1. Republican Gerrymandering is leading to a decrease in voting power.

1.1 Motivation

My groups' project is focused on understanding and explaining the various elements that may be affecting voters' power to vote in the state of Georgia. Gerrymandering is a particular practice that can greatly disadvantage opposing parties, which in this case disproportionally affects racial minority groups who tend to lean more Democratic.

1.2 Hypotheses

H1: Republicans' demographic distribution will draw districts to distribute minorities at a threshold that will ensure that the majority is always white, significantly differing from Democrats' demographic distribution.

H2: Republicans, by limiting minority votes, will decrease the power of their vote (which we can see with increased absolute value of Efficiency_gap metric).

1.3 Analysis Plan

The first step of the analysis will be focused on understanding the demographic distribution of each district, and comparing the differences between the Republican and Democratic proposals. Then we will analyze how these changes affect the overall power of the voters for different parties according to each proposed redistricting.

2 Data Source(s)

2.1 Description

The dataset I obtained has information about the various proposed redistricting maps, with demographic and partisan voting index information for each state's districts. It also describes the partisanship of current districts.

Important Columns

- *Metric - encompasses demographic information, partisan voting index scores, competitiveness, and statewide Median Seat and Efficiency_gap scores.*
- *Values - stores the quantitative value for each of the above metrics. Not all are meant to be treated in the same way.*

- *Map - Distinguishes between the Democratic and Republican proposed maps. Also has current districts (labeled as 117 for the 117th Congress). Another map type was labeled as “draft”, but with no documentation it was unclear what it referred to, so I did not use it in my analysis.*

Special Terminology

- *PVI - Partisan Voting Index is calculated by comparing the districts voting for presidential candidates in past two elections to the national average percentage.*
- *Median - refers to the ‘Median seat metric’, which shows the difference between the PVI value for the most median district, compared to the state as a whole. Theoretically, median district and state should be close to the same.*
- *Efficiency_gap - measures the difference between the two parties "wasted votes", that do not have as much power per district.*
- *Competitiveness - distinguished by a 1 or 0, regarding whether the Median seat is within 5 points, which means that it could lean either way during an election.*

2.2 Source(s)

This dataset was obtained from Five Thirty Eight, a website that focuses on opinion poll analysis, politics, and economics blogging.

“Design and development by Ryan Best and Aaron Bycoffe. Research and additional contributions by Nathaniel Rakich, Galen Druke, Kaleigh Rogers, Alex Samuels, Geoffrey Skelley, Amelia Thomson-DeVeaux, Monica Potts, Mackenzie Wilkes, Jean Yi, Sydnie Cobb, Oren Oppenheim and Tina Yin. Story editing by Sarah Frostenson. Copy editing by Santul Nerkar.”

This was cited as the source for the new proposed Georgia map by Republicans: https://www.legis.ga.gov/joint-office/reapportionment

Interpretation and directions for how to navigate some of the data metrics were found here: https://fivethirtyeight.com/features/how-fivethirtyeights-redistricting-tracker-works/

2.3 Format

The dataset had all the information for every state, and had terms and and labels that were unclear. It was in a table where all of the quantitative values were in the

same column. There were some null data points, or labels that when imported into Tableau showed up as “Null”, such as for the the column District for the rows that indicated “Statewide” metrics.

2.4 Transformations

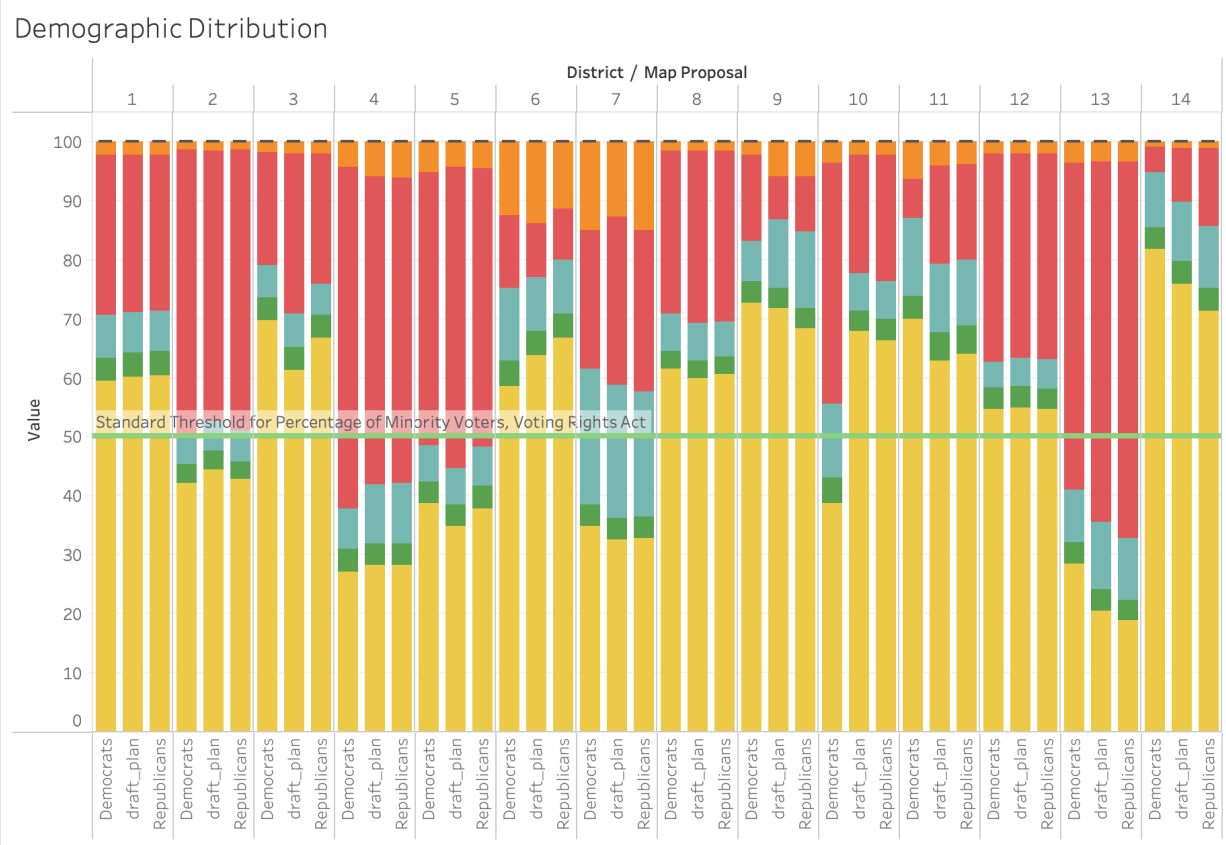
Once I was able to discern what the labels (such as 117) were meant to represent, I was able to change their values to something that would be more easily interpretable, such as “Current map”. I was also able to parse out the relevant quantitative information to look only at the metrics I desired by creating groups.

Grouped all of the minorities into one to create a clear visual narrative.

3 Exploration

Hypothesis 1:

When I began my data exploration process, I was most interested in the impacts that the Republican gerrymandering would have on the voting power for minorities, so naturally I began by visualizing the demographic distribution of each district according to the available graphs.

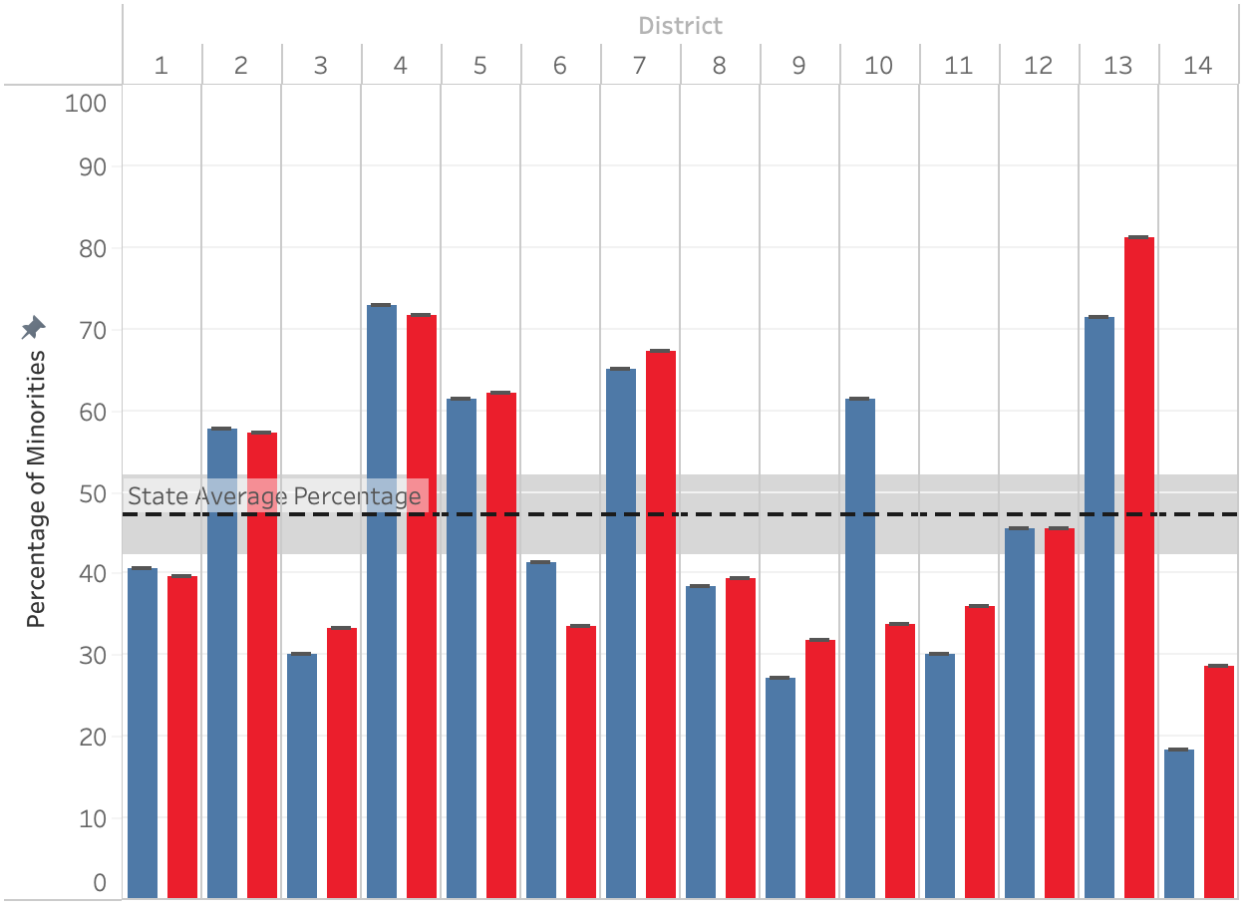


I had been expecting to see egregious violations and dramatic differences in the demographic distributions across the board for all of the districts, so I was disappointed and a bit confused to see that, for most of the districts, the republican proposal did not differ greatly from the democratic proposal map. The one obviously notable difference was in district 10. Apart from that however, most districts were relatively similar.

At that time, I was still looking at the draft-plan, hoping to find some explanation for what it represented. My hope was that it was a draft created by a non-partisan committee, but without being able to find any additional information to shed light onto it, I ended up excluding it from further analysis.

Since I was certain (from reading articles and alternative sources) that Republicans were using gerrymandering tactics to disadvantage democrats, I did some more research about how demographics are considered to be manipulated. It was then that I learned about (and remembered from AP US History) the Voting Rights Act, that stated that in cases where it is possible,

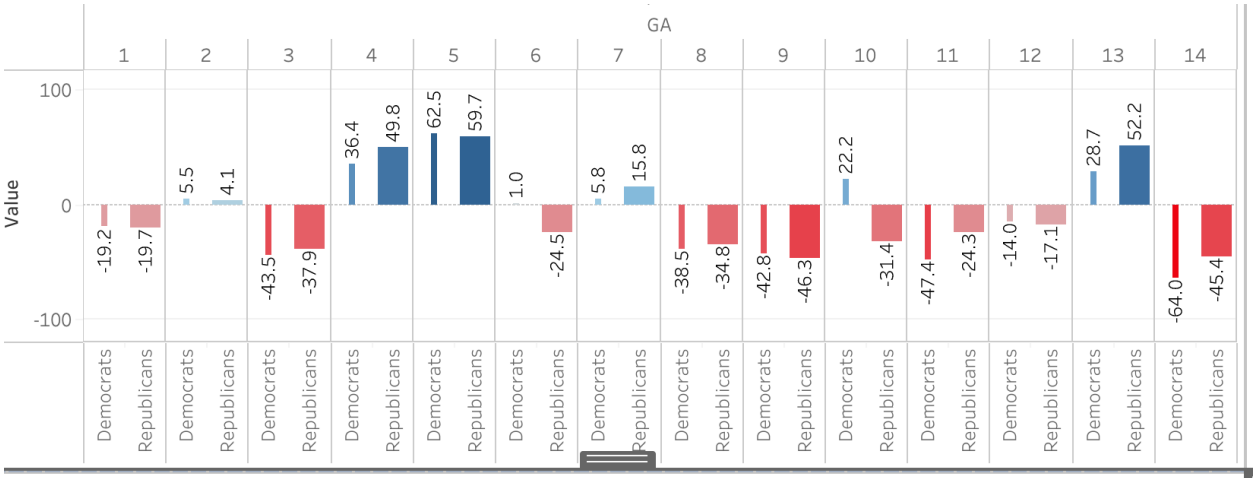
districts should aim to be drawn to allow for an equal chance for minorities to elect their choice, which is often interpreted as having 50% of the demographic be represented by them for each district. I then grouped all of the minorities together, and created a new graph to visualize how many districts met or were close to this criteria.



Less than half of them were. I then considered that it may be possible that a state may not have a distribution where minorities comprised 50%. So I calculated the average, and found it to be quite close to 50% at 47.2%. Both parties had proposals where less than half of the districts represented this, and both parties seemed as if they were participating in gerrymandering by disproportionately

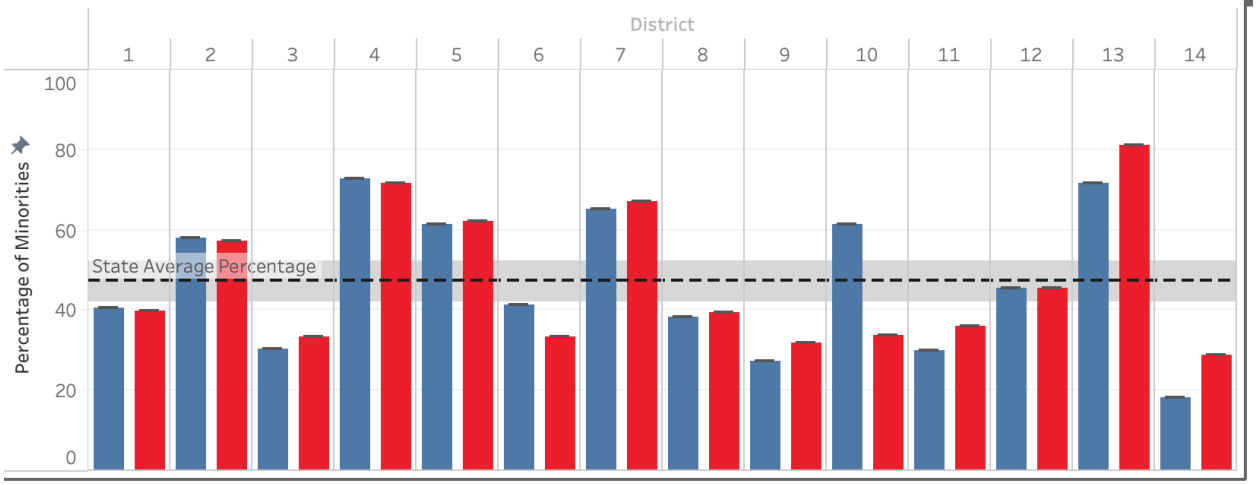
distributing minorities into a few select districts to have a greater representation for white people in all other districts.

I then began to wonder if the districts where minorities really were over the state average tended to vote more democratic, so I took a look at their pvi scores as well.



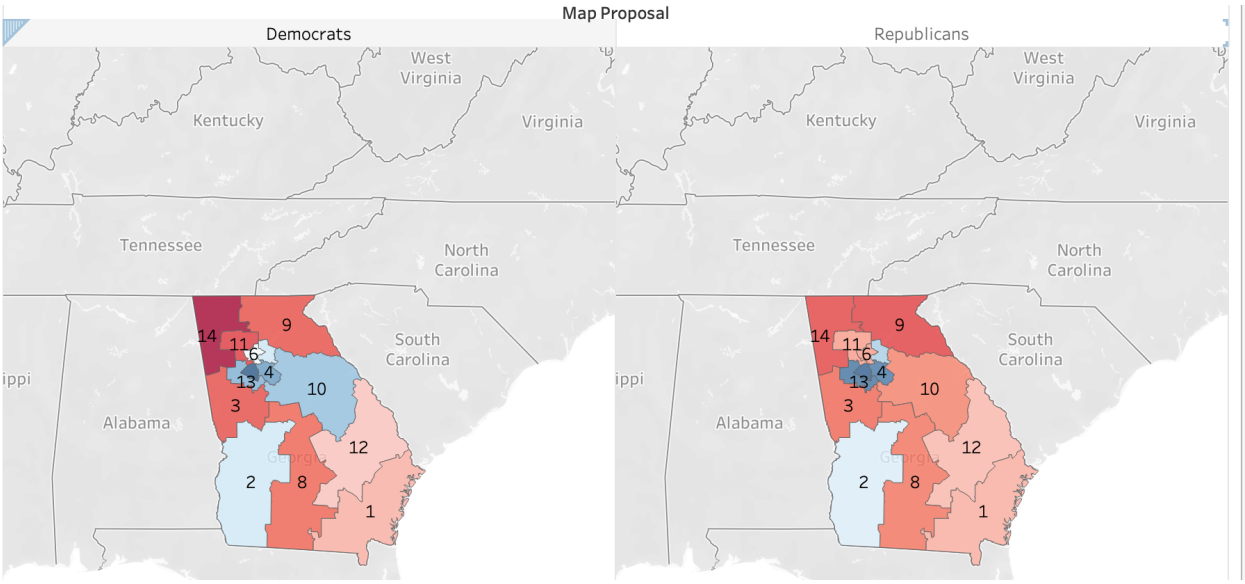
Only 6 out of 14 Districts come within 10% of the State Average Minority Distribution

The Voting Rights Act **requires** that, where possible, districts should be drawn where a **racial minority makes up at least 50 percent** of the voting-age population. All districts here where that is the case have a PVI towards **Democrats.**



It was indeed the case. Looking at the PVI scores combined with the demographic distributions made me realize that both were likely to be impacted by their geographic location, since large cities tend to be more left leaning. I then plotted the PVI scores on a geographic map, and found this to be as expected. (The cluster by 13 and 4 is Atlanta). I was not able to upload new maps to

represent the actual proposed boundaries for each map, so the district lines are based on the current map.



Hypothesis 2:

Beyond this, I wanted to understand how these changes were impacting the power of democrats votes. At this point, having seen how overall similar the demographic distribution had been overall, and seeing the PVI scores represented side by side, I was expecting a relatively low amount of favoring towards Republicans.

I knew that the metrics that would be important to look at were the Efficiency_gap and Median Seat. While I would have loved to see the efficiency_gap information for each district, it was only available statewide.

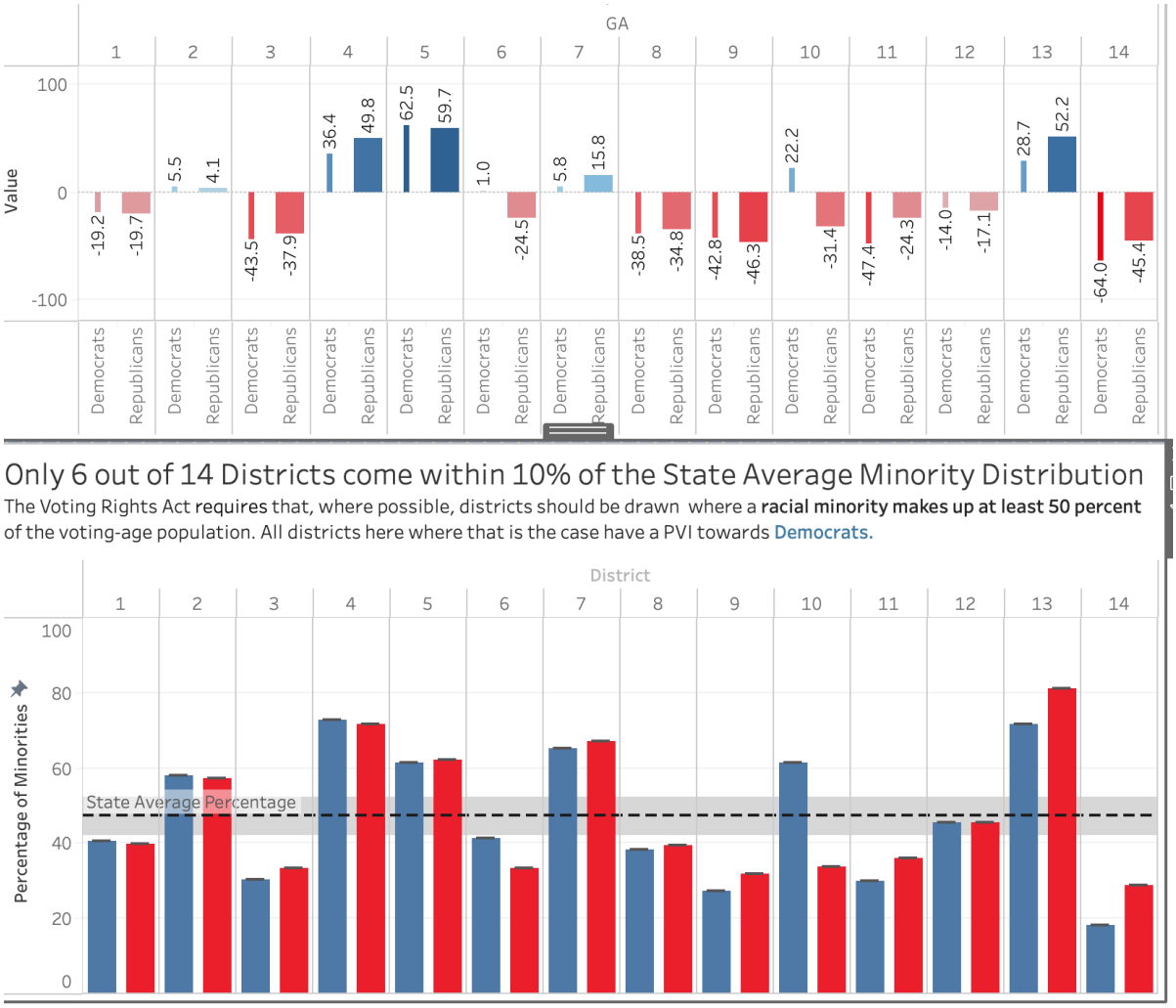
Efficacy_Gap and Median Seat Table

	Map Proposal		
Metric	Current	Democra..	Republic..
Efficiency_gap	-7.25	-0.20	-15.90
Median Seat	-11.94	0.90	-14.57

I created a table to understand the exact values, and was shocked to see exactly how much of an impact the Republican proposed map had on the two metrics. Looking at the current map, I was surprised to see that it was also pretty skewed to the right, until I learned that it was also drafted and passed with a Republican majority. The figure that most shocked me was that the efficiency_gap, which can be thought about how many “wasted votes” the party creates for their opponent, was more than doubled. It made me a bit sad to think about, as a common narrative in voting often centers around individuals feeling like their vote doesn’t matter. The Democrats also showed that there is a possible way to arrange districts to minimize the Efficiency gap, and make the median district PVI as close as possible to the statewide PVI. For my final dashboard however, I made another version that showed this information in a more visually digestible way.

4 Dashboards

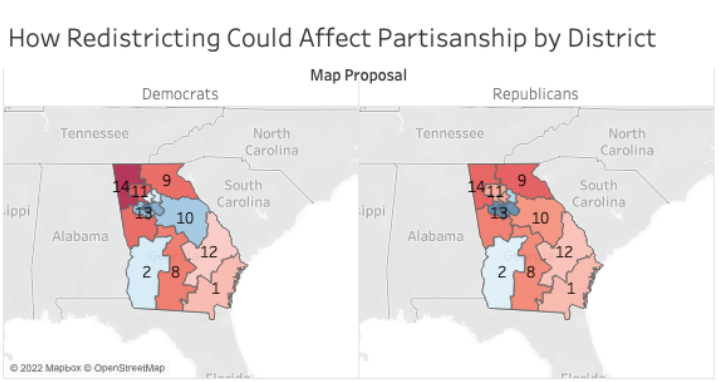
4.1 Hypotheses #1

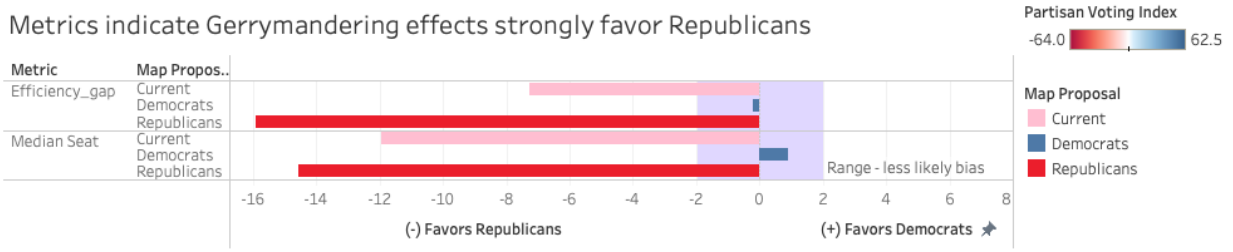


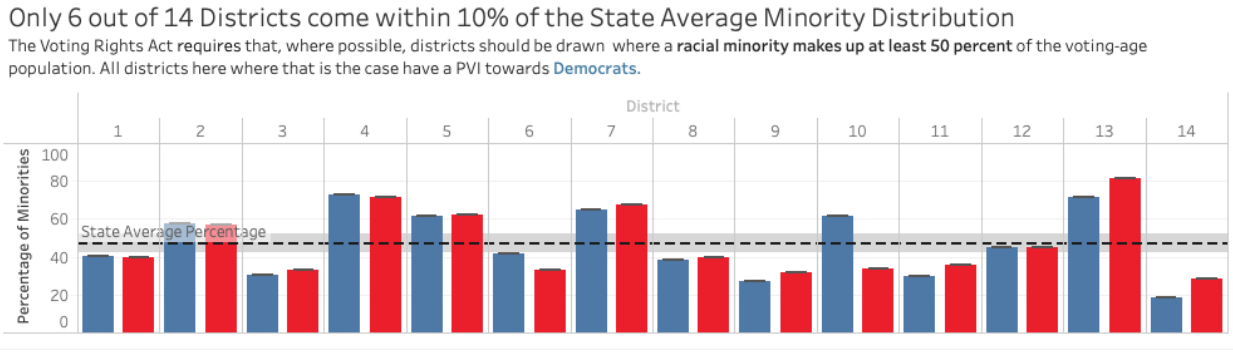
My first hypothesis was incorrect. The minority distribution for each district did not differ significantly across the state. Only in a few districts was the difference dramatic, such as in 10, 13, and 14. This dashboard also looks at how the PVI score for each district is correlated with the minority representation. Democrat proposed map has one more district that meets the state average thresmark.

Having secured favorable conditions for Current districting, Republicans propose and pass Map that will further disadvantage opposing Democratic party.

Three important metrics indicate gerrymandering
Efficiency_gap measures the difference between the two parties "wasted votes", that do not have as much power per district.
Median Seat shows the difference between the PVI value for the most median district, compared to the state as a whole. Theoretically, median district and state should be close to the same.
Minority representation per district should be around 50% whenever possible. Gerrymandering can involve lumping most minorities into few Districts to increase number of Republican Districts.

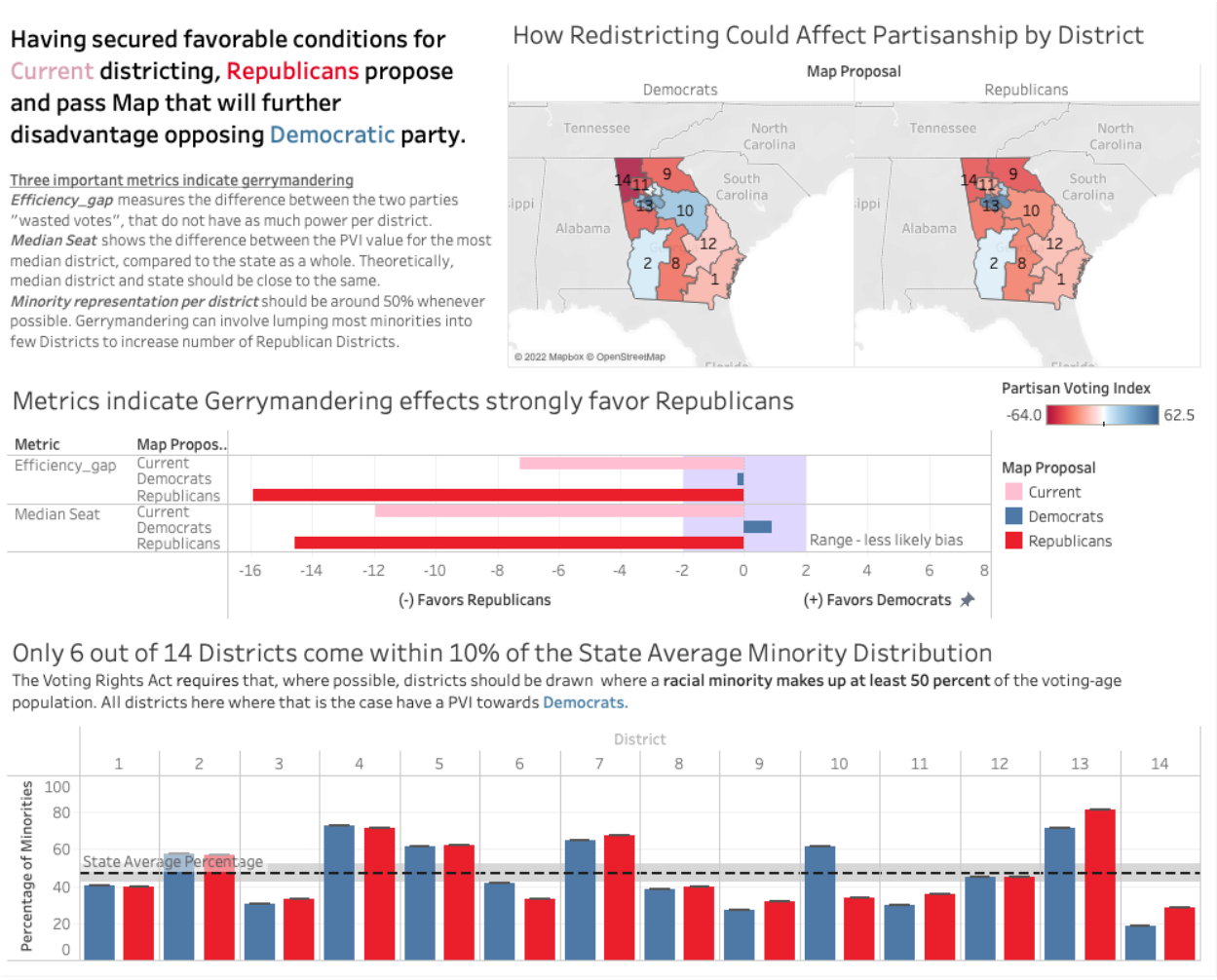






My second hypothesis considering the power for democratic voters decreasing was correct. Here we can see that statewide, the Republican proposed map disrupts the PVI and demographic minorty distribution, both of which affect the Efficeincy_gap, thus reducing the power for Democratic voters.

5 Conclusion



For my final Tableau dashboard, I chose to present the visualizations that most clearly answered and supported my assumption regarding the effects of voting power resulting from Republican Gerrymandering. Since my original hypothesis that Republicans would have greatly differed from Democratic proposals for demographic distributions across all districts, I chose instead to focus on showing the overall imbalance for that shows how few districts behave in accordance with the spirit of the Voting Rights Act. Similarly I show how the PVI for each district would be affected, and provide geographic context by overlaying it on the map. My third graph shows the two metrics most closely related to the power of the vote (for my H2), and displays a comparison to the current version of the map.