

DSBA 5122: Visual Analytics

Class 4: Time and Space

Ryan Wesslen

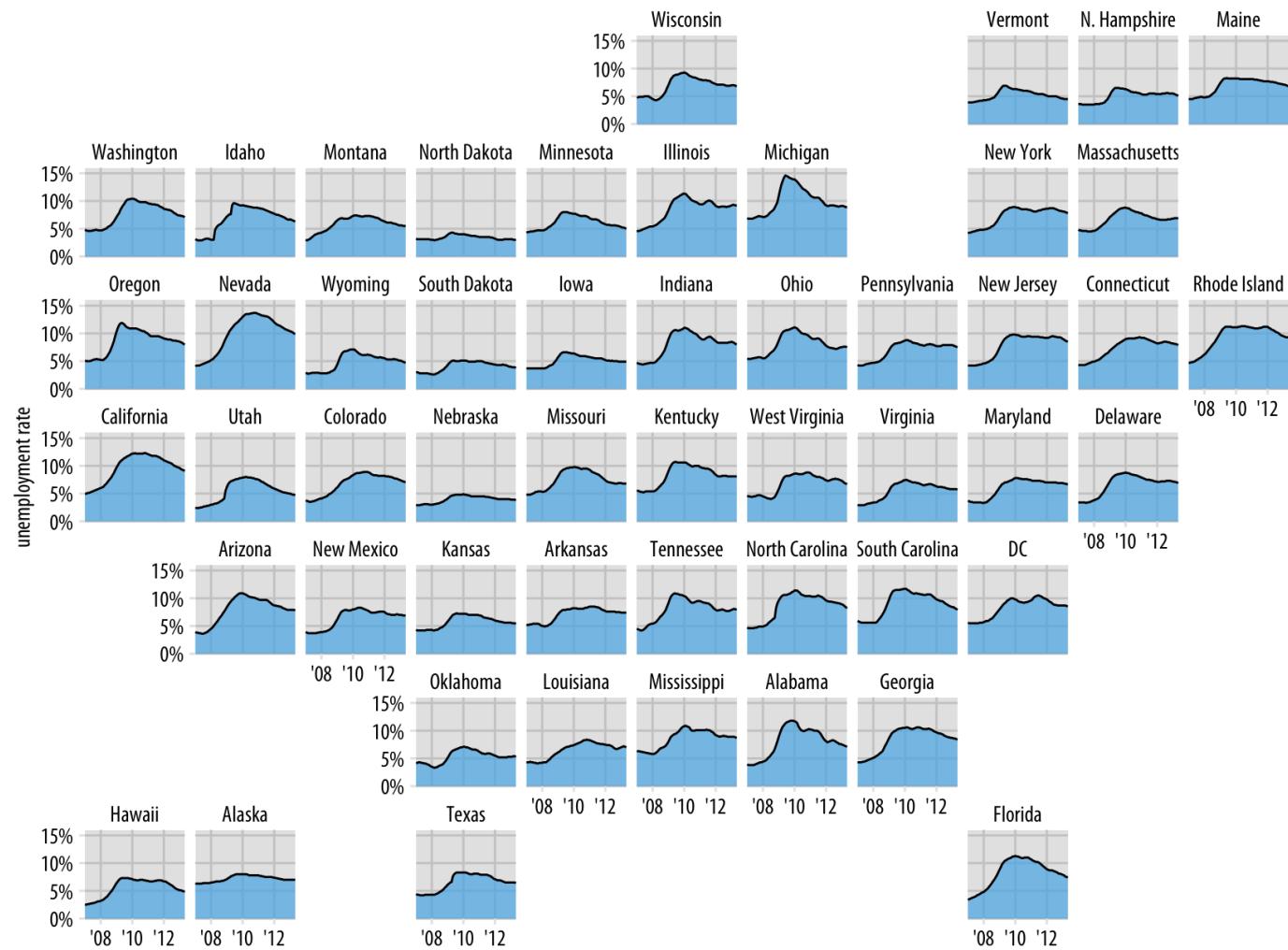
February 11, 2019

Time and space

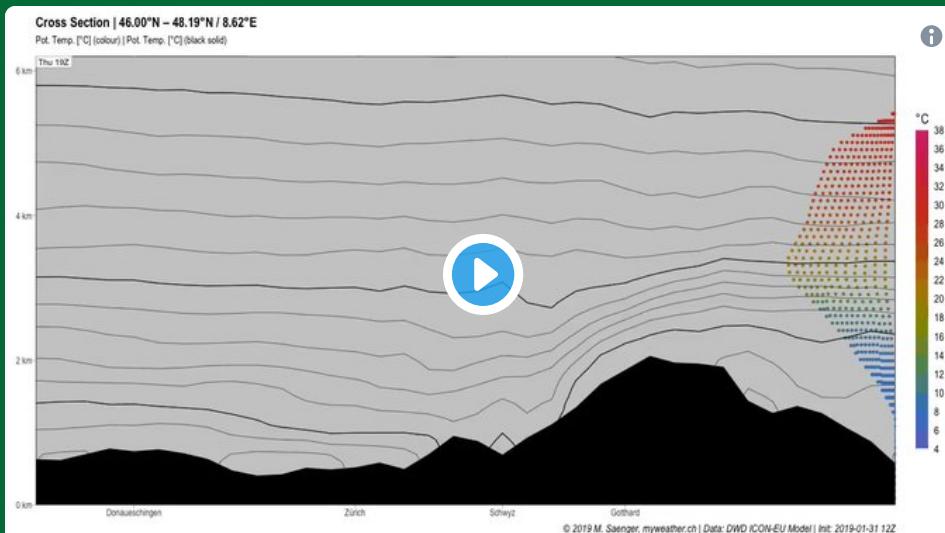


**2Chainz, baby, don't lie to me
Time and space don't apply to me**

Time and Space - why?



Time: Cairo Chapter 8 and Wilke Chapters 13-14



myweather.ch
@myweather_ch



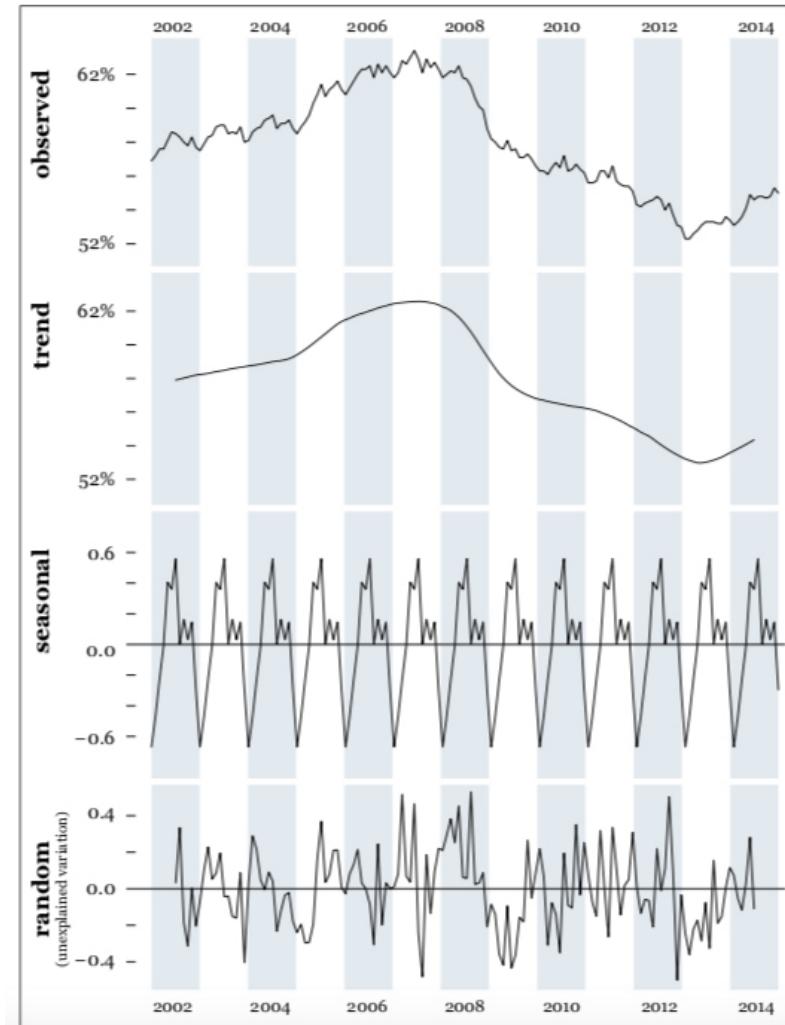
Visualisation of the streamflow across the #Alps during today's #Foehn event. Uplift and resulting snowfall on the windward side (right) and strong Foehn winds down the lee slopes (centre). Explanations: see below. Made with #ggplot2 and #ggeanimate.

136 3:03 PM - Feb 1, 2019

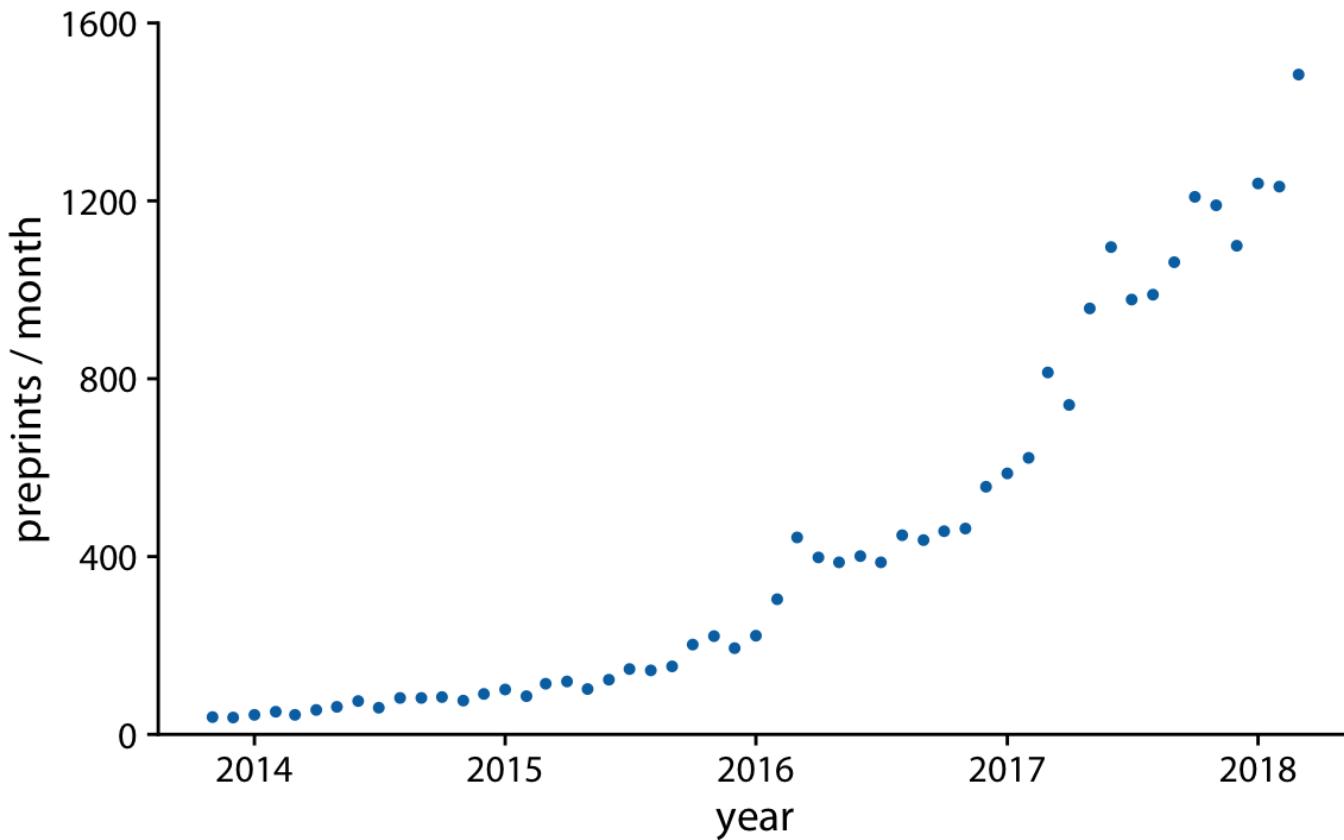
49 people are talking about this



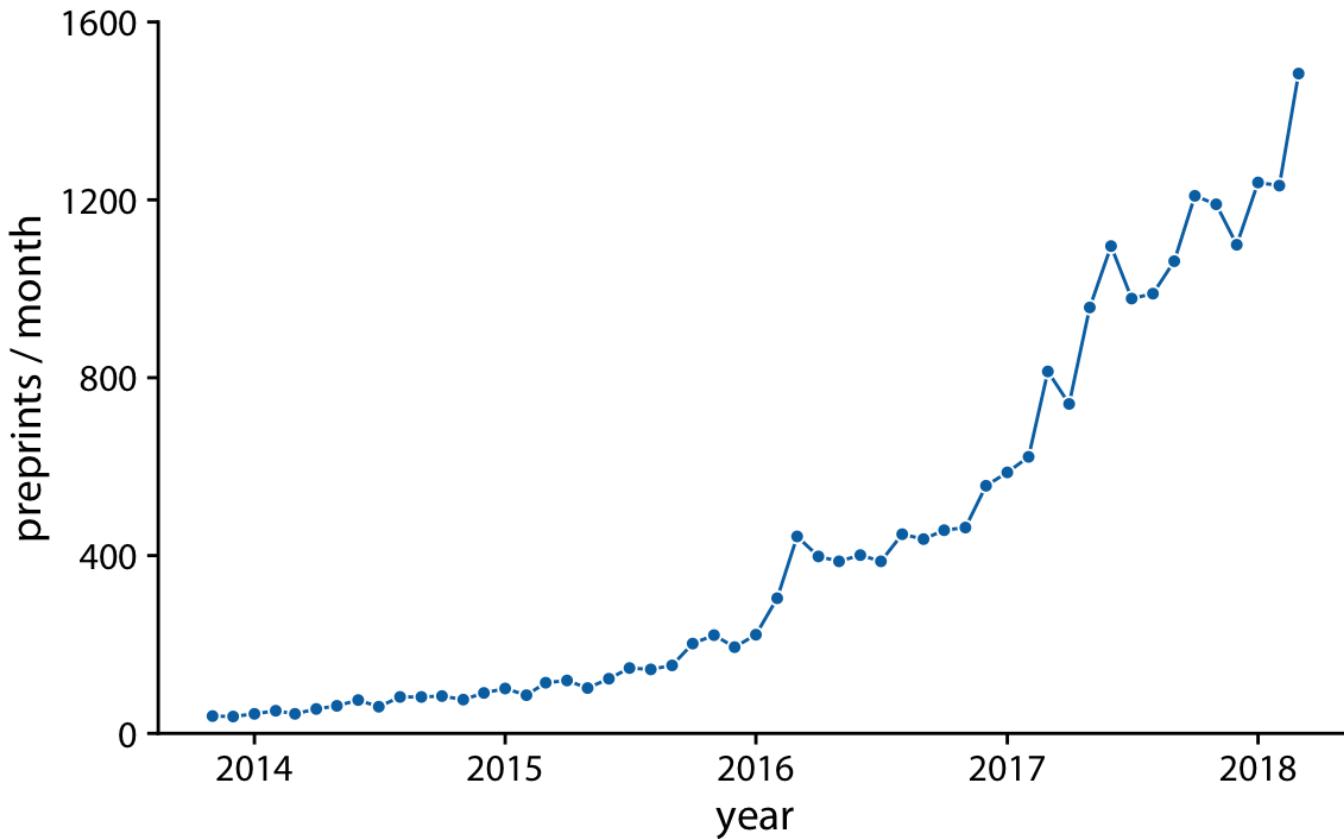
Trend + Seasonal + Noise



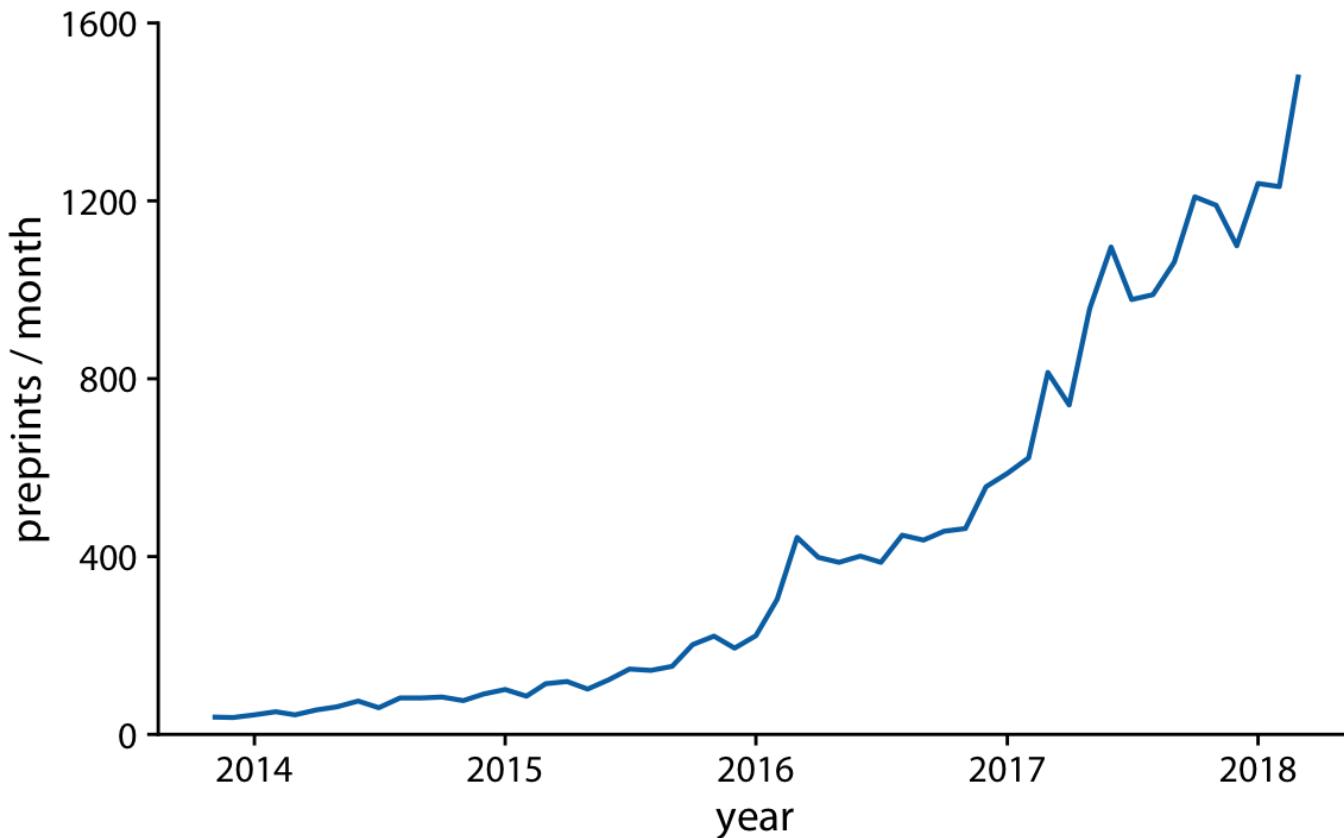
Visualizing one temporal variable



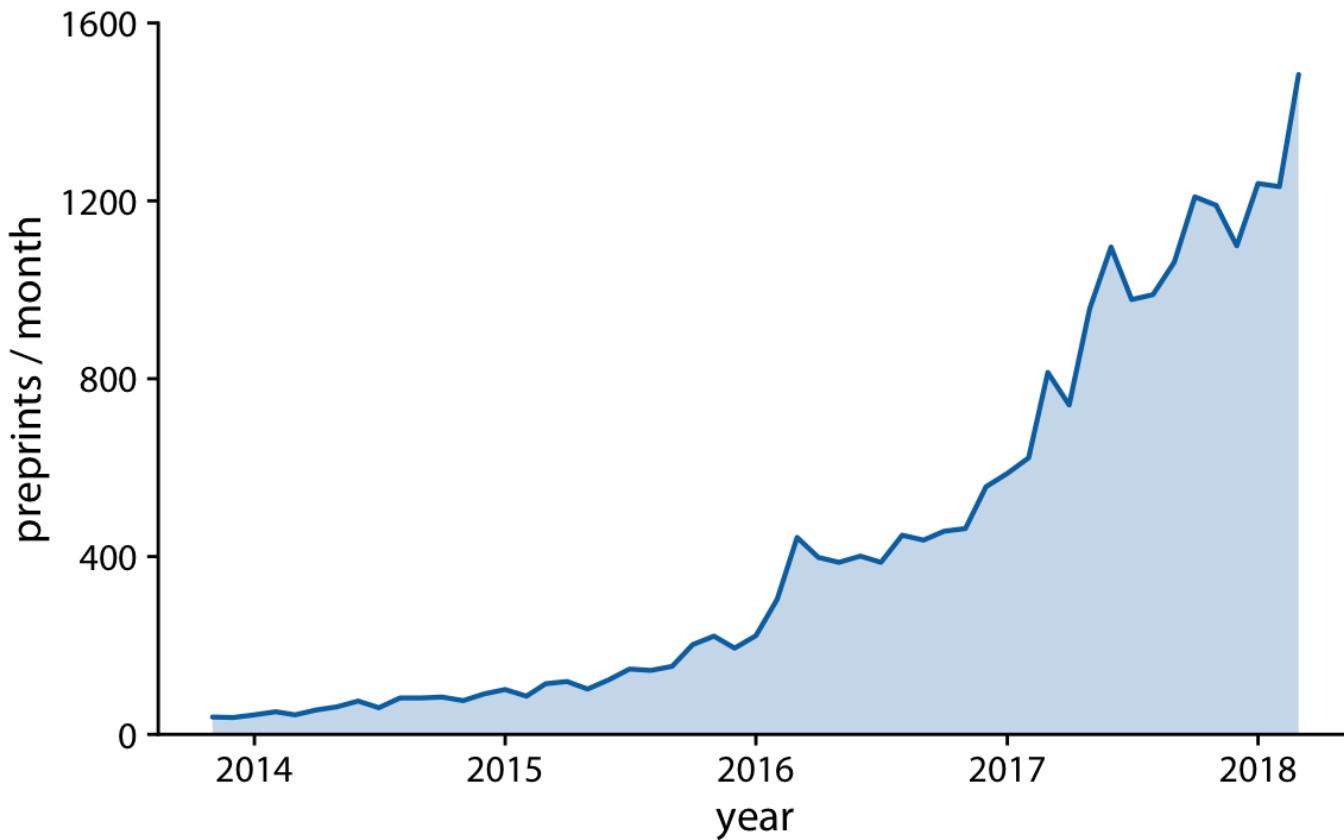
Visualizing one temporal variable



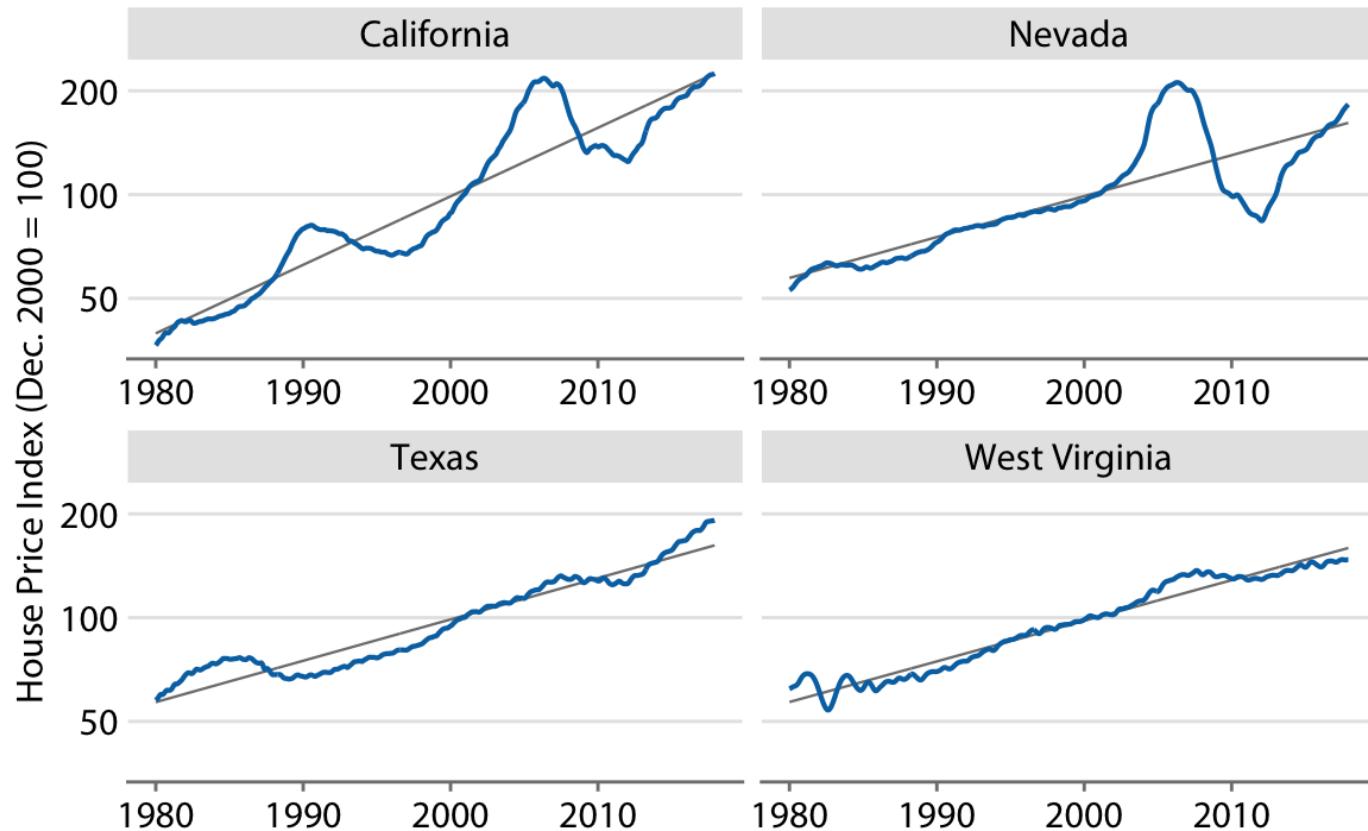
Visualizing one temporal variable



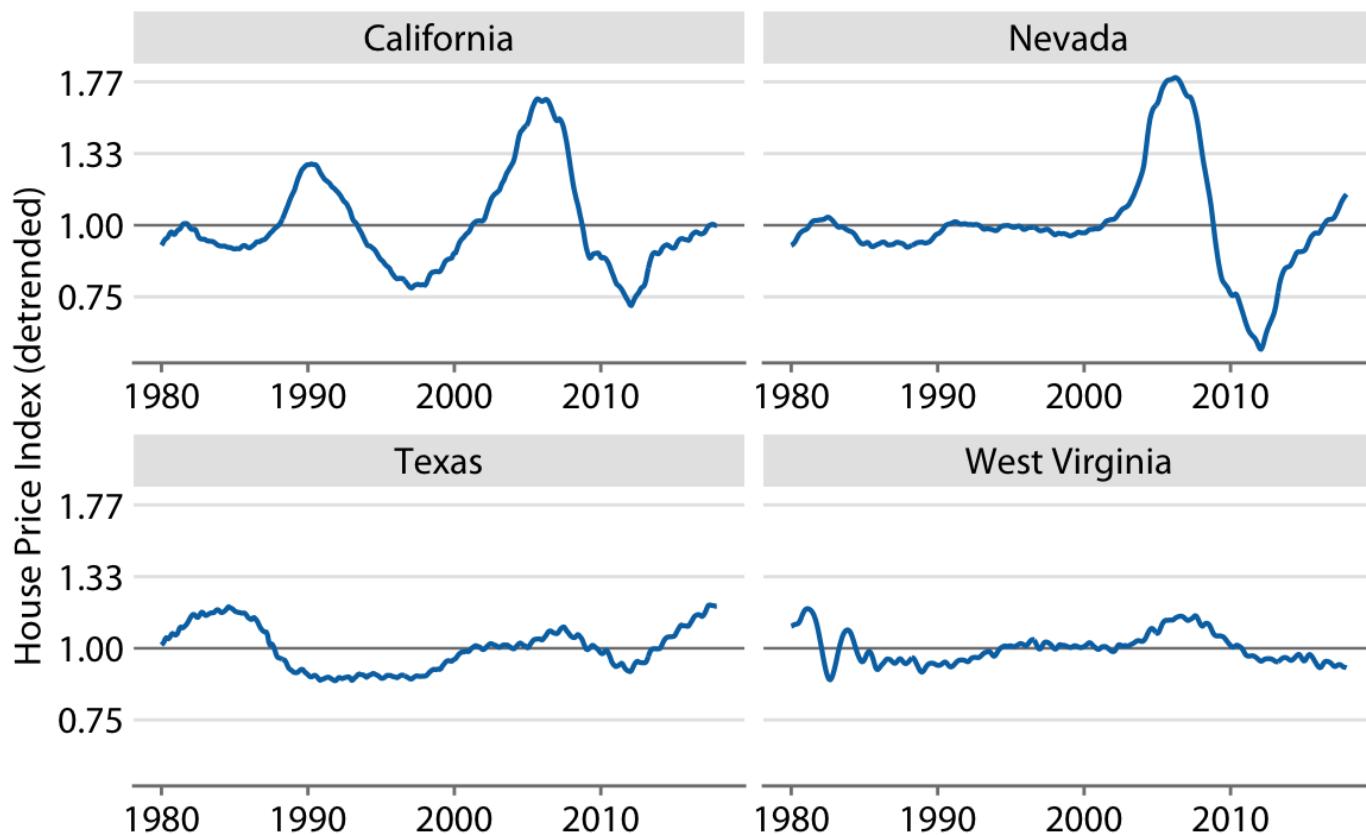
Visualizing one temporal variable



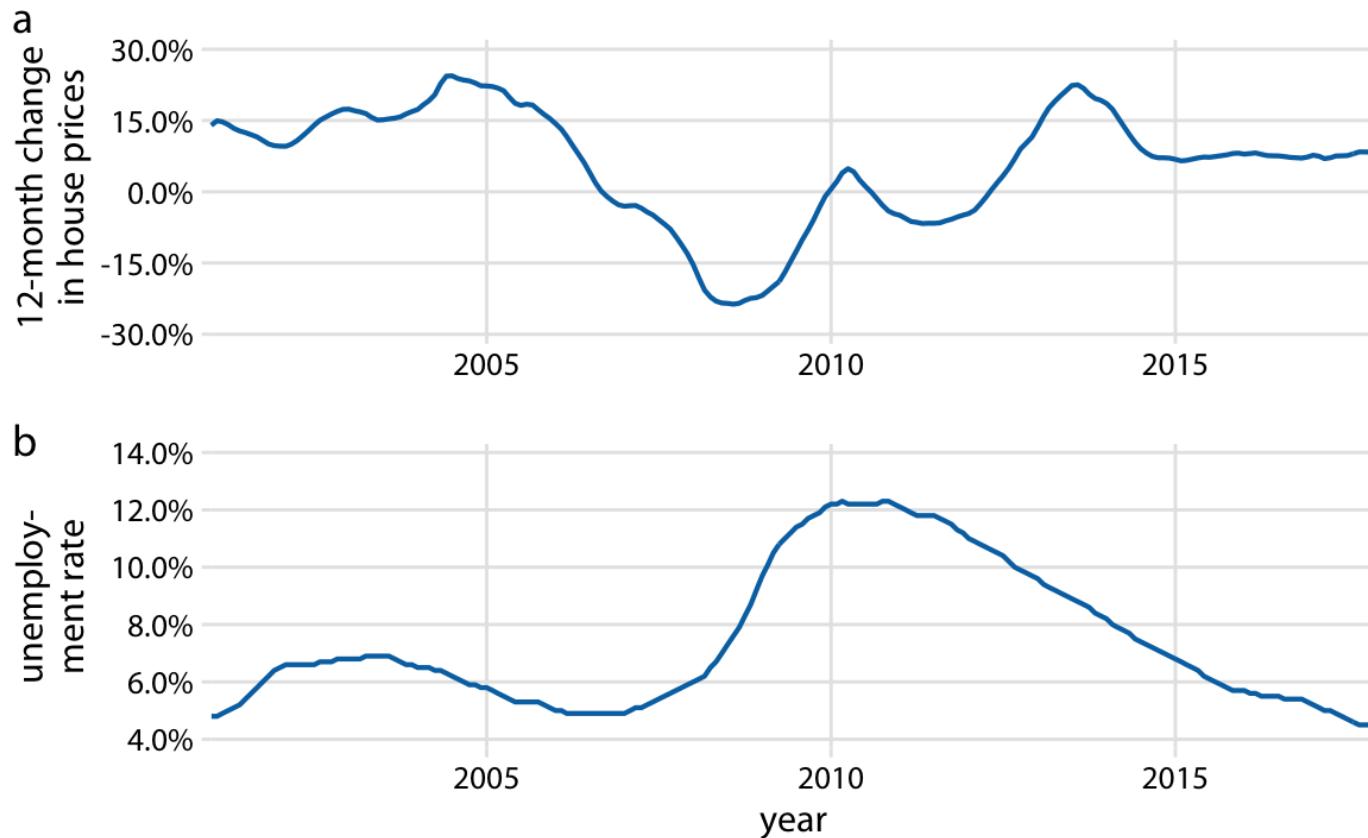
Visualizing Indexes



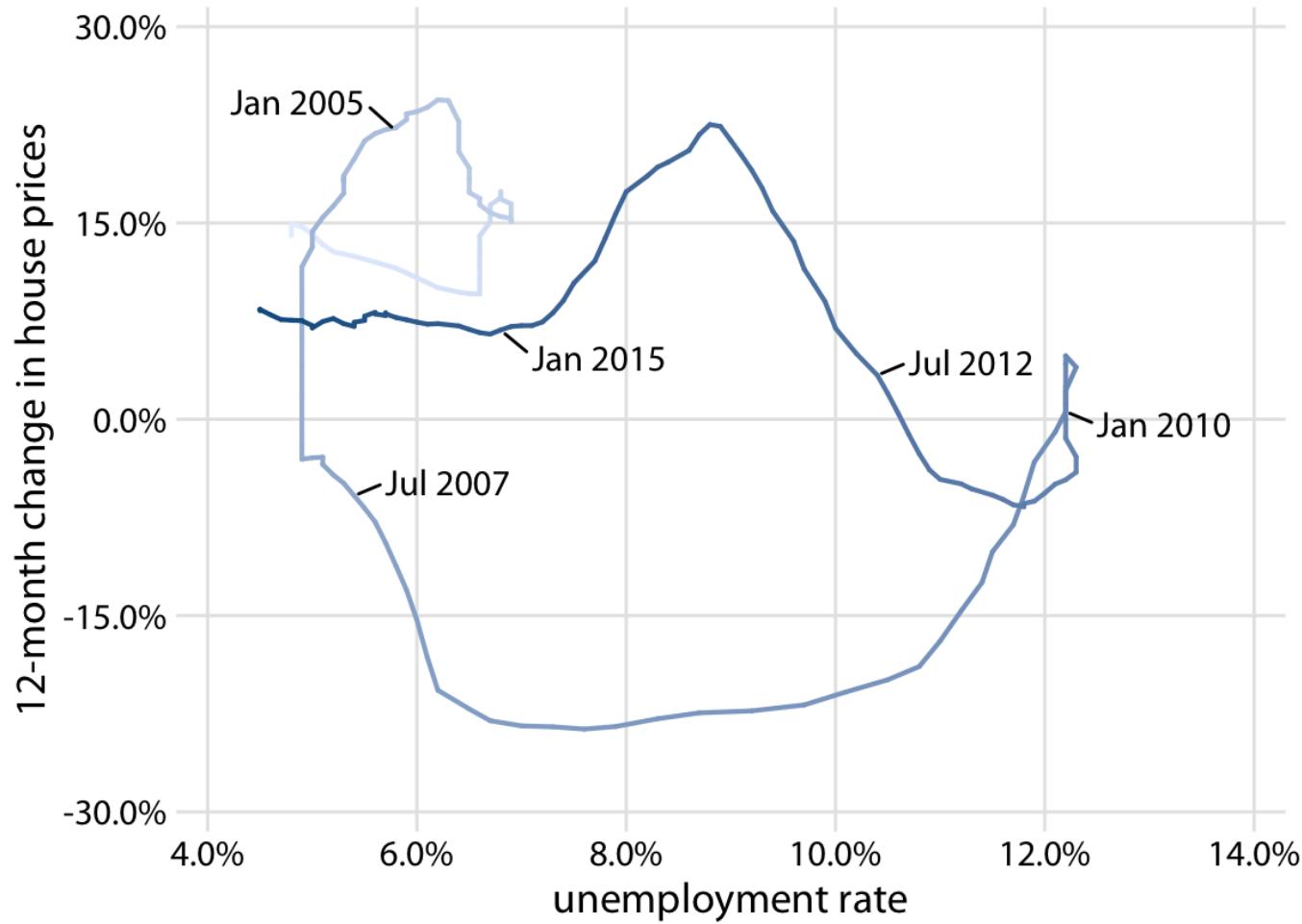
Visualizing Indexes



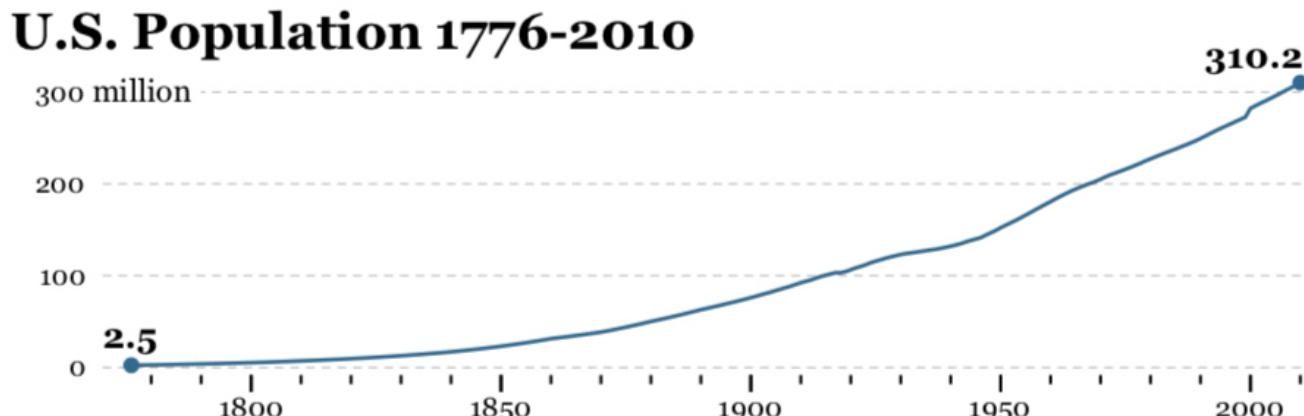
Visualizing two temporal variables



Visualizing two temporal variables



Ratios to log



Change ratio in comparison to the previous year

1.04

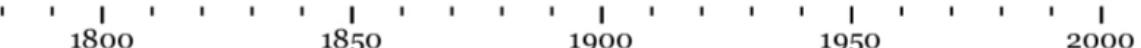
1.03

1.02

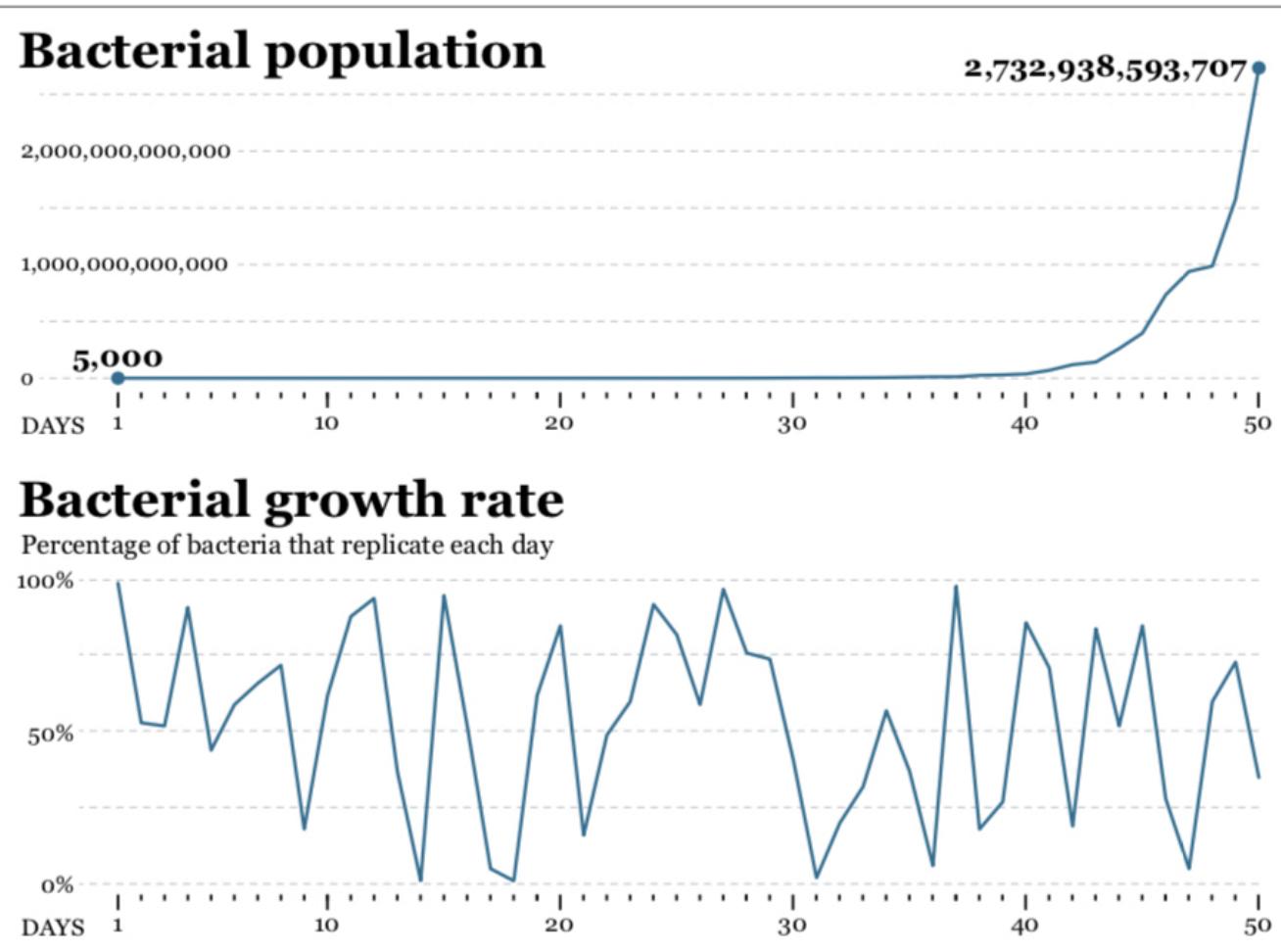
1.01

1.00

1918



Ratios to log



Mix effects

Change in median wage 2000-2013

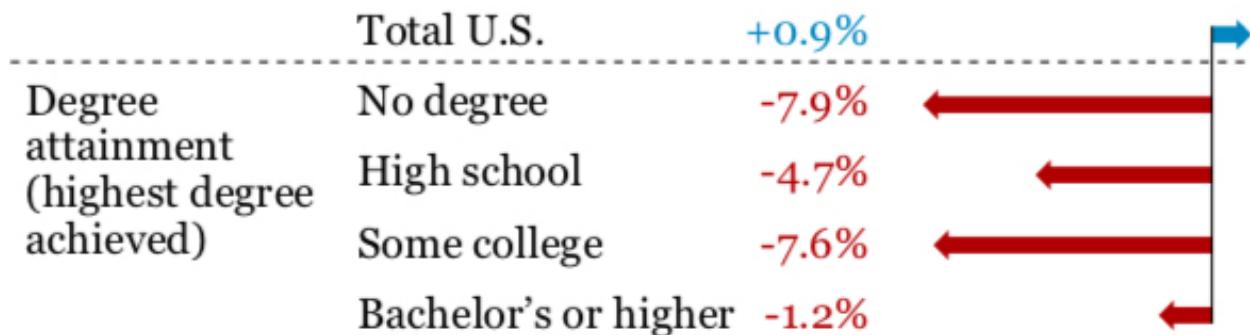


Figure 8.23 Isn't there a contradiction in this chart?

Timelines storyteller

The screenshot shows a presentation slide with a light gray background. At the top right, there is a small navigation bar with the text "Timeline 194 13" and "2010 2019". Below this, the main title "The Daily Routines of Famous Creative People": A Timeline Story is centered. The slide content area is currently empty, indicated by a large white space. At the bottom, there is a standard Mac OS X-style menu bar with icons for file, edit, view, insert, format, and windows. The "format" icon is highlighted with a red box.

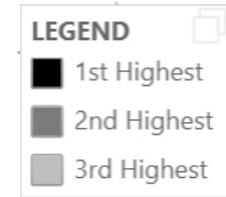
<https://timelinestoryteller.com/>

Example: Charlotte Protest Tweets

Top 3 topics by hour

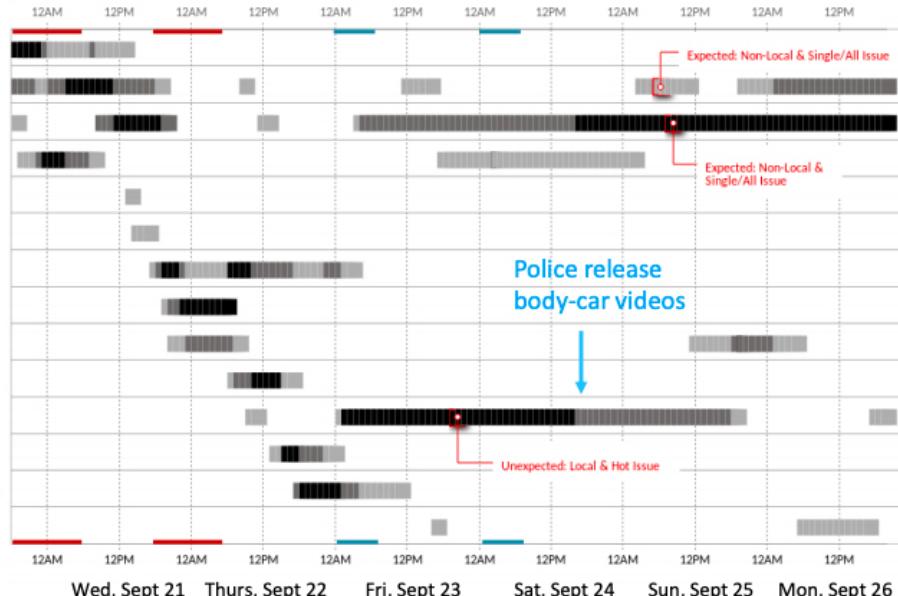
Protest Periods

City Curfews



Top Topics by Top Five Words

reading + book + disabled + son + sick
black + cop + officer + man + unarmed
drop + gun + planted + weapon + hand
#keithlamontscott + #video + #policeshootings
riots + telling + erupt + calm + also
violence + stop + act + congress + must
looting + rioting + go + country + home
#charlotteprotest + #charlit + marshall
guard + gas + tear + factsbymax + nomypti
obama + thugs + rioters + obamas + blm
release + wife + video + released + releases
#charlotteriots + #msnbc + organization + group
curfew + midnight + #hillary + #charlotteprotests
last + hide + died + bullets + rubber



Timeline created by
Microsoft's Timelines Storyteller
<https://timelinestoryteller.com/>

Spatial/Maps: Cairo Chap. 10 and Wilke Chap. 15



TimSalabim
@TimSalabim3



A nice example of projection distortion! How big is Alaska really?

Claus Wilke @ClausWilke

Putting Hawaii and Alaska into their place. #rstats
#dataviz #gganimate



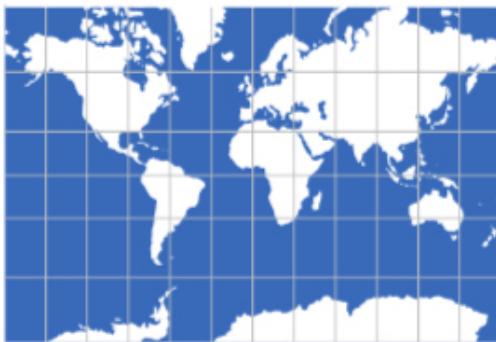
Scale



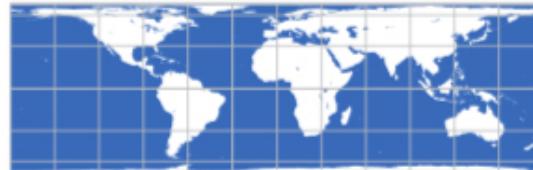
Figure 10.1 The same region of the world represented at two different scales.

Projections

Mercator



Lambert cylindrical



Mollweide



Goode's Homolosine

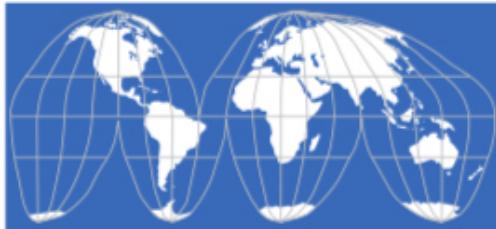


Figure 10.4
Four very
popular map
projections.

Projections

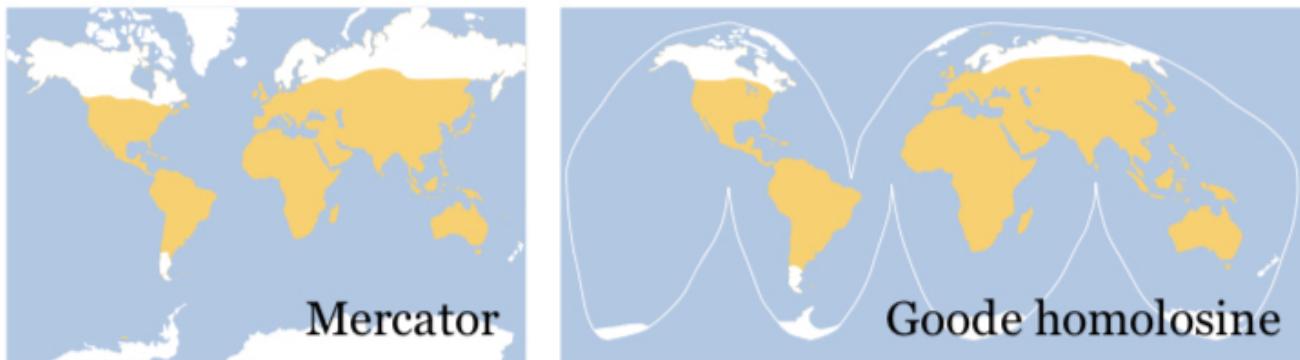


Figure 10.5 The same story will look very different depending on the projection you choose.

Map encoding

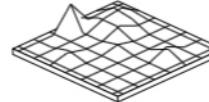
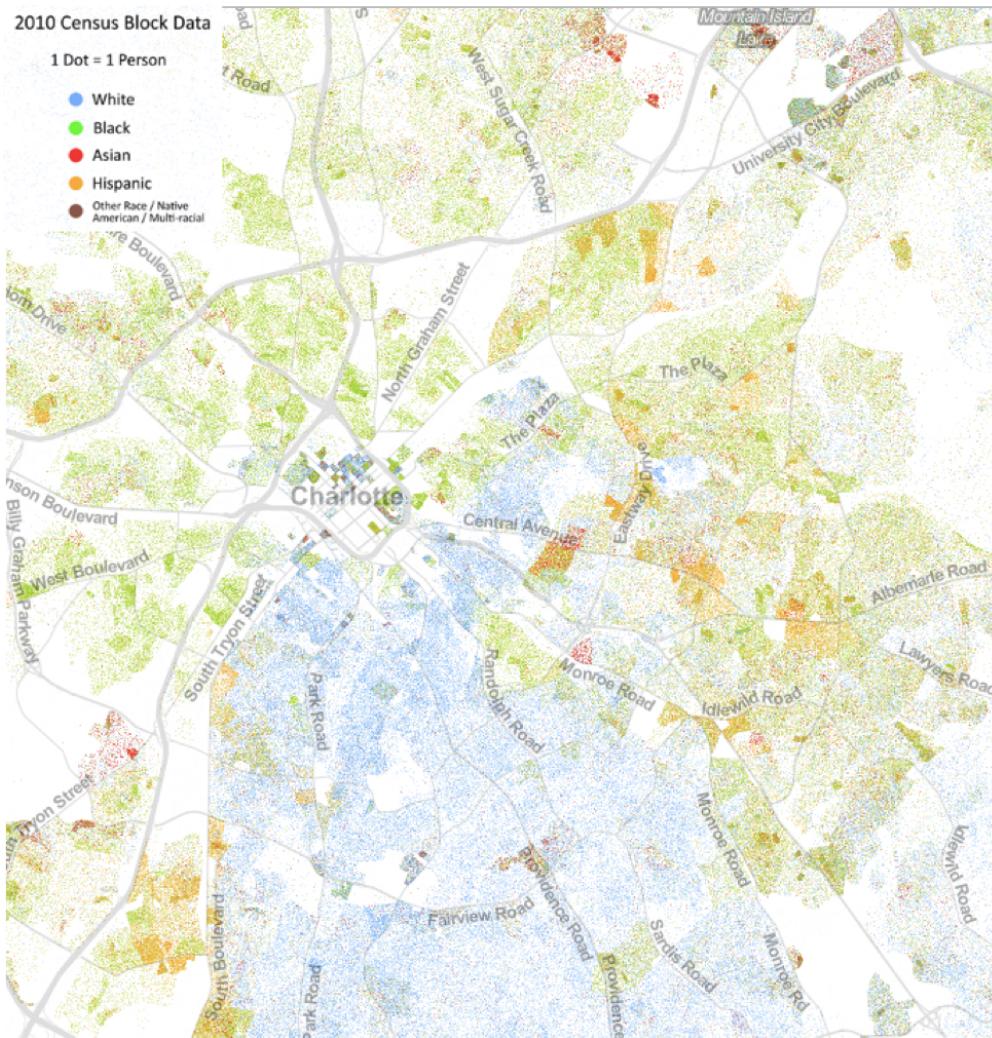
Point	Line	Area	Volume
Qualitative 	Qualitative 	Qualitative 	Qualitative NONE
Quantitative 	Quantitative 	Quantitative 	Quantitative 

Figure 10.9 Symbols to encode data on maps.

UVA's Racial Dot Map



Chloropleths

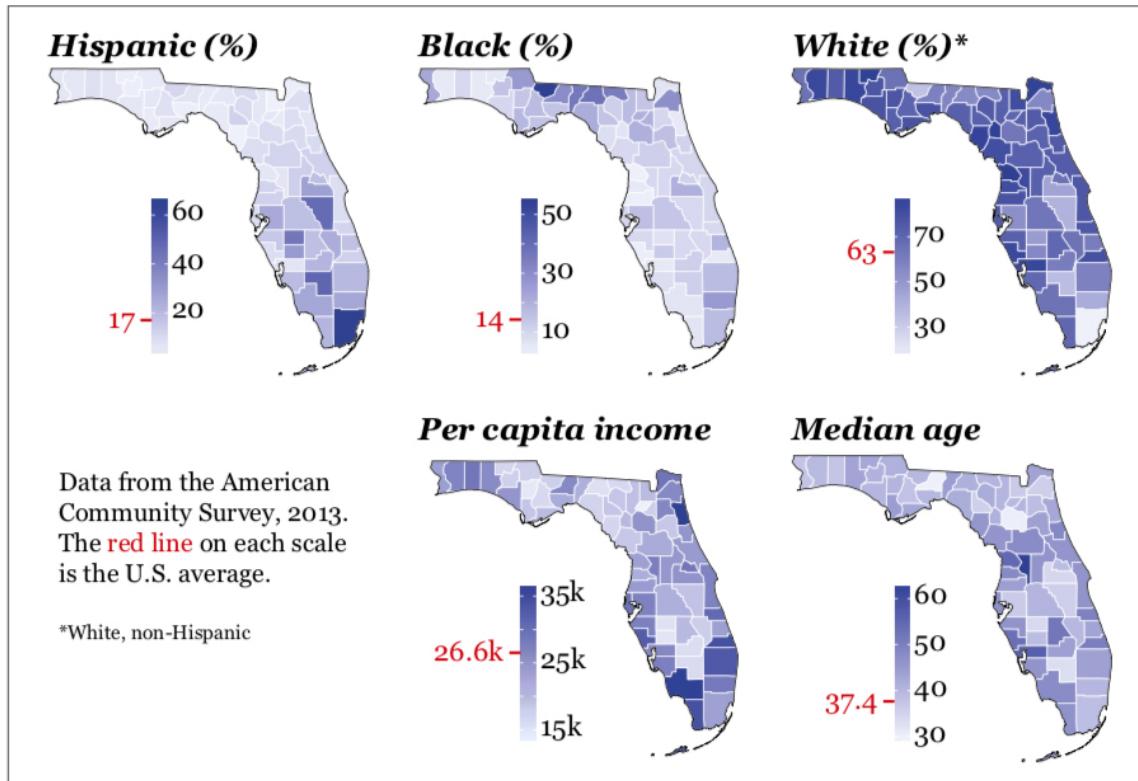


Figure 10.21 Exploring Florida with choropleth maps. Designed with code inspired by a tutorial by Ari Lamstein (www.arilamstein.com).

Chloropleths

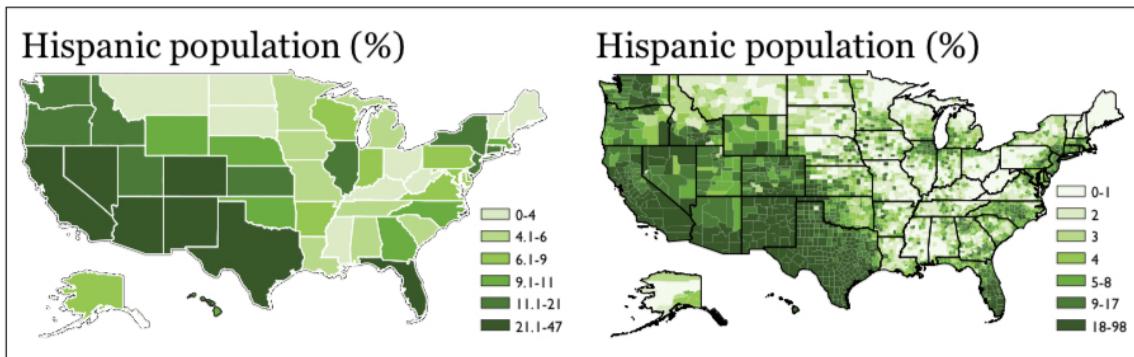


Figure 10.22 Two levels of data aggregation: state level and county level. If you paid attention to my words about projections at the beginning of this chapter, you may have noticed that these maps are based on a Web Mercator projection. That isn't a great choice, but I couldn't change the default projection in the software I was using!

Chloropleths

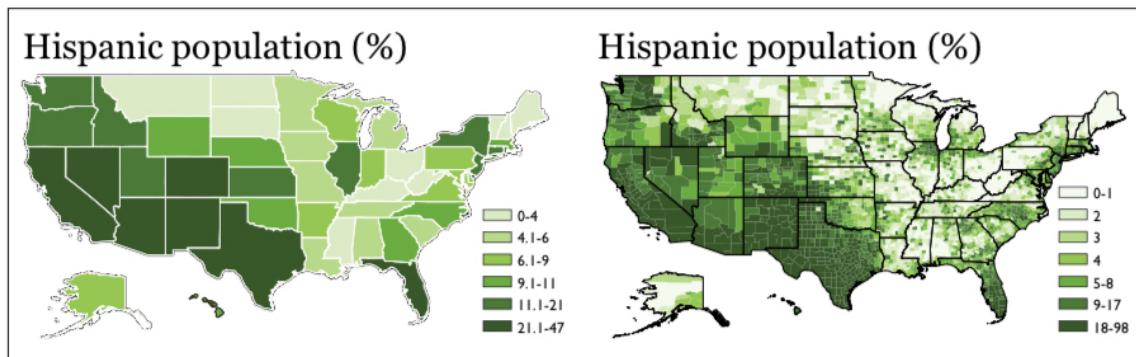


Figure 10.22 Two levels of data aggregation: state level and county level. If you paid attention to my words about projections at the beginning of this chapter, you may have noticed that these maps are based on a Web Mercator projection. That isn't a great choice, but I couldn't change the default projection in the software I was using!

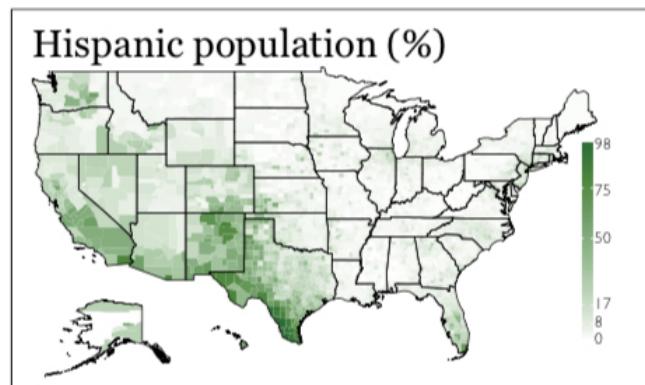


Figure 10.23 Adjusting the color scale to reveal more detail.

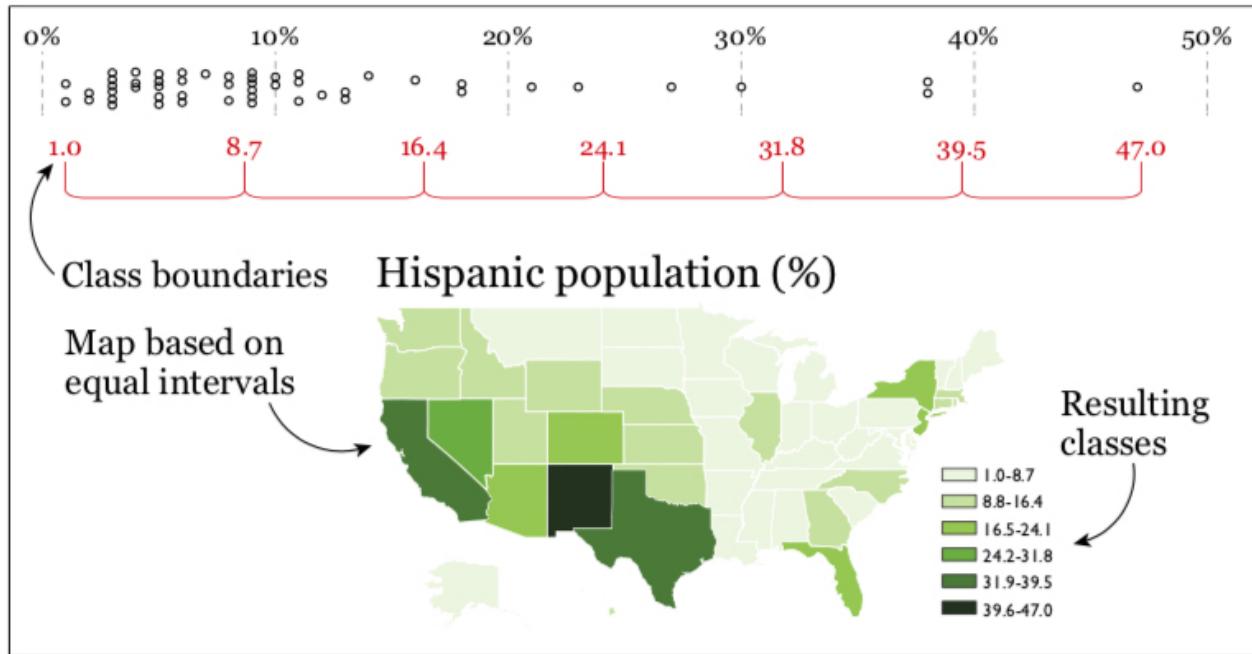


Figure 10.25 Choropleth map based on classes (intervals) of roughly equal size.

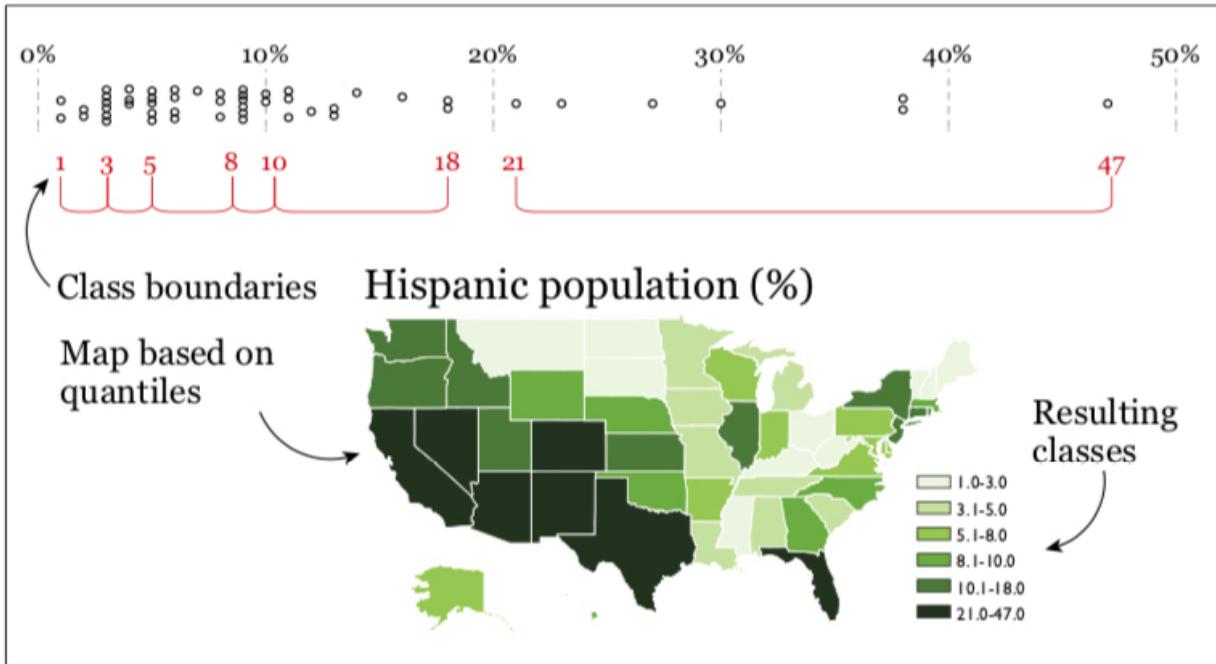


Figure 10.26 Choropleth map based on classes that contain roughly similar number of observations, between seven and ten each.

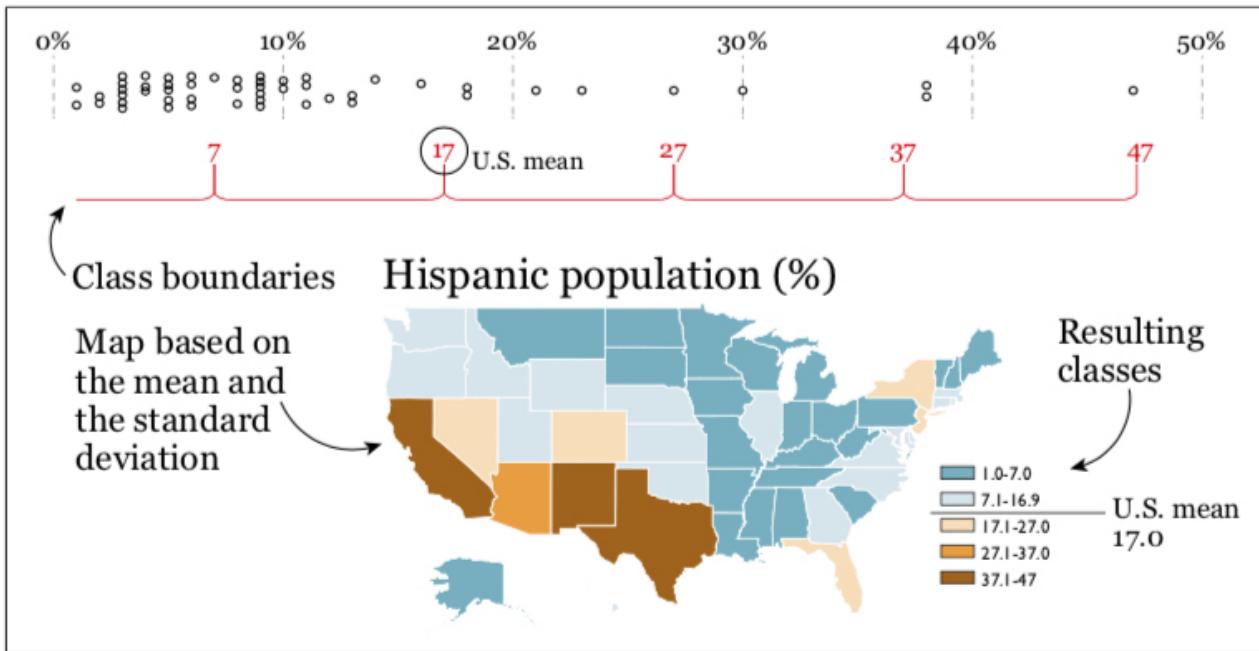


Figure 10.27 A divergent color scheme based on the mean and the standard deviation.

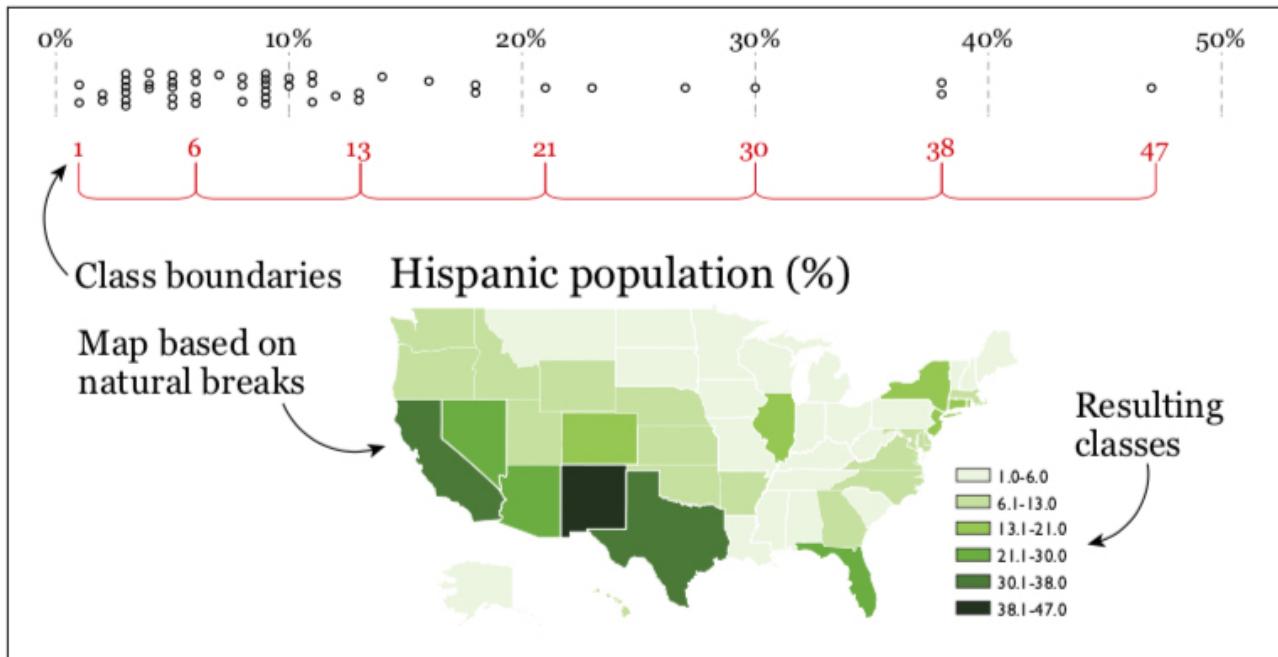


Figure 10.28 Optimal classification.

kernel density

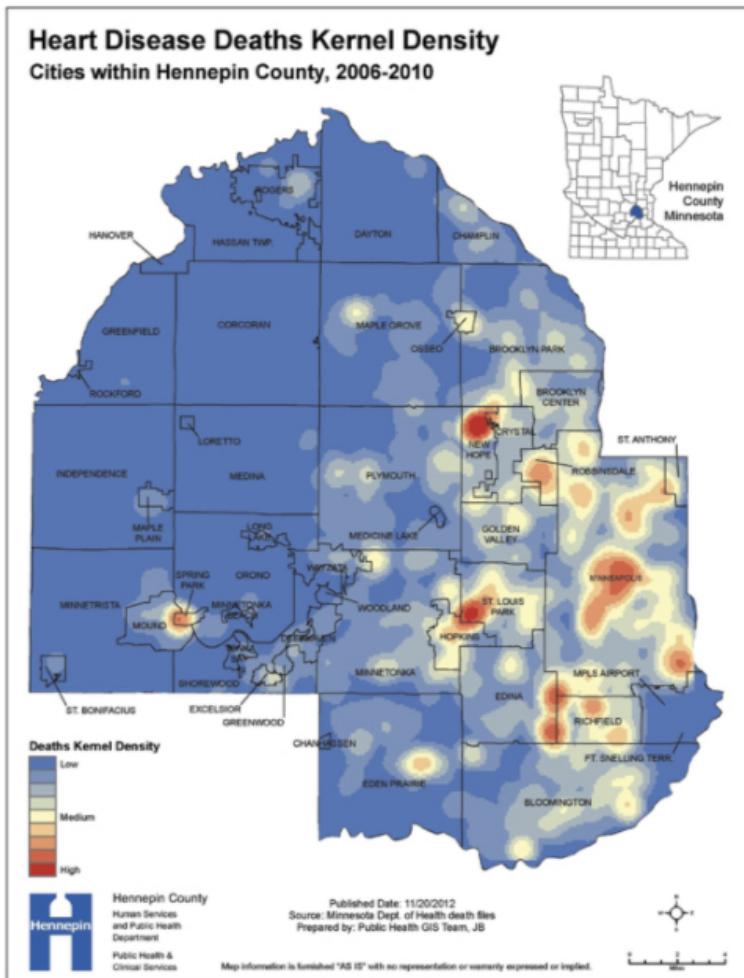


Figure 10.39 Map by Brondum J. "Heart Disease Deaths Kernel Density, Hennepin County, Minnesota."
November 2012. Hennepin County Human Services and Public Health Department.

hexabin

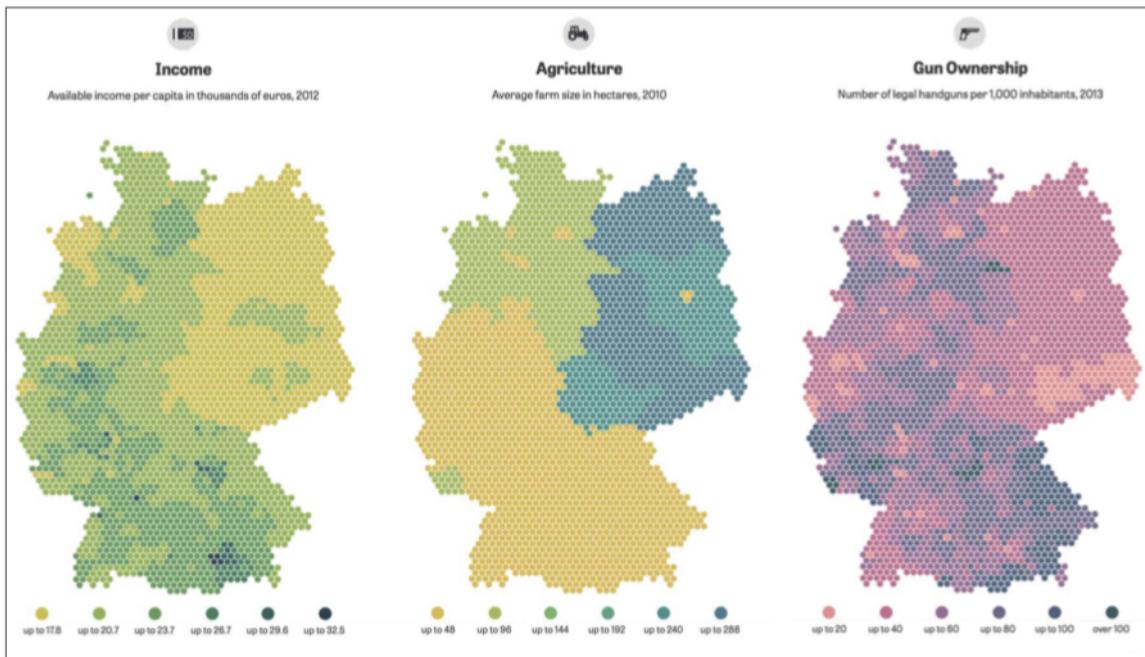


Figure 10.40 Maps from “A Nation Divided,” Zeit Online:
<http://zeit.de/feature/german-unification-a-nation-divided>.
Notice the stark differences between West Germany and East Germany.

3d height

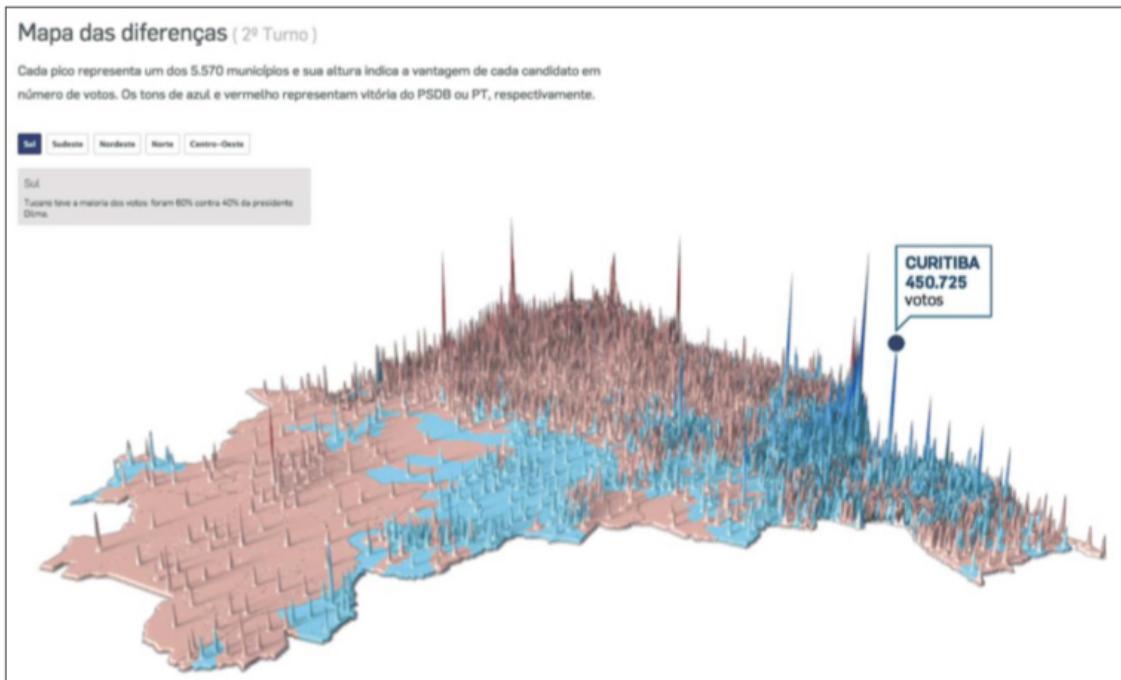


Figure 10.41 Estado de São Paulo. Presidential election results:
<http://infograficos.estadao.com.br/politica/resultado-eleicoes-2014/>.

Voronoi of Airport locations



Figure 10.42 Voronoi map of U.S. airports, by Mike Bostock:
<http://bl.ocks.org/mbostock/4360892>.

3D Voronoi of Airport locations

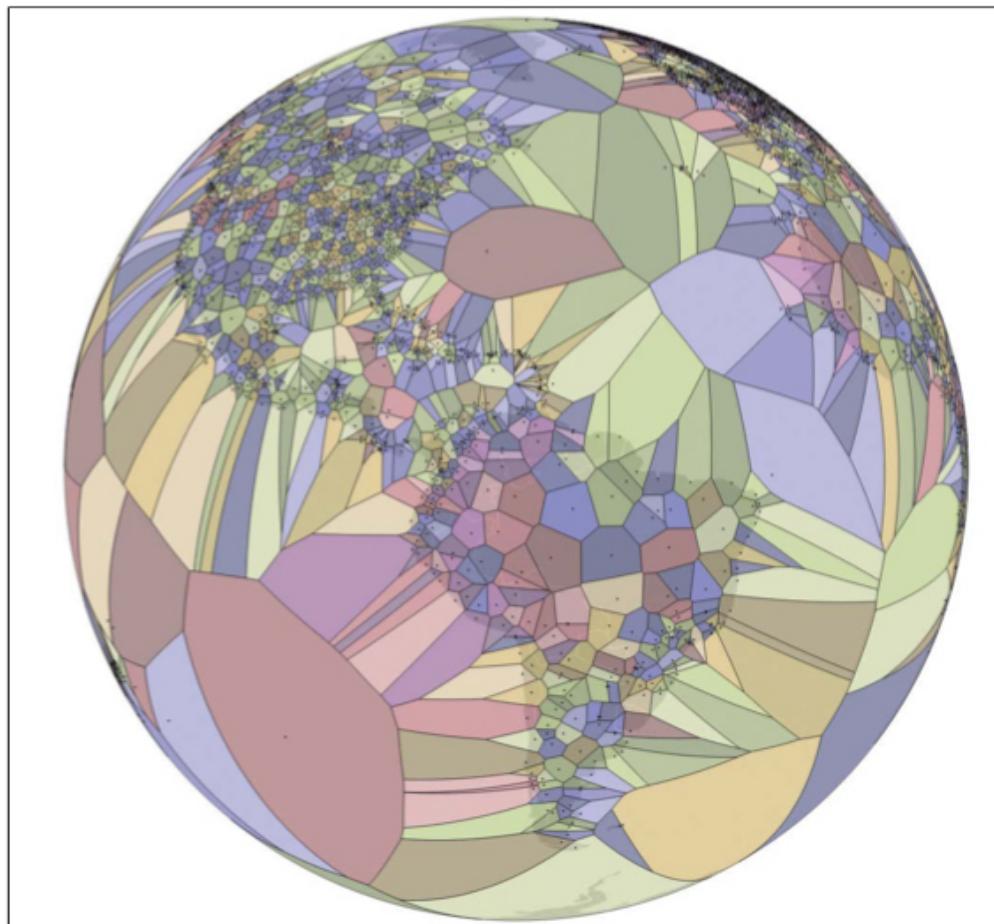


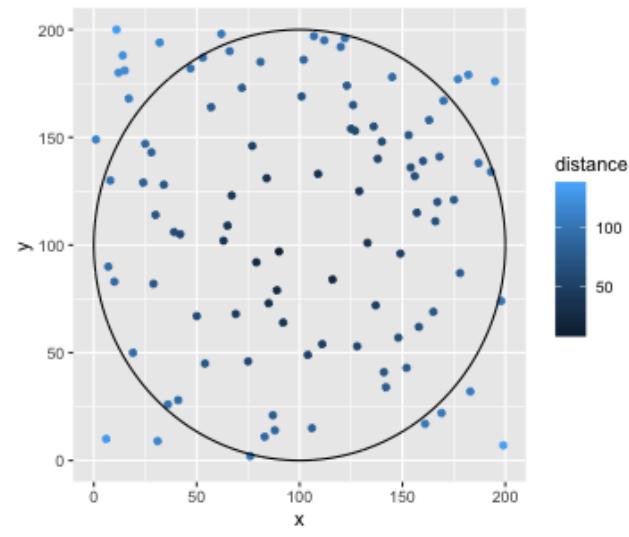
Figure 10.43 Interactive 3D Voronoi map of world airports, by Jason Davies:
<https://www.jasondavies.com/maps/voronoi/airports/>.

```
library(ggvoronoi)
```

```
head(points, n = 2)
```

```
##      x    y   distance
## 1 152  43  77.15569
## 2  14 188 123.04471
```

```
ggplot(points) +
  geom_point(aes(x,y,color=distance)) +
  geom_path(data=circle,aes(x,y,group=group))
```



```
ggplot(points, aes(x,y,fill=distance)) +
  geom_voronoi() +
  stat_voronoi(geom="path") +
  geom_point()
```

