

Mapping with QGIS 1: Getting Started with GIS

•••

Dr. Jerry Shannon, Geography/FHCE
Meagan Duever, UGA Libraries

Today's agenda

Types of spatial data: vector/raster

Loading data into QGIS: points, polygons, and
raster

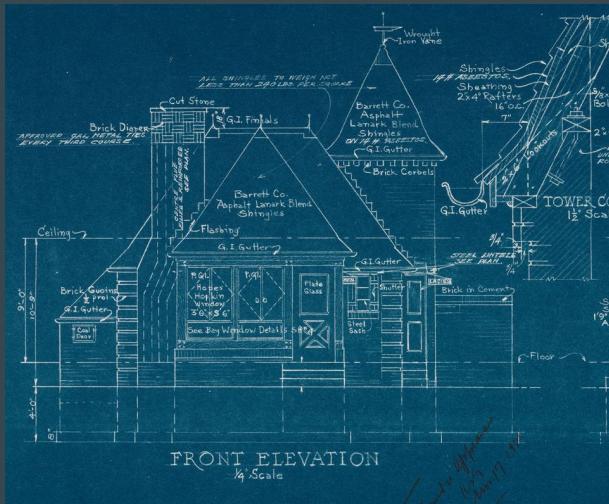
Visual variables and spatial data

Changing symbology in QGIS

Making print maps in QGIS

Geographic information systems and GIScience

GIS refers to **technology** for working with spatial datasets



GIScience focuses on **methods** for analyzing these datasets.



ArcGIS®

ESRI

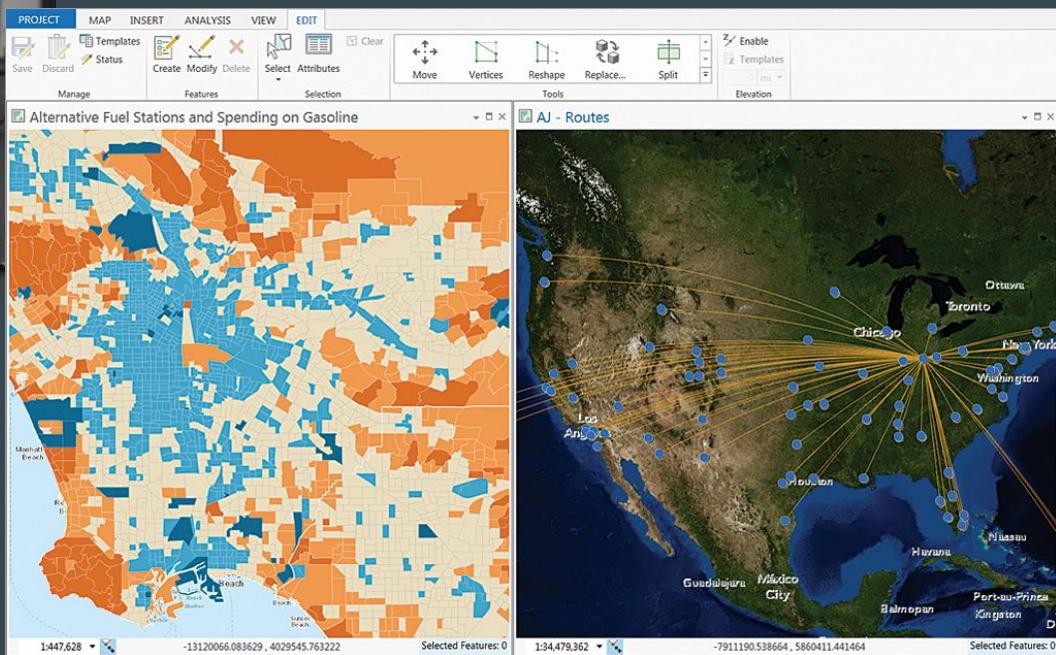
CARTO



Social Explorer®



ESRI



ESRI



3.0.3
2.18.20 LTR

DISCOVER QGIS FOR USERS GET INVOLVED DOCUMENTATION

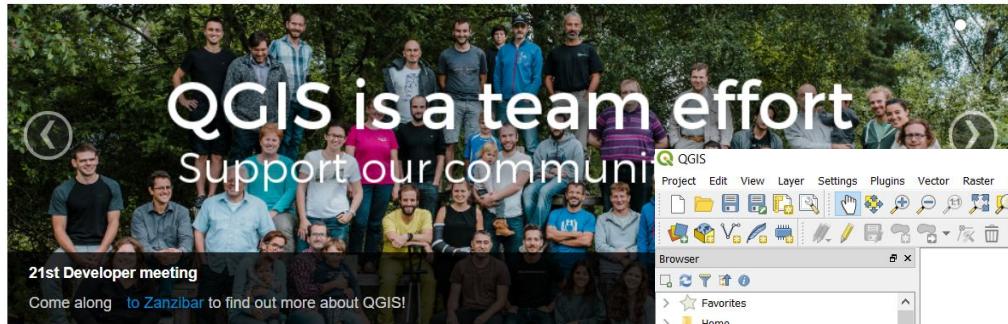
Search

English ▾

3.1 frozen since 2018-05-18 12:00:00 UTC
Time until packaging 2018-06-22 12:00:00 UTC 9d 15h 37m
Time until next pointrelease 2018-06-22 12:00:00 UTC 9d 15h 37m

QGIS

A Free and Open Source Geographic Information System



Create, edit, visualise, analyse and publish geospatial information on Windows,

For your desktop, server, in your web browser and as de

Project Edit View Layer Settings Plugins Vector Raster Database Web MMQGIS Processing Help

Browser

- > Favorites
- > Home
- > C:\
- > U:\
- GeoPackage
- SpatiaLite
- PostGIS
- MSSQL
- Oracle
- DB2
- WMS
 - > Georgia aerial imagery
 - > Mapbox Light
- XYZ Tiles

Advanced Digitizing

CAD tools are not enabled for the current map tool

Layers

- ACS City Dat 2014 ACS simplify

The screenshot displays the QGIS desktop application. The top menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, MMQGIS, Processing, and Help. Below the menu is a toolbar with various icons for file operations, selection, and analysis. On the left, there are two open panels: 'Browser' and 'Layers'. The 'Browser' panel lists local drives (C:\, U:\), databases (GeoPackage, SpatiaLite, PostGIS, MSSQL, Oracle, DB2), and external sources (WMS, XYZ Tiles). It also shows a connection to 'Georgia aerial imagery' and 'Mapbox Light'. The 'Layers' panel shows a single layer named 'ACS City Dat 2014 ACS simplify'. The main workspace shows two maps: one of Alaska with a red polygon overlay and one of the contiguous United States with county boundaries. A status bar at the bottom indicates the zoom level.



Search or jump to...



Pull requests Issues Marketplace Explore



qgis / QGIS

Watch ▾

282

Star

2,068

Fork

1,252

Code

Pull requests 47

Projects 0

Wiki

Insights

QGIS is a free, open source, cross platform (lin/win/mac) geographical information system (GIS) <http://qgis.org>

48,184 commits

49 branches

107 releases

266 contributors

GPL-2.0

Branch: master ▾

New pull request

Create new file

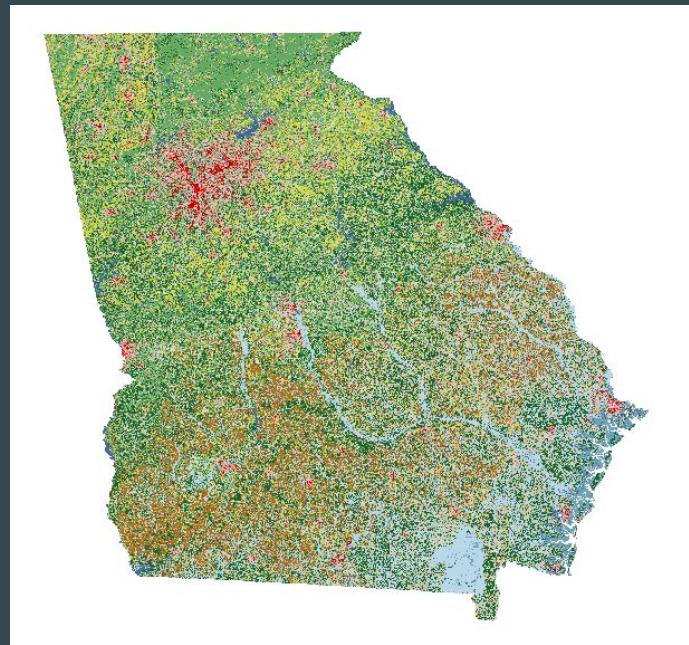
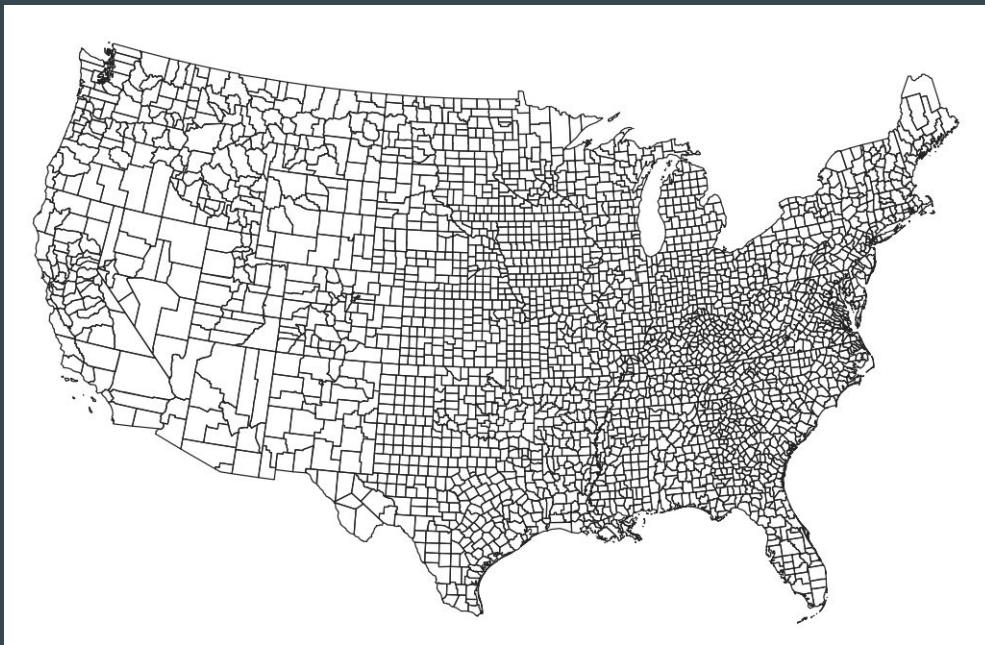
Upload files

Find file

Clone or download ▾

 elpaso	Merge pull request #7227 from elpaso/locale-make-overrideable	...	Latest commit 4d3ff9a 3 hours ago
 .ci/travis	Merge pull request #6647 from luipir/certs_not_removed_with_pk... [FEATURE] Introduction of QGIS Quick library	22 hours ago	2 months ago
 .github	Fix some wording and spelling	5 months ago	5 years ago
 .tx	[i18n] integrate esperanto translation	2 years ago	5 days ago
 cmake	[cmake] fix deprecated OLD policy for CMP0053	2 months ago	a month ago
 cmake_templates	[FEATURE] Introduction of QGIS Quick library	2 months ago	
 debian	add mdal provider to debian and osgeo4w packages		

Working with spatial data



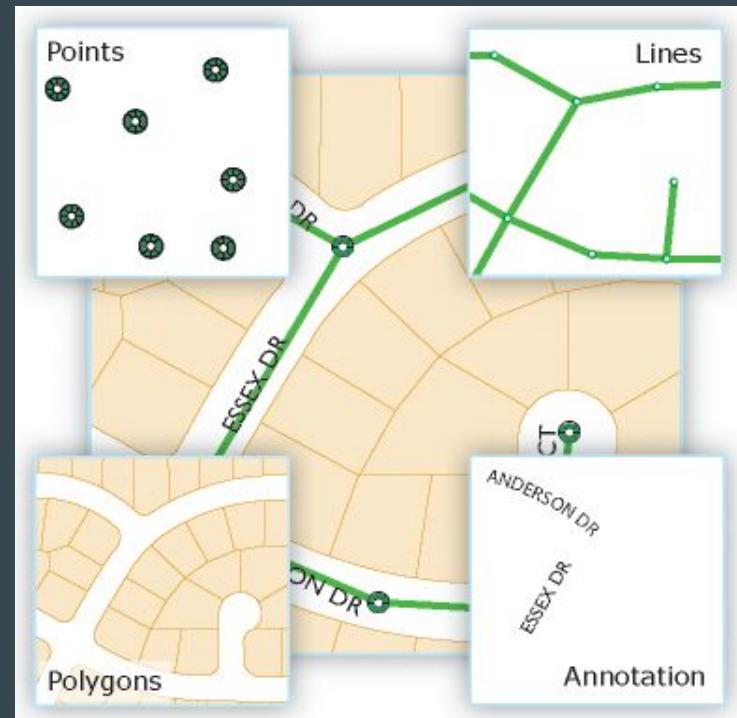
Vector data

Points, lines, and polygons

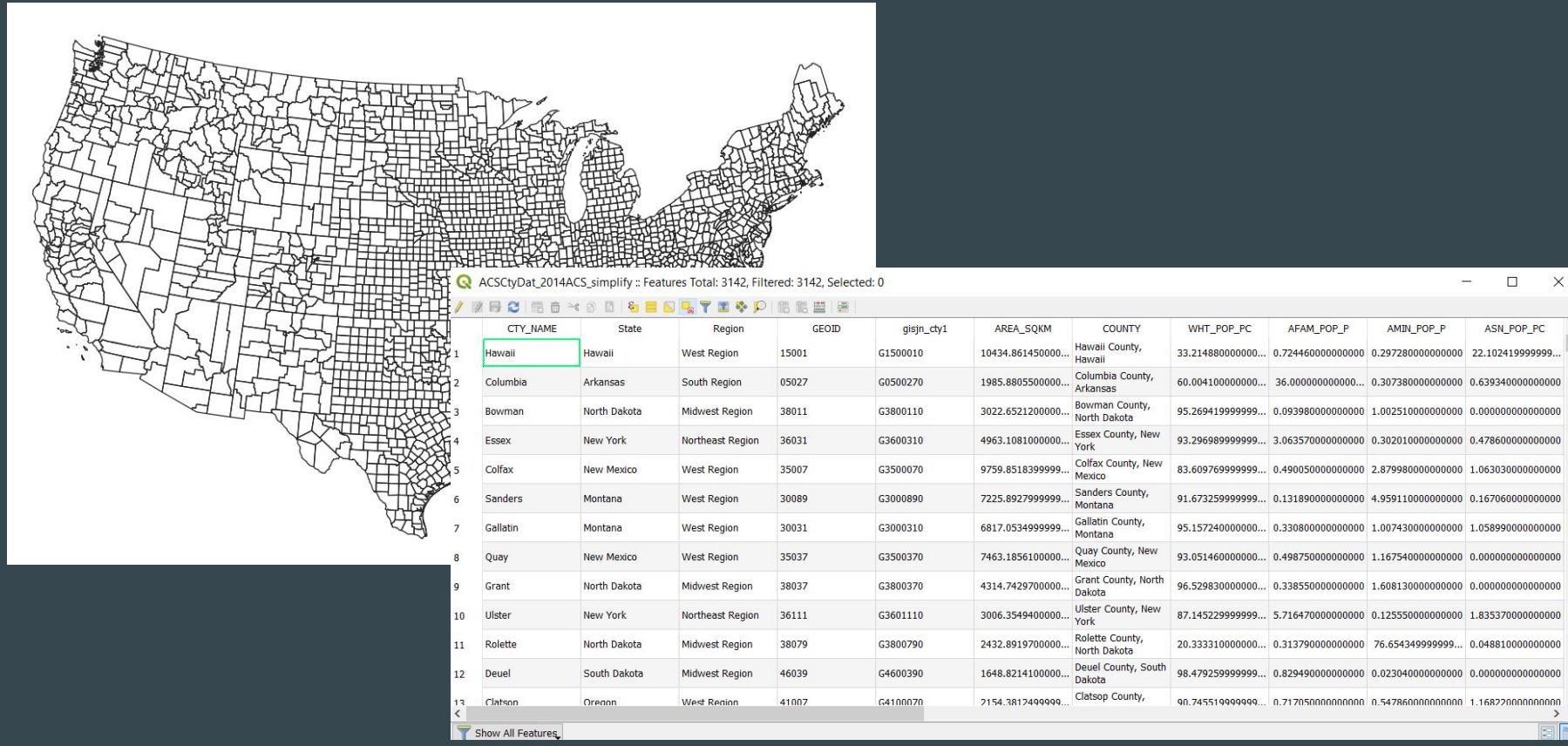
Irregular spacing

Can be gaps between
features

Multiple variables for one
feature

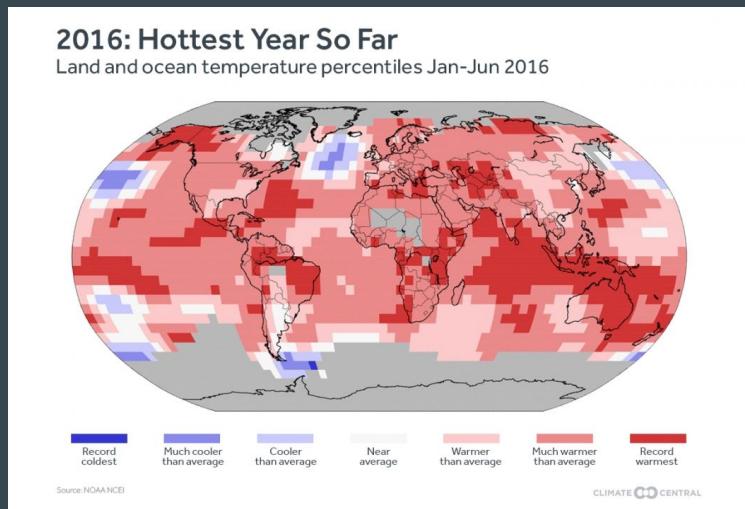


Vector data: structure

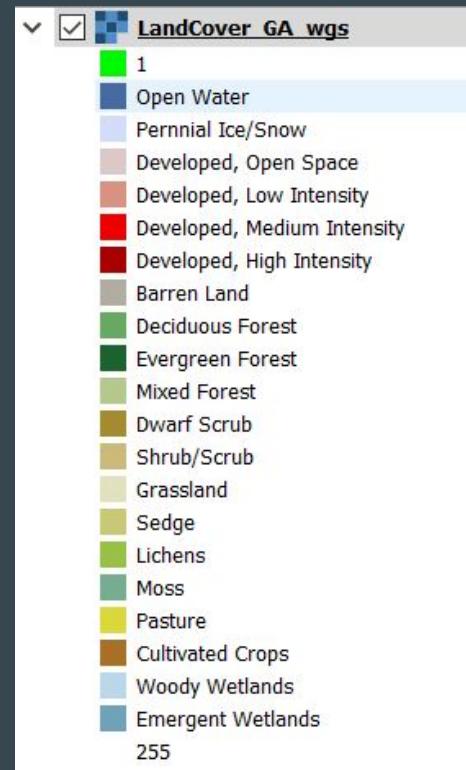


Raster

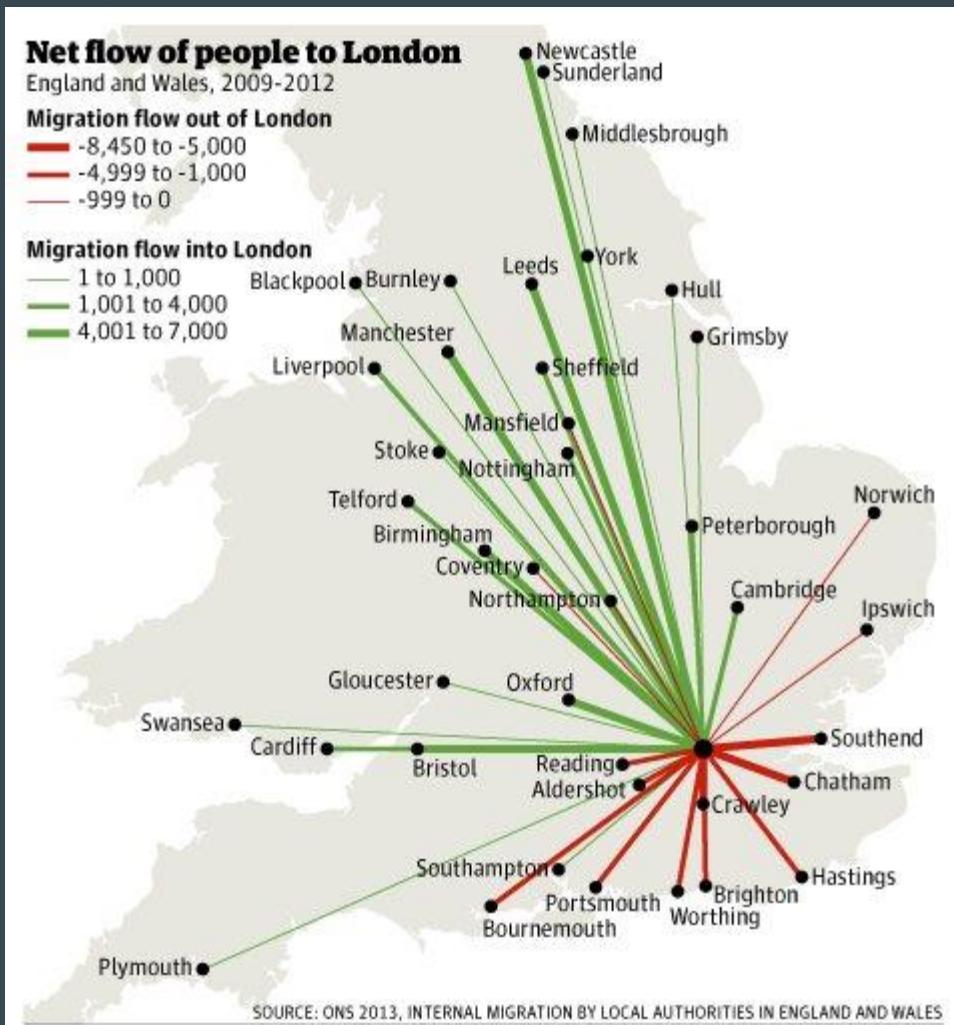
Made of pixels or grid cells
Regular spacing
Usually just one variable
Each pixel/cell has its own value



Raster data: Structure

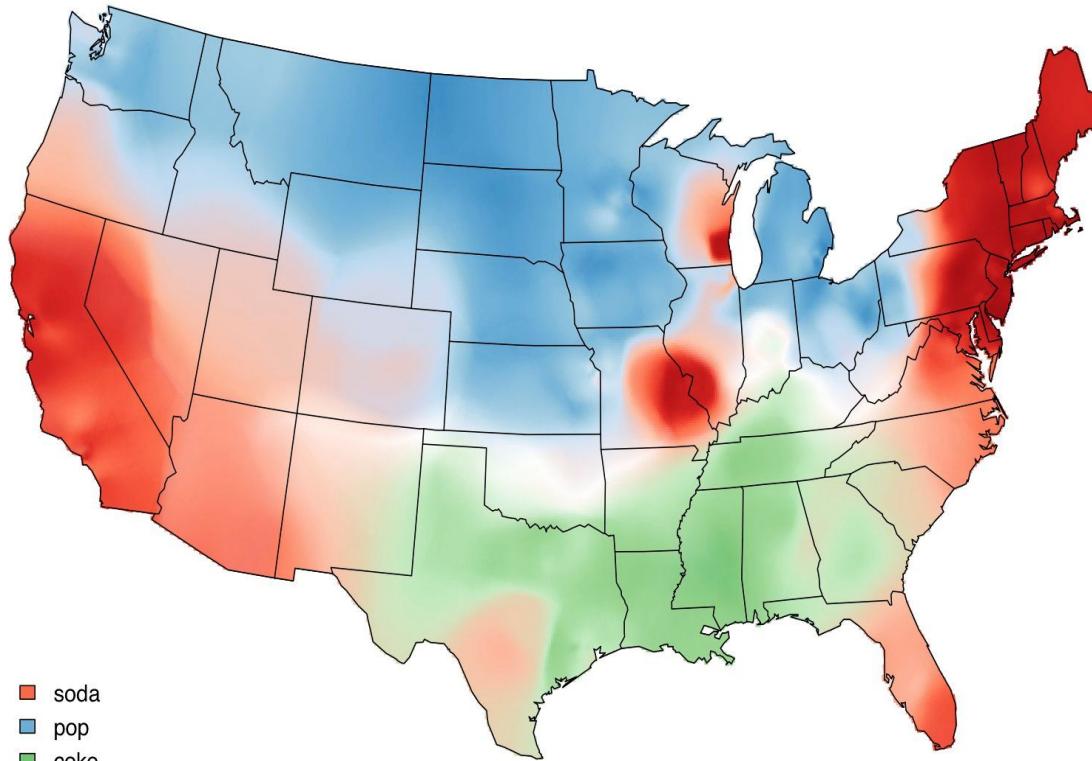


What data do you see on this map?



What data do you see on this map?

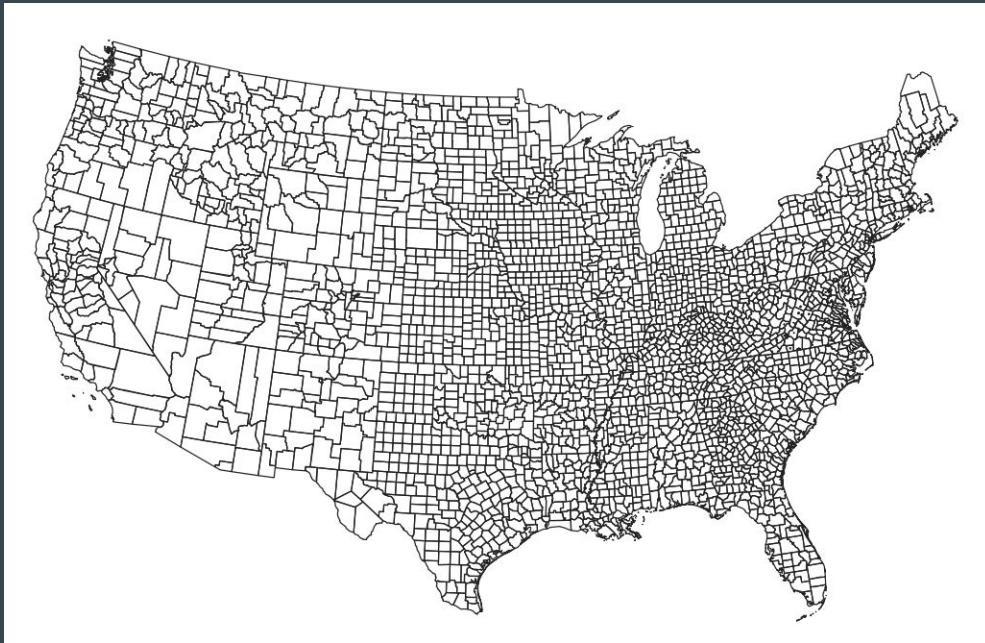
What is your generic term for a sweetened, carbonated beverage?



Map by Joshua Katz, Department of Statistics, NC State University
Based on survey data from Bert Vaux, Department of Linguistics, University of Cambridge

[Link](#)

Loading geographic data in QGIS



Visual variables: Showing Differences

	Points	Lines	Areas	Best to Show
Shape		Possible, but too Weird to Show	Cartogram	Qualitative Differences
Size			Cartogram	Quantitative Differences
Color Hue				Qualitative Differences
Color Value				Quantitative Differences
Color Intensity				Qualitative Differences
Texture				Qualitative & Quantitative Differences

Shape: usually qualitative difference

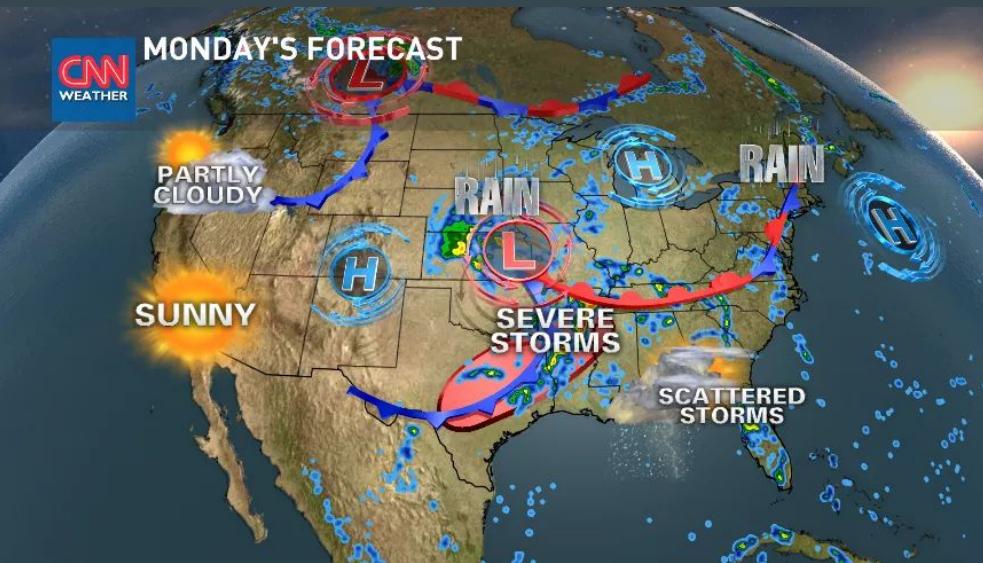
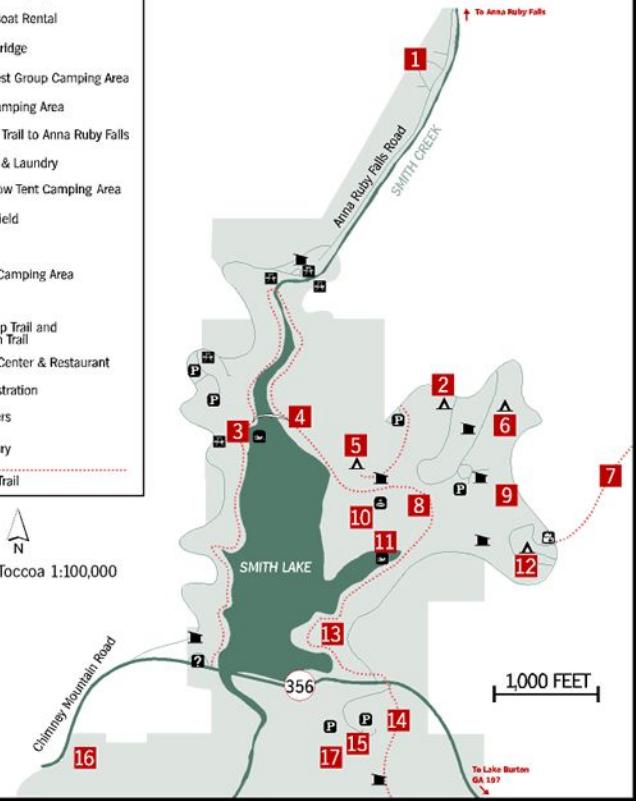
Google maps
icons



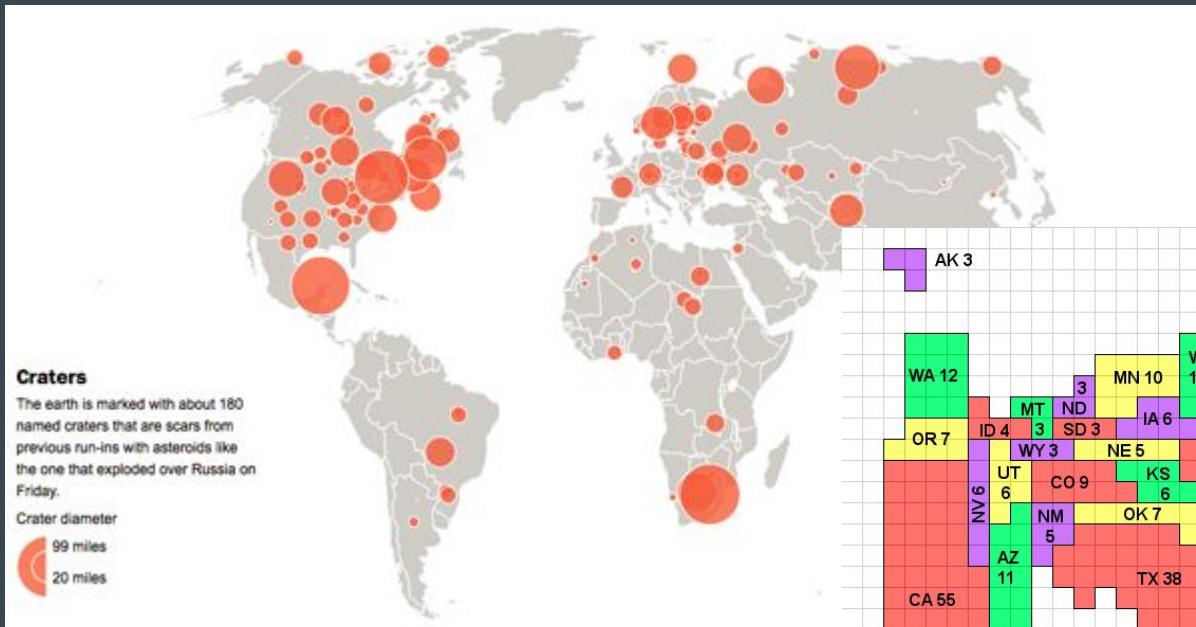
Unicoi State Park

Located 2 miles north of Helen, Unicoi State Park has 12 miles of trails, trout fishing, and mountain biking.

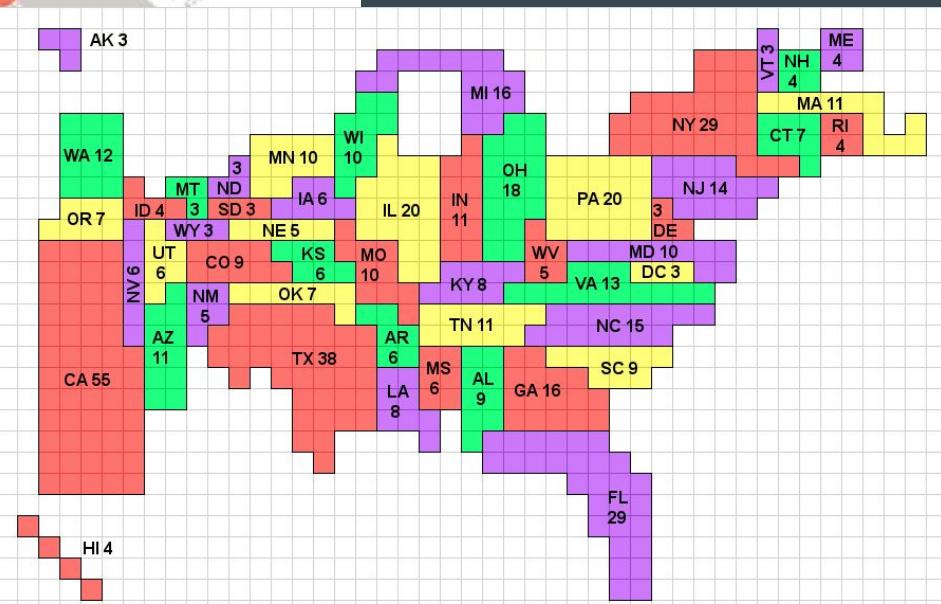
- 1 Smith Creek Cottage Area
 - 2 Laurel Ridge Camping Area
 - 3 Beach and Boat Rental
 - 4 Pedestrian Bridge
 - 5 Squirrel's Nest Group Camping Area
 - 6 Big Brook Camping Area
 - 7 Smith Creek Trail to Anna Ruby Falls
 - 8 Trading Post & Laundry
 - 9 Hickory Hollow Tent Camping Area
 - 10 Recreation Field
 - 11 Beach
 - 12 Little Brook Camping Area
 - 13 Cottages
 - 14 Bottoms Loop Trail and Unicoi/Helen Trail
 - 15 Conference Center & Restaurant
 - 16 Park Administration
 - 17 Lodge Clusters
- Park Boundary
- Trail



Size: differences in amount



Washington Post (via PSU)



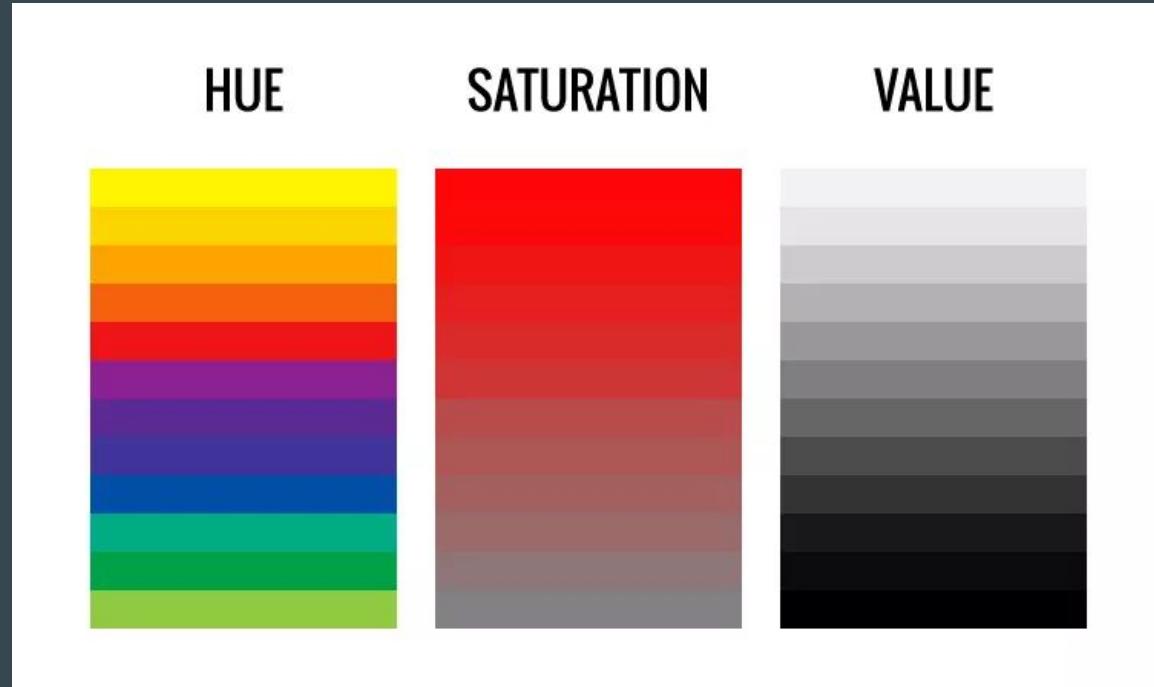
DailyKos

Colors

Hue: Which color?

Saturation (Intensity): How much color?

Value: How light/dark?



From the [Plotly blog](#)

Hue

use of color hue

Total Iraq & Afghanistan War Casualties
Casualties per million population, as of Feb. 2010



- 80 – 230
- 42 – 79
- 26 – 41
- 13 – 25
- 16 – 12

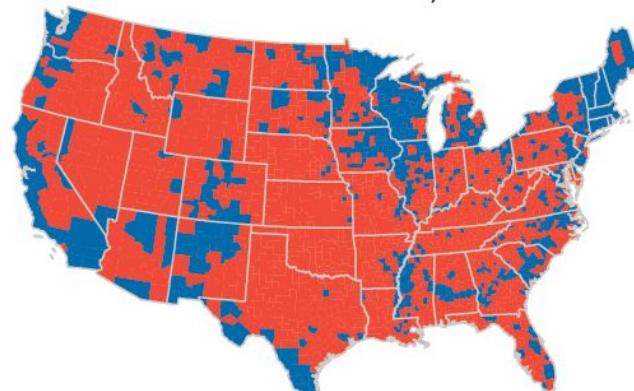
Hue is a poor choice for showing *quantitative* data. Using hue makes it difficult to see the patterns on the map, as the colors do not suggest the order (low to high) in the data.

use of color hue

- McCain Win
- Obama Win

Color hue is a good choice for showing *qualitative* data. Qualitatively different hues parallel the qualitatively different data.

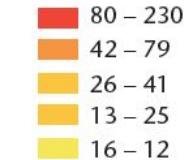
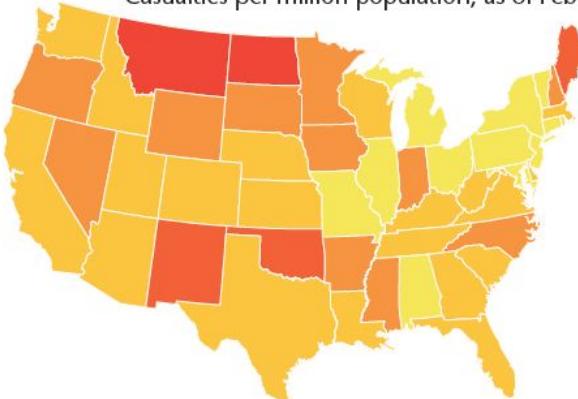
Presidential Election, 2008



Value

😊 use of color value

Total Iraq & Afghanistan War Casualties
Casualties per million population, as of Feb. 2010



Value is a good choice for showing *quantitative* data. The use of one hue varying in value parallels the order in the data.

😢 use of color value

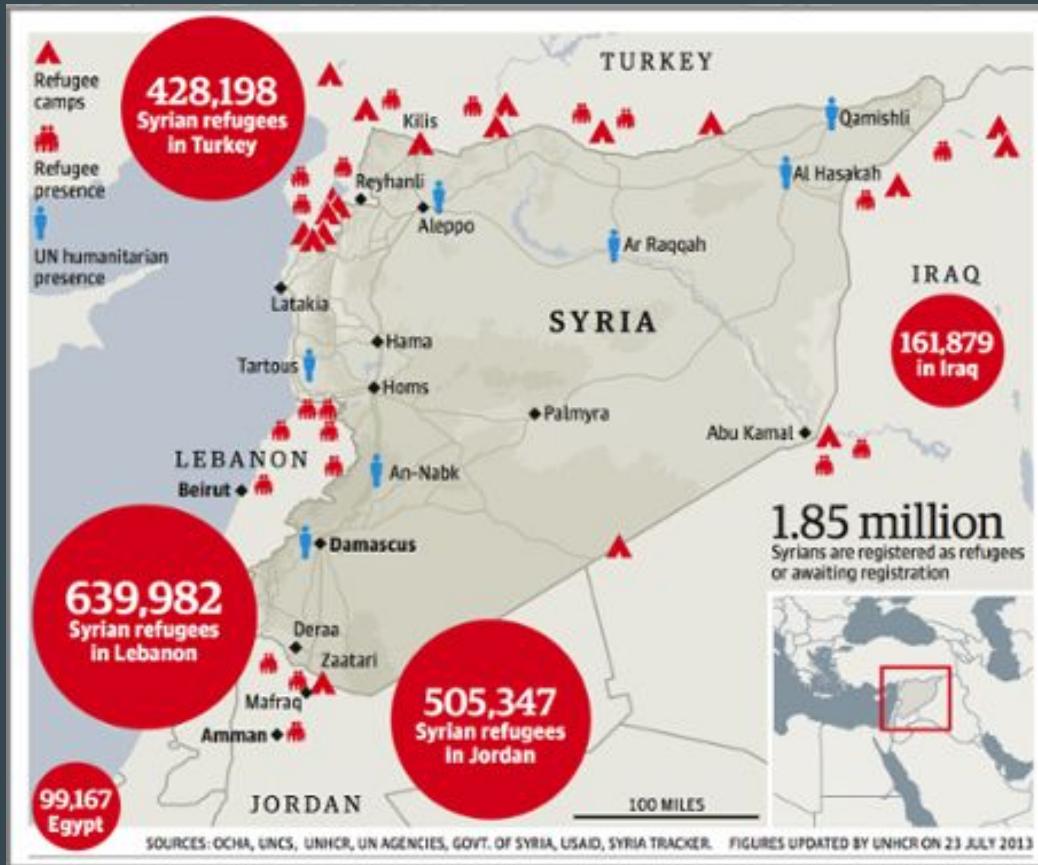
Presidential Election, 2008



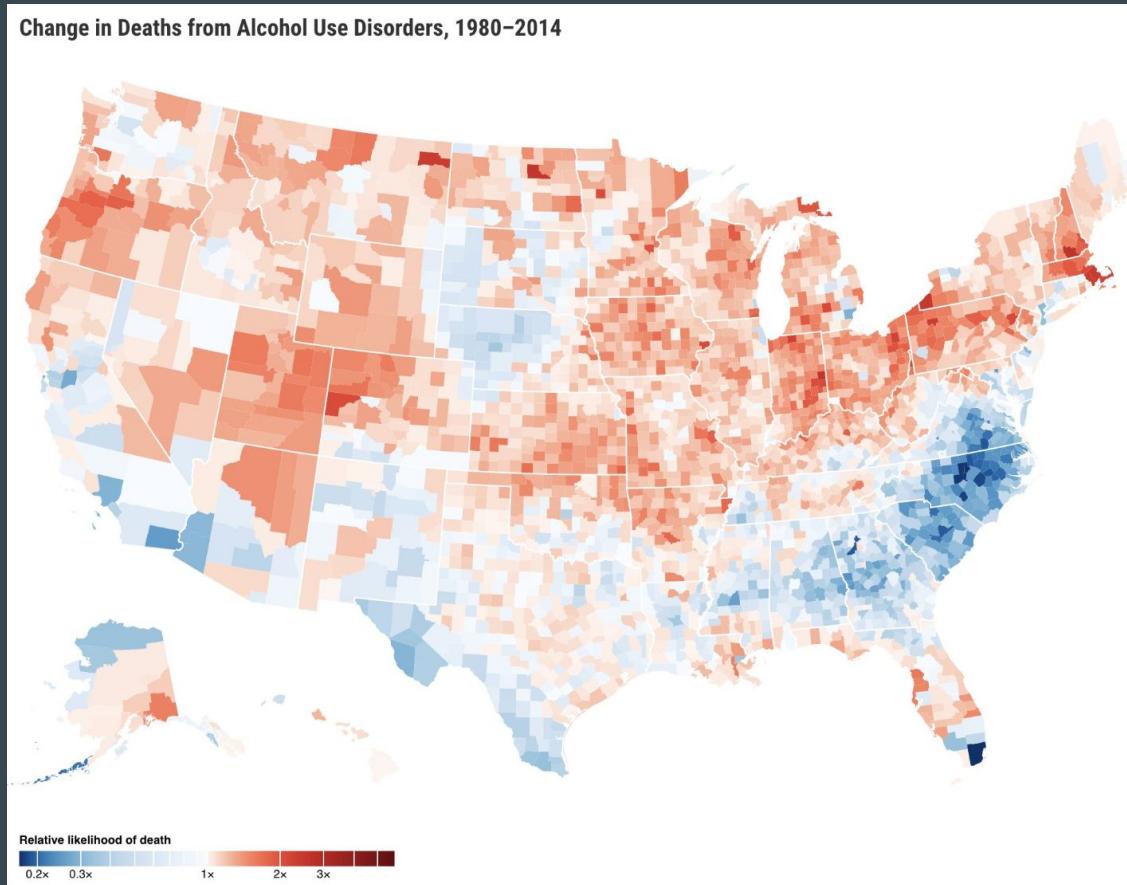
Color value is a poor choice for showing *qualitative* data. Values suggest an ordered difference, which is not appropriate for these data.



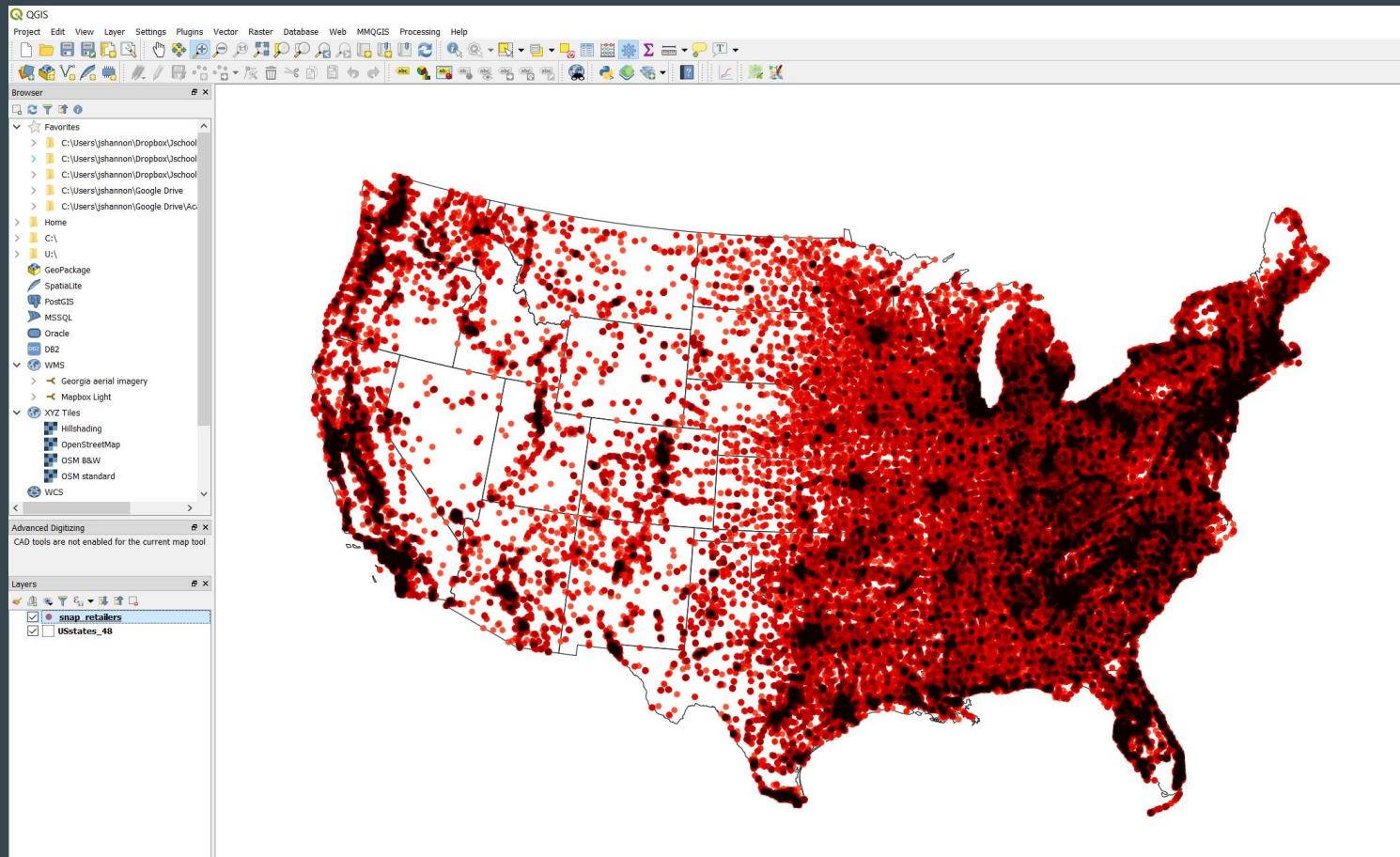
What role do visual variables play on this map?



What role do visual variables play on this map?

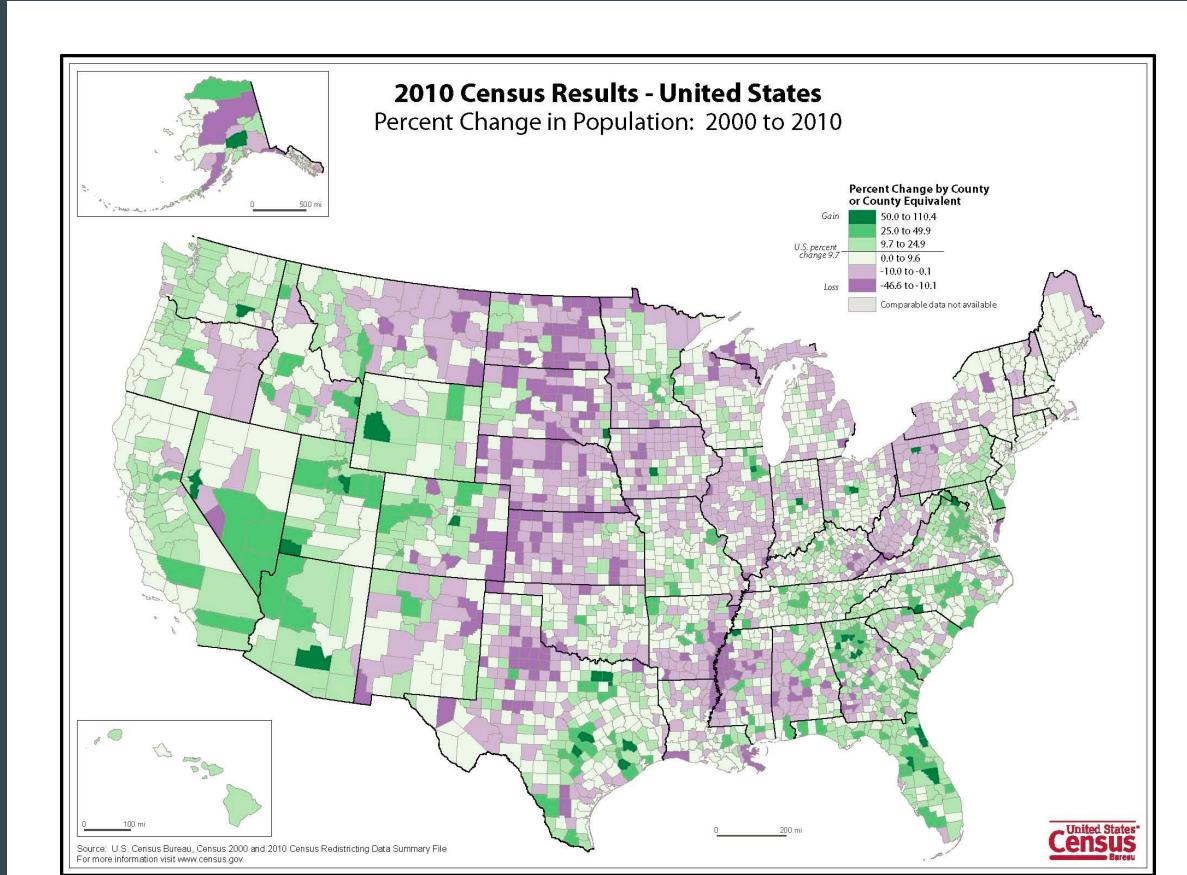


Using Visual Variables in QGIS

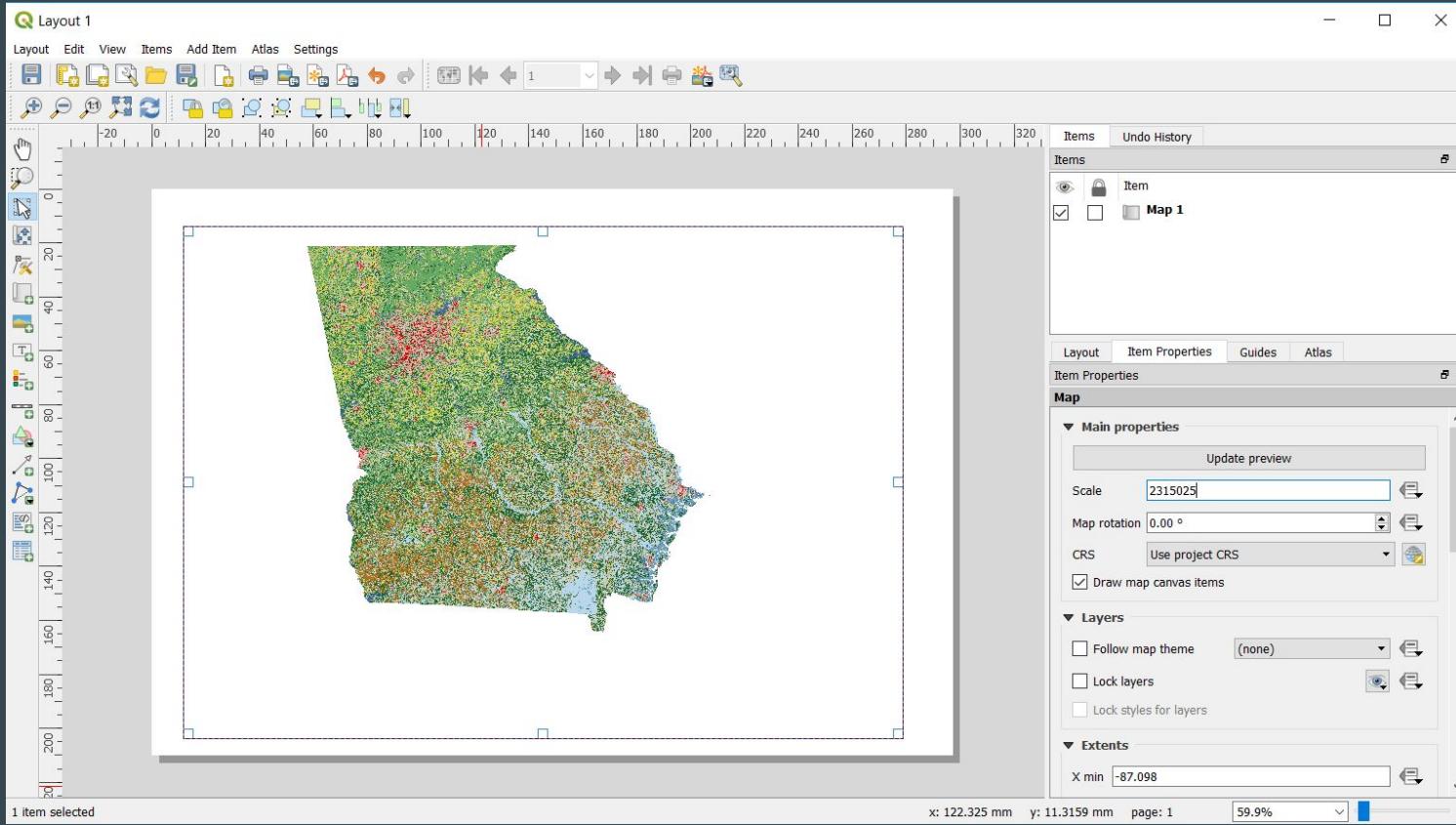


Required map elements

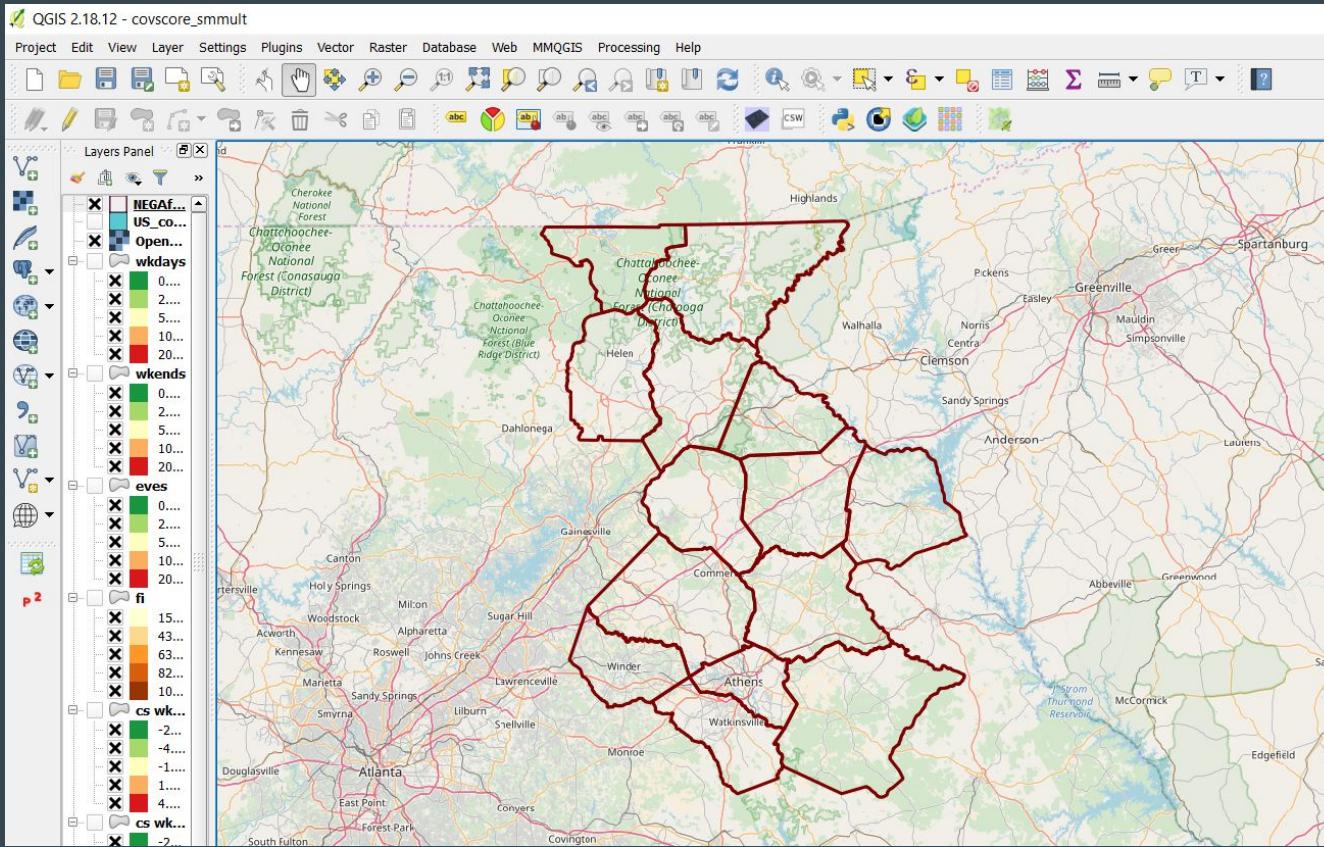
1. Map/data
2. Legend
3. Title
4. Scale bar
5. North arrow
6. Citation



Print composer



Adding basemaps with the OpenLayers plugin



How'd we do?

