



Redistricting 2021: How to Map a Changing Georgia Briefing Document

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Redistricting 2021: How to Map a Changing Georgia

Major changes have taken place in Georgia over the last decade between the 2011 and 2021 decennial redistricting. These changes, as highlighted by the 2020 Georgia census, include a growth in population from 9.7 million to 10.7 million people, increasing population diversity contrasted with a reduction in the white population, and a general demographic shift from rural to urban locations. In addition, while Georgia remains politically polarized, with more Republicans living in rural and exurban areas and Democrats clustered in cities, the overall partisan trend is much more balanced as Georgia becomes a swing state with close margins in major elections.

What is a Fair Map?

To be considered fair, proposed district maps for the State Senate, State House of Representatives, and U.S. Congress should comply with the following criteria.

Respect voters' political preferences

- Reflect the natural political preferences of voters distributed across the state
- Allow for competition

Reflect Georgia's diversity

- Provide sufficient majority-minority opportunity districts and comply with the Voting Rights Act
- Preserve minority influence districts

Honor communities of interest

The benchmarks presented in this document are a valuable tool for assessing the fairness of a specific district map, especially for determining when partisan advantage is due to natural political geography or gerrymandering. However, a computer analysis alone cannot ensure a fair map, which requires human value judgments and map-drawing intelligence. The role of benchmarking is rather to guide the map creation process by providing objective standards for comparison with proposed maps.

Statistical Benchmarks for Fair Maps

Working with Fair Districts GA (FDGA), the Princeton Gerrymandering Project (PGP), has conducted a state-of-the art analysis using 2020 census data to create benchmarks/fairness tests that can be used to evaluate proposed maps drawn by the Georgia General Assembly (GGA) and released later this year.

PGP created benchmarks for the State House, State Senate, and Congress by drawing 1 million simulated maps per chamber then measuring partisan balance, competitive districts, and minority representation for each map to develop a numeric range for each test. Figure 1 - Georgia 2021 Benchmark Ranges per Chamber is an overview of the results of that analysis.

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| | Benchmarks / Fairness tests (range of values based on 2020 census data and average of major statewide elections 2018-21) | | |
|---------------------|---|------------------------------|--|
| | Partisan balance | Competitive districts | Minority representation |
| State House | 92-99 Republican districts 81-88 Democratic districts | 9 - 22 competitive districts | At least 48 Black-majority districts 3-11 Black-influence districts |
| State Senate | 28-32 Republican districts 24-28 Democratic districts | 1 - 7 competitive districts | At least 16 Black-majority districts 0-3 Black-influence districts |
| Congress | 8-9 Republican districts 5-6 Democratic districts | 0 - 3 competitive districts | 4 Black-majority districts 0 - 1 Black-influence districts |

Figure 1 - Georgia 2021 Benchmark Ranges per Chamber

2021 Proposed Map Evaluation

FDGA and PGP will evaluate all maps proposed by the legislature later this year, ideally before the maps are considered for approval in the special legislative session. Proposed State House, State Senate, and Congressional maps will be compared to the 2020 statistical benchmarks for fair maps. The differences in the expected analysis results of the 1 million simulated maps and actual analysis results of the proposed map can highlight the possibility of map manipulation or gerrymandering.

Using Benchmarks for Fair Maps

Benchmarks identify the range of values for partisan balance, competitiveness, and minority representation that we would expect in a map drawn without partisan intent. Proposed maps should meet established redistricting guidelines, including recognizing communities of interest, respecting political boundaries such as counties and precincts, and acknowledging minority voting patterns to comply with the Voting Rights Act (VRA). Draft maps can be rapidly checked to see if they fall within the benchmark ranges. FDGA and PGP will evaluate draft maps upon request.

Benchmarks are stated as a range of values, but is there a point within the range that is better, or fairer, than another? Benchmark ranges are the numerical outcome from the analysis of the simulated map collection, with some results occurring more frequently than others. This frequency constitutes a statistical distribution, like a normal curve, with a tail on either side of a midpoint. A map that falls outside the distribution curve would be considered an outlier, indicating possible gerrymandering. Likewise, a map that sits at the extreme end of the distribution curve is less desirable than the thousands of possible maps spanning the midpoint of the range. Ideally, enacted maps should closely resemble a significant number of the simulated maps.

For additional information about the benchmarking process refer to Testing Maps Against Non-partisan Statistical Benchmarks on page 10.

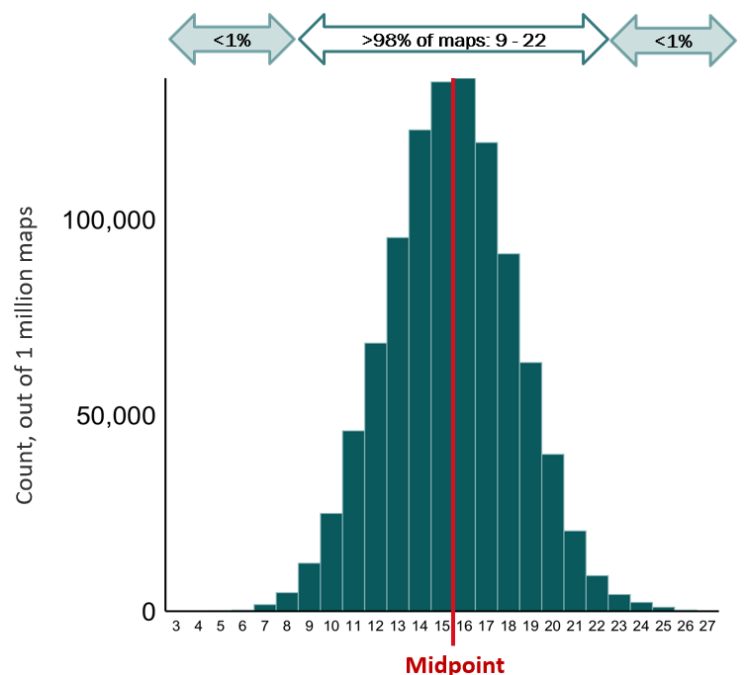


Figure 2 - Normal Curve Distribution of Map Analysis Outcomes

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2011-2021 Comparison: Georgia Senate

Summary

Figure 3 - State Senate Comparison Summary is a more detailed look at the statistical ranges for the State Senate, comparing the 2021 benchmarks using the 2020 census data to those generated by an analysis of the 2011 decennial redistricting based on the 2010 census. The differences reflect the changes in the population, demographics, and voter preferences of the state over the decade.

| State Senate | Benchmarks / Fairness tests (compared to simulated maps) | | |
|--|--|--|---|
| | Partisan balance | Competitive districts | Minority representation |
| Expectations for fair 2021 maps: 2020 census and 2018-21 election results | 28-32 Republican districts 24-28 Democratic districts (>98% of simulated maps) | 1-7 competitive districts (>98% of simulated maps) | At least 16 Black-majority districts 0-3 Black-influence districts (>98% of simulated maps) |
| 2011 Benchmarks: 2010 census and 2012 election results | 35-39 Republican districts 17-21 Democratic districts (>98% of simulated maps) | 2-9 competitive districts (>98% of simulated maps) 50% of districts show evidence of voter packing or cracking | 15 Black majority districts 0-5 Black-influence districts (>98% of simulated maps) |

Figure 3 - State Senate Comparison Summary

Partisan Balance

Figure 4 - State Senate Partisan Balance illustrates the differences in partisan lean between the 2011 and 2021 benchmarks, showing the the narrowing gap between Republican and Democratic voters. In the 2021 benchmark, each party would win 28 seats in approximately 5 percent of the 1 million simulated maps created for the for the analysis. The mid-point of the distribution curve shows 26 Democratic and 30 Republican districts, or 2-district partisan lean. The tail of the distribution is a 4-district partisan lean. Ideally, enacted maps should closely resemble a significant number of the simulated maps.

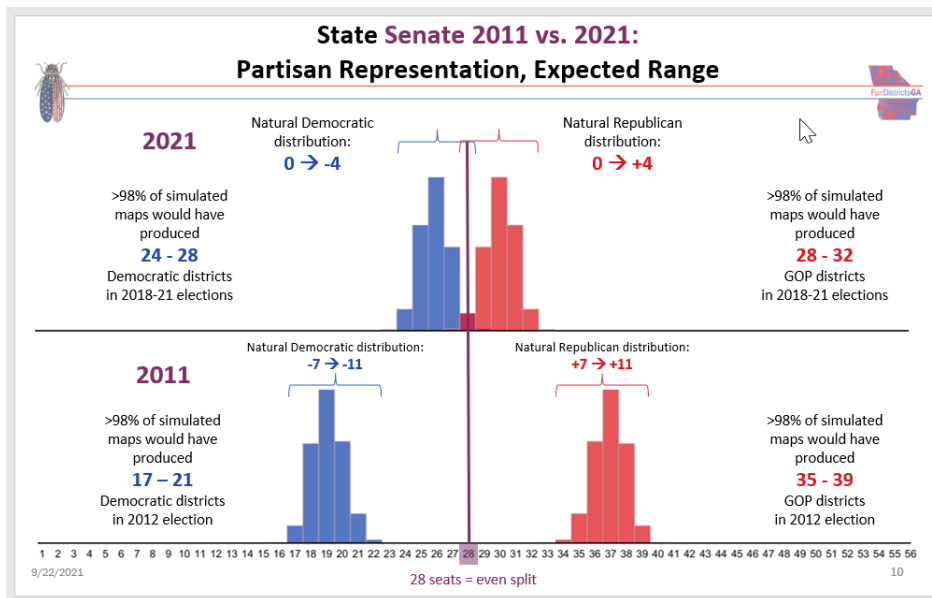


Figure 4 - State Senate Partisan Balance

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Competitive Districts

Figure 5 - State Senate Competitive Districts shows the range of competitive districts that a fair map might be expected to have in 2011 and in 2021. Recent studies have suggested that the vote margins for races to be considered competitive have narrowed. This altered criteria has in turn reduced the number of competitive districts in 2021 in contrast to what we might expect to see based on other analysis results.

As long as other redistricting guidelines are followed and partisan balance is not affected, maps that have more competitive districts are generally more desirable. In past redistricting cycles, both Democrats and Republicans have gerrymandered maps by creating non-competitive, safe seats.

As Figure 5 shows, in 2011 this resulted in only one competitive district, on the tail end of the distribution curve. Our 2021 benchmarks show that it should be possible to create maps with up to seven competitive districts that comply with redistricting guidelines.

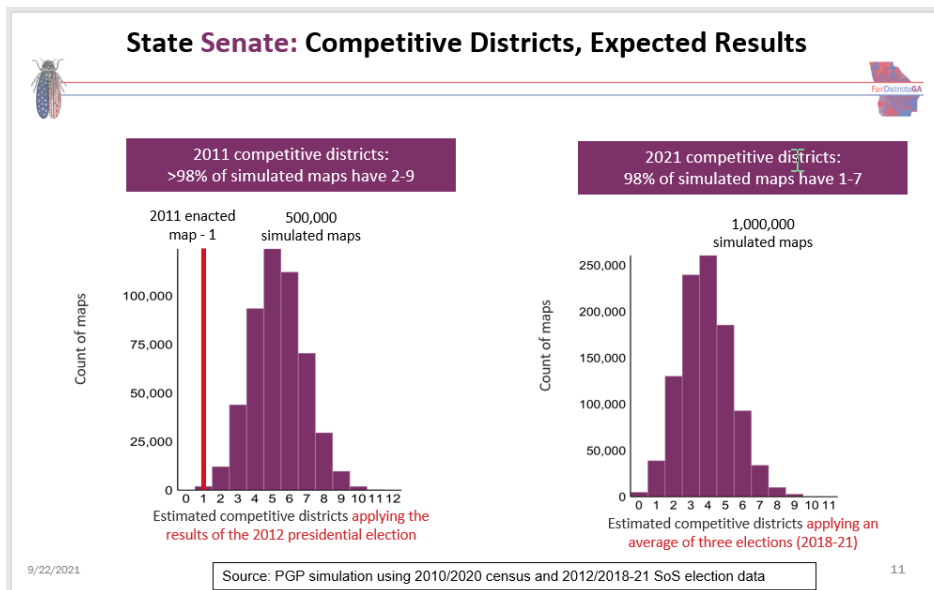


Figure 5 - State Senate Competitive Districts

Minority Representation

Figure 6 - State Senate Black Representation compares the number of Black Opportunity and Black Influence districts resulting from the statistical analysis of the 2011 and 2021 simulated maps. For each simulated map, we calculate the Black Voting Age Population (BVAP) for each of the 56 Senate districts. This analysis results in minimum requirements for Black Opportunity districts, which are protected by the VRA if they meet specific criteria, and ranges for Black Influence districts with BVAP percentages of between 37% and 50%. Black Influence districts are important for fair minority representation since studies have shown that at these population levels, Black voters can elect candidates of their choice by forming coalitions with other groups.

The 2021 statistical analysis of 1 million simulated maps indicates that it is now possible to draw at least 16 Black majority districts in a 2021 Senate map. While a numerical benchmarking analysis of the Senate 2021 simulated maps may suggest that at least one more than the current 15 VRA districts is

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indicated, further evaluation is necessary to determine if it is required under the VRA by meeting other criteria. This evaluation can also determine if more than 16 Black majority districts can be drawn.

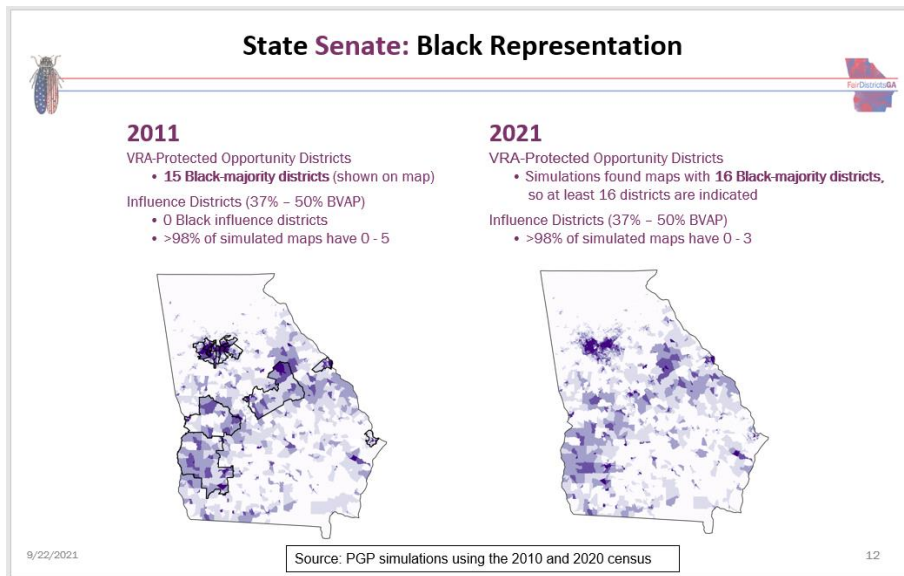


Figure 6 - State Senate Black Representation

2011-2021 Comparison: Georgia House of Representatives

Summary

Like the State Senate example, Figure 7 - State House Comparison Summary is a detailed look at the statistical ranges for the State House, comparing the 2021 benchmarks using the 2020 census data to those generated by an analysis of the 2011 decennial redistricting based on the 2010 census. The differences reflect the changes in the population, demographics, and voter preferences of the state over the decade.

| State House | Benchmarks / Fairness tests (compared to simulated maps) | | |
|--|--|--|--|
| | Partisan balance | Competitive districts | Minority representation |
| Expectations for fair 2021 maps: 2020 census and 2018-21 election results | 92-99 Republican districts 81-88 Democratic districts (>98% of simulated maps) | 9-22 competitive districts (>98% of simulated maps) | At least 48 Black-majority districts 3-11 Black-influence districts (>98% of simulated maps) |
| 2011 Benchmarks: 2010 census and 2012 election results | 110-119 Republican districts 61-70 Democratic districts (>98% of simulated maps) | 10-22 competitive districts (>98% of simulated maps) 45% of districts show evidence of evidence of voter packing or cracking | 47 Black majority districts 2-9 Black-influence districts (>98% of simulated maps) |

Figure 7 - State House Comparison Summary

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Partisan Balance

Figure 8 - State House Partisan Balance illustrates the difference in partisan lean between the 2011 and 2021 benchmarks, showing the narrowing gap between Republican and Democratic voters. In the 2021 benchmark, the natural distribution curve shows a difference of two to nine districts in favor of Republicans. The midpoint of the distribution curve shows 85 Democratic and 90 Republican districts, or a five-district partisan lean. The tail of the distribution curve is a nine-district partisan lean. Ideally, enacted maps should closely resemble a significant number of the simulated maps.

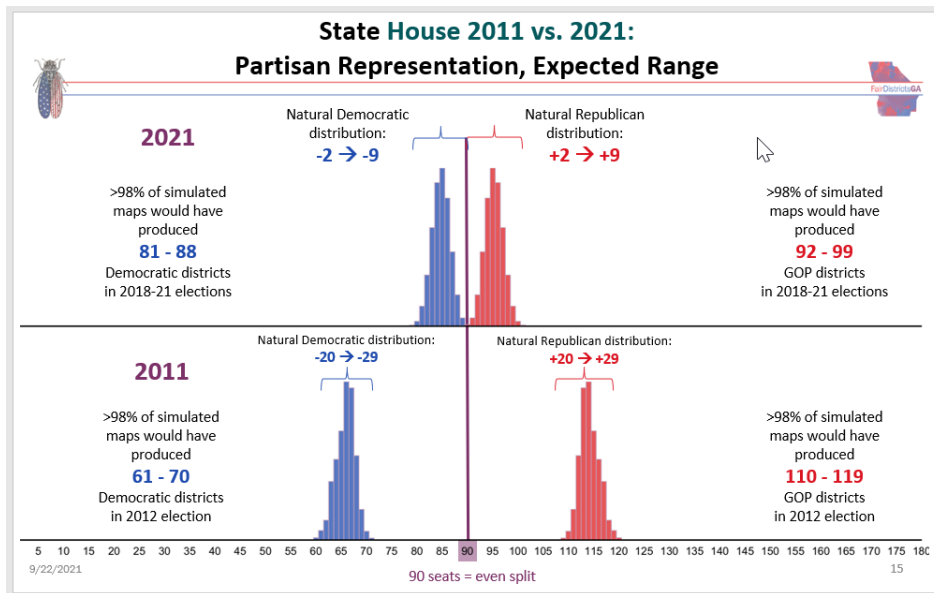


Figure 8 - State House Partisan Balance

Competitive Districts

Figure 9 - State House Competitive Districts shows the range of competitive districts that a fair map might be expected to have in 2011 and in 2021. For 2011, this resulted in only 10 competitive districts, on the tail of the distribution curve. Our 2021 simulation shows that it should be possible to create maps having many more competitive districts, especially around the 15 to 16-district midpoint of the range.

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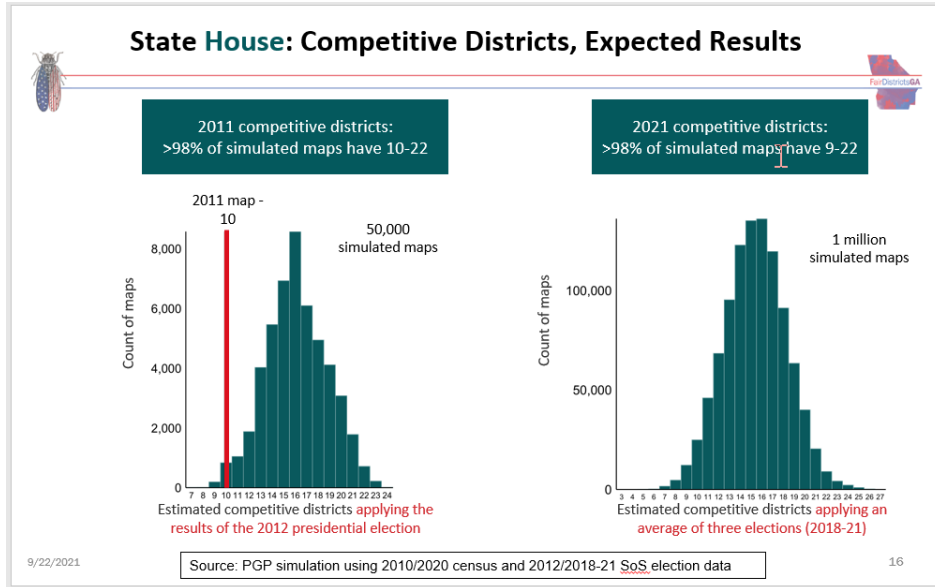


Figure 9 - State House Competitive Districts

Minority Representation

Figure 10 - State House Black Representation compares the number of Black Opportunity and Black Influence districts resulting from the statistical analysis of the 2011 and 2021 simulated maps. For each simulated map, we calculate the BVAP or Hispanic Voting Age Population (HVAP) for each of the 180 House districts. This analysis results in requirements for Black or Hispanic Opportunity districts, which are protected by the VRA if they meet specific criteria, and ranges for Black or Hispanic Influence districts with BVAP or Hispanic percentages of between 37% and 50%. Influence districts are important for fair minority representation since studies have shown that at these population levels, minority voters can elect candidates of their choice by forming coalitions with other groups.

The 2021 statistical analysis of 1 million simulated maps indicates that it is now possible to draw at least 48 Black majority districts in a 2021 Senate map. While a numerical benchmarking analysis of the Senate map ensemble may suggest that at least one more than the current 47 VRA districts is indicated, further evaluation is necessary to determine if they are required under the VRA by meeting other criteria. This evaluation can also determine if more than 48 Black majority districts can be drawn.

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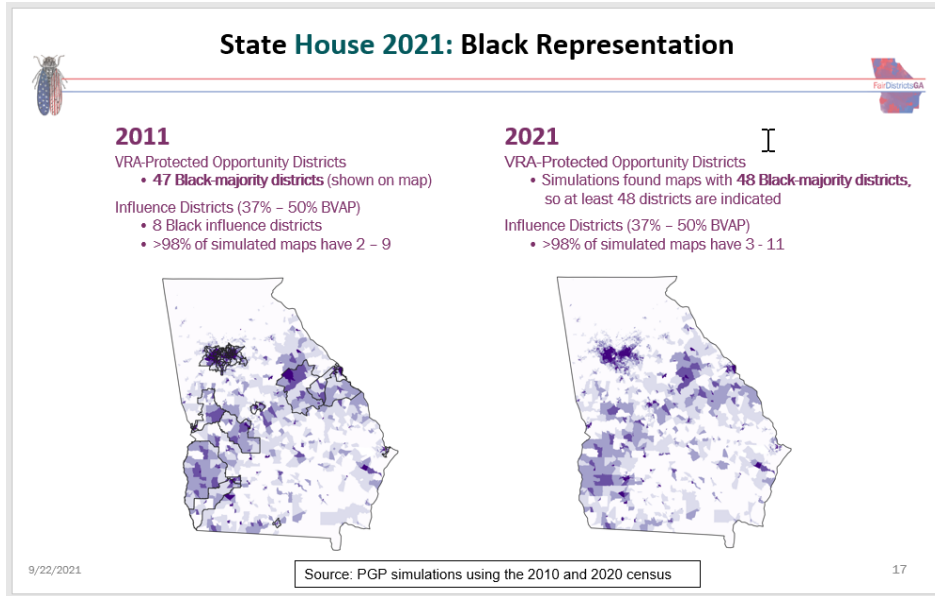


Figure 10 - State House Black Representation

In addition, as Figure 11 - State House Hispanic Representation shows, it is now possible to draw at least one majority-Hispanic Opportunity district in a 2021 Senate map. Further evaluation will be needed to determine if it is required under the VRA by meeting other criteria. This evaluation can also determine if more than one Hispanic majority district can be drawn.

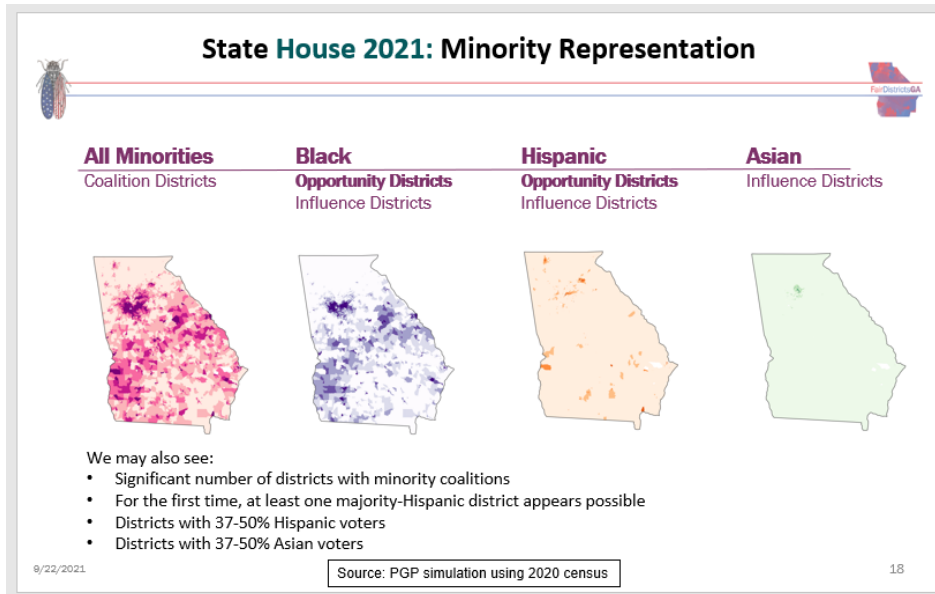


Figure 11 - State House Hispanic Representation

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2011-2021 Comparison: U.S. Congress

Summary

Figure 12 - U.S. Congress Comparison Summary is a detailed look at the statistical ranges for the U.S. Congress, comparing the 2021 benchmarks using the 2020 census data to those generated by an analysis of the 2011 decennial redistricting based on the 2010 census. The differences reflect the changes in the population, demographics, and voter preferences of the state over the decade.

| U.S. Congress | Benchmarks / Fairness tests (compared to simulated maps) | | |
|--|---|--|---|
| | Partisan balance | Competitive districts | Minority representation |
| Expectations for fair 2021 maps: 2020 census and 2018-21 election results | 8-9 Republican districts 5-6 Democratic districts (>98% of simulated maps) | 0-3 competitive districts (>98% of simulated maps) | 4 Black-majority districts 0-1 influence districts (>98% of simulated maps) |
| 2011 Benchmarks: 2010 census and 2012 election results | 9-10 Republican districts 4-5 Democratic districts (>98% of simulated maps) | 0-3 competitive districts; (>98% of simulated maps) | 4 Black majority districts 0-1 influence districts (>98% of simulated maps) |

Figure 12 - U.S. Congress Comparison Summary

Testing Maps Against Non-partisan Statistical Benchmarks

One way to separate the effects of gerrymandering from natural political geography is to compare each currently enacted or proposed map to a large collection simulated maps drawn without political influence. This collection of maps, sometimes called an ensemble, should reflect Georgia’s natural demographic pattern and political preferences. Characteristics of the ensemble such as partisan balance, competitiveness, and minority representation become the statistical benchmarks, or fairness tests, for proposed or enacted maps. Statistically, we can compare how closely an enacted map meets the benchmarks by calculating what percentage of the collection of maps is similar to the proposed or enacted map. Ideally, proposed or enacted maps should closely resemble a significant number of the ensemble maps.

Simulated Map Methodology

For the 2021 benchmark analysis, PGP created an ensemble of 1 million simulated maps per chamber based on 2020 census data. Potential maps are created with no political influence or intent and must comply with the following criteria to be included in the final collection of maps.

- Every district is within 5 percent of ideal population—source: GGA Redistricting Guidelines¹
- Districts are as compact as those on the existing maps with no additional cut edges—source: GGA Redistricting Guidelines
- There are no more county splits than in the enacted map—source: GGA Redistricting Guidelines
- Districts are contiguous—source: Georgia state Constitution

¹ 2021-2022 Guidelines for the House Legislative and Congressional Reapportionment Committee, Section III A General Principles for Drafting Plans, p. 2.

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Redistricting 2021: How to Map a Changing Georgia

- Simulated maps must contain, at a minimum, at least the same number of VRA districts as the enacted map—source: Section 2, Voting Rights Act of 1965 as amended

All criteria are weighted equally; to be included in the map ensemble, a potential map must comply with each requirement separately.

To create benchmarks for each chamber, the 1 million simulated maps included in the ensemble were analyzed to determine the natural demographics and political preferences we might expect to see in a fair map. The analysis yields a statistical distribution or a normal curve with a midpoint and a tail on either side. The entire distribution curve is the span of outcomes or numerical results for that analysis.

First Test: Partisan Balance and Competitive Districts

To determine benchmarks for partisan balance, ensemble maps for the State House, State Senate, and Congress were evaluated by applying an average of three recent elections (2018 governor, 2020 president, and 2021 senate) to each map by precinct to determine the partisan lean of each district. The objective is to determine a fair range of both Republican and Democratic seats reflecting Georgia's natural demographic pattern and political geography.

Additionally, benchmarks should estimate a range of competitive districts that could be won by either party. Recent studies have suggested that the vote margins for competitive races have narrowed from 45% - 55% to 46.5% - 53.5%. The most recent, narrower range was used for the 2021 benchmark analysis.

In practice, fair partisan balance and competitive districts are determined by comparing the analysis results of proposed or enacted maps to the analysis results of the ensemble of 1 million simulated maps. This comparison can highlight possible map manipulation if enacted map analysis results are lower or higher than a significant percentage of the ensemble maps or include instances of extreme districts that differ from the entire ensemble of all 1 million simulated maps.

Second Test: Minority Representation

Likewise, to estimate minority representation we calculate the BVAP or HVAP for each district in each map of the State House, State Senate, and Congressional map ensembles. This analysis results in requirements for Opportunity districts, which are protected by the VRA if they comply with specific criteria, and ranges for Influence districts with BVAP or HVAP percentages of between 37% and 50%. Influence districts are important for fair minority representation since studies have shown that at these population levels, minority voters can elect candidates of their choice by forming coalitions with other groups.

While a numerical benchmarking analysis of 1 million simulated maps per chamber may suggest that additional VRA districts are indicated for the State House and Senate, further evaluation is necessary to determine if they are required under the VRA by meeting other criteria.

About Fair Districts GA

Fair Districts GA (FairDistrictsGA.org) is the sole non-partisan organization in Georgia focused exclusively on fighting gerrymandering, the practice of drawing legislative district lines to favor one group over another. Our ultimate goal is to reform Georgia's process for drawing state and federal electoral maps. We support stronger standards and a non-partisan, transparent, accountable redistricting process.

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Redistricting 2021: How to Map a Changing Georgia

About the Princeton Gerrymandering Project

Operating at the intersection of law, math, and political science, PGP (gerrymander.princeton.edu) is dedicated to reforming redistricting nationwide. PGP's state-of-the art analysis used existing maps and recent election results to estimate the true extent of gerrymandering in Georgia. Using 2020 census data, PGP has created benchmarks for fair electoral maps that will be used to evaluate proposed maps drawn by the Georgia state legislature. Experts have submitted similar analysis as testimony in significant anti-gerrymandering litigation in federal and state courts.