Data visualization and Making Maps

QERM 597 Spring 2022
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Outline

- Introduction
- Spatial data (sf package)
- Static maps (ggplot)
- Leaflet interactive maps
- Tmap static, animated, and interactive maps

Data visualization tips from Stephen Herd

Box 12.1 Numbers in text vs. graphics

For displaying two or three numbers, a graphic wastes page space, and asks your reader to divert attention from text to graphic and back again: "*Fertilized seeds were larger than unfertilized ones (Figure A)*". This could have been presented more effectively in text as "*Fertilized seeds were larger than unfertilized ones (1.8 ± 0.3 g vs 0.9 ± 0.2 g).*"

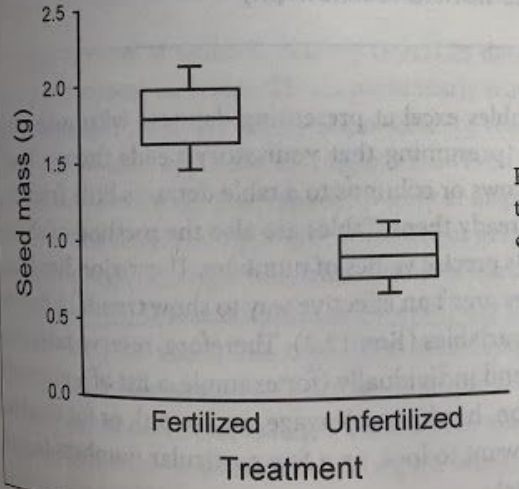


Figure A. Wasted: all this structure just to compare two numbers

(box continues next page)

- Displaying two or three numbers is a graphic waste!

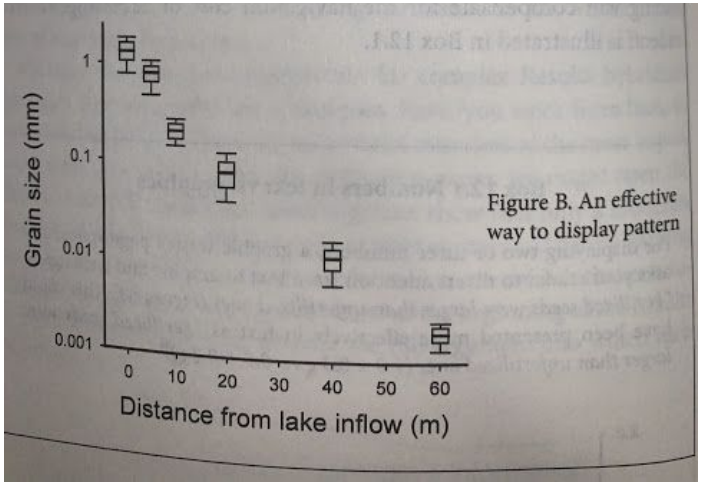
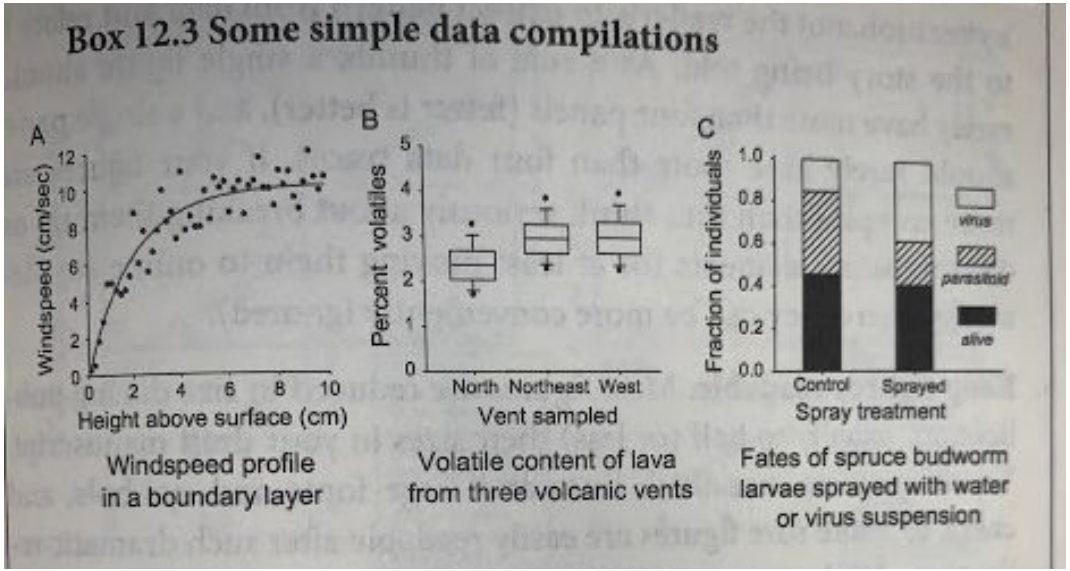


Figure B. An effective way to display pattern

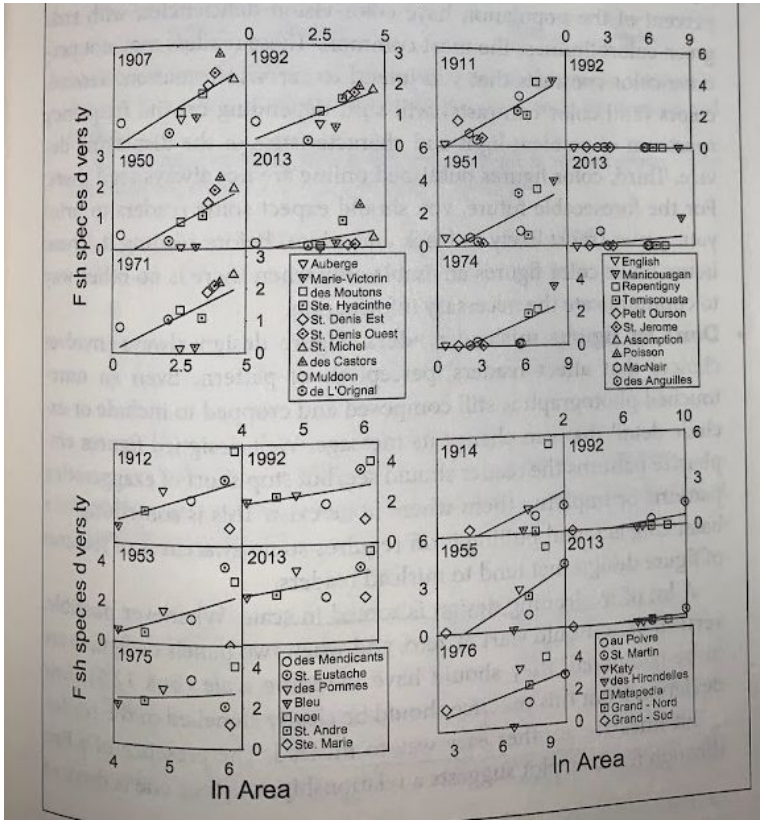
Data visualization tips from Stephen Herd

- Use straight forward and familiar types of figures



Data visualization tips from Stephen Herd

- Make figures simple and readable



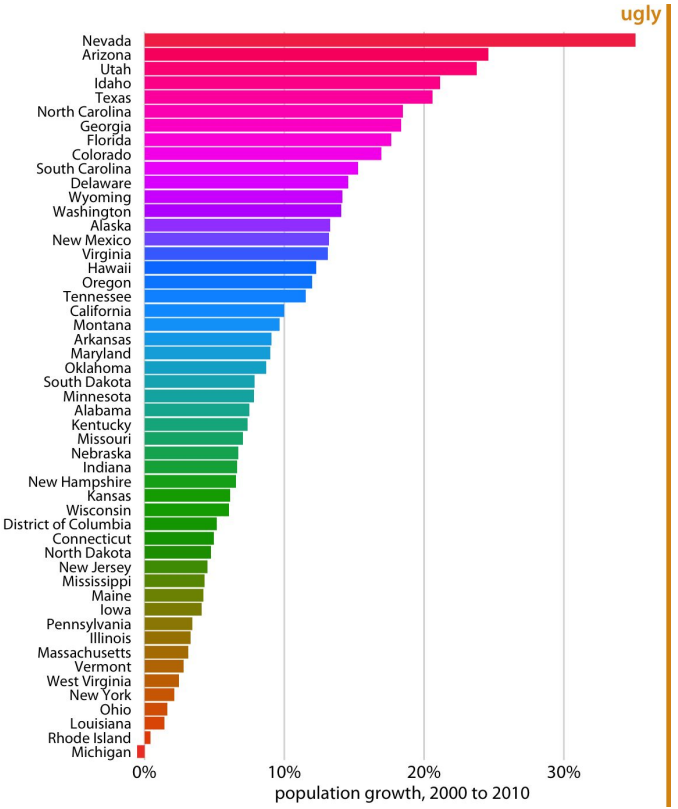
Data visualization tips from Stephen Herd

- Don't let figures mislead readers

https://www.statisticshowto.com/probability-and-statistics/descriptive-statistics/misleading-graphs/
https://topdrawer.aamt.edu.au/Statistics/Misunderstandings/Misleading-graphs/Misleading-scales

Data visualization tips from Stephen Herd

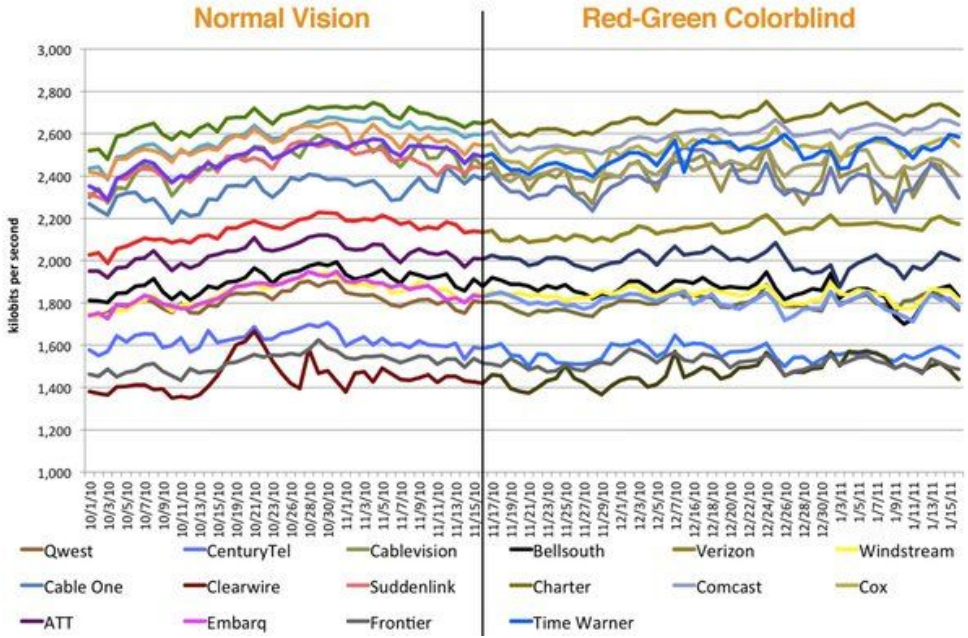
- Minimize color



https://clauswilke.com/dataviz/color-pitfalls.html

https://www.quora.com/What-are-some-bad-examples-of-utterly-unreadable-data-visualisations

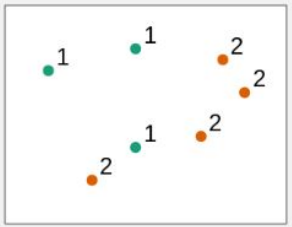
Colorblind friendly palettes



- http://www.cookbook-r.com/Graphs/Colors_(ggplot2)/#a-colorblind-friendly-palette
- https://www.quora.com/What-are-some-bad-examples-of-utterly-unreadable-data-visualisations

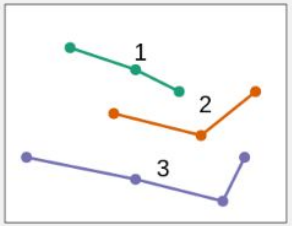
Introduction to Spatial Data

Spatial data: vector data



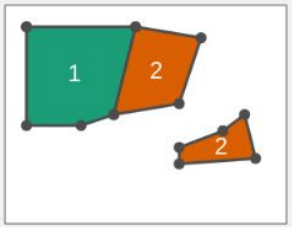
Example attributes for point data

ID	name	has	evergreen
1	Broadleaf	Leaves	FALSE
2	Conifer	Needles	TRUE



Example attributes for line data

ID	name	lanes	cycling
1	Road A	4	FALSE
2	Road B	3	TRUE
3	Road C	2	TRUE

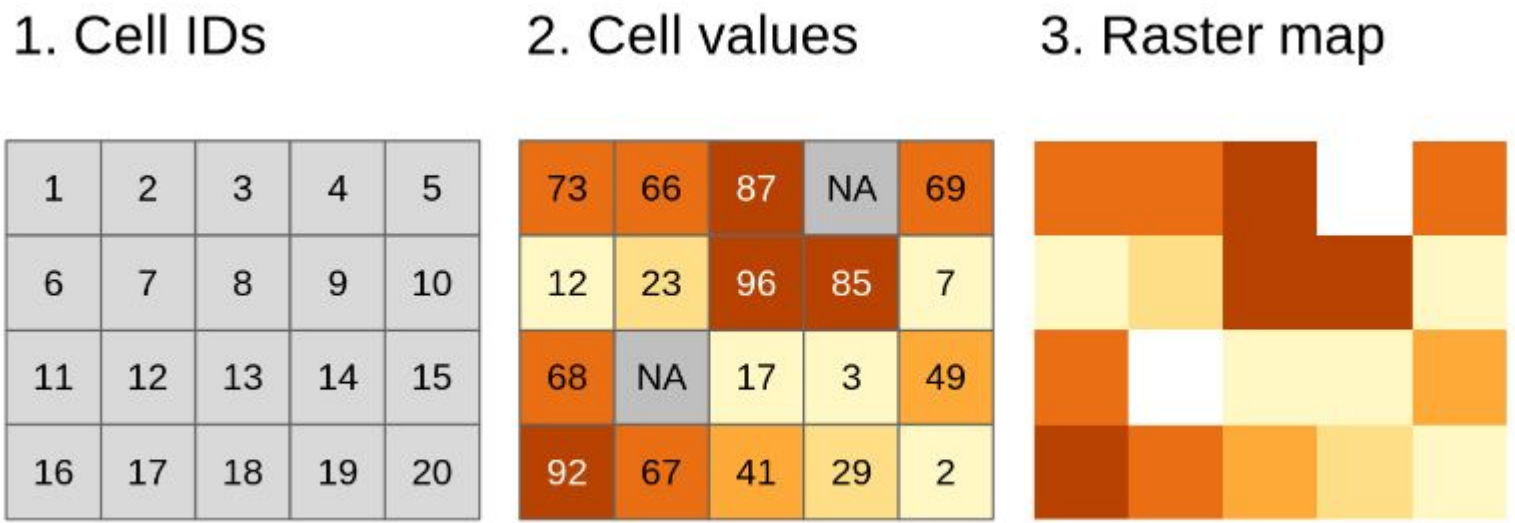


Example attributes for polygon data

ID	name	population	touristic
1	Country A	1000	FALSE
2	Country B	500	TRUE

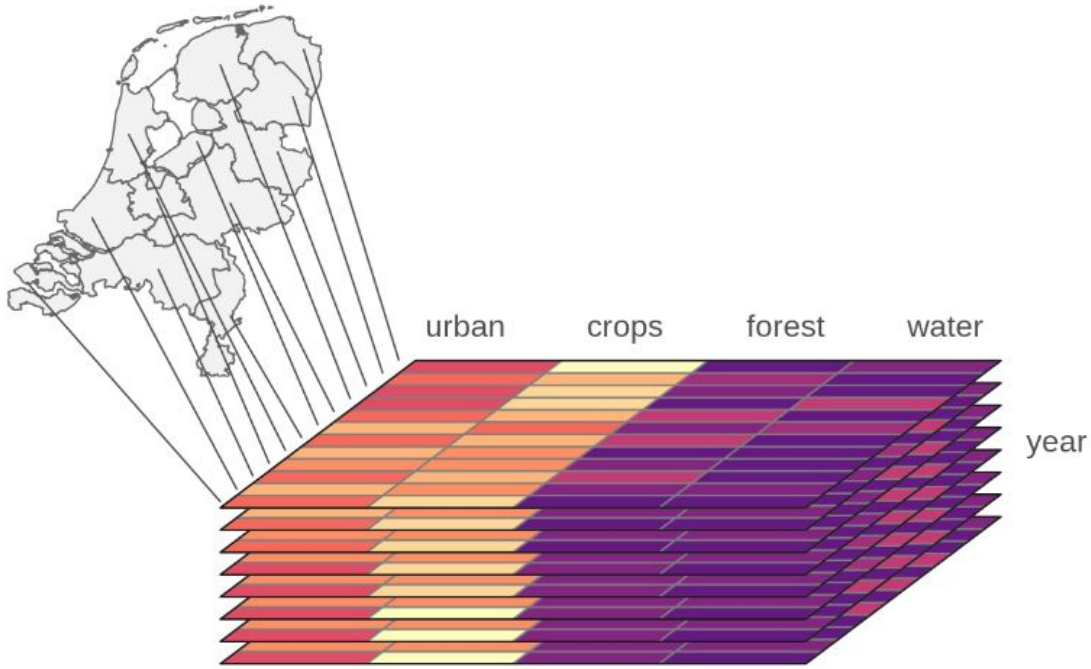
https://r-tmap.github.io/tmap-book/geodata.html

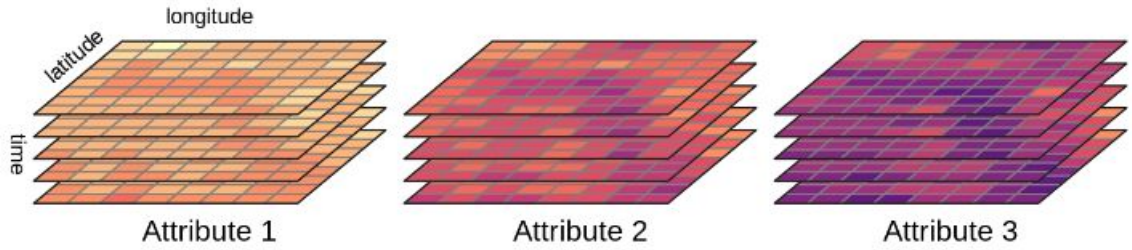
Spatial data: raster



https://r-tmap.github.io/tmap-book/geodata.html

Spatial data: spatial data cubes





https://r-tmap.github.io/tmap-book/geodata.html