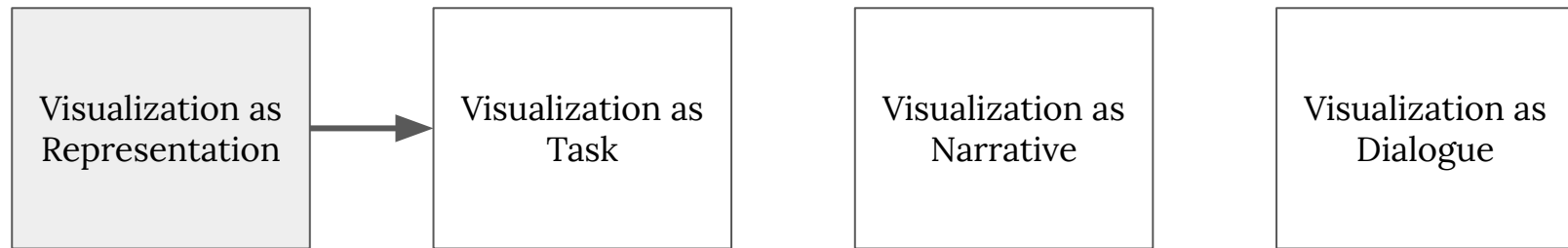


New Languages / Complex Types

A Samuel Pottinger
Stat 198: IDSV
Mar 10, 2025

Context Setting



> Charts without names: Using dimensions, measures, and encodings to read a graphic.

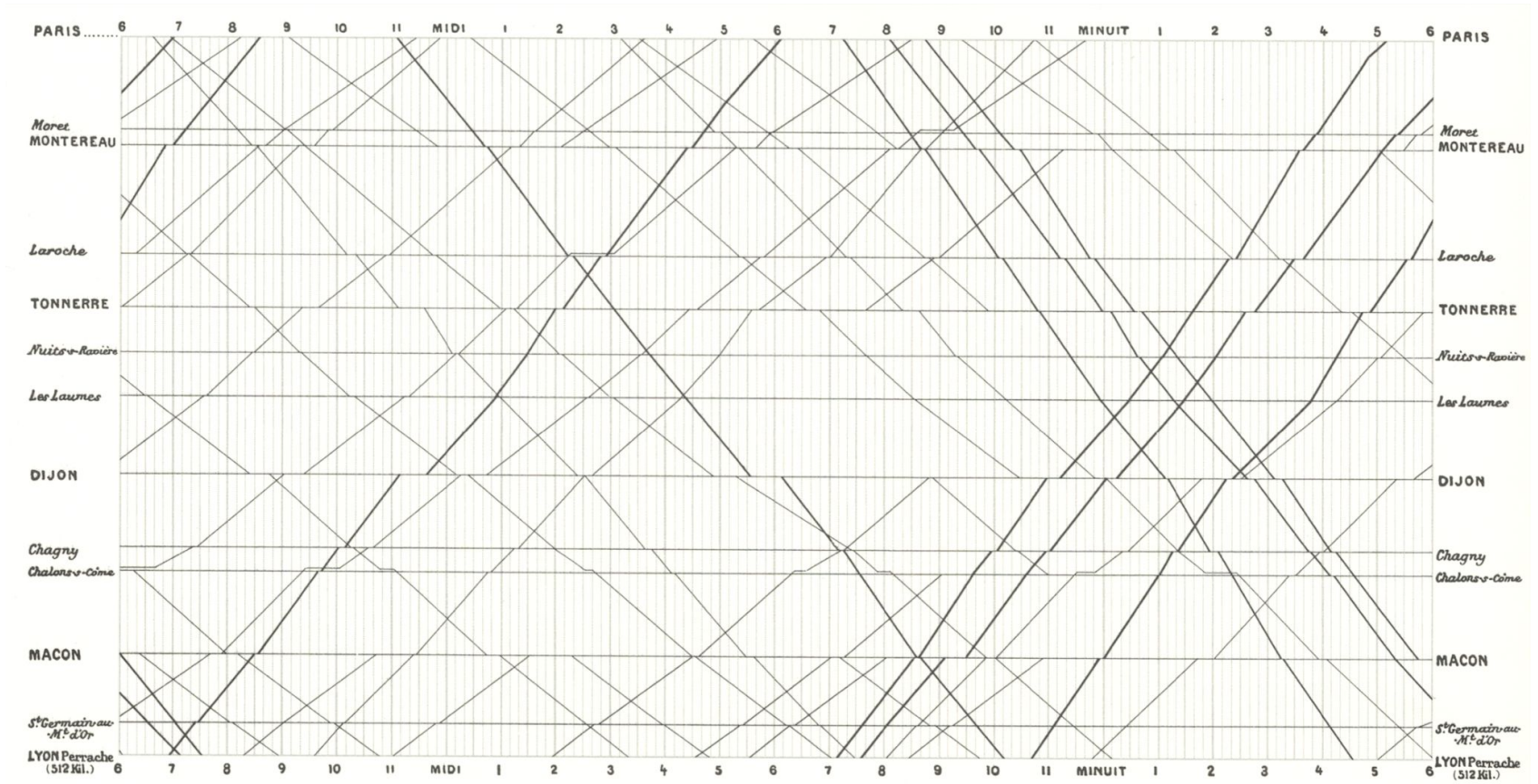
More tips for complexity: Movements and levels

Group activity: Homework 11 in class!

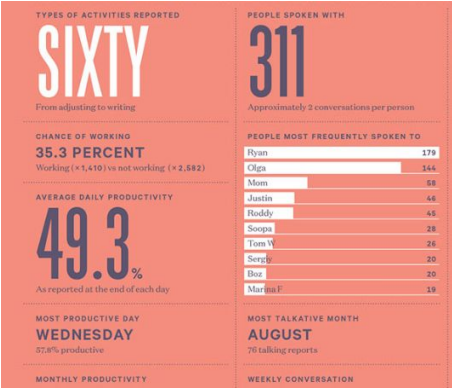
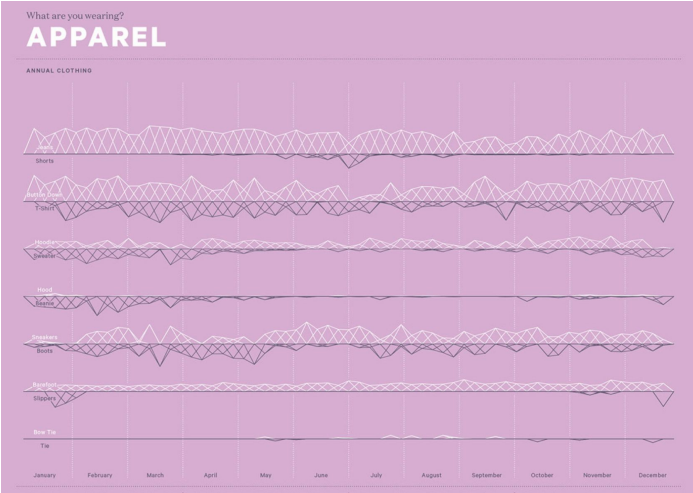
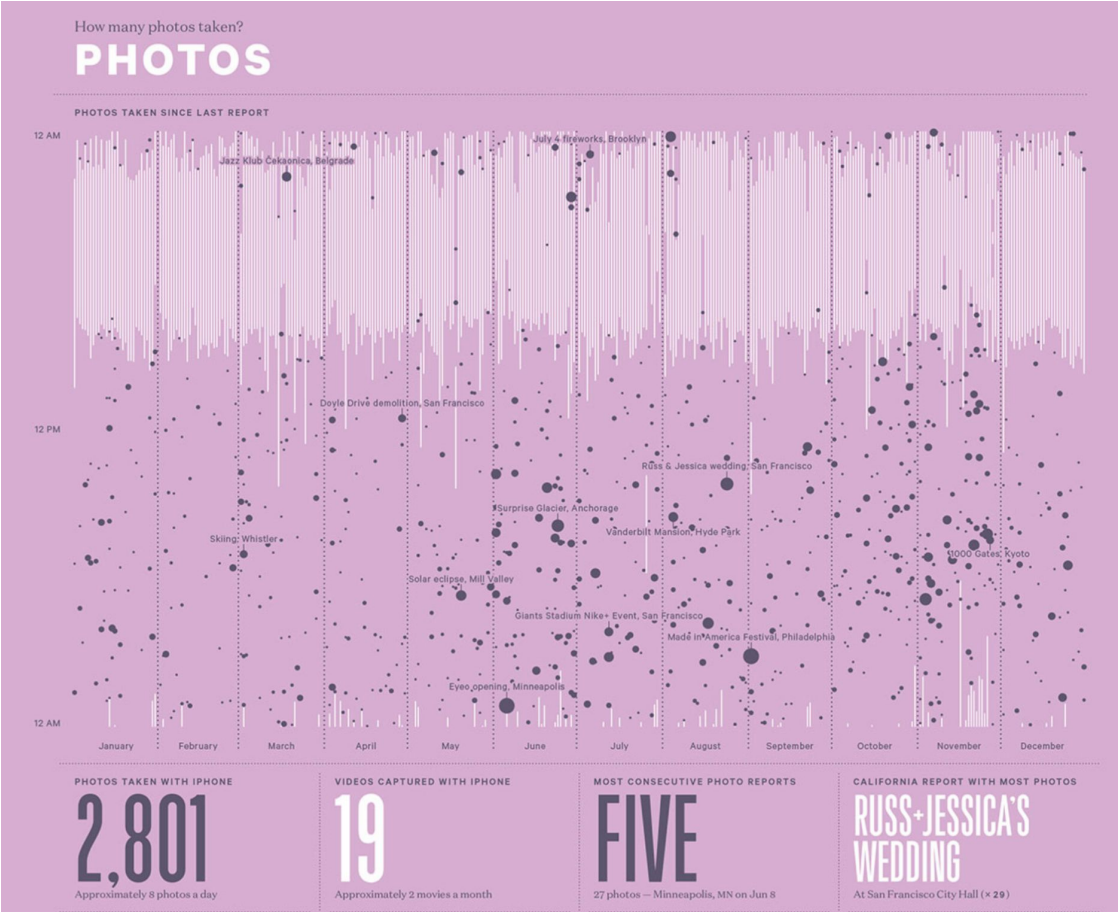
Complex data: what non-CSV data inputs might look like.

Advice for maps: using the first perspective to navigate maps.

Charts without names - Marey



Charts without names - Felton



Charts without names - Minard

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.
Dessinée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite - Paris, le 20 Novembre. 1869

Les nombres d'hommes présents sont représentés par les largueurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en lettres des zones. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Chiers, de Fézensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre. Pour mieux faire juger à quel point la dévastation de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davout qui avaient été détachés sur Minsk et Mielnik aient rejoint avec Ouchakov-Witold, avaient toujours marché avec l'armée.

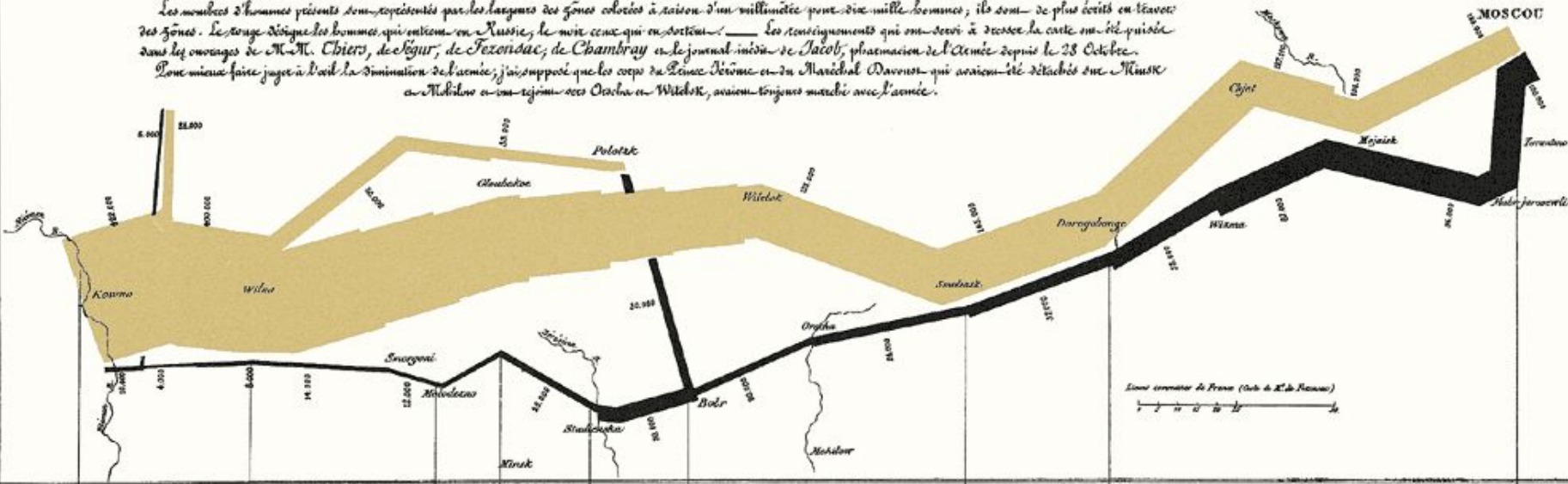
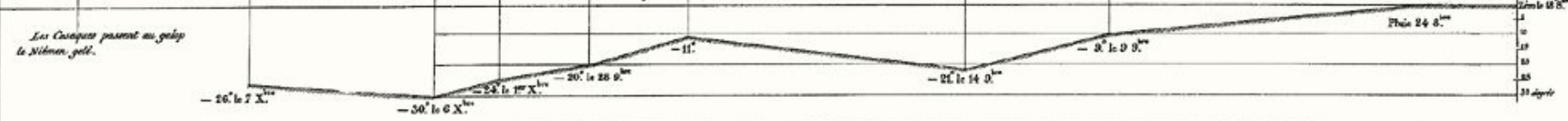


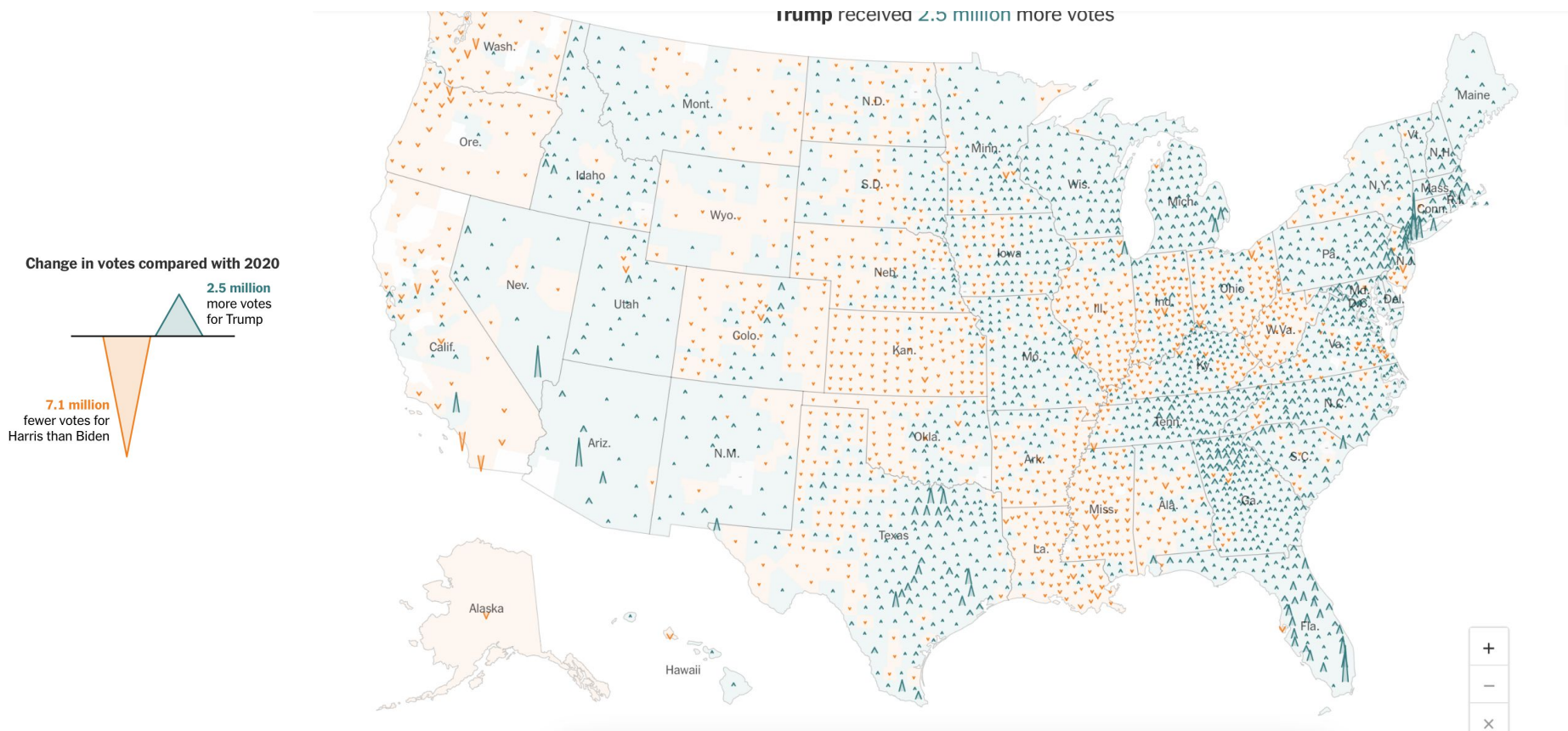
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



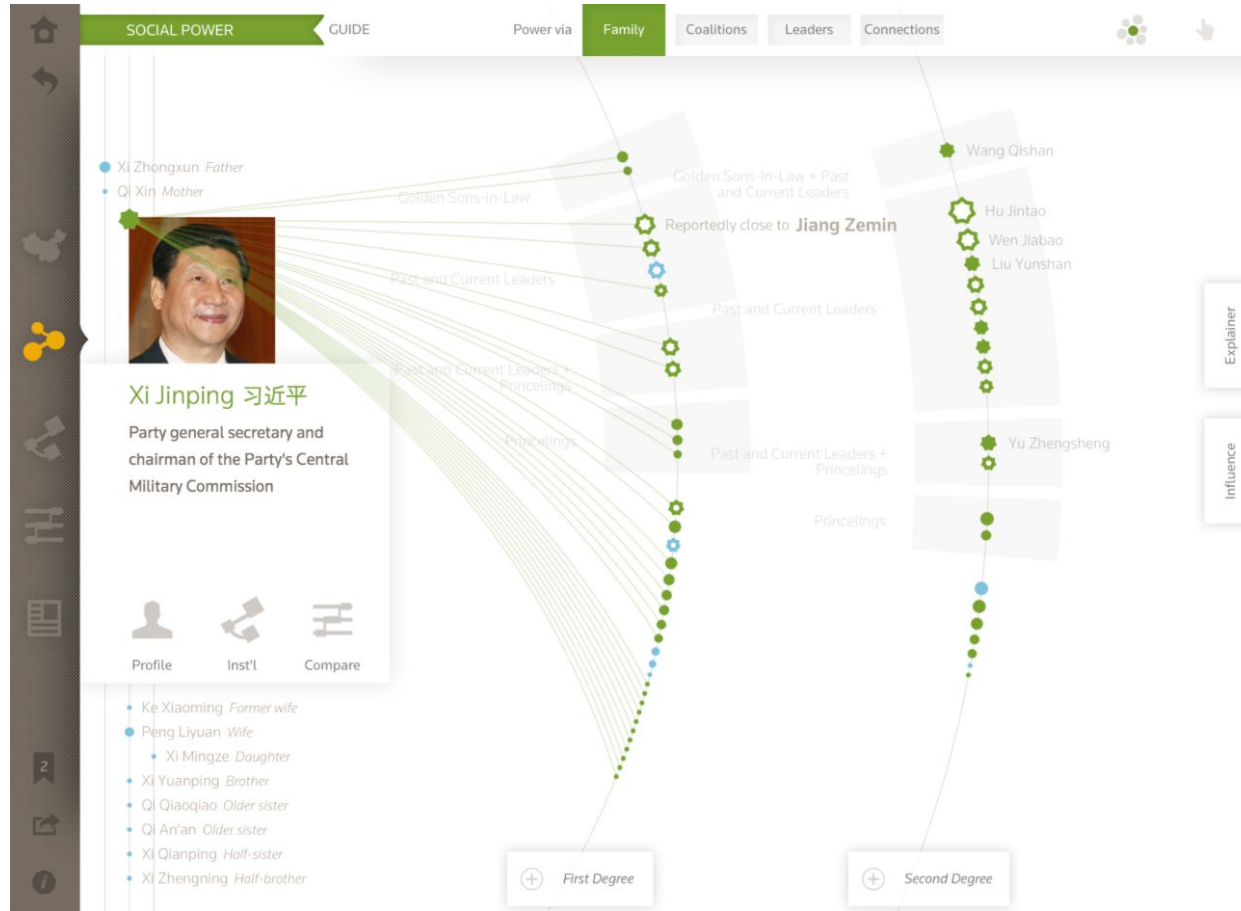
Avec par Engestr, 1. Par 3^e Mars 1870 à Paris.

Dep. Nat. Représ. à Comptes.

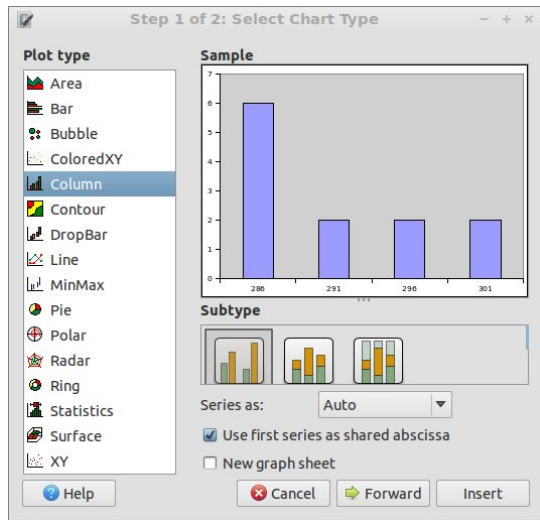
Charts without names - NYT



Charts without names - Fathom



Charts without names



Instead of thinking in chart names, think in encodings.

What are the dimensions and measures?

How can I map those to encoding devices?

Today

Charts without names: Using dimensions, measures, and encodings to read a graphic.

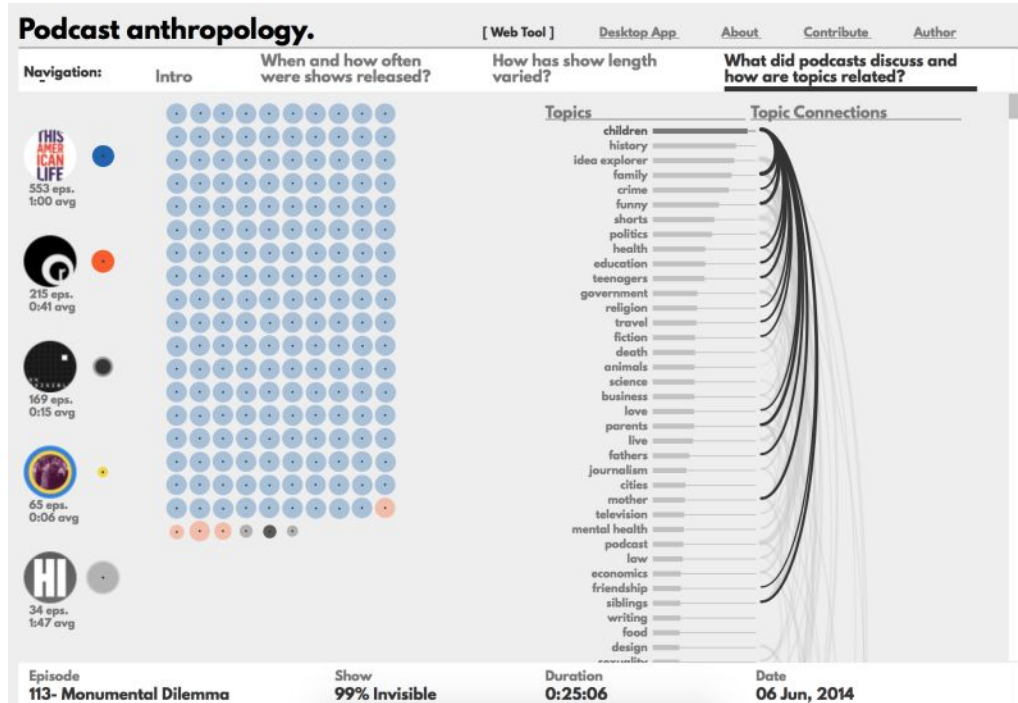
> More tips for complexity: Movements and levels

Group activity: Homework 11 in class!

Complex data: what non-CSV data inputs might look like.

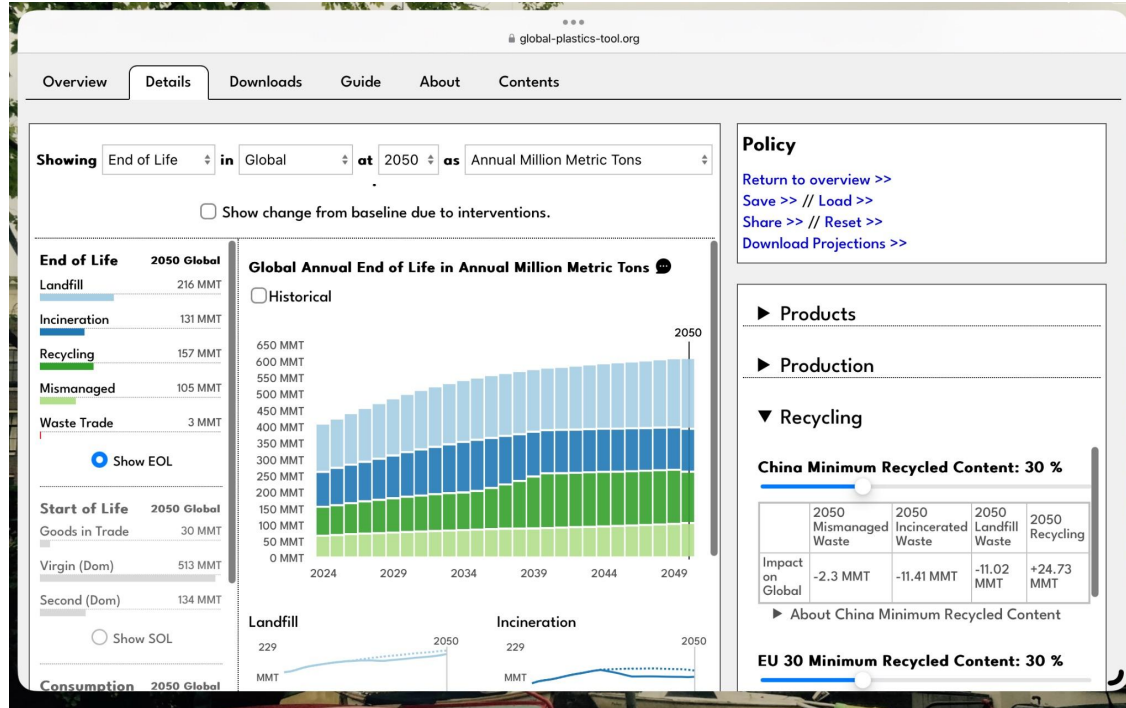
Advice for maps: using the first perspective to navigate maps.

Movements



Podcast Anthropology

Levels



Global Plastics Tool

Two new tools

Movements: Reuse visual motifs or graphical representations across multiple plots to create a story between them. (Jonathan Harris)

Levels: Start with very simple graphics but, as the user spends more time interacting, add in more sophistication (Ben Fry)

Today

Charts without names: Using dimensions, measures, and encodings to read a graphic.

More tips for complexity: Movements and levels

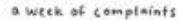
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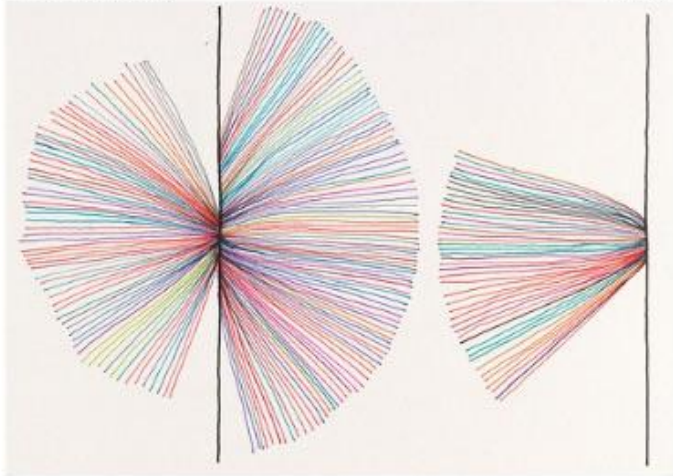
Advice for maps: using the first perspective to navigate maps.

Dear Data

Draw (by hand with a pen, no code) your last five years and your next five years.



Stefanie



Today

Charts without names: Using dimensions, measures, and encodings to read a graphic.

More tips for complexity: Movements and levels

Group activity: Homework 11 in class!

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Text formats

CSV

JSON

YAML

GeoJSON

We will do some work with GeoJSON

Name	Age	Friends
John Doe	25	Jane Doe, Jack Smith
Jane Doe	27	John Doe, Mary Sue

CSV

We will do some work with GeoJSON

JSON

```
{
  "people": [
    {
      "age" : 25,
      "name": "John Doe",
      "friends": ["Jane Doe", "Jack Smith"]
    },
    {
      "age" : 27,
      "name": "Jane Doe",
      "friends": ["John Doe", "Mary Sue"]
    }
  ]
}
```

We will do some work with GeoJSON

GeoJSON

The screenshot shows the **geojson.io** interface. The map on the left displays California with a rectangle drawn around the San Francisco Bay Area, highlighting the city of San Francisco and surrounding areas. The right panel shows the JSON output for this selection:

```
1 {  
2   "type": "FeatureCollection",  
3   "features": [  
4     {  
5       "type": "Feature",  
6       "properties": {},  
7       "geometry": {  
8         "coordinates": [  
9           [  
10            [  
11              -121.84792412763511,  
12              37.24061239054306  
13            ],  
14            [  
15              -121.84792412763511,  
16              38.03923070198135  
17            ],  
18            [  
19              -122.9465902436149,  
20              38.03923070198135  
21            ],  
22            [  
23              -122.9465902436149,  
24              37.24061239054306  
25            ],  
26            [  

```

Mapbox, OSM

Binary formats

Protobuf

Avro

Arrow

Geotiff

Geobuf

GeoArrow

COG

Today

Charts without names: Using dimensions, measures, and encodings to read a graphic.

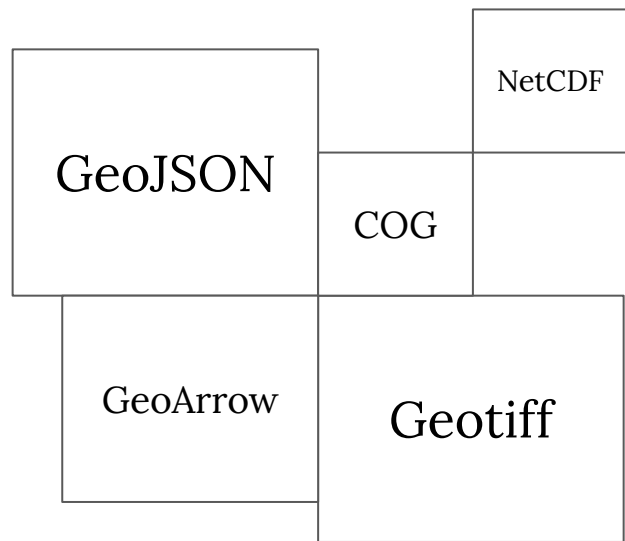
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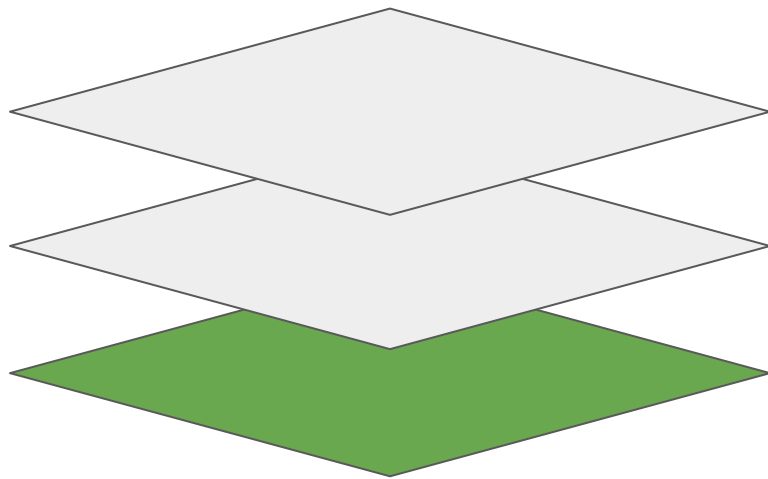
> Advice for maps: using the first perspective to navigate maps.

What makes maps hard - technically

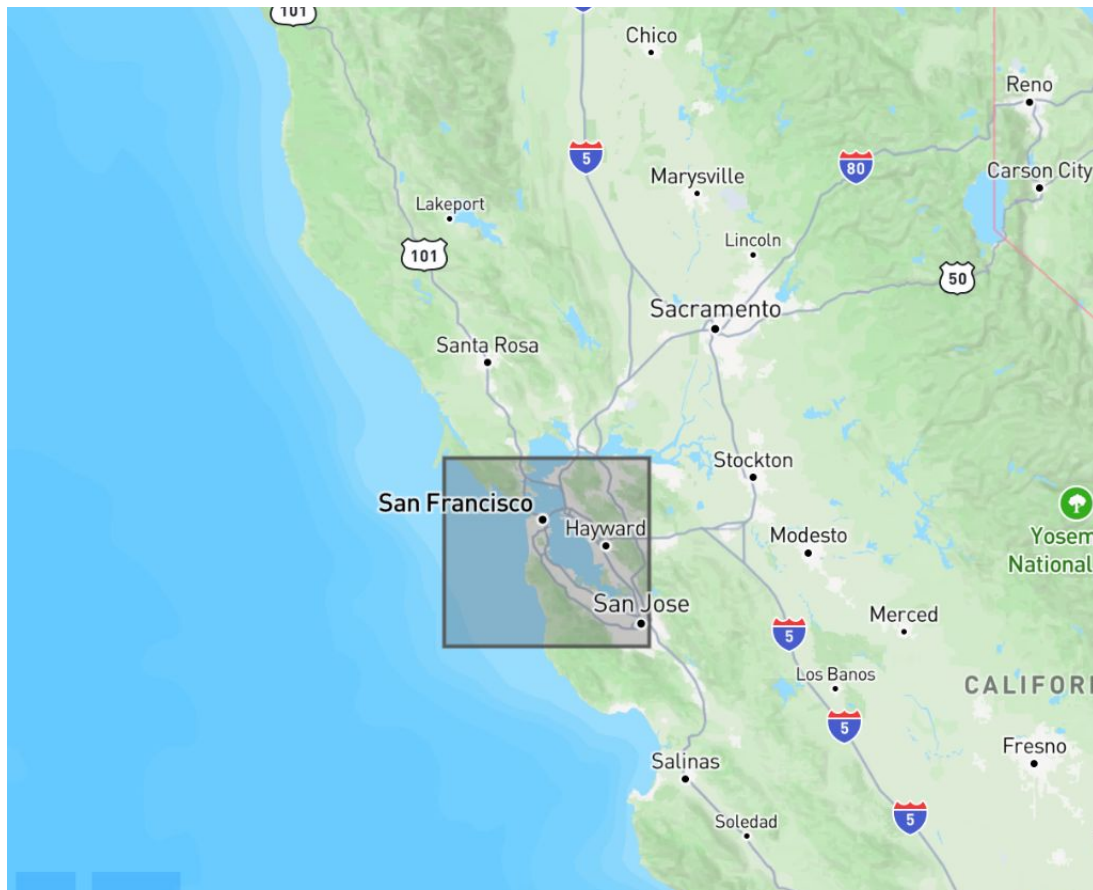


It is not uncommon to encounter geospatial datasets in the many gigabytes lots of formats

The “basemap” is also often very large.



What makes maps hard - from design

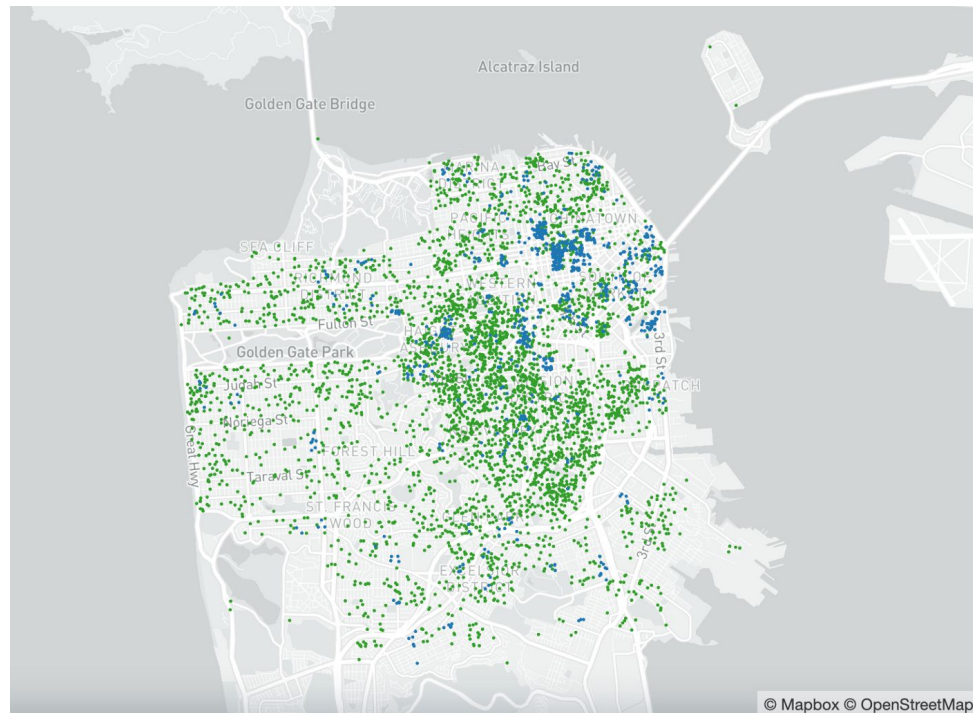


Mapbox, OSM

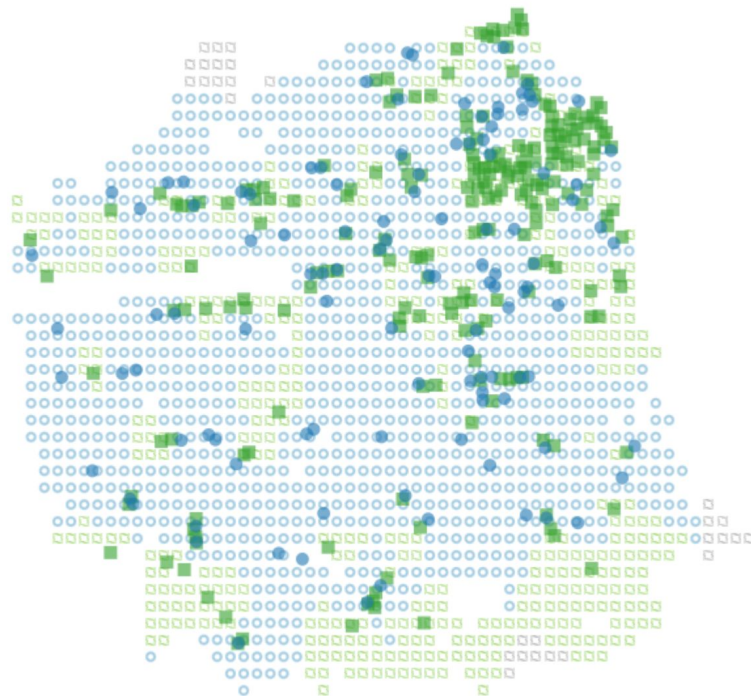
You almost always lose your best encoding device right away to vertical and horizontal position in space.

The basemap itself often includes substantial visual elements that can occlude the glyphs on top.

Applying our advice - preattentive features



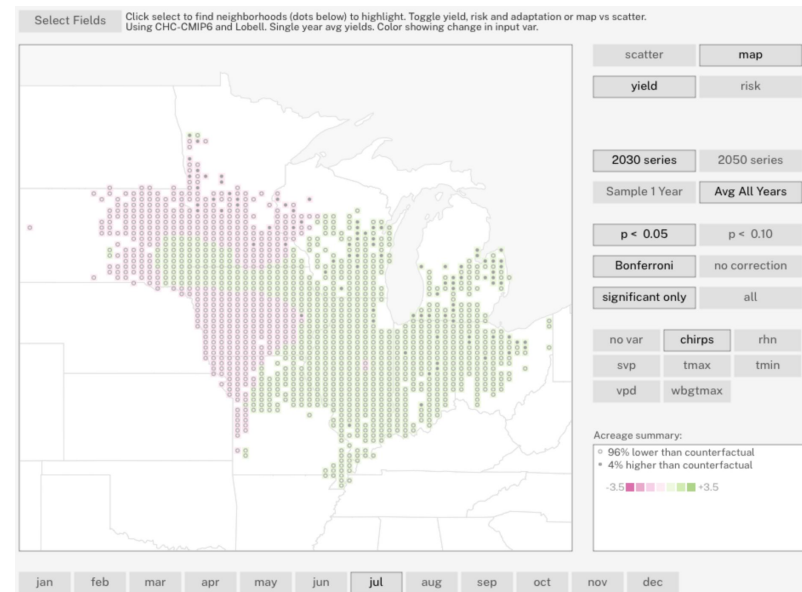
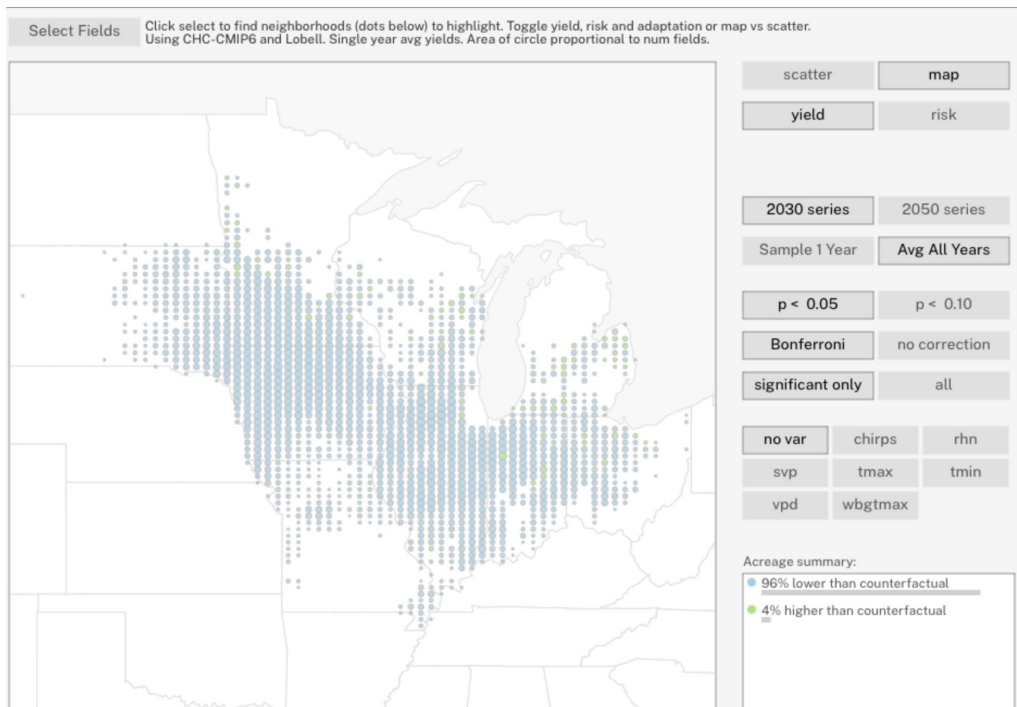
Keep a focus on things that will pop: shape, form, color.



Applying our advice - valuable encoding devices

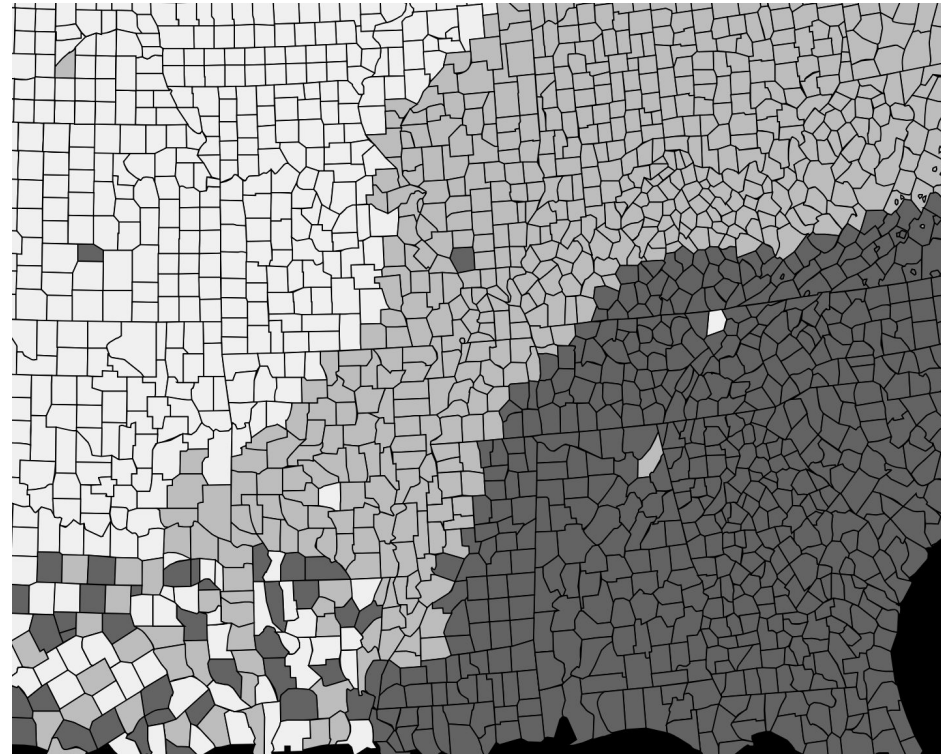
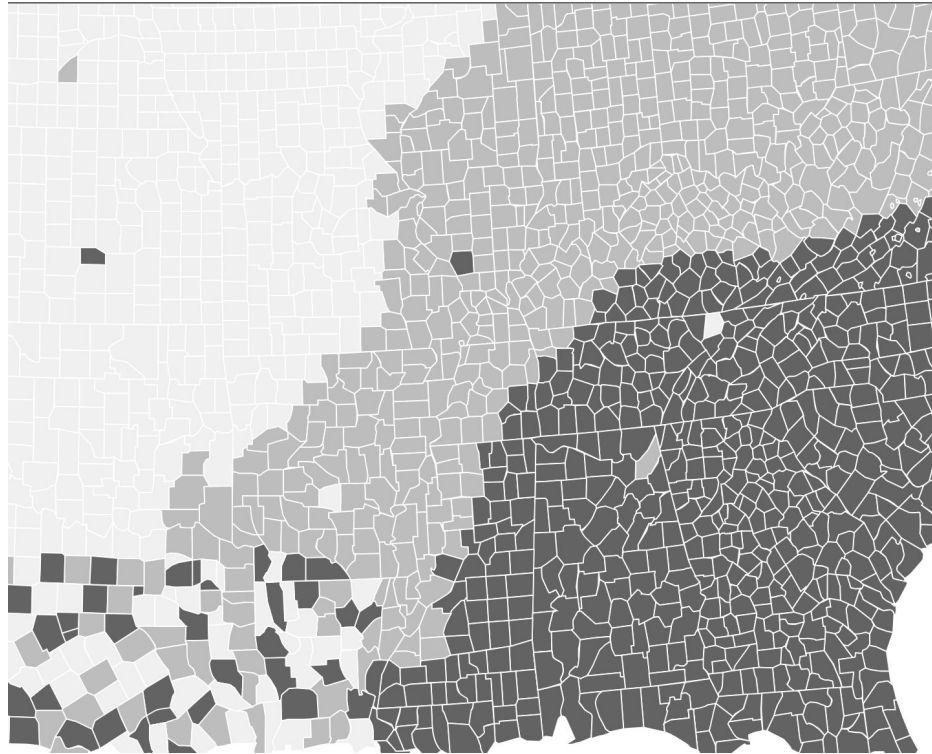
Consider area for depicting small details

Consider color for things where there are very large differences.

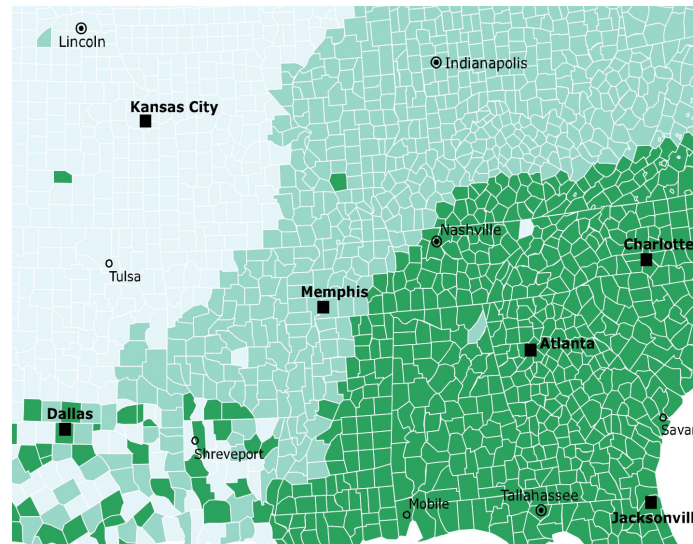
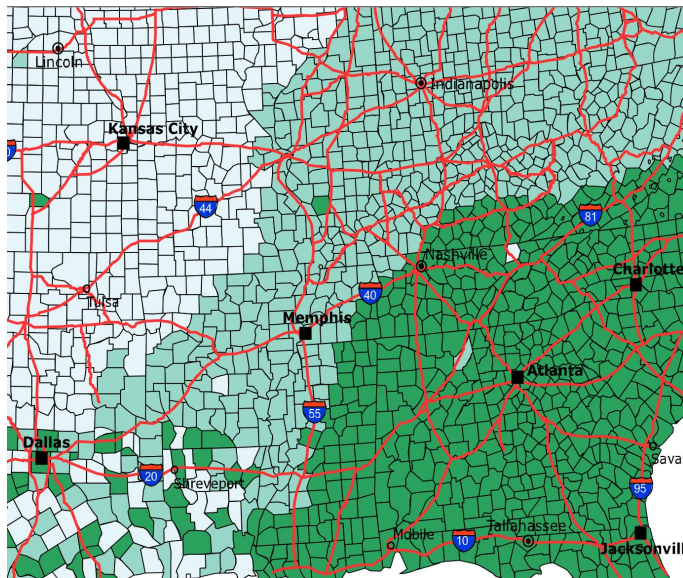
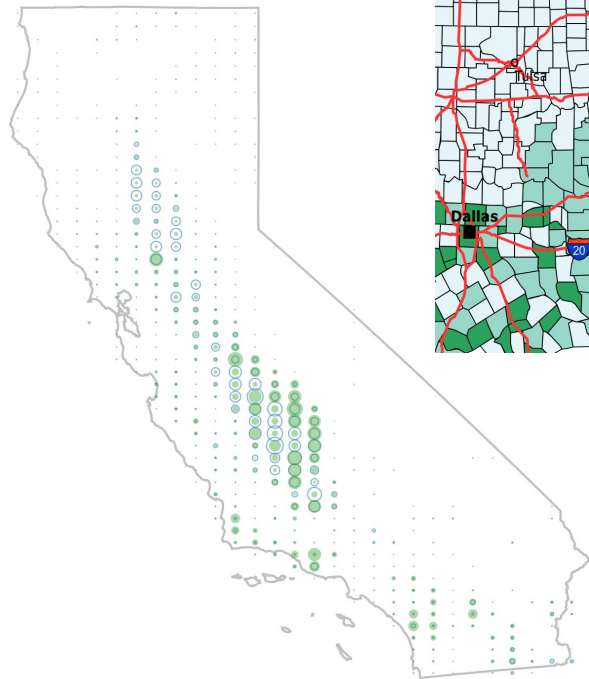


Applying our advice - quantitative color scales

Focus on contrast against background to create strong figure / ground.



Applying our advice - keep channels clear



Applying our advice - focus on the user

Teaser for the next lecture -

If we narrow our focus by understanding the user and their tasks, maybe not all of the data are relevant?

Other complex data: networks

There's more advice on networks. See the reading!

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