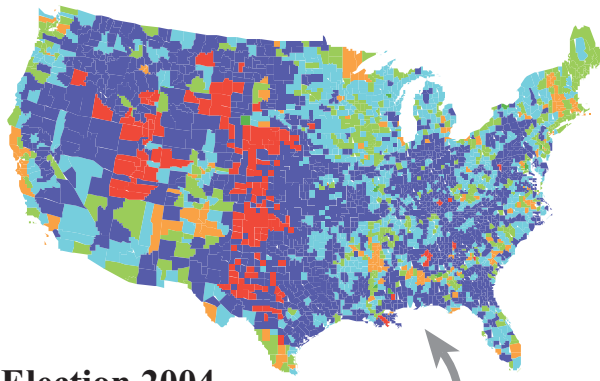


Color on Maps

Color is a **vital** and **vexing** part of making maps. Prior to the computer, making color maps was difficult and expensive. With computers, color is always an option and is often used poorly and even when it is not necessary. Yes, you can easily use color on you map, but ask yourself: *Is it really necessary?* If so, then at least use color well.















*no!
no!
no!*

Election 2004

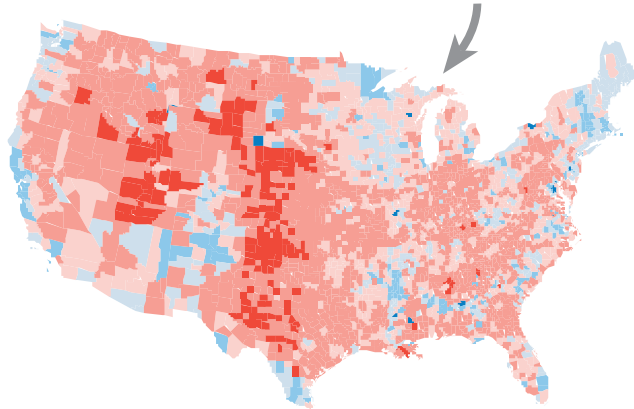
The *fruity* colors on the above map may appeal to those with dubious tastes, but they make the data *tough to understand*:

- ✓ which counties have the **highest** rates?
- ✓ which counties have the **lowest** rates?

Switch to *red & blue* and ask the same questions of the map. The reader has a much *easier* time interpreting the data!

	Large Bush Win	
	Medium Bush Win	
	Small Bush Win	
	Small Kerry Win	
	Medium Kerry Win	
	Large Kerry Win	

*ya!
ya!
ya!*



“Color is a cartographic quagmire!”

Mark Monmonier, *How to Lie with Maps*, 1996

Color is a “cartographic quagmire” because it is often misused – especially since color has become ubiquitous with computer map making. Color is also a problem because:

- ✓ **color terminology is confusing, with no single standard.**
- ✓ **there are many ways to define and specify colors.**
- ✓ **you can make very effective maps using black and greys.**

Extract yourself from the **quagmire**:

1

How do we see colors on maps?

Light source, map surface, and color perception.

2

How do we create colors on maps?

Color specification systems.

3

The complexity of color on maps.

Interactions, perceptual differences, and color connotations.

4

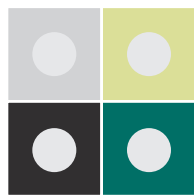
Basic color guidelines for maps.

Matching colors to data on choropleth maps.

3 The complexity of color use on maps

The use of colors on maps is complex: colors interact with surrounding colors, there are perceptual differences among map viewers, and color has symbolic connotations.

color interacts with surrounding colors



Simultaneous Contrast

The appearance of any color on a map depends on the colors that surround it. This optical illusion makes the grey dot on the top look slightly darker than the grey dot below (for most people).

If the background of a map has varying colors, check that the symbols that are supposed to be the same color look the same everywhere on the map.



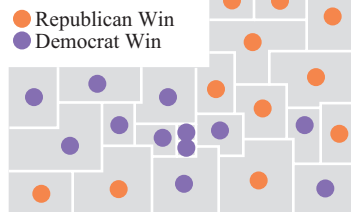
Purity of Hues

When used together on a map, some hues look pure, while other hues look like mixtures. Green and red seem to be relatively pure compared to orange or purple, which seem to be a mix.

Consider the purity of hues when combining colors on a map. If your goal for your map is to imply distinctive differences, use pure hues (green, red, blue). If your goal is to imply less distinctive differences, use mixed hues (orange, brown).

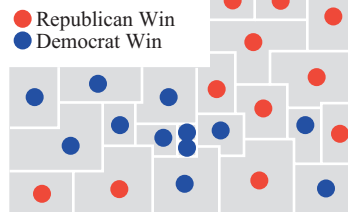
Poor use of purity of hues:

2002 Township Elections Reed County, WI



Good use of purity of hues:

2002 Township Elections Reed County, WI



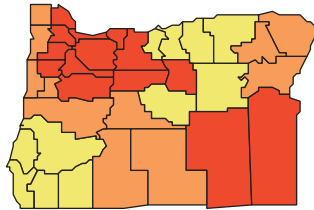
4

Basic color guidelines for maps

Color differences should suggest differences in your data. Qualitative, binary, and ordered (quantitative) differences can be matched to colors that suggest similar variations.

Poor qualitative colors (value):

Favorite Hotdog Condiment
Majority Opinion, Oregon, 2003

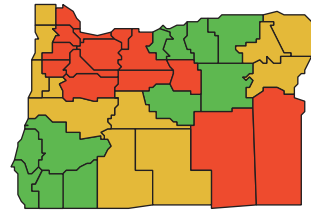


■ Ketchup
■ Mustard
■ Relish

This value series suggests an order in the data that does not exist.

Good qualitative colors (hue):

Favorite Hotdog Condiment
Majority Opinion, Oregon, 2003

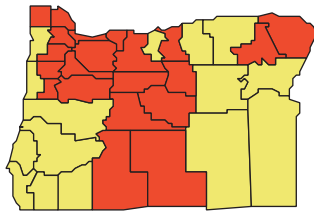


■ Ketchup
■ Mustard
■ Relish

Three hues suggest no order and reflect actual condiment colors.

OK binary colors (value):

Elvis Is Dead?
Majority Opinion, Oregon, 2003

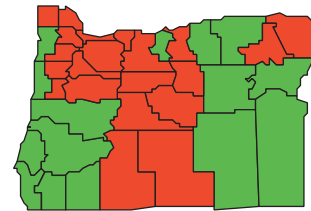


■ Yes
■ No

This pair of values suggests that **Yes** opinions are more important than **No**.

OK binary colors (hue):

Elvis Is Dead?
Majority Opinion, Oregon, 2003



■ Yes
■ No

Two hues suggest either opinion is as important.

Mapping Qualitative Data

Mapping Binary Data