Motivation: Beyond the Data

- With the advent of opportunities within data analytics and sciences, there is a clear need for students to understand the basics of data science (1).
- Data visualization is a critical need within industry with data visualization targeted job postings increasing by 1500% in the past decade (2).
- However, only 18% of undergraduates majoring in computer science were women in 2015, as compared to ~40% of undergraduates in geosciences (3, 4).
- Geosciences as a whole has the lowest diversity of all STEM fields at all levels of higher education (5).
- Embracing growth mindset teaching and beliefs in STEM courses has positive implications for all students, but in particular decreases racial achievement gaps (6).

Developed a unique 400 level undergrad/grad course on data skills & statistics through visualization in geosciences

Growth Mindset: Enabling Learning with Jupyter

A growth mindset is: “the idea that ability is malleable and can be developed through persistence…” (6)

Jupyter provides novel ways to interact with and see code, visualization, text, and equations

Students can turn in both source code AND output grades – for progress focused grades

Focus on Statistics Through Visualizations

Programming & statistics presented through back to back lecture to application in interactive notebooks

Course labs online!
github.com/astro-abby/data_vis_statistics_geosciences

Visualization and data analytics are not only necessary skillsets for students but an avenue for learning in computation sciences, geosciences, and statistics

References:

5. Murphy, J. R., C. Tavekar, and J. Hodges (2016), Increasing gn, which data ability is.
Fast how larger racial achievement gaps and inspire less student motivation in their classes.
Sci Adv, 2, eaaf5041 (2016)