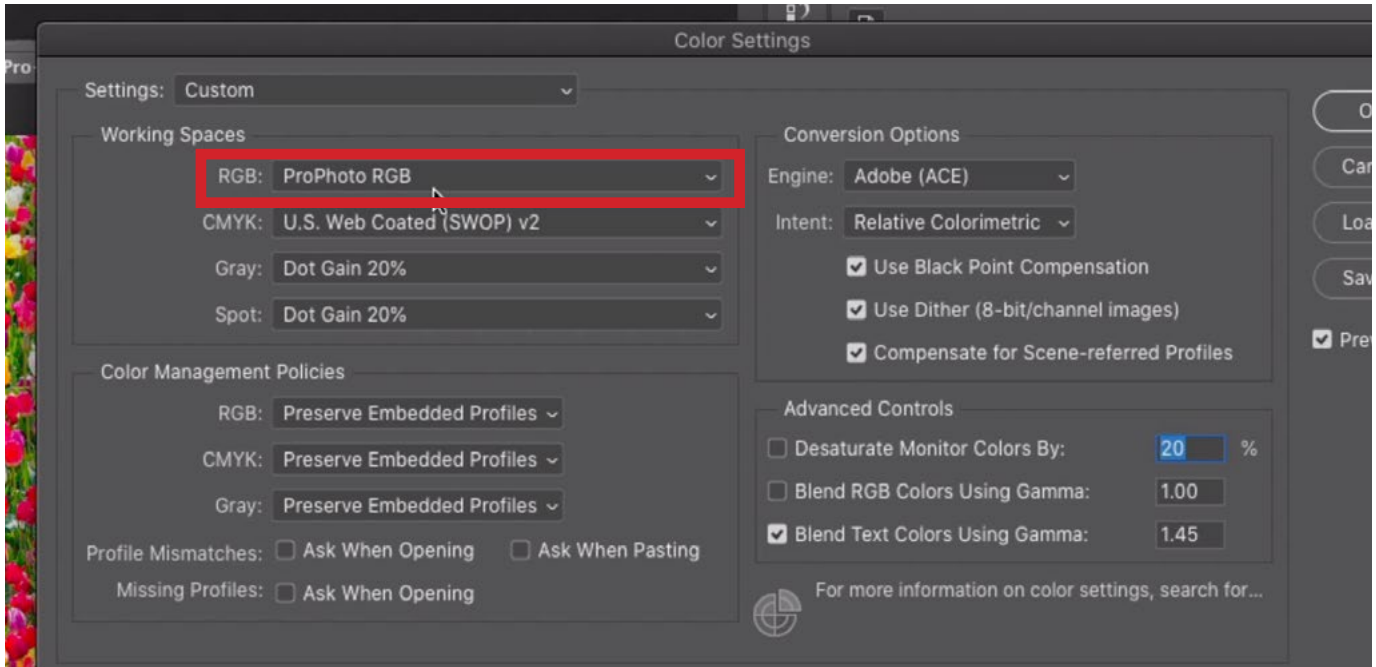
If the RGB menu, within the Color Settings dialog, got changed to something OTHER than sRGB, it could cause the colors in your untagged images to look wrong.

Dull Colors in Save for Web (31:50)

If you commonly use the Save for Web command (File > Export > Save for Web), you may find that the colors can look a little wonky, or dull. That's because the Save for Web command is doing something that other programs won't do and therefore, it's not always showing you an accurate preview of what the image is going to look like in another program. This is tied to the "Convert to RGB" check box, which can be found within the settings on the right side of the dialog. Let's talk about what this setting does.

If you're not printing your image in a high quality fashion, it is common to convert the image to sRGB. This is because some programs do not support color management, which means that they don't read the color profile that is assigned to an image. These programs are going to assume that every single image is in sRGB mode. Most consumers use that setting and most devices default to that setting as well.

It's only graphic designers and photographers that really deviate from that sRGB setting. They deviate because the range of colors that you can make in sRGB is not as wide of a range as what most desktop printers are capable of making. Therefore, by using sRGB, they'd be limiting the range of colors in the image and not taking full advantage of the printer's capabilities.

When you use Photoshop's Save for Web command, it's acting like a dumb program, or a program that would ignore the color profile. Therefore, the image will end up looking as if it were in sRGB mode. If the image was NOT originally in sRGB mode, then it will likely look dull.

This is where the "Convert to sRGB" check box comes in. If the image you're saving is not in sRGB, you can turn this check box on in order to convert the image and make it look normal again.

Note that this Save for Web view is a little outdated because most modern programs do support color profiles and you would not need to convert the image to sRGB in order for them to be displayed correctly.
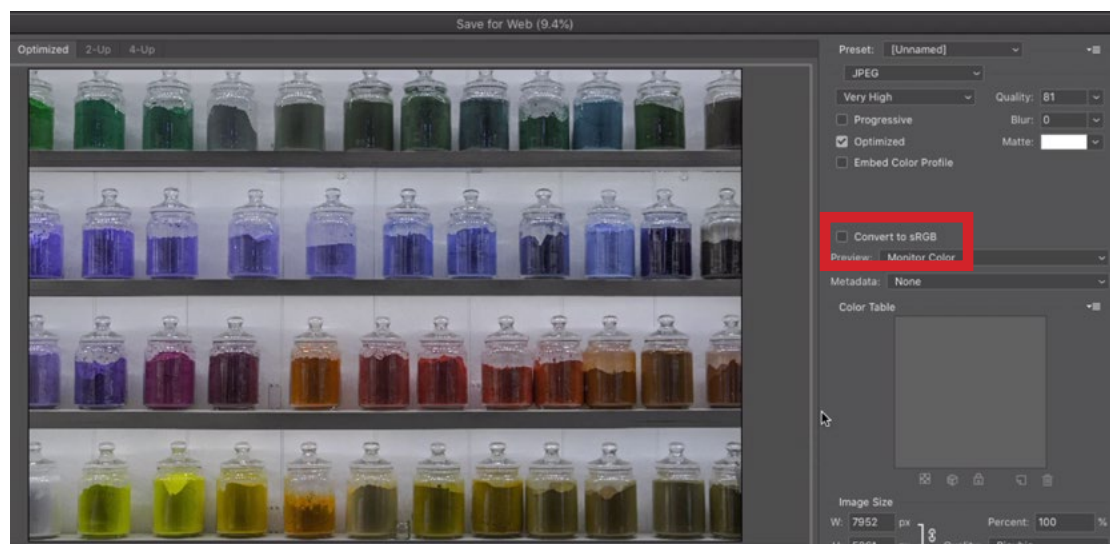
The Convert to RGB check box is located on the right side of the Save for Web dialog.