Guidelines for scientific data visualization

ENS-215

(Winter 2023)

Considerations when preparing a graphic

- What point/argument does it support?
- What is the goal/purpose of the graphic?
- Who is the audience?
  - Experts in your field
  - General scientific audience (range of disciplines)
  - General public, policy makers,…

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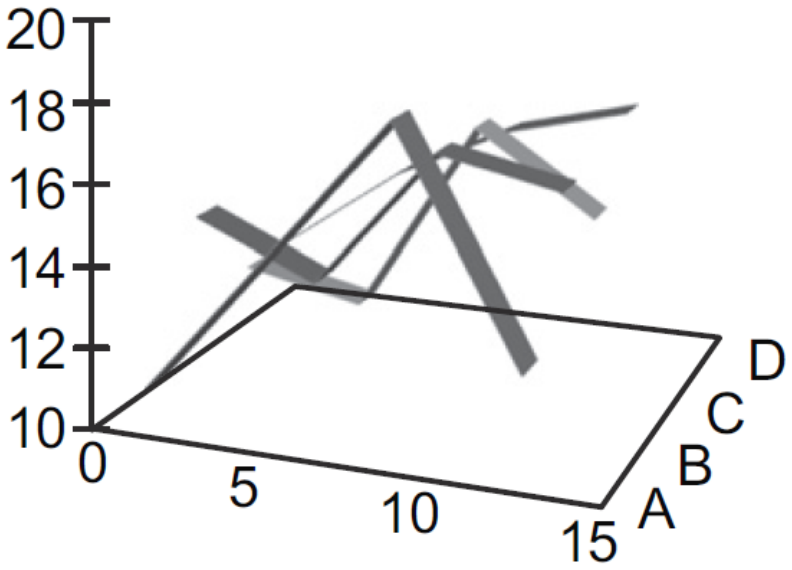
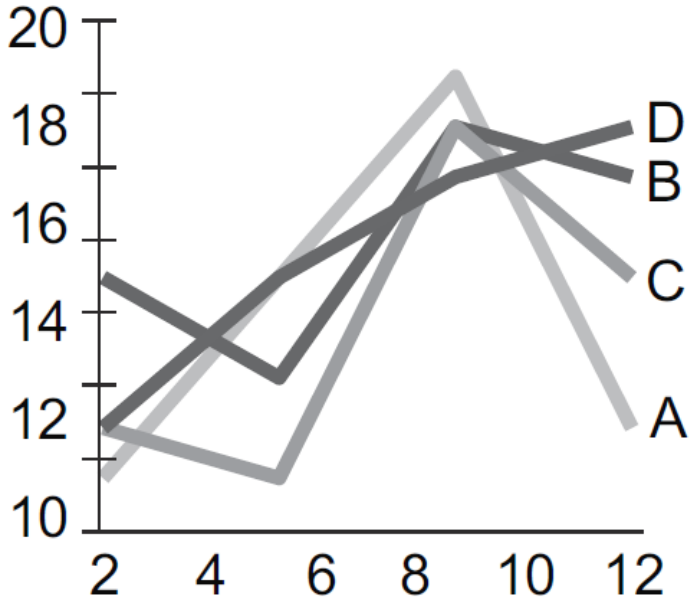
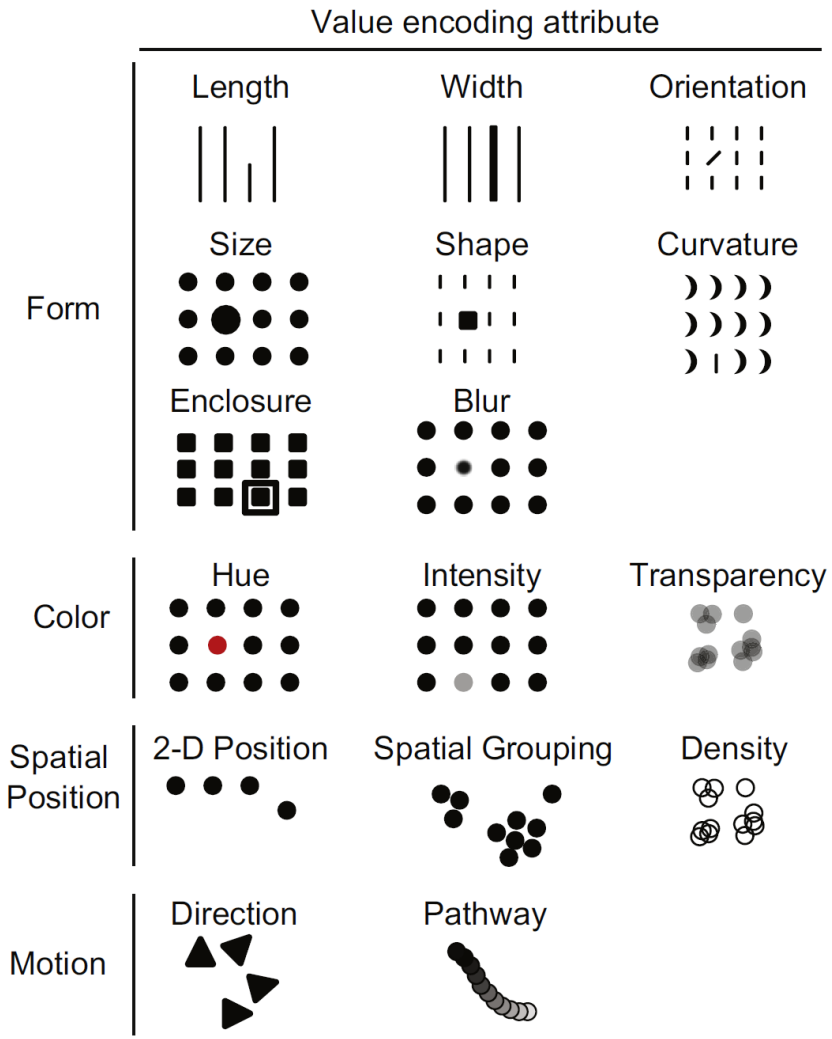
- **Is it accessible/does it reach the intended audience?**





Guideline: Create the simplest graph that conveys the information you want to convey

Kelleher and Wagener (2011)



Guideline: consider the type of encoding object and attribute used to create a plot

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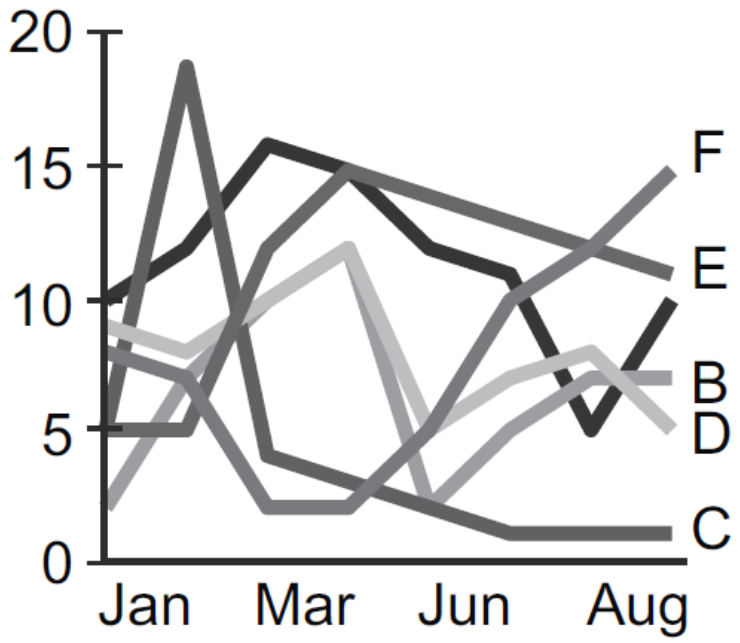
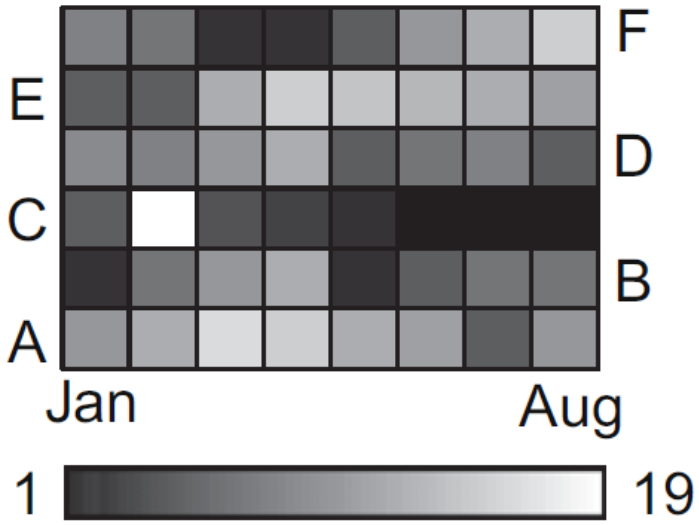
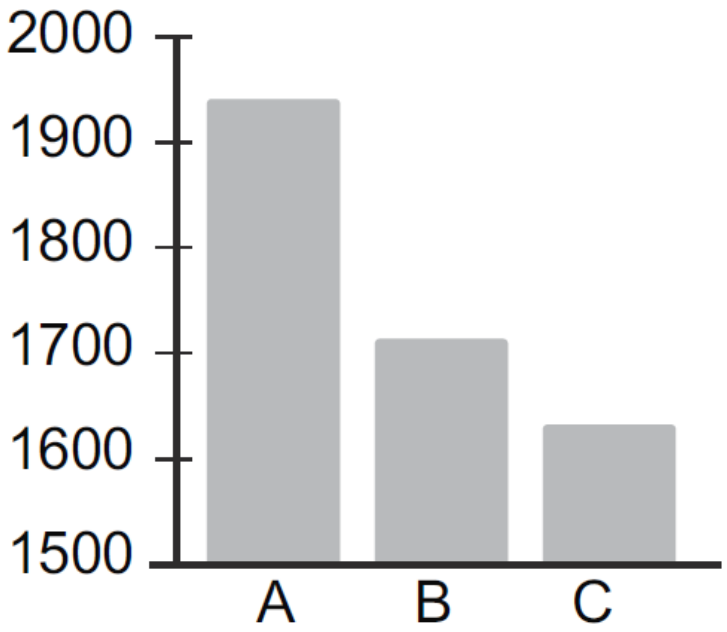
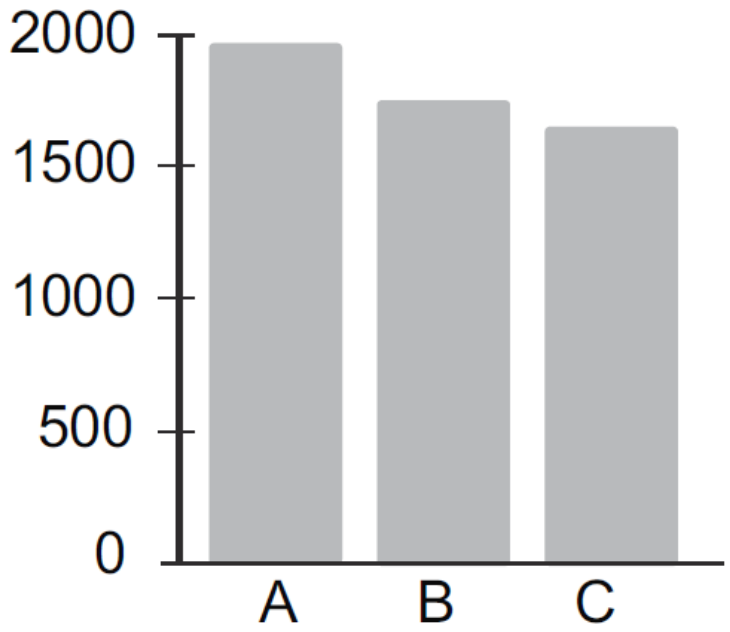




Guideline: focus on visualizing patterns or on visualizing details, depending on the purpose of the plot

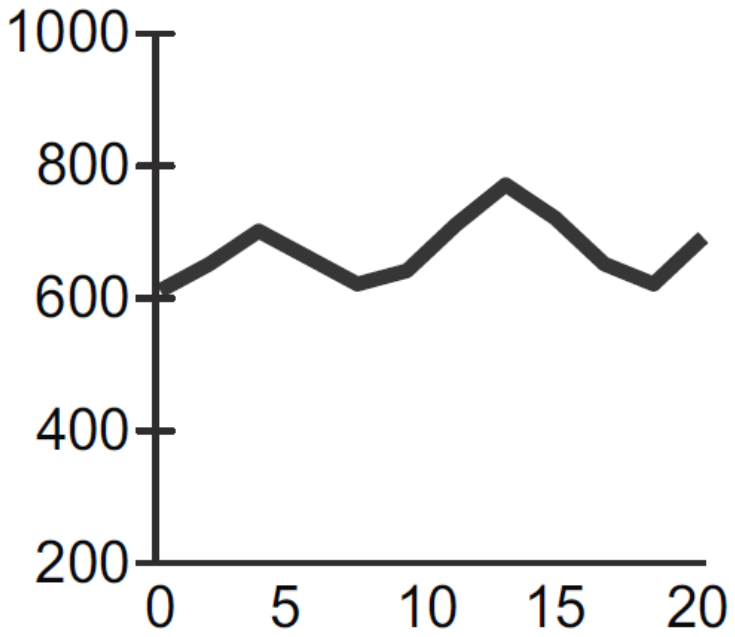
Kelleher and Wagener (2011)

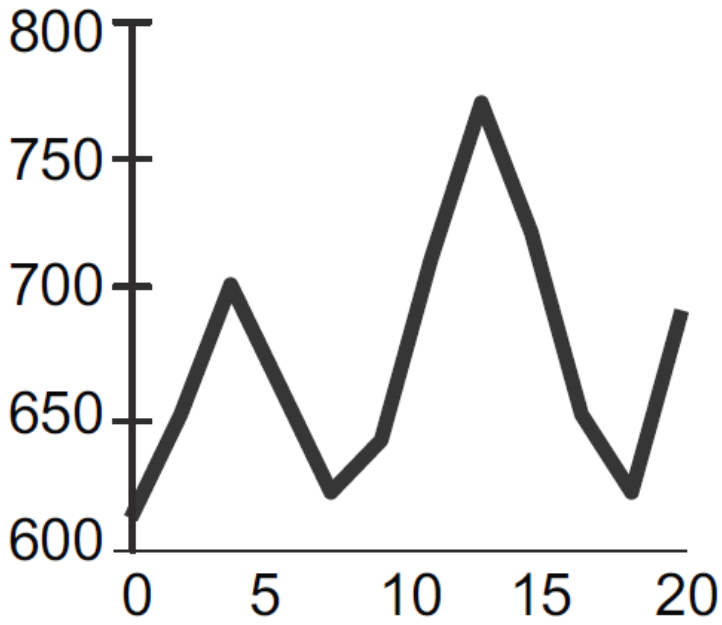




Guideline: select meaningful axis ranges

Kelleher and Wagener (2011)





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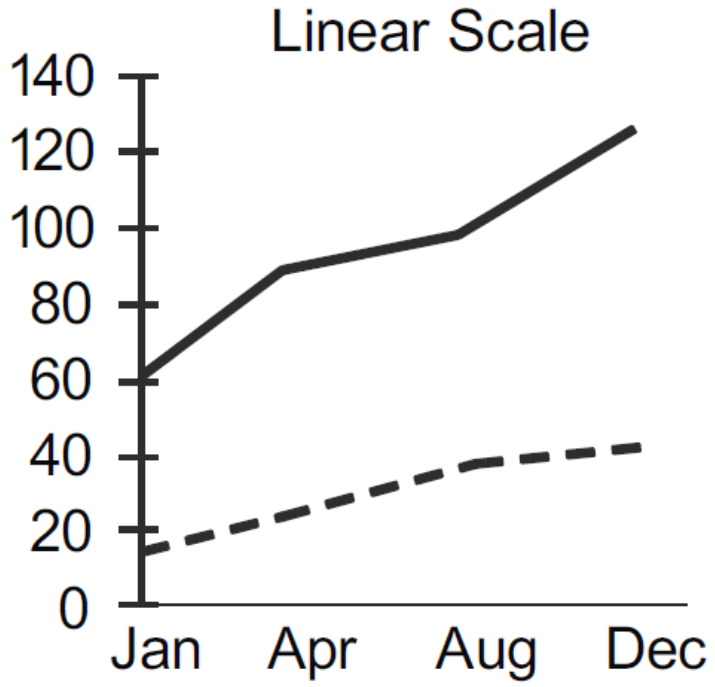

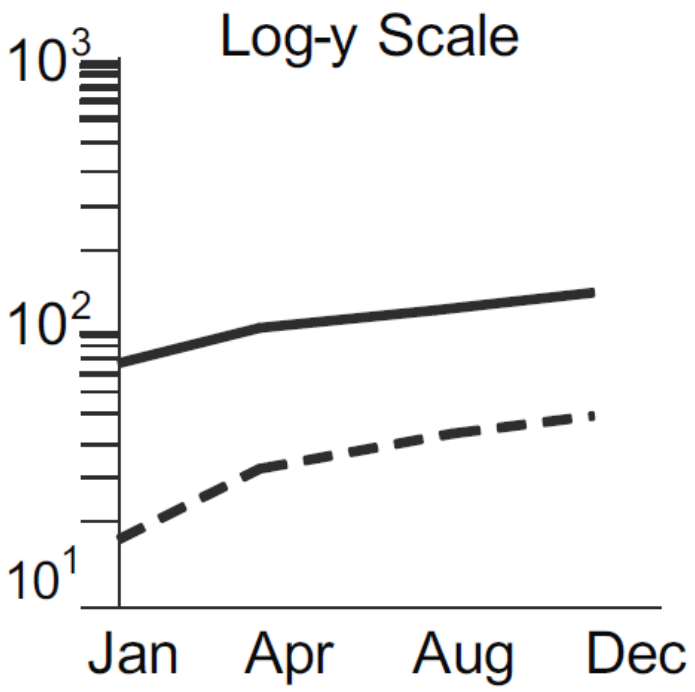

Guideline: data transformations and carefully chosen graph aspect ratios can be used to emphasize rates of change for time-series data

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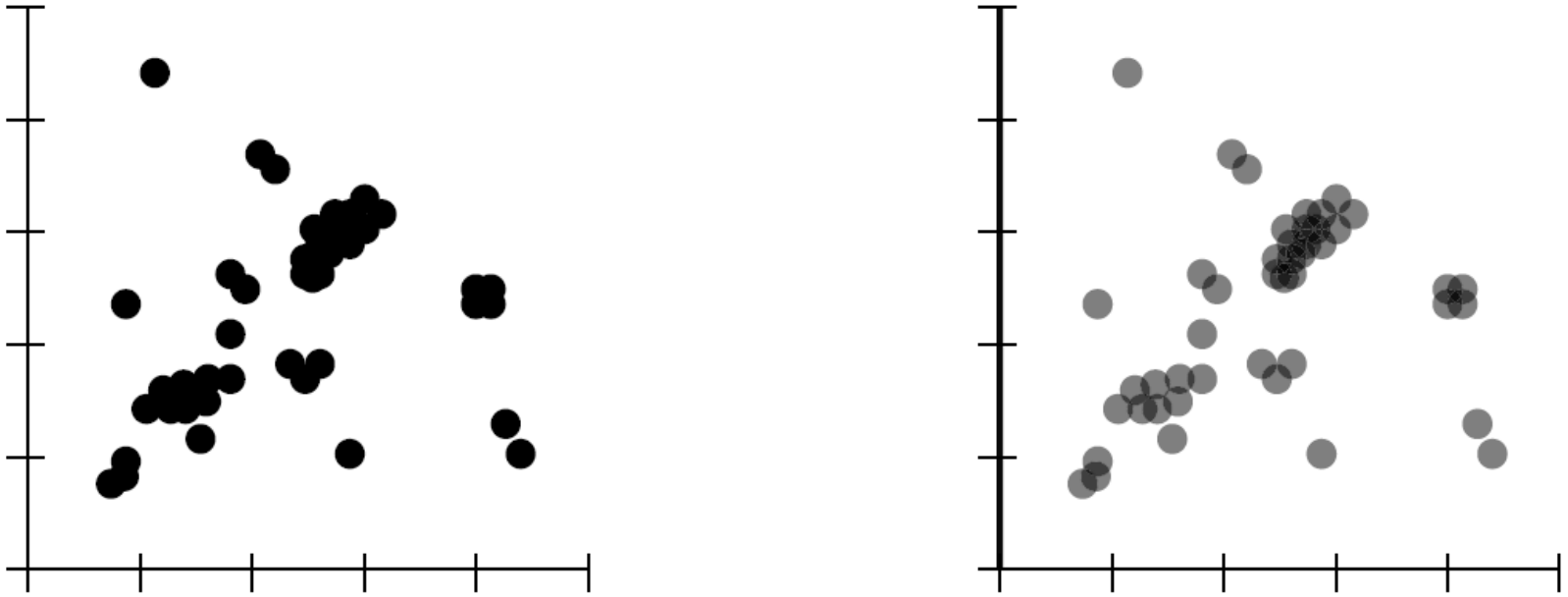
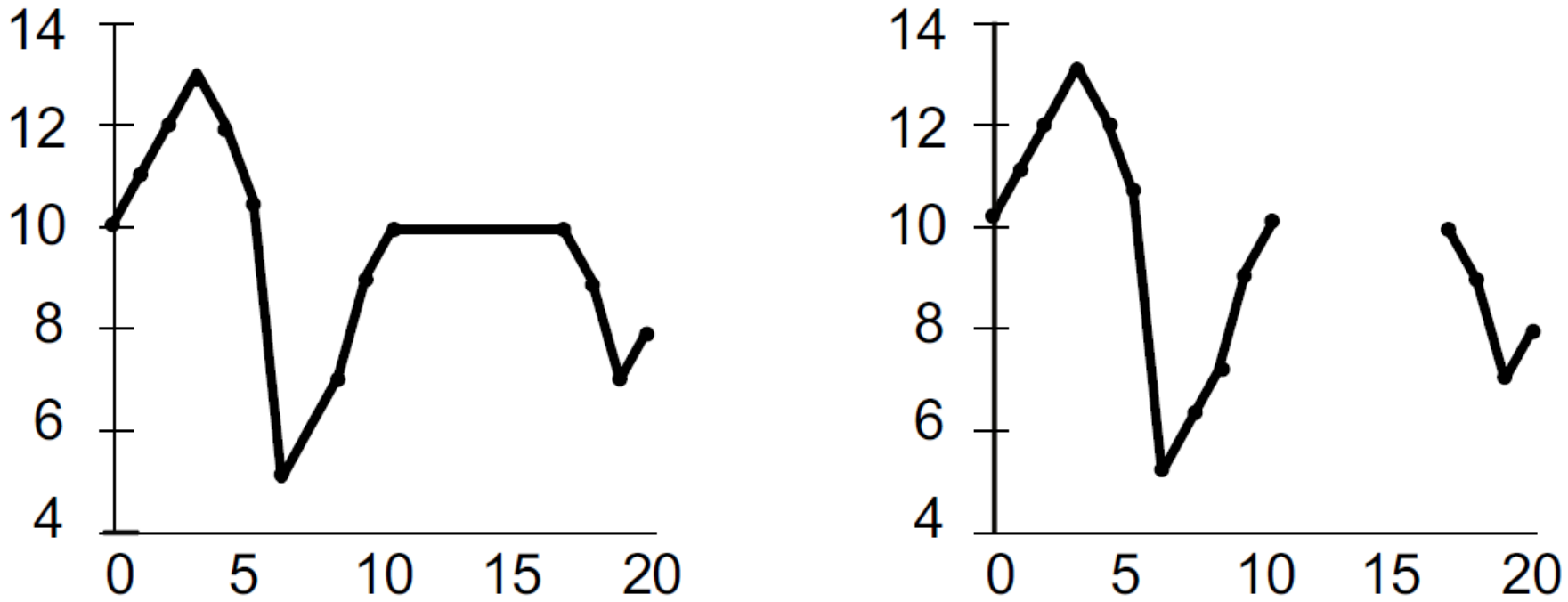


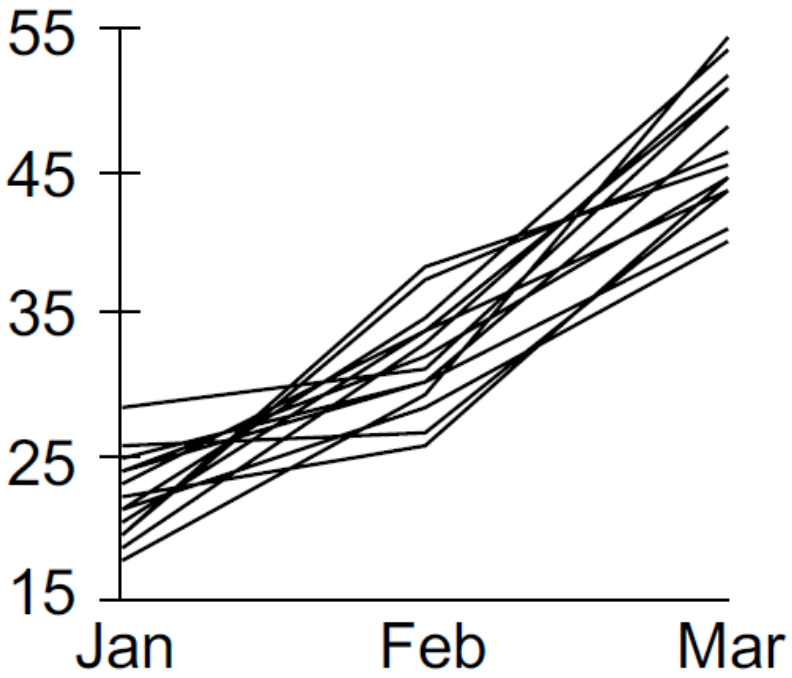
Guideline: plot overlapping points in a way that density differences become apparent in scatter plots

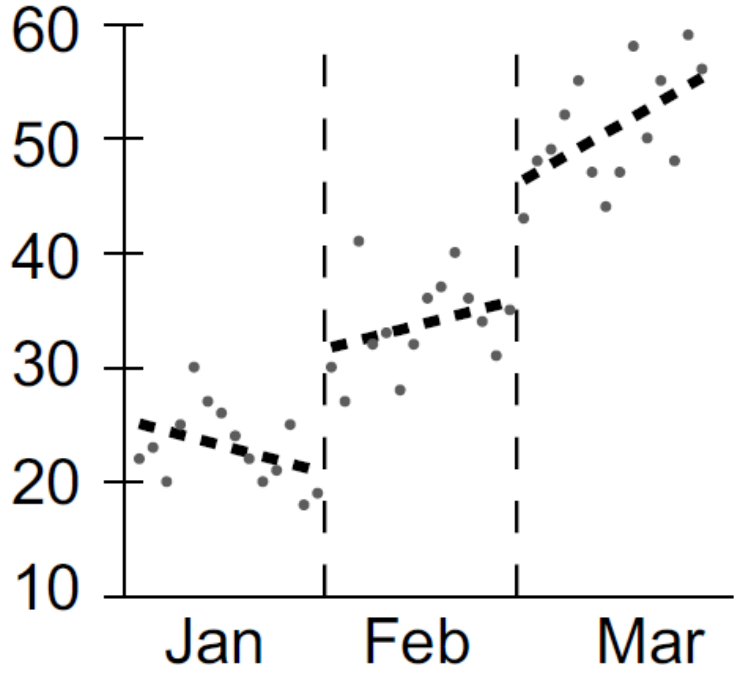
Kelleher and Wagener (2011)



Guideline: use lines when connecting sequential data in time-series plots

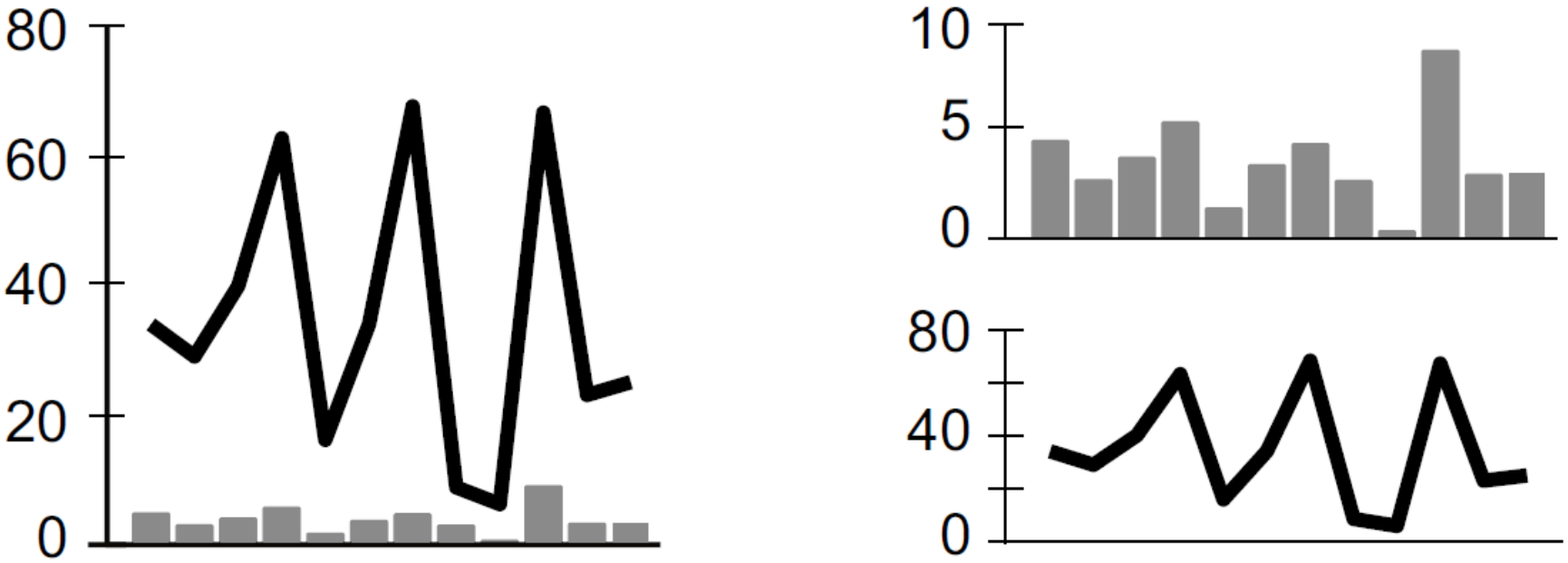
Kelleher and Wagener (2011)





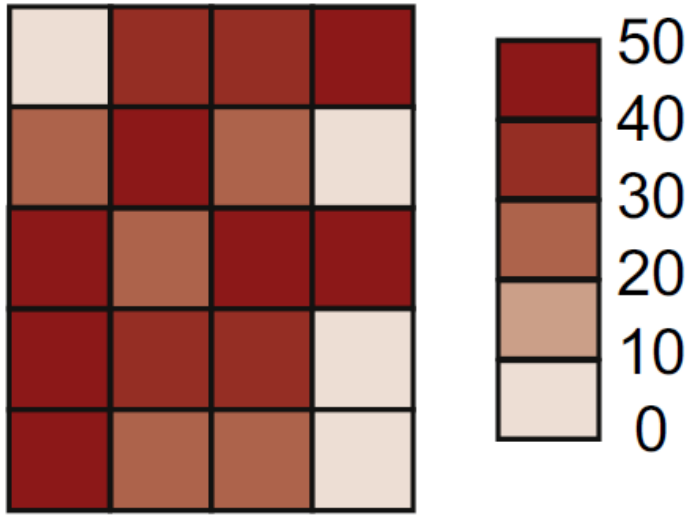
Guideline: aggregate larger datasets in meaningful ways

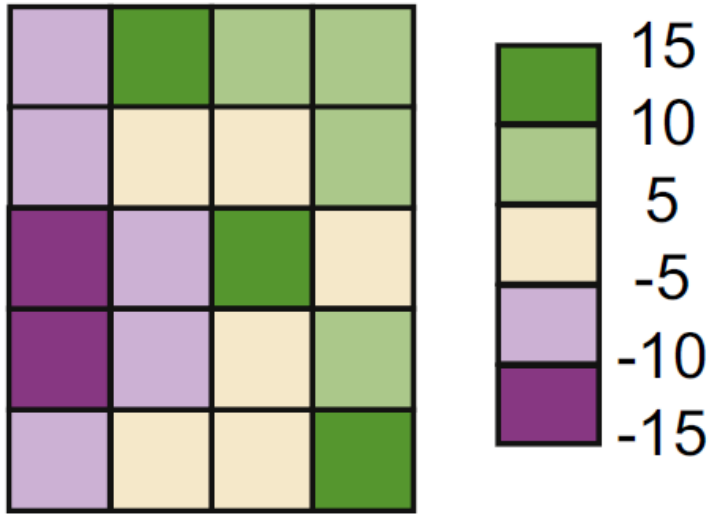
Kelleher and Wagener (2011)



Guideline: Keep axis ranges as similar as possible to compare variables

Kelleher and Wagener (2011)





Guideline: select an appropriate color scheme based on the type of data

Kelleher and Wagener (2011)