GIS
Tips & Tricks

By Al Karlin, Ph.D. CMS-L, GISP

When Color Matters

INTRODUCTION

Last month, I discussed some customizations that you can use to make your text and labels more appealing and readable. Continuing along with the theme of "never accept the defaults", this month I discuss making custom colors for polygon fills, labels, and text. First, a little bit about color and how it is constructed in digital space.

In digital space, colors are constructed either by (1) adding or combining light waves of different frequencies together or by (2) subtracting or absorbing light waves leaving those frequencies not absorbed to be reflected to form the color. The standard computer display uses light-emitting diodes (LEDs) that transmit Red, Green, and Blue (RGB) light onto a black mask. The light waves are added together to construct the RGB display. Alternatively, most color printers use dyes of Cyan, Magenta, Yellow, and Black (CMYK) to absorb light and reflect what remains in a subtractive process. In either case, the actual color is coded as a sequence of numeric values for each RGB or CMYK color.

For web-based applications and coding purposes, colors can be coded using a hexadecimal coding scheme. The hexadecimal code always starts with the hash tag (#) and is followed by three pairs of characters sequenced together. The characters are recorded as hexadecimal value combinations of numbers (1-9) and/or letters (a-f). The pairs control the additive values for Red, Green and Blue in order. So, in this system #000000 is the code for lack of RGB and hence, produce Black, and #ffffff is the code for all primary colors which when combined produce White.

As color is represented as numerical values for amount of Red, Green, and Blue (or Cyan, Magenta, Yellow, and Black), the range of those values depends on the number of computer bits available to store the color. For example, if the RGB values are being stored as 24-bit values, 8 bits (0- 255) are available for each primary color. Storing similar values using the CMYK scheme would require 32 bits.

Finally, the properties of the color (or Hue), how strong or weak the color is (the Saturation) and by the amount of black added to the color (the Value), commonly abbreviated as HSV. Chroma refers to the purity of a color and is similar to Value in that a high Chroma value refers to a color with no added black, gray or white. You can visit web-based

resources (https://learn.leighcotnoir.com/artspeak/elements-color/hue-value-saturation/) for additional information.

Many firms have developed a corporate color scheme, unique for the company, that has become associated with the firm. We are all familiar with the Blue/Orange color scheme for Federal Express, and a lot of us remember the bright yellow boxes associated with Kodak products, or the colors associated with our favorite college or professional sports team. In my corporate case, Dewberry has created a custom color for the firm that they simply call "berry", and "berry" is the color of the "dewberry" on their custom logo. The color is digitally described as, (1) CMYK: 0-100-10-60, or (2) RGB: 125-20-66, or (3) HEX: #7b003f (Figure 1).

Figure 1. The Dewberry "berry" custom color, HEX: #7b003f.

The following Tips and Tricks assume that you know how to engage with the Esri symbology/color engine in ArcGIS Pro to choose colors from the Esri pre-determined color palette. There are several documents available from Esri (https://pro.arcgis.com/en/pro-app/latest/help/mapping/layer-properties/work-with-color-schemes.htm) and videos on YouTube (https://www.youtube.com/watch?v=7Nwq-nMVsUo) to help you become familiar with the symbology/color engine. So, here are a few ideas and tips for upgrading the colors on your next map. And, of course, many of these options are available in other GIS software packages.

TIP #1 — CHOOSING A DIFFERENT COLOR FROM THE ESRI COLOR PALETTE

Remember that whenever ArcGIS Pro (or Desktop) renders an object or layer, the software assigns a color randomly. Text, of course, defaults to black fill with black outline, and polygon fill color(s) are determined randomly with a 60% gray 0.7-point outline. Everything, however, is customizable.

In Figure 2, I loaded a Florida County layer and ArcGIS Pro assigned it the Tzavorite Green fill color with a 0.7-point 60% gray border.

Of course, I could just choose another fill color (and/or pattern) from in the Symbology menu (Figure 3) by clicking on the color arrow and selecting a color from the palette. Alternatively, opening the color palette and using the "Color Properties" opens the Color Editor to allow you to make a custom color (Figure 4).

Selecting the "Color Properties" activates the Color Editor as in Figure 4. Once the Color Properties dialog box is activated:

1. Use the Color Mode selector to select the color description method (Figure 4). Esri offers six descriptors (RGB, HSV, HSL [Hue, Saturation, Lightness], Lab [Lightness and two channels for Color; A and B] Grayscale, and CMYK). For this example, I chose CMYK.
2. Specify the values for CMYK and transparancy as in Figure 5. To specify the numerical values, simply enter the numbers into the appropriate boxes, or use the sliders to fill-in the values.
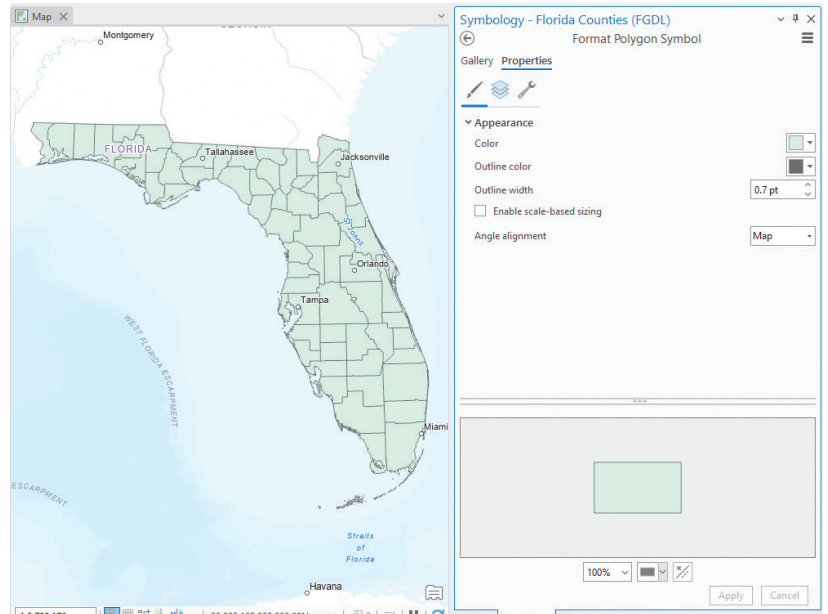3. Pressing the OK button will apply the color to your polygon fill as in Figure 6.

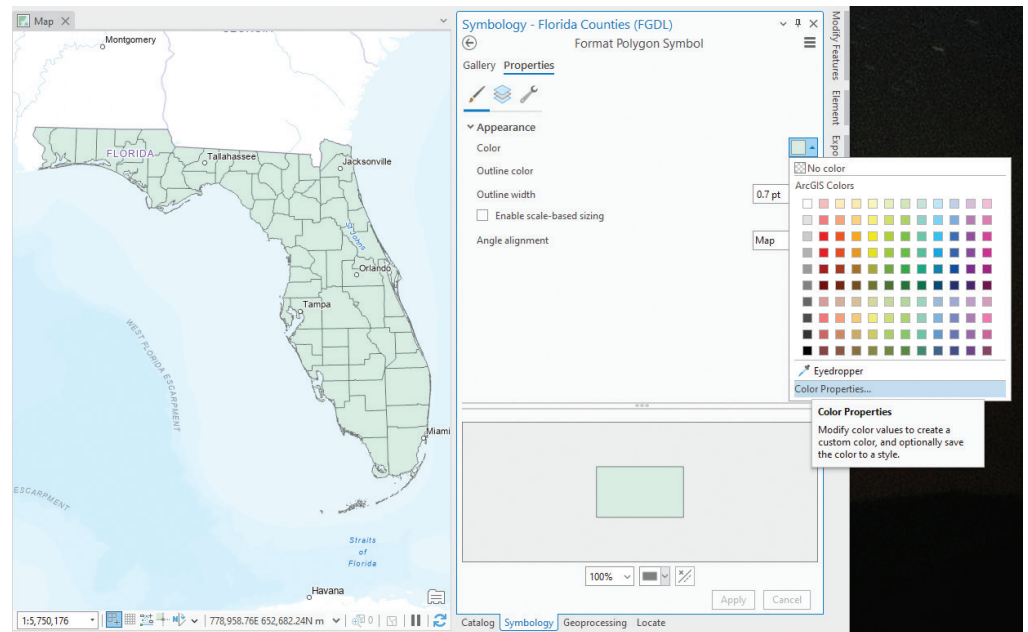Figure 2. The Esri "default" color randomly assigned to the polygon fill.

Figure 3. Using the pre-selected color palette to change the default polygon fill color with the customize "Color Properties" highlighted to construct a custom color.
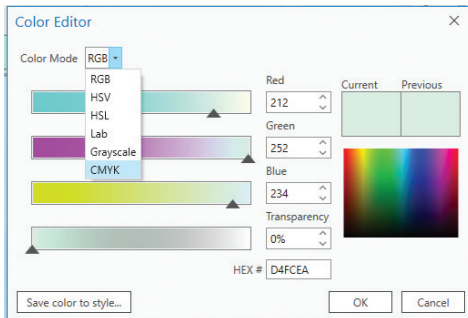

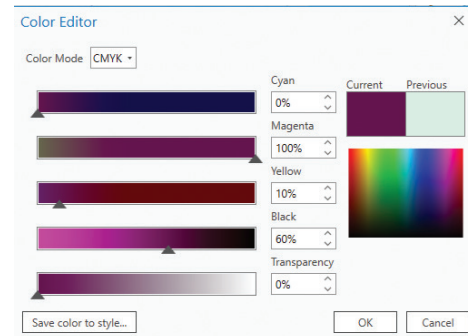Figure 4. The Esri Color Editor showing the color mode selector options.

Figure 5. Use the sliders or enter the appropriate values into the boxes for Cyan, Magenta, Yellow and Black. NOTE: you can also specify the Transparency on this menu.
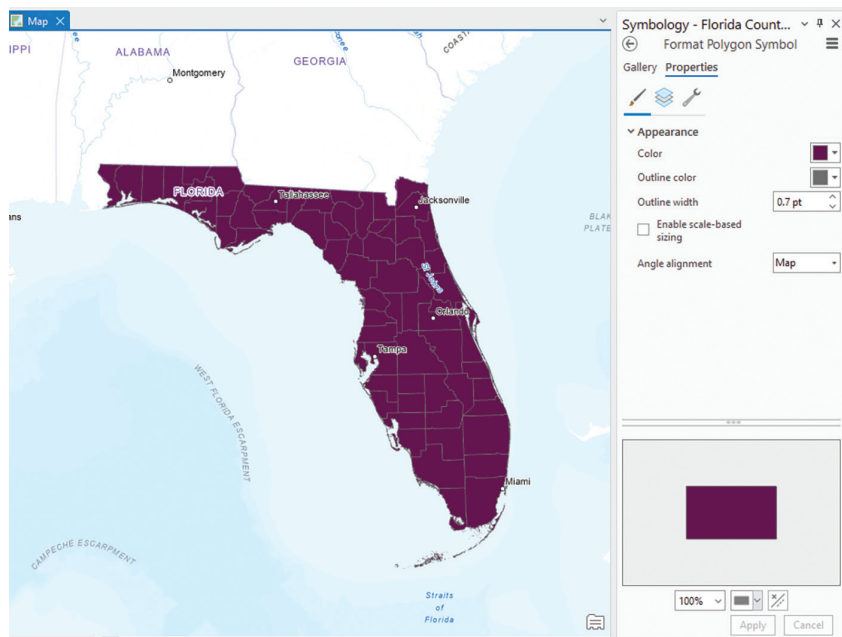
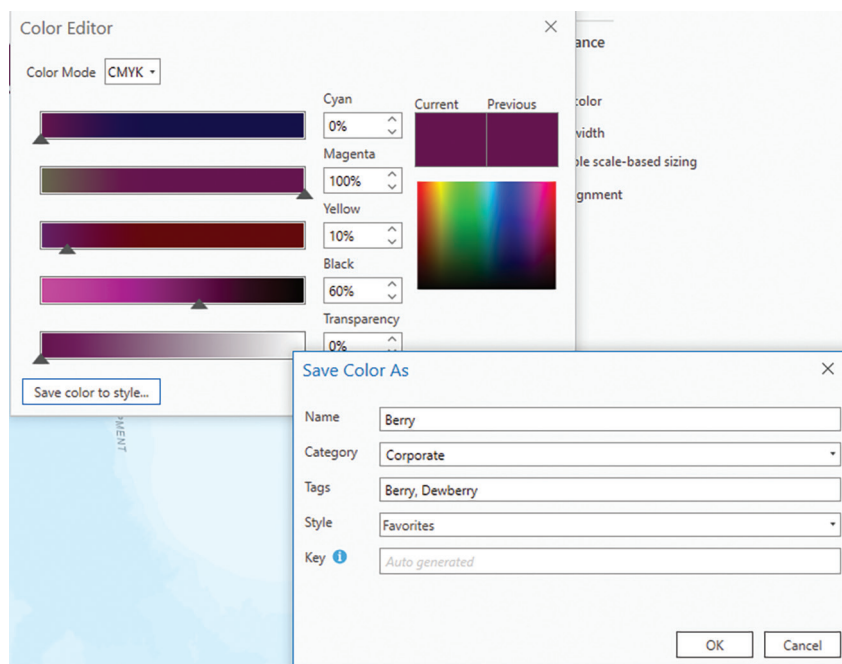Figure 6. Applying the custom color to your polygon fill.

Figure 7. Saving a custom color to your styles menu.

The Color Editor can be used to create a one-time custom color or you can save the custom colors to your personal custom color palette (Figure 7.) To save the color(s) use the "Save color to style…" option. You can name the color and create custom categories on your style menu. This is a convenient way to store colors that you will be reusing.

TIP #3 — MAKING THE COLOR TRANSPARENT

While there are several places where you can control the transparency of colors, you can use Color Editor and the Style to save multiple transparency levels for your colors.

Send your questions, comments, and tips to GISTT@ASPRS.org.

Al Karlin, Ph.D., CMS-L, GISP is a senior geospatial scientist with Dewberry's Geospatial and Technology Services group in Tampa, FL. Al works with all aspects of lidar, remote sensing, photogrammetry, and GIS-related projects. Al also teaches Mapmaking for the Social Sciences and Geographic Information Systems at the University of Tampa.

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