EXHIBIT 11

Excerpts of Expert Report of Dr. Kassra A.R. Oskooii, dated August 1, 2024

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF NORTH CAROLINA

SHAUNA WILLIAMS, et al., *Plaintiffs*, v. REPRESENTATIVE DESTIN HALL, in his official capacity as Chair of the House Standing Committee on Redistricting, et al., *Defendants*.	Civil Action No. 23 CV 1057
NORTH CAROLINA STATE CONFERENCE OF THE NAACP, et al., *Plaintiffs*, v. PHILIP BERGER, in his official capacity as the President Pro Tempore of the North Carolina Senate, et al., *Defendants*.	Civil Action No. 23 CV 1104

Expert Report of Dr. Kassra A.R. Oskooii

August 1, 2024

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I. Executive Summary

1. I am a tenured Associate Professor and Provost Teaching Fellow in the department of Political Science and International Relations at the University of Delaware. I have been engaged in this matter by counsel for the NAACP Plaintiffs[1] ("Plaintiffs") in this consolidated matter to conduct racially polarized voting ("RPV") and electoral performance analyses of the State House, State Senate, and Congressional plans enacted by the North Carolina General Assembly in October of 2023 (the "2023 House Plan," "2023 Senate Plan," and "2023 Congressional Plan," respectively), as well as for demonstrative plans provided by the Plaintiffs. I also analyzed RPV for districts in the 2022 Interim Congressional Plan, as well as areas added to and subtracted from Congressional District 1 in the 2023 Congressional Plan as compared to the 2022 Interim Congressional Plan.

2. More specifically, for the RPV analysis, I was asked to examine whether the Black population in various regions of interest is politically cohesive and whether the White population in those regions votes sufficiently as a bloc to enable White voters to usually defeat Black-preferred candidates. The framework I used for examining racially polarized voting was established in the United States Supreme Court case *Thornburg v. Gingles*, 478 U.S. 30 (1986), numerous subsequent cases, and the factors set forth in the U.S. Senate Report accompanying 1982 amendments to the Voting Rights Act.

3. My opinions on Black cohesion and White bloc voting are based on a careful analysis of all the contested, precinct-sorted federal, state, and judicial general election results from years 2016 to 2022, held across the entire state and reported by the North Carolina State Board of Elections (NCSBE). In total, I examined 49 unique election contests, broken down by year as follows: 7 in 2022, 20 in 2020, 4 in 2018, and 18 in 2016.

4. I examined election contests covering all the precincts in the state of North Carolina to ensure that comparative analyses across various maps and district boundaries, such as the 2023 enacted maps and demonstrative maps, are consistent and directly comparable. This approach ensures uniform data from all precincts, unlike regional elections, which may omit certain precincts and lead to incomplete analyses or analyses that will not be helpful in making direct comparisons across different district boundaries and plans.

[1] NAACP Plaintiffs include the North Carolina State Conference of the NAACP, Common Cause, Mitzi Reynolds Turner, Dawn Daly-Mack, Hollis Briggs, Corine Mack, Calvin Jones, Linda Sutton, and Syene Jasmin.

5. To assess the presence or absence of RPV, I rely on two well-established statistical methods to estimate voting patterns by race: the Iterative Ecological Inference ("EI") method and the EI Rows by Columns ("RxC") method. The statistical methods I rely on to estimate vote choice by race are agnostic as to *why* voters support or oppose different candidates; the analysis simply shows *which* candidates different groups of voters prefer, which are referred to as "Candidates of Choice" or "Preferred Candidates."

6. Overall, the accumulated evidence I considered leads me to the following conclusions.

7. By using two ecological inference methods, Iterative EI and RxC, which are the standard methods of measuring RPV, and applying these to past electoral results paired with voter demographic data, I have identified definitive evidence of Racially Polarized Voting in the areas at issue in this matter, i.e., the Northeast and Triad areas of North Carolina.

8. In my analysis of State Senate Legislative Districts ("SLDs"), I found:

    a. There are clear patterns of RPV in each of the Northeast 2023 Enacted Senate Legislative Districts I analyzed (SLDs 1, 2, 5, and 11). Black voters voted cohesively for candidates disfavored by White voters in all 49 out of 49 contests across all districts, and White voters vote as a bloc against Black-preferred candidates in at least 48 (and in 3 districts all) of the 49 contests (or 98%) I examined.

    b. Average Black cohesion estimates are above 95% across all 2023 Enacted Senate districts, EI models, and election years.

    c. A comparison of midterm election years to one another and presidential elections years to one another suggests that White bloc voting is increasing over time. This trend is consistent across both methods of EI and all individual 2023 Enacted Senate districts analyzed. In more recent election years (2022 and 2020), White bloc voting average estimates range from percentages in the mid 70s to the high 80s.

    d. Average Black cohesion estimates are also above 95% in Plaintiffs' two demonstrative districts.

    e. Giving greater weight to more recent elections, I conclude that Black-preferred candidates will usually be defeated in SLDs 1, 2, and 11, and that if current trends in the patterns of RPV persist, it is likely that Black voters in SLD 11 will face similar challenges as in 2022, when they were unable to elect a Black-preferred candidate and lost by an average of 7.5 percentage points. In SLD 5, and despite consistent patterns of racially polarized voting, White voters are not numerous enough to prevent the success of candidates supported by highly cohesive Black voters. However, the average margin of victory has declined over time.

a. Plaintiffs' demonstrative plans show that it is possible to construct two Black-majority districts in this region that will consistently perform in every election cycle, including the most recent 2022 election.

9. In my analysis of State House Legislative Districts ("HLDs"), I found:

a. There are clear patterns of RPV in the area, or "cluster," of Northeast 2023 Enacted House Legislative Districts I analyzed (HLDs 4, 5, 7, 8, 9, 10, 12, 23, 24, 25, 27, and 32), which is also supported by district-specific analyses despite the EI models relying on much less information. Black voters voted cohesively for candidates disfavored by White voters in all 49 out of 49 contests across all districts, and White voters vote as a bloc against Black-preferred candidates in all but two districts in all 49 out of 49 contests. In those two districts, HLDs 8 and 12, White voters vote as a bloc against Black-preferred candidates in 47 and 48 out of 49 elections respectively.

b. Average Black cohesion cluster estimates are above 95% across the EI models and election years. A comparison of midterm election years to one another and presidential elections years to one another suggests that White bloc voting is increasing over time. This trend is consistent across both methods of EI and all individual 2023 Enacted House districts analyzed. In more recent election years (2022 and 2020), White bloc voting averages in the cluster range from percentages in the mid to the high 80s.

c. Black cohesion estimates are comparable to or higher than the level of political cohesion observed in the enacted HLDs in all six demonstrative districts in House Demonstrative Plan A and all six demonstrative districts in House Demonstrative Plan B.

d. Overall, only the two majority Black Voting Age Population ("BVAP") districts, HLDs 23 and 25, and the one plurality BVAP district, HLD 8, have consistently performed for Black voters, including the most recent 2022 contests. If current RPV trends continue, White bloc voting will likely continue to hinder the electoral success of Black-preferred candidates in the remaining majority White Voting Age Population ("WVAP") districts, making it even more difficult for Black voters to elect their candidates of choice.

e. Plaintiffs' demonstrative plans demonstrate it is possible to draw at least six BVAP majority districts that perform if the Black population is not spread across the 12 enacted districts in the region.

f. Taken together, the accumulated evidence across all the three maps (the 2023 Enacted House map and Plaintiffs' two demonstratives) suggests that Black-voters will be able to consistently elect their candidates of choice in Black-majority districts. However, Black voters are highly unlikely to succeed in WVAP majority districts, especially if the pattern of worsening RPV in these areas, which has been consistently ongoing since at least 2016, continues. Put differently, if the current trends of increased RPV continue, White voters will likely shut out Black-preferred candidates in the 9 out of 12 2023 Enacted HLDs in which they comprise a majority of the VAP.

10. In my analysis of Congressional Legislative Districts ("CLDs"), I found:

a. There are clear patterns of RPV in CLDs 1 and 6 of the 2022 Interim Congressional Legislative Plan. Black voters voted cohesively for candidates disfavored by White voters in all 49 out of 49 contests across all districts, and White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests I examined across all districts. Electoral performance shows that 2022 Interim CLD 1 performed for Black voters between 2016 and 2020, with 2022 showing very close win/loss margins, where only 29% of Black-preferred candidates prevailed. Relative to CLD 1, the 2022 Interim CLD 6 performed for Black voters in all the election years considered.

b. There are also clear patterns of racially polarized voting in each of the 2023 Enacted Congressional Legislative Districts (CLDs 1, 5, 6, 9 and 10) that I analyzed. Black voters voted cohesively for candidates disfavored by White voters in all 49 out of 49 contests across all districts, and White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests I examined across all districts.

c. Average Black cohesion estimates are above 95% across all 2023 Enacted Congressional districts, EI models, and election years. A comparison of midterm election years to one another and presidential elections years to one another suggests that White bloc voting is increasing over time. This trend is consistent across both methods of EI and all individual 2023 Enacted Congressional districts analyzed. In more recent election years (2022 and 2020), White bloc voting average estimates range from percentages in the mid 70s to the high 80s.

d. Notably, a comparison of the 2022 Interim Plan to the 2023 Enacted Plan reveals significant changes in electoral performance. Under the Interim Plan, CLD 6 was a performing district with a 100% win rate for Black-preferred candidates from 2018 to 2022 and a 94% win rate in 2016. However, under the 2023 Enacted Plan, none of the Triad area 2023 Enacted CLDs (5, 6, 9, or 10) performed for Black voters. Additionally, CLD 1 went from a district where Black-preferred candidates won 29% of the contests in election year 2022 under the 2022 Interim Plan to a 2023 Enacted CLD 1 where all Black-preferred candidates would have lost in 2022 by larger margins.

e. The difference in performance for Black-preferred candidates in terms of rates and margins of victory and loss in the 2022 election between the 2022 Interim CLD 1 and the 2023 Enacted CLD 1 is likely attributable to difference in White bloc voting rates of those who were removed from and added to the 2023 enacted district. This is particularly the case since the racial composition of the Black and White populations did not substantially change. An analysis of racially polarized voting between areas added to those removed from CLD 1 between 2022 and 2023 show that precincts added to the 2023 Enacted CLD 1 exhibit much higher levels of White bloc voting compared to the removed precincts. While Black voter cohesion remains strong in the added precincts, the increased White bloc voting likely contributed to the reduced electoral success of Black-preferred candidates in the new 2023 district.

11. In my review of two reports that I understand were submitted by Dr. Jeffrey B. Lewis in prior North Carolina state court redistricting litigation from 2021 and 2022, I find that the analyses and results presented in these reports are insufficient to determine with a reasonable degree of scientific certainty whether, and how many, majority BVAP (Black Voting Age Population) districts need to be drawn to comply with the Voting Rights Act.

II. Background and Qualifications

12. I am Associate Professor and Provost Teaching Fellow in the department of Political Science and International Relations at the University of Delaware. I joined the faculty in 2016 and received tenure in 2021. I am also an affiliated faculty member at the University of Delaware's Data Science Institute, Master of Science in Data Science, Center for Political Communication, and Center for the Study of Diversity. My academic specializations include racial and ethnic politics, political behavior, political psychology, and political methodology. I teach courses on the Voting Rights Act, race and ethnicity in politics, and American political behavior.

13. My research and teaching focus on American political behavior, political methodology, political psychology, political representation, voting rights, and redistricting. My research has appeared in numerous leading peer-reviewed, social science journals, including *Sociological Methods and Research, Political Behavior, Public Opinion Quarterly, Political Psychology, Advances in Political Psychology, British Journal of Political Science, Electoral Studies, Perspectives on Politics, Urban Affairs Review, State Politics and Policy Quarterly, and Journal of Public Policy.*

14. I received my Ph.D. in Political Science, specializing in American politics, racial and ethnic politics, and political methodology, from the University of Washington in Seattle, Washington in 2016. Prior to that, I received my master's degree in political science at the University of Washington and received a political methodology field certificate from the Center for Statistics & the Social Sciences in 2013. I received my Bachelor of Arts in Political Science in 2008 at the University of Washington, with minors in Human Rights and Law, Societies, and Justice.

15. Throughout my academic career, I have taught courses on a range of topics related to voting behavior and redistricting. This includes instruction on demographic and electoral data collection and analysis utilizing election returns, voter history files, Decennial U.S. Census data, and American Community Survey data. I have also instructed on the evaluation of electoral maps for compliance with the Voting Rights Act of 1965 ("VRA") and traditional redistricting principles.

16. I have served as an expert witness in various redistricting and voting rights cases, where I utilized demographic data derived from voter files, the U.S. Decennial Census, or American Community Survey to conduct racially polarized voting and electoral performance analyses, to develop demonstrative/illustrative and remedial plans, and to evaluate plans for compliance with the VRA and traditional and state-specific redistricting principles. The cases I have worked on include *Dickinson Bay Area Branch NAACP v. Galveston County, Texas*, No. 3:22-cv-117-JVB (S.D. Tex. 2023) [Deposed & Testified]; *Baltimore County Branch of the NAACP v. Baltimore County, Maryland*, No. 1:21-cv-03232-LKG (D. Md. 2022); *Common Cause Florida v. Lee*, No. 4:22-cv-00109-AW-MAF (N.D. Fla. 2022); *Common Cause Florida v. Byrd*, No. 4:22-cv-00109-AW-MAF (N.D. Fla. 2022) [Deposed]; *Reyes v. Chilton*, No. 4:21-cv-05075-MKD (E.D. Wash. 2021) [Deposed]; *Finn et al. v. Cobb County Board of Elections and Registration*, No. 1:22-cv-02300-ELR (N.D. Ga. 2022); *Caroline County Branch of the NAACP v. Town of Federalsburg*, Civ. Action No. 23-SAG-00484 (D. Md. 2023); *Coca v. City of Dodge City, et al.*, Case No. 6:22-cv-01274 (D. Kan. 2022) [Deposed & Testified]; *Soto Palmer v. Hobbs*, No. 3:22-cv-05035-RSL (W.D. Wash. 2021) [Testified]; *Wicomico County Branch of the NAACP et al v. Wicomico County, MD*, Civ. Action No. 23-MJM-03325 (D. Md. 2023); and *Stone v. Allen*, No. 2-21-cv-1531 (N.D. Ala. 2021) [Deposed]; *New York*

Communities for Change et al. v. County of Nassau, NY et al., No. 602316/2024 (N.Y.S.).

17. As an expert consultant, I advised the State of Maryland on its 2021 Congressional and Legislative redistricting plans as it pertains to compliance with the Voting Rights Act. I have also examined and redrawn the 2022 school board district boundaries of the Roswell Independent School District in the state of New Mexico.

18. I have published peer-reviewed academic papers on ecological inference methods as it pertains to racially polarized voting analysis. In 2022, I published a paper in the top-ranked Sociological Methods and Research journal titled "Estimating Candidate Support in Voting Rights Act Cases: Comparing Iterative El & El-RxC Methods." In 2016 I published a paper titled "eiCompare: Comparing Ecological Inference Estimates across EI and EI:RxC" in the R Journal. Both papers utilize a software package I co-developed called "eiCompare," which is a reproducible code that quantifies, compares, and represents data on racial voting patterns. The package enables social scientists to use aggregate-level election and demographic data retrieved from the U.S. Census, American Community Survey, and voter files to predict racial and ethnic group voting behavior. eiCompare has been cited in numerous academic papers and in court filings. More information about my qualifications and expert witness and consulting background, including all my publications over the past ten years, can be found on my Curriculum Vitae, appended to this declaration as **Appendix A.**

19. In the *Galveston County* case in the Southern District of Texas, the court recognized me as an expert on racially polarized voting analysis and credited my analyses, opinions, and testimony, granting them "substantial weight." *See Petteway v. Galveston Cnty.*, No. 3:22-CV-57, 2023 WL 6786025, at *9 (S.D. Tex. Oct. 13, 2023) ("The court recognized Dr. Oskooii as an expert on racially polarized voting analysis. The defendants' expert on the second and third Gingles preconditions, Dr. John Alford, testified that he greatly respects Dr. Oskooii as a methodologist. Dr. Alford agreed with the numerical accuracy of . . . Dr. Oskooii's ecological-inference results and adopted their results for his analysis."). I was also found "highly credible" as a *Gingles I* expert by the District Court of Kansas in *Coca v. Dodge City*, 6:22-cv-1274 (D. Kan. July 10, 2024).

20. The information in this Report is based upon information that has been made available to me or known to me to date. My work in this matter is ongoing, and I reserve the right to modify or supplement any conclusions as additional information is made available or as I perform further analysis.

21. I am being compensated at a rate of $350 per hour for my work in this matter. My compensation is not in any way contingent on the content of my opinions or the outcome of this matter.

III. Scope of Inquiry

22. I was asked by counsel for Plaintiffs to apply reliable principles and methods that are standard to my area of expertise and utilize sufficient facts and data from sources I deem accurate and reliable, including past electoral results, to examine the following:

    a. For **Senate Legislative Districts**, to assess (*i*) whether the Black population in the 2023 enacted SLDs in Northeast North Carolina is politically cohesive, (*ii*) whether the White population votes sufficiently as a bloc to enable White voters to usually defeat Black-preferred candidates, (*iii*) whether the 2023 enacted SLDs will or will not usually perform for Black voters based on past electoral results, (*iv*) whether the Black population is politically cohesive in Plaintiffs' *Gingles I* demonstrative SLDs, and (v) whether the demonstrative SLDs proposed by the Plaintiffs usually perform for Black-preferred candidates.

    b. For **House Legislative Districts**, to assess (*i*) whether the Black population in the 2023 enacted HLDs in Northeast North Carolina is politically cohesive, (*ii*) whether the White population votes sufficiently as a bloc to enable White voters to usually defeat Black-preferred candidates, (*iii*) whether the 2023 enacted HLDs in Northeast North Carolina will or will not usually perform for Black voters based on past electoral results, (*iv*) whether the Black population is politically cohesive in Plaintiffs' *Gingles I* demonstrative HLDs, and (*v*) whether the demonstrative HLDs proposed by the Plaintiffs usually perform for Black-preferred candidates.

    c. For **Congressional Legislative Districts**, to assess the level of racially polarized voting and likely performance for Black voters in (*i*) CLDs 1 and 6 of the 2022 Interim Congressional Plan, (*ii*) CLDs 1, 5, 6, 9, and 10 of the 2023 Congressional Plan, (*iii*) areas *added* to CLD 1 in the 2023 Congressional Plan as compared to the 2022 Interim Congressional Plan, and (*iv*) areas *subtracted* from CLD 1 in the 2023 Congressional Plan as compared to the 2022 Interim Congressional Plan.

    d. I was also asked by counsel for Plaintiffs to review two reports that I understand were submitted in prior North Carolina redistricting litigation in North Carolina State Court, *N.C. League of Conservation Voters v. Hall*: the Expert Report of Dr. Jeffrey B. Lewis dated December 28, 2021, and the Supplemental Expert Report of Dr. Jeffrey B. Lewis dated February 18, 2022. Counsel for Plaintiffs asked me to evaluate whether it was possible to determine from those reports whether or not the Voting Rights Act required majority-BVAP districts anywhere in North Carolina.

IV. Methodology and Data

A. Racially Polarized Voting ("RPV")

23. The analysis of racially polarized voting is relevant to the Plaintiffs' allegations that the state House, state Senate, and Congressional districts enacted by the North Carolina General Assembly in 2023 will result in racial vote dilution.

24. As set forth in my 2022 paper "Estimating Candidate Support in Voting Rights Act Cases: Comparing Iterative EI and EI-RxC Methods," the U.S. Supreme Court established a three-pronged test to assess Section 2 of the Voting Rights Act (VRA) claims:

> In *Thornburg v. Gingles*, 478 U.S. 30 [(1986)], the court established a legal framework to guide VRA challenges to legislative districts or at-large voting systems that have been accused of diluting minority voting opportunities. According to *Gingles*, there are three prongs that plaintiffs must establish through an analysis of voting data to make a successful claim: (1) the minority group is both geographically compact and large enough to create a single-member district, (2) the minority group tends to vote together and is politically cohesive, and (3) the nonminority (majority group) tends to vote in the opposite direction, such that it can usually block the minority groups' preferred candidate (Ross 1993).

25. In general, RPV occurs when a minority racial group or groups favor candidates ("candidates of choice") that are disfavored by the majority racial group. Put differently, RPV exists when minority and majority voters choose different candidates. Thus, if a majority of voters[2] from both the minority and majority demographic groups vote for the same candidate in a contest, RPV is not present in that contest.

26. To determine the presence or absence of RPV, analysts look for patterns across multiple contests rather than drawing inferences based on only one election, with more weight typically given to more recent elections since they are typically more indicative of future voting patterns.

27. In situations where RPV is present, majority voters (for example, White voters) may be able to consistently or usually prevent minority voters (for example, Black voters)

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[2] In multi-candidate contests one would consider plurality of voters.

from electing their candidates of choice by voting as a bloc against minority voters' preferred candidate.

28. An electoral performance analysis[3] is typically conducted to determine if RPV in a jurisdiction(s) usually results in preventing minority voters from being able to elect their candidates of choice.

B. RPV Methodology

29. The voting patterns of different demographic groups typically must be inferred using statistical methods. This is because public records do not show which candidate each individual voter voted for since elections are conducted by secret ballot.

30. To estimate the vote choice of White and Black voters across the various district boundaries or regions of interest in North Carolina, I utilize two state-of-the-art ecological inference methods.[4]

31. Ecological inference methods generate estimates of racial voting patterns from data on the relationship between the demographic composition of voting precincts and the votes cast for candidates in each precinct.

32. The first method is commonly referred to as King's Iterative EI,[5] often preferred when there are two racial groups and two candidates. Ecological inference analysis was developed in the late 1990s by Professor Gary King of Harvard University to improve upon the shortcomings of ecological regression, which is an older technique pre-dating the 1986 *Gingles* decision. Unlike ecological regression, ecological inference

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[3] Another term used by scholars and the courts is called a "functional" or "effectiveness" analysis. In this Report, an electoral performance analysis is interchangeable with a functional or effectiveness analysis.

[4] "Ecological inference is the process of using aggregate (*i.e.*, ecological) data to infer discrete individual-level relationships of interest when individual-level data are not available. Ecological inferences are required in political science research when individual-level surveys are unavailable (*e.g.*, local or comparative electoral politics), unreliable (racial politics), insufficient (political geography), or infeasible (political history). They are also required in public policy (*e.g.*, for applying the Voting Rights Act) and other academic disciplines ranging from epidemiology and marketing to sociology and quantitative history." King, G. and Roberts, M., 2012, *EI: a (n R) program for ecological inference*, Harvard University, at 2.

[5] King, G., 2013, *A Solution to the Ecological Inference Problem*, Princeton University Press.

uses maximum likelihood estimation[6] and the method of bounds,[7] which takes advantage of more information from the available data. For example, assume a precinct with 100 voters, 70 Black and 30 White, and two candidates—Candidate A and Candidate B—where Candidate A receives 80 votes. In this hypothetical precinct, at least 50 Black voters voted for Candidate A—that is, even if all 30 White voters voted for Candidate A, 50 of the remaining votes had to come from Black voters—and at most all 70 Black voters voted for Candidate A.

33. Ecological inference uses this information about the range of possible values (bounds) from each precinct in generating its estimates, but ecological regression does not. Instead, ecological regression assumes a linear relationship between the percentage of minority voters in a precinct and the votes cast for each candidate. Therefore, ecological regression relies on a constancy assumption[8] that the share of votes for a candidate among demographic groups is the same across all precincts. This assumption is hardly met or realistic in many cases.

34. The second—and more computationally intensive method—is called EI Rows by Columns ("RxC"), which uses a hierarchical Bayesian model[9] to estimate multiple rows (candidates) and multiple columns (racial groups) simultaneously (rather than iteratively). Dr. Gary King is an author of this Bayesian method as well.

35. These two methods are closely related in that they both take ecological (i.e., group-level) data—such as election precinct-level vote totals and demographic data at the precinct-level—to predict vote choice by racial/ethnic groups. King's EI is referred to as the iterative approach because it runs a 2-by-2 analysis of each candidate and

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[6] To simplify, MLE creates a model that represents different possible scenarios of how Black and White voters might have voted and calculates how likely each one is, given the data. It then chooses the combination that has the highest likelihood (i.e., the one that best matches the observed data).

[7] The method of bounds is a technique used within ecological inference to establish the range of possible values (bounds) for individual-level proportions given aggregate data. These bounds are useful for understanding the potential variability in voter behavior within the constraints of the aggregated data.

[8] The constancy assumption, also known as the homogeneity assumption, posits that the relationship between the independent and dependent variables is consistent across all units of analysis (e.g., precincts). Specifically, it assumes that the voting behavior of a demographic group (e.g., Black and White voters) is constant across all precincts. This assumption about uniformity in voting behavior across all units of analysis may not match reality as the voting behavior of demographic groups can vary significantly across different precincts due to a variety of different factors.

[9] Rosen, O., Jiang, W., King, G. and Tanner, M.A., 2001, *Bayesian and frequentist inference for ecological inference: The R× C case*, Statistica Neerlandica, 55(2), at 134-156. The Bayesian approach combines the likelihood of the observed data with prior distributions for the parameters.

each racial group in iterations, whereas the RxC method estimates multiple rows and multiple columns simultaneously in one model.

36. In summary, both versions of EI operate similarly in that the following VTD/Precinct-level data is required to estimate vote choice for different racial or ethnic groups: (1) the percentage of each racial and ethnic group under consideration; (2) the share of votes received by each candidate; and (3) the total votes cast between the candidates. A comprehensive assessment of the two methods using VTD/Precinct-level data ranging from two candidates and two racial groups to multiple candidates and up to four racial groups suggests that they produce substantively similar findings regarding RPV patterns.[10]

37. The statistical methods I rely on to estimate voting patterns by race/ethnicity are agnostic as to why voters support or oppose different candidates; the results simply reveal *which* groups of voters prefer *which* candidates.

38. To conduct RPV analyses with each EI method, I use a peer-reviewed, open-source software package titled "eiCompare," which includes the necessary functions to estimate vote choice by race and ethnicity with both iterative EI and RxC.[11] This package, which I am an author of, is publicly available on GitHub[12] and can be uploaded into the statistical computing and graphics software called "R."[13]

C. Electoral Performance Methodology

39. An electoral performance analysis is an effective approach to evaluate the success (or failure) of different candidates under different map/district boundaries to answer the question of whether majority voters usually prevent the election of candidates that minority voters prefer.

40. To conduct a performance analysis, one does not typically need to rely on any estimation methods. The most crucial part of conducting such an analysis is to correctly identify the VTDs/Precincts that fall inside the electoral jurisdictions of interest (e.g., Senate Legislative District 1).

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[10] Barreto, M., Collingwood, L., Garcia-Rios, S. and Oskooii, K.A., 2022, *Estimating candidate support in Voting Rights Act Cases: Comparing iterative EI and EI-R×C Methods*, Sociological Methods & Research, 51(1), at 271-304.

[11] Collingwood, L., Oskooii, K., Garcia-Rios, S. and Barreto, M., 2016, *eiCompare: Comparing Ecological Inference Estimates across EI and EI: RxC*. R J., 8(2), at 92.

[12] eiCompare: https://github.com/RPVote/eiCompare

[13] The R Foundation, *What is R?*, https://www.r-project.org/about.html

41. If precincts are split between two districts, the analyst must appropriately allocate the votes from a split precinct. This allocation is performed with a split precinct analysis whereby votes for each candidate in a split precinct are allocated based on the VAP of the Census blocks inside the precinct. This ensures that votes are distributed based on where people reside (down to the lowest census unit, the Census block) rather than the size of geographic areas that may not entail any population. Here, VAP data is typically preferable to CVAP data because VAP is available at the Census block-level while the most granular CVAP data is only available at the Census block-group level. Furthermore, VAP data comes from the enumeration of the population conducted during the Decennial Census as opposed to CVAP data that comes from the American Community Survey, which is based on a sample of the population.

42. Once the votes for candidates are correctly allocated to precincts that fall inside the district(s) of interest, all that is left is to aggregate the candidate votes in the subject jurisdiction(s)—that is, count the votes received by a candidate across all the precincts in a district. The aggregated vote total for each candidate is then divided by the total votes cast in the election in the subject jurisdiction (*i.e.*, Senate Legislative District 1) to produce vote percentages.

43. This analysis, which essentially reconstructs previous election results based on various district boundaries (e.g., Enacted vs Demonstrative Districts), will demonstrate which contests the preferred candidates of minority voters (*e.g.*, Black voters) win or lose.

D. Data

Election Data

44. To provide a comprehensive evaluation of RPV patterns, I examined every single contested[14] statewide general election reported by the North Carolina State Board of Elections (NCSBE) from years 2016 to 2022. In total, I examined 49 contested Federal, Council of State, and Judicial elections encompassing all the precincts (and voters) across the state of North Carolina.

45. The election data I rely on were produced by official sources and are publicly available. For the 2020 and 2022 general election results I downloaded precinct-level/sorted vote total for each contest and candidate from the NCSBE's website.[15] I

[14] Contested elections in this context are defined as elections in which at least two candidates run against each other. An election must be contested to use it to examine RPV patterns.

[15] NCSBE Election Data Links:
https://dl.ncsbe.gov/?prefix=ENRS/2022_11_08/results_precinct_sort/ and
https://dl.ncsbe.gov/?prefix=ENRS/2020_11_03/results_precinct_sort/

downloaded precinct-sorted election returns for contests held in years 2016 and 2018 from the Redistricting Data Hub (RDH),[16] because RDH provided a more accessible version of the NCSBE's precinct-sorted election data for those years, which were produced by the Voting and Election Science Team (VEST).[17]

46. **Table 1** provides the list of the general elections that I analyzed for this Report, along with statewide vote percentages per candidate as reported by the NCSBE.[18]

47. With only two exceptions, my analysis focuses on the two top-vote-receiving candidates in each contest since many contests only had two candidates or candidates outside of the top two were unable to garner at least 10 percent of the total statewide vote. The two contests in which I account for three candidates are the 2018 Supreme Court Associate Justice Seat 1 contest in which the third-placed candidate, Christopher Anglin, secured 16.37 percent of the statewide vote and the 2018 Appeals Court Judge Seat 2 contest in which the third-placed candidate, Sandra Ray, received 15.50% of the statewide vote.[19]

48. I examined contests covering the entire state of North Carolina rather than focusing on specific regional elections to ensure that any comparative analysis across various maps and district boundaries (e.g., 2023 enacted maps and demonstrative maps at various levels of geography) considers the same candidates and contests available to all voters, regardless of their residence.

49. This approach ensures a consistent and directly comparable analysis across the many district boundaries that I have been asked to examine. Regional elections, in contrast, would not cover certain precincts within specific districts (especially under the 2023 enacted maps or any demonstrative plans since no elections have been held under these plans), potentially leading to incomplete or biased analyses due to the lack of uniform data across all the areas of interest.

[16] Redistricting Data Hub Election Data Links: https://redistrictingdatahub.org/dataset/vest-2016-north-carolina-precinct-and-election-results/ and https://redistrictingdatahub.org/dataset/vest-2018-north-carolina-precinct-boundaries-and-election-results-shapefile/

[17] https://dataverse.harvard.edu/dataverse/electionscience

[18] I relied on the NCSBE "Election Results Dashboard" to report statewide vote percentages for each candidate, which can be found here: https://er.ncsbe.gov

[19] Third-Place candidate vote percentages for these contests can be found here: https://er.ncsbe.gov/?election_dt=11/06/2018&county_id=0&office=JUD&contest=0

Table 1: List of 49 General Elections Analyzed

Contest	Type	Year	Candidate Name	% Vote	Candidate Name	% Vote
U.S. Senate	General	2022	Ted Budd	50.50%	Cheri Beasley	47.27%
Supreme Court Justice 3	General	2022	Richard Dietz	52.39%	Lucy Inman	47.61%
Supreme Court Justice 5	General	2022	Trey Allen	52.19%	Sam Ervin IV	47.81%
Appeals Court 8	General	2022	Julee Flood	52.42%	Carolyn Thompson	47.58%
Appeals Court 9	General	2022	Donna Stroud	54.40%	Brad Salmon	45.60%
Appeals Court 10	General	2022	John Tyson	52.74%	Gale Adams	47.26%
Appeals Court 11	General	2022	Michael Stading	52.85%	Darren Jackson	47.15%
U.S President	General	2020	Donald Trump	49.93%	Joe Biden	48.59%
U.S. Senate	General	2020	Thom Tillis	48.69%	Cal Cunningham	46.94%
Governor	General	2020	Dan Forest	47.01%	Roy Cooper	51.52%
Lt. Governor	General	2020	Mark Robinson	51.63%	Yvonne Holley	48.37%
Attorney General	General	2020	Jim O'Neill	49.87%	Josh Stein	50.13%
Auditor	General	2020	Anthony Street	49.12%	Beth Wood	50.88%
Commissioner of Agriculture	General	2020	Steve Troxler	53.86%	Jenna Wadsworth	46.14%
Commissioner of Insurance	General	2020	Mike Causey	51.76%	Wayne Goodwin	48.24%
Commissioner of Labor	General	2020	Josh Dobson	50.83%	Jessica Holmes	49.17%
Secretary of State	General	2020	E.C. Sykes	48.84%	Elaine Marshall	51.16%
Superintendent of Public Instruction	General	2020	Catherine Truitt	51.38%	Jen Mangrum	48.62%
Treasurer	General	2020	Dale Folwell	52.58%	Ronnie Chatterji	47.42%
Supreme Court Justice 1	General	2020	Paul Newby	50.00%	Cheri Beasley	50.00%
Supreme Court Justice 2	General	2020	Phil Berger	50.67%	Lucy Inman	49.33%
Supreme Court Justice 4	General	2020	Tamara Barringer	51.21%	Mark Davis	48.79%
Appeals Court 4	General	2020	April Wood	51.78%	Tricia Shields	48.22%
Appeals Court 5	General	2020	Fred Gore	51.27%	Lora Cubbage	48.73%
Appeals Court 6	General	2020	Chris Dillon	51.95%	Gray Styers	48.05%
Appeals Court 7	General	2020	Jeff Carpenter	51.59%	Reuben Young	48.41%
Appeals Court 13	General	2020	Jefferson Griffin	51.16%	Chris Brook	48.84%
Supreme Court Justice 1	General	2018	Barbara Jackson	34.07%	Anita Earls	49.56%
Appeals Court 1	General	2018	Andrew Heath	49.21%	John Arrowood	50.79%
Appeals Court 2	General	2018	Jefferson G. Griffin	35.72%	Tobias Hampson	48.79%
Appeals Court 3	General	2018	Chuck Kitchen	46.83%	Allegra Collins	48.58%
U.S. President	General	2016	Donald Trump	49.83%	Hilary Clinton	46.17%
U.S. Senate	General	2016	Richard Burr	51.06%	Deborah Ross	45.37%
Governor	General	2016	Pat McCrory	48.80%	Roy Cooper	49.02%
Lt. Governor	General	2016	Dan Forest	51.81%	Linda Coleman	45.32%
Attorney General	General	2016	Buck Newton	49.73%	Josh Stein	50.27%
Auditor	General	2016	Chuck Stuber	49.93%	Beth Wood	50.07%
Commissioner of Agriculture	General	2016	Steve Troxler	55.56%	Walter Smith	44.44%
Commissioner of Insurance	General	2016	Mike Causey	50.40%	Wayne Goodwin	49.60%
Commissioner of Labor	General	2016	Cherie Berry	55.19%	Charles Meeker	44.70%
Secretary of State	General	2016	Michael LaPaglia	47.74%	Elaine Marshall	52.26%
Superintendent of Public Instruction	General	2016	Mark Johnson	50.60%	June Atkinson	49.40%
Treasurer	General	2016	Dale Folwell	52.70%	Dan Blue	47.30%
Supreme Court Justice 1	General	2016	Robert Edmunds	45.53%	Michael Morgan	54.47%
Appeals Court 1	General	2016	Phil Berger	50.25%	Linda Stephens	49.75%
Appeals Court 2	General	2016	Hunter Murphy	48.70%	Margaret Eagles	45.60%
Appeals Court 3	General	2016	Bob Hunter	54.37%	Abe Jones	45.63%
Appeals Court 4	General	2016	Richard Dietz	53.47%	Vince Rozier	46.53%
Appeals Court 5	General	2016	Valerie Zachary	53.81%	Rickye McKoy-Mitchell	46.19%

Voter Demographic Data

50. When constructing a dataset for RPV analysis, analysts typically use the United States Census Bureau data on Voting Age Population (VAP) and Citizen Voting Age Population (CVAP) to determine the racial and ethnic composition of voters across precincts. This approach can be informative, but not the most ideal method of identifying the racial and ethnic composition of voters. This is because CVAP data usually does not account for all eligible voters who voted in every election and VAP data can create another level of imprecision in areas that include large numbers of adult non-citizens.

51. To address such limitations, analysts often use statistical methods, such as Bayesian Improved Surname Geocoding (BISG), to generate probabilistic predictions about voters' racial and ethnic backgrounds. This approach produces a demographic dataset of actual voters rather than just those eligible to vote or of voting age. However, none of these methods are necessary because voter registration records in the state of North Carolina include data on voters' self-identified race and ethnicity.

52. Therefore, I downloaded precinct-level voter demographic data by race and ethnicity (voter history stats) for each general election year from the NCSBE website.[20] This data was then merged with each year's election data by precincts.

Precinct and Map Boundaries

53. I downloaded Precinct shapefiles for all the election years under consideration from the NCSBE website.[21] I supplemented this data with Redistricting Hub's "North Carolina 2022 General Election Precinct-Level Results and Boundaries" shapefile[22] to identify the geographic coordinates of a precinct in which the NCSBE precinct shapefile did not include.

54. I downloaded all the State Senate, House, and Congressional district map boundaries (shapefiles) from the North Carolina General Assembly's "Legislative and

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[20] Voter demographic data ("history stats") can be found here:
https://dl.ncsbe.gov/?prefix=ENRS/2022_11_08/;
https://dl.ncsbe.gov/?prefix=ENRS/2020_11_03/;
https://dl.ncsbe.gov/?prefix=ENRS/2018_11_06/;
https://dl.ncsbe.gov/?prefix=ENRS/2016_11_08/.

[21] Precinct Shapefiles are available here: https://dl.ncsbe.gov/?prefix=PrecinctMaps/.

[22] RDH 2022 election results shapefile is available here:
https://redistrictingdatahub.org/dataset/north-carolina-2022-general-election-precinct-level-results-and-boundaries/.

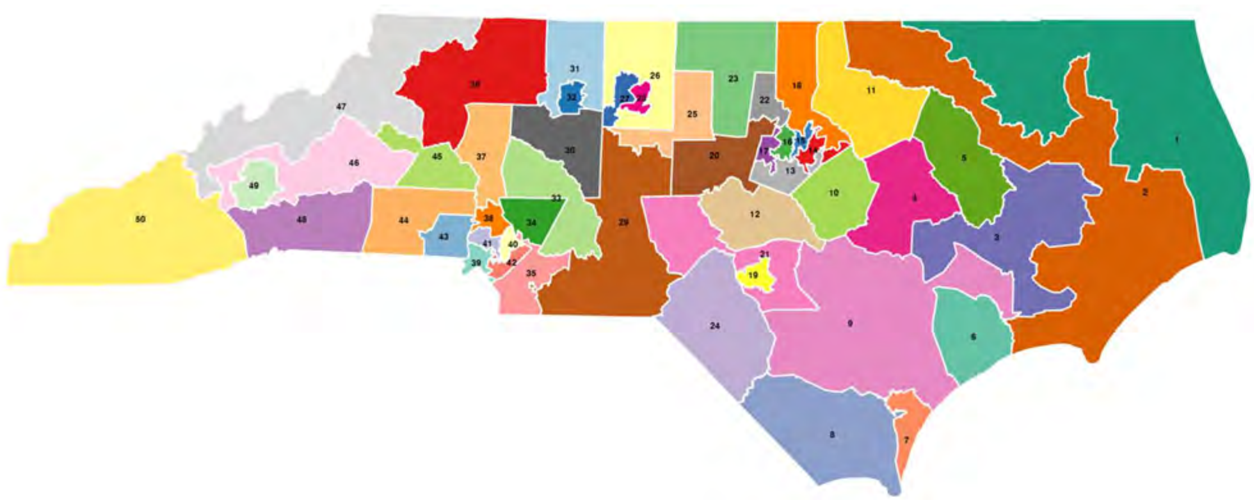
Congressional Redistricting" website.[23] Finally, counsel for Plaintiffs sent me the following demonstrative map shapefiles: State House Plan A, State House Plan B, and State Senate Plan A.

V. RPV and Performance Analyses and Results: State Senate Legislative Districts

55. This section reports all the ecological inference estimates across various State Legislative Districts under different plans. The aim is to determine whether racially polarized voting exists in the challenged region such that Black voters exhibit political cohesiveness (in that the majority or plurality of Black voters vote for the same candidates) and White voters vote as a bloc against or in opposition of Black candidates of choice. I also report the results of a series of electoral performance analyses to evaluate the extent to which Black-preferred candidates usually win or lose under different district boundaries (Enacted and demonstrative).

56. I begin with the 2023 Enacted Senate Legislative Map, shown below in **Figure 1**, before assessing Black voter cohesion in Plaintiffs' demonstrative districts.

Figure 1: Boundaries of the 2023 Enacted Senate Legislative Districts



A. RPV Results by SLDs

57. I begin with the two districts challenged by Plaintiffs, SLD 1 and SLD 2 enacted in 2023, which broadly cover the area of Plaintiffs' *Gingles I* Demonstrative District 2.

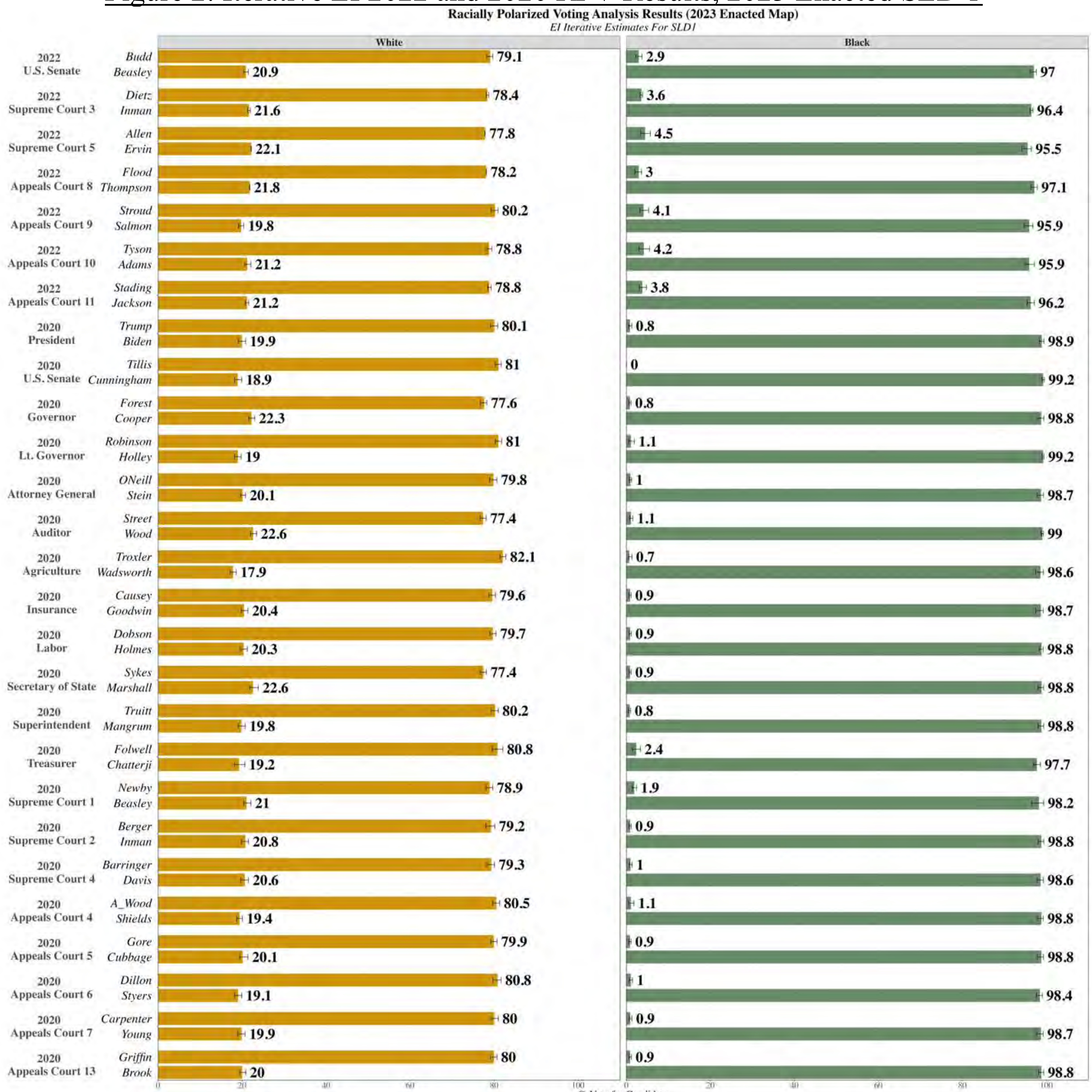
58. Analyses of **SLD 1** reveal clear patterns of RPV. Black voters are politically cohesive (meaning that the majority or plurality of Black voters vote for the same candidates)

[23] https://www.ncleg.gov/redistricting.

in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 48 out of 49 contests (or 98%).

59. The King's iterative EI analysis results of White vs. Black vote choice for the 7 general election contests held in 2022 and 20 contests in 2020 are displayed in **Figure 2**. Due to the large number of estimates, I display two election cycles in one plot to limit the number of plots in this Report, and I discuss the results by election year.

<u>Figure 2: Iterative EI 2022 and 2020 RPV Results, 2023 Enacted SLD 1</u>



60. The left side of **Figure 2** lists the contest names (e.g., U.S. Senate), election years (e.g., 2022), and associated candidate names (e.g., Budd versus Beasly). The color-

coded panels present vote estimates by racial groups (left panel in gold is the White vote and the right panel in green is the Black vote). The bars within each panel represent estimated vote percentages, with lines/bands indicating 95% confidence/credible intervals (CIs) around the point estimates.[24] Vote estimate percentages are also provided at tail ends of the CI bands for readability.

61. The results for the 2022 election cycle show stark RPV patterns. The iterative EI results for the U.S. Senate shows that an estimated 79.1% of White voters preferred candidate Budd, while only 20.9% voted for his opponent, Beasley. In contrast only 3% of Black voters voted for Budd, while an estimated 97% voted for Beasley. In other words, Black voters clearly preferred Beasley, while 79.1% of White voters voted as a bloc against the Black-preferred candidate.

62. The pattern of White and Black voters preferring opposing candidates is evident in the other six election contests held in 2022. Across the board, Black voters exhibit high levels of political cohesion, while White voters also show high levels of cohesion to disfavor candidates preferred by Black voters.

63. Considering all seven 2022 elections together, Black voter support for Black-preferred candidates ranges from 95.5 to 97.1 percent, with an average cohesion of 96.31%. White voter opposition toward Black-preferred candidates ranges from 77.8 to 80.2 percent, with an average bloc vote rate of 78.75%.

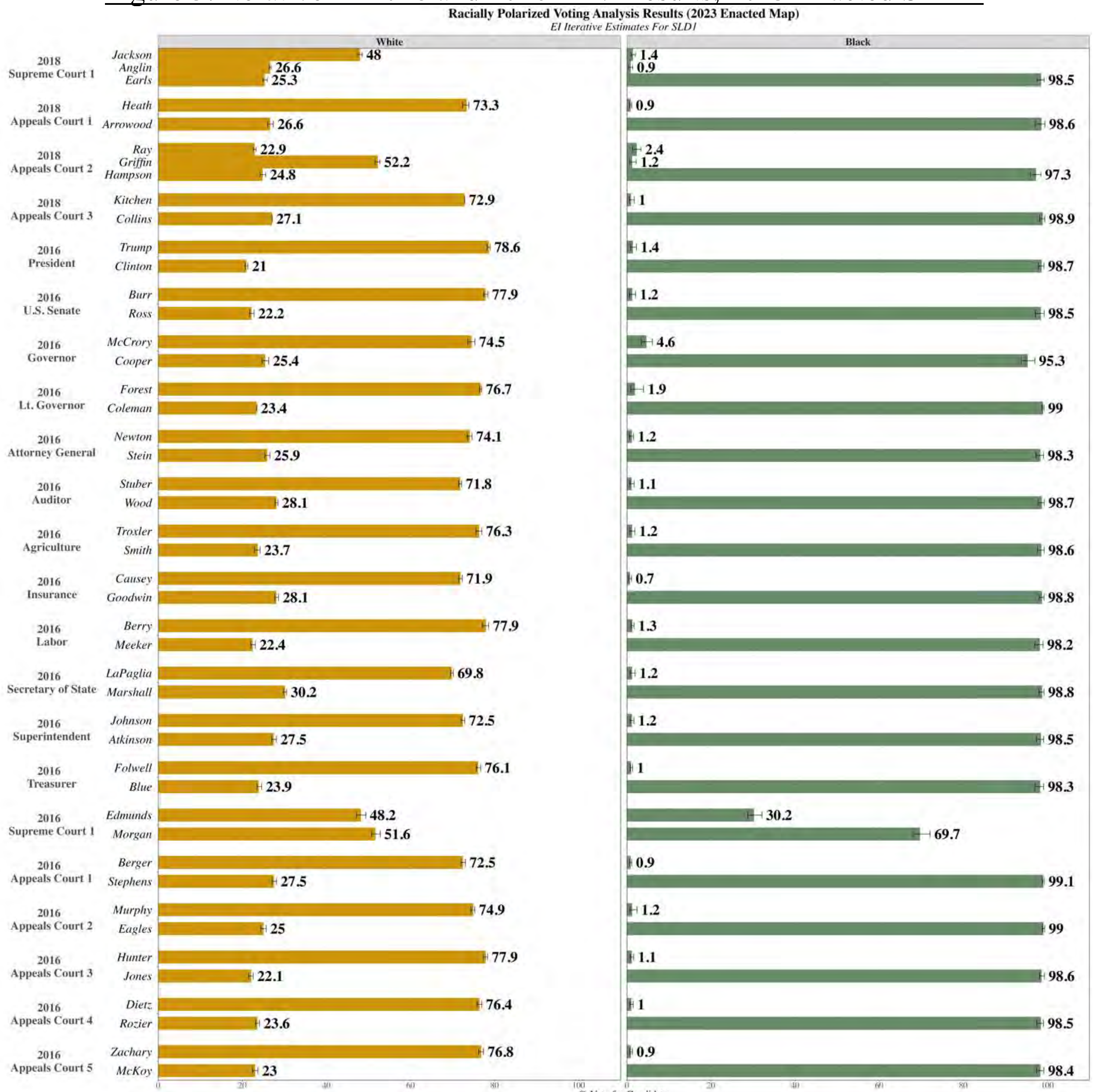
64. RPV also exists in every 2020 contest. All candidates not supported by White voters received overwhelming support from Black voters. The degree of RPV is so stark that the highest level of White support for Black-preferred candidates is only 22.6% (e.g., see 2020 Auditor contest).

65. Across the 20 elections held in 2020, the average Black voter support for Black-preferred candidates is 98.73%, while the average White voter bloc voting rate against Black-preferred candidates is 79.78%.

[24] Confidence intervals provide information about the probability that the interval contains or covers the unknown true parameter (Frequentists approach). Credible intervals capture uncertainty in the location of the parameter values (Bayesian approach). Scientific studies often report 90% or 95% CIs, with some studies, depending on context, reporting 67% CIs or lower. CIs are sensitive to the sample size and the standard deviation of the study groups. If the sample size is small and dispersion is high, the CIs become wider. Each electoral jurisdiction is unique with different racial group concentrations and sizes across different Voting Precincts/VTDs. Therefore, analysts should not apply overly strict or rigid guidelines uniformly to all jurisdictions.

66. The King's iterative EI analysis results of White vs. Black vote choice for the 4 general election contests held in 2018 and 18 general election contests in 2016 are displayed in **Figure 3**.

Figure 3: Iterative EI 2018 and 2016 RPV Results, 2023 Enacted SLD 1



67. In 2018, two out of the four contests feature the standard two candidates and show that about 73% of White voters voted in opposition to Black-preferred candidates. Black voters in these two contests were highly cohesive, with about 99 percent supporting their candidate of choice.

68. The remaining two 2018 contests feature three candidates receiving at least 10% of the statewide vote. In both contests, anywhere from 97.3% to 98.5% of Black voters coalesced behind a single candidate. In contrast, around 50% of White voters backed one candidate, with the rest of the White voters splitting their votes among the remaining two candidates. However, in both three-candidate elections, 74.6% of White voters voted against the Black-preferred candidate (Earls) in the Supreme Court Justice Seat 1 contest, and 75.1% voted against the Black-preferred candidate (Hampson) in the Appeals Court Judge Seat 2 contest.

69. Taking all four 2018 contests together, 98.33% of Black voters, on average, voted for Black-preferred candidates, while an average of 74.01% of White voters bloc voted against candidates preferred by Black voters.

70. The results of the 2016 elections provide further evidence of high levels of RPV patterns in SLD 1. Across 17 out of 18 elections held in 2016, a majority of Black and White voters preferred opposing candidates. The average Black voter support for Black-preferred candidates is 96.83%, while the average White bloc voting rate against Black-preferred candidates is 73.61%.

71. In only 1 out of 18 election contests White voters split their votes fairly evenly, with a slight preference toward the Black-preferred Supreme Court Justice candidate, Morgan. However, Morgan received an estimated 69.7% of the Black vote, which is the lowest percentage of support (about 30 percentage points lower) from Black voters across all the 49 elections.

72. Based on the individual estimates shown in **Figures 2 and 3**, the average iterative EI estimates for Black voter support for Black-preferred candidates in SLD 1 are 96.31% in 2022, 98.73% in 2020, 98.33% in 2018, and 96.83% in 2016.

73. In **Figures 4** and **5**, I also report the results of the second method, EI RxC, for the 2022-2020 and 2018-2016 elections, respectively.

Figure 4: EI RxC 2022 and 2020 RPV Results, 2023 Enacted SLD 1

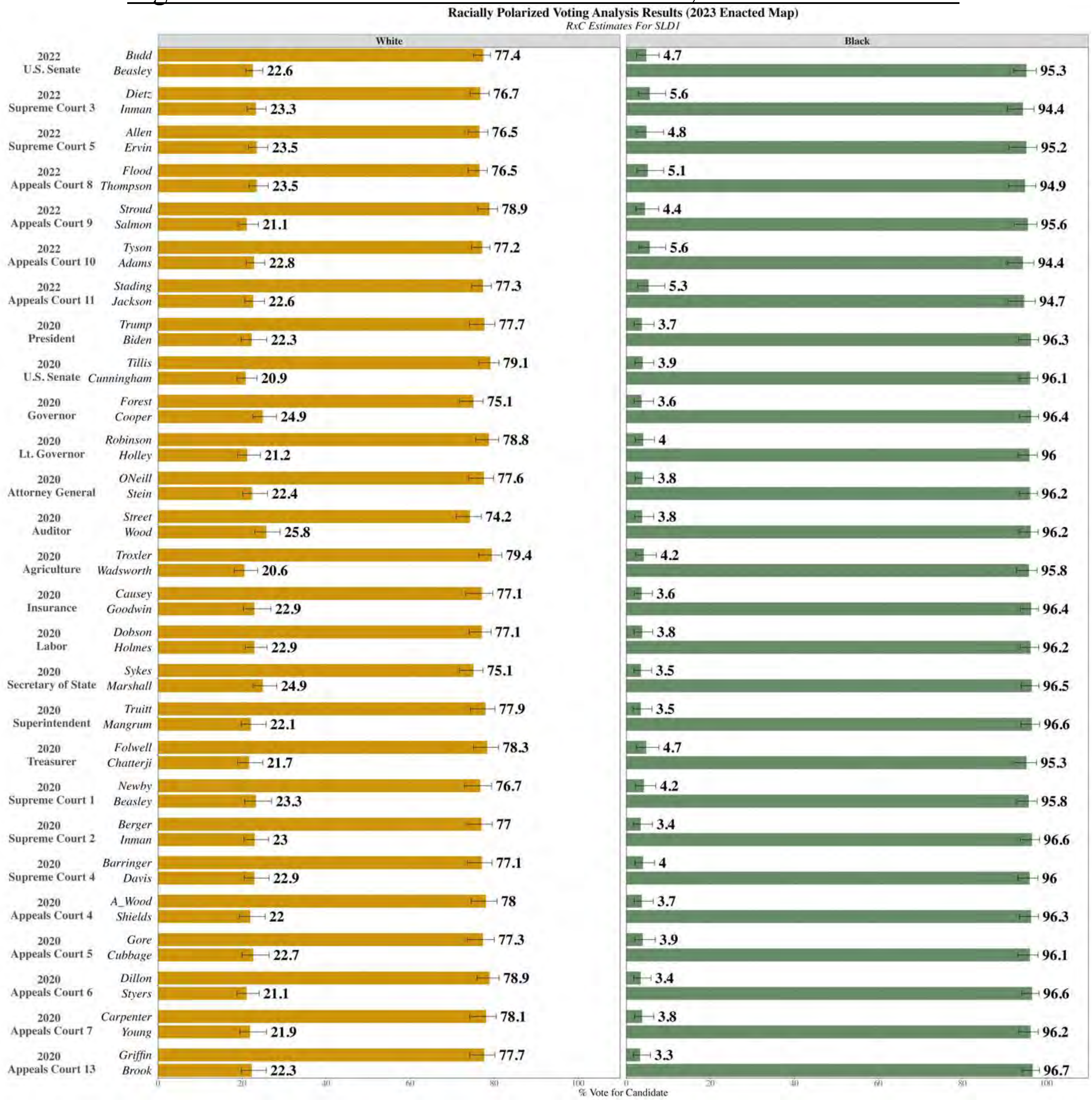
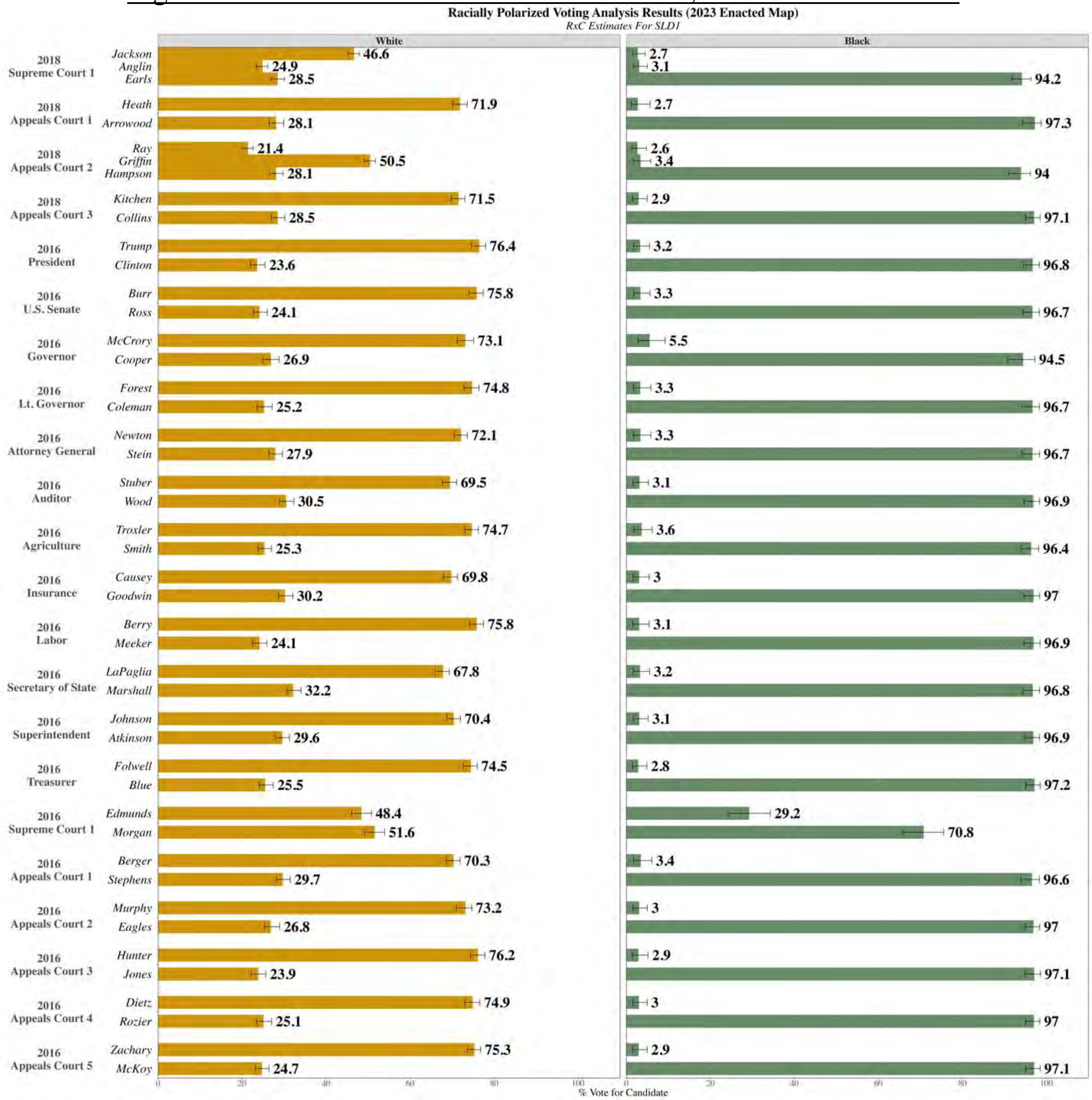


Figure 5: EI RxC 2018 and 2016 RPV Results, 2023 Enacted SLD 1



74. As shown in **Figures 4** and **5**, the EI RxC model results are substantively consistent with the iterative EI results, with an estimated average of 94.93%, 96.22%, 95.64%, and 95.27% of Black voters supporting the same candidates in 2022, 2020, 2018, and 2016, respectively. The average SLD 1 EI RxC estimates for White bloc voting against Black-preferred candidates is 77.22% in 2022, 77.42% in 2020, 71.71% in 2018, and 71.84% in 2016. Since the EI RxC model results are substantively consistent with the EI iterative model results, I have included the EI RxC charts going forward in **Appendix B** to ease readability of this report, while discussing those results in the body of this Report.

75. Analyses of **SLD 2** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

76. The average iterative EI estimates for Black voter support for Black-preferred candidates in SLD 2, with individual estimates shown in **Figures 6 and 7**, are 98.88% in 2022, 98.58% in 2020, 98.52% in 2018, and 97.66% in 2016. For the EI RxC model, shown in **Appendix Figures B-1 and B-2**, the averages are 96.37%, 96.64%, 96.34%, and 96.50%, respectively.

Figure 6: Iterative EI 2022 and 2020 RPV Results, 2023 Enacted SLD 2

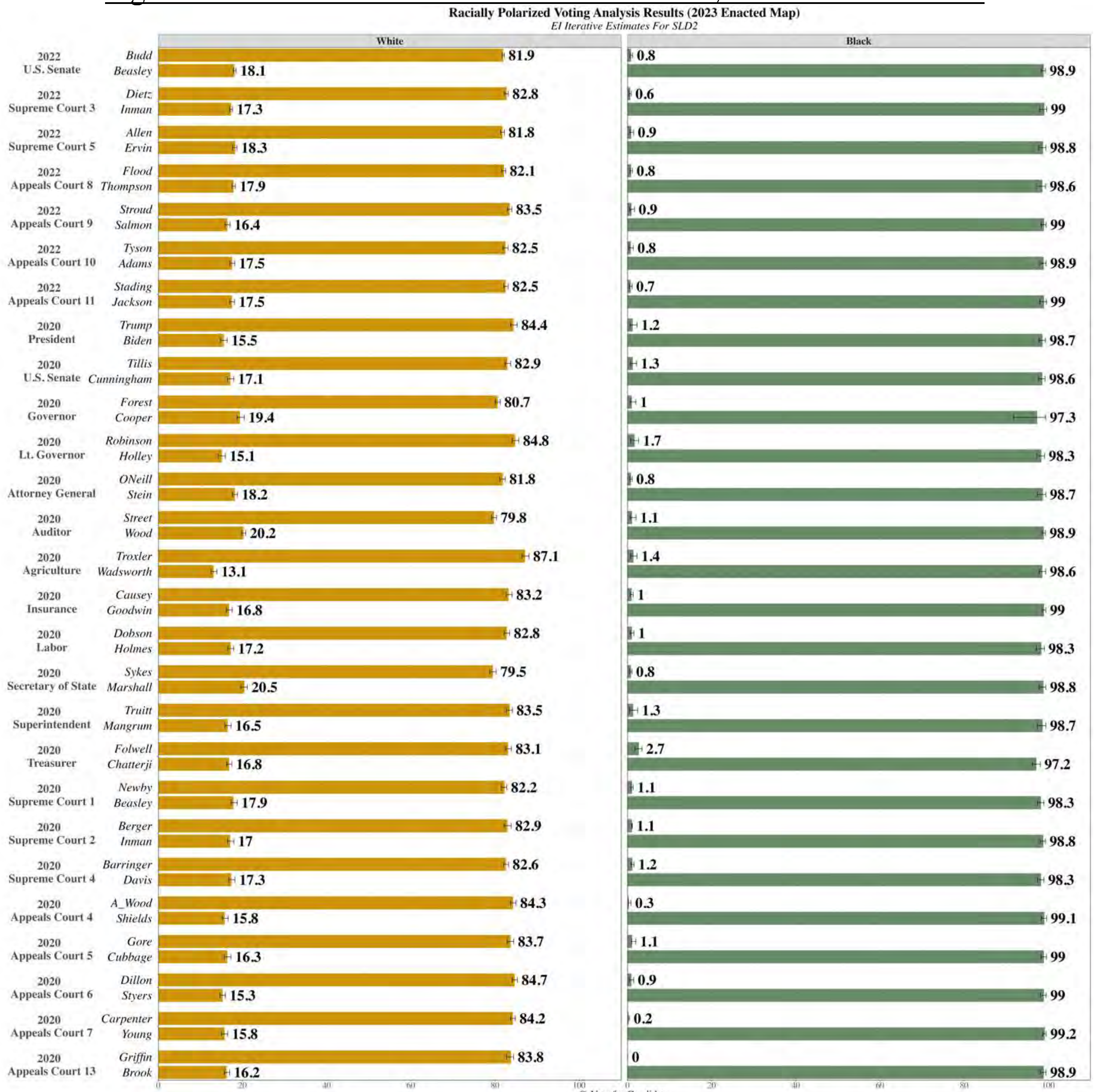
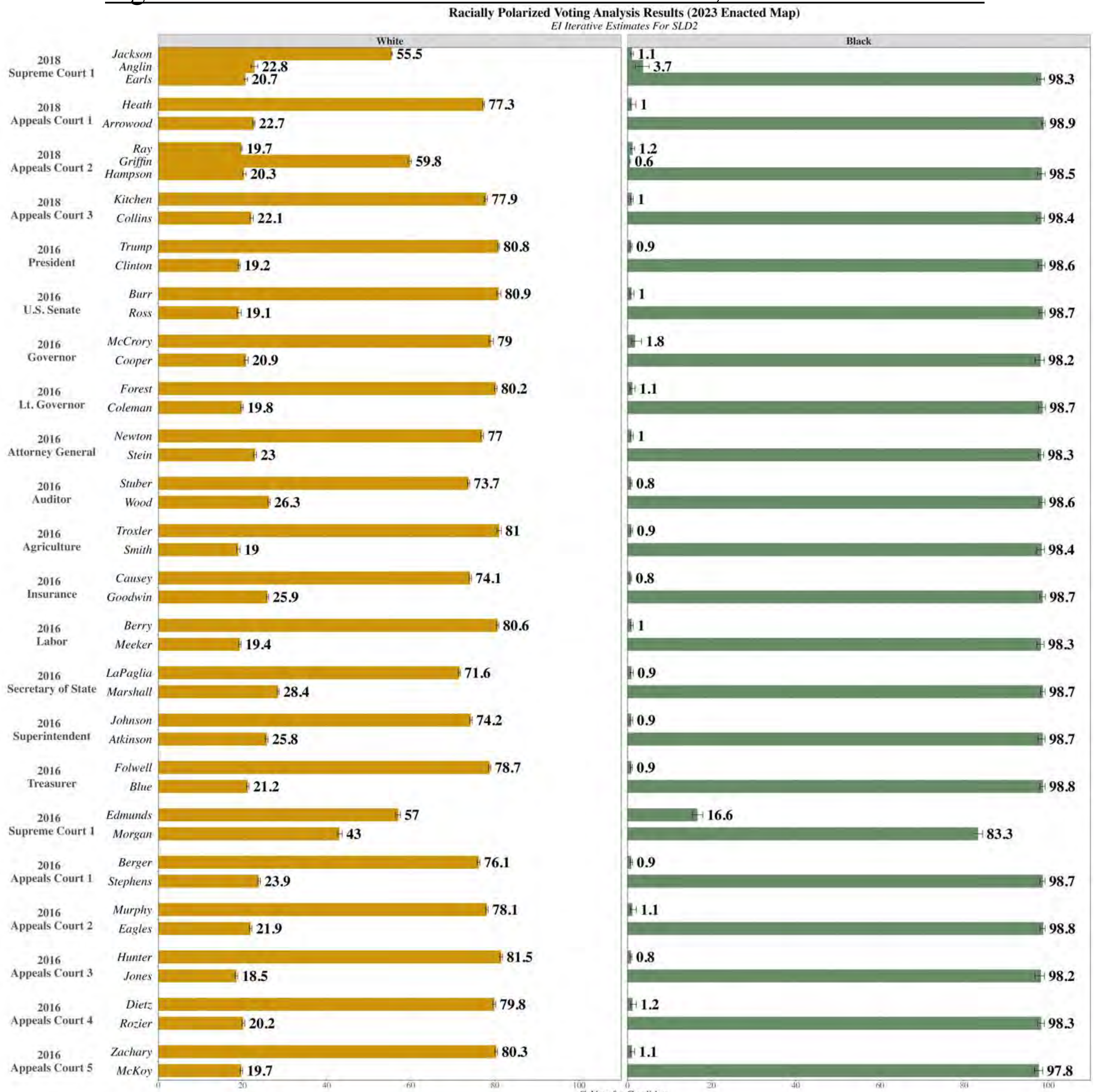


Figure 7: Iterative EI 2018 and 2016 RPV Results, 2023 Enacted SLD 2



77. Based on the individual estimates shown in **Figures 6 and 7**, the average iterative EI estimates for White bloc voting against Black-preferred candidates in SLD 2 are 82.44% in 2022, 83.10% in 2020, 78.26% in 2018, and 76.93% in 2016. For the EI RxC model, shown in **Appendix Figures B-1** and **B-2**, the averages are 81.47%, 82.55%, 77.07%, and 75.99%, respectively.

78. Next, I analyzed RPV in **SLD 5**, which overlaps with some of the area of Plaintiffs' *Gingles I* demonstrative district 5. Analyses of **SLD 5** reveal clear patterns of RPV.

Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

79. The average iterative EI estimates for Black voter support for Black-preferred candidates in SLD 5, with individual estimates shown in **Figures 8 and 9**, are 98.95% in 2022, 98.90% in 2020, 98.99% in 2018, and 97.51% in 2016. For the EI RxC model, shown in **Appendix Figures B-3 and B-4**, the averages are 95.77%, 96.81%, 95.66%, and 95.72%, respectively.

Figure 8: Iterative EI 2022 and 2020 RPV Results, 2023 Enacted SLD 5

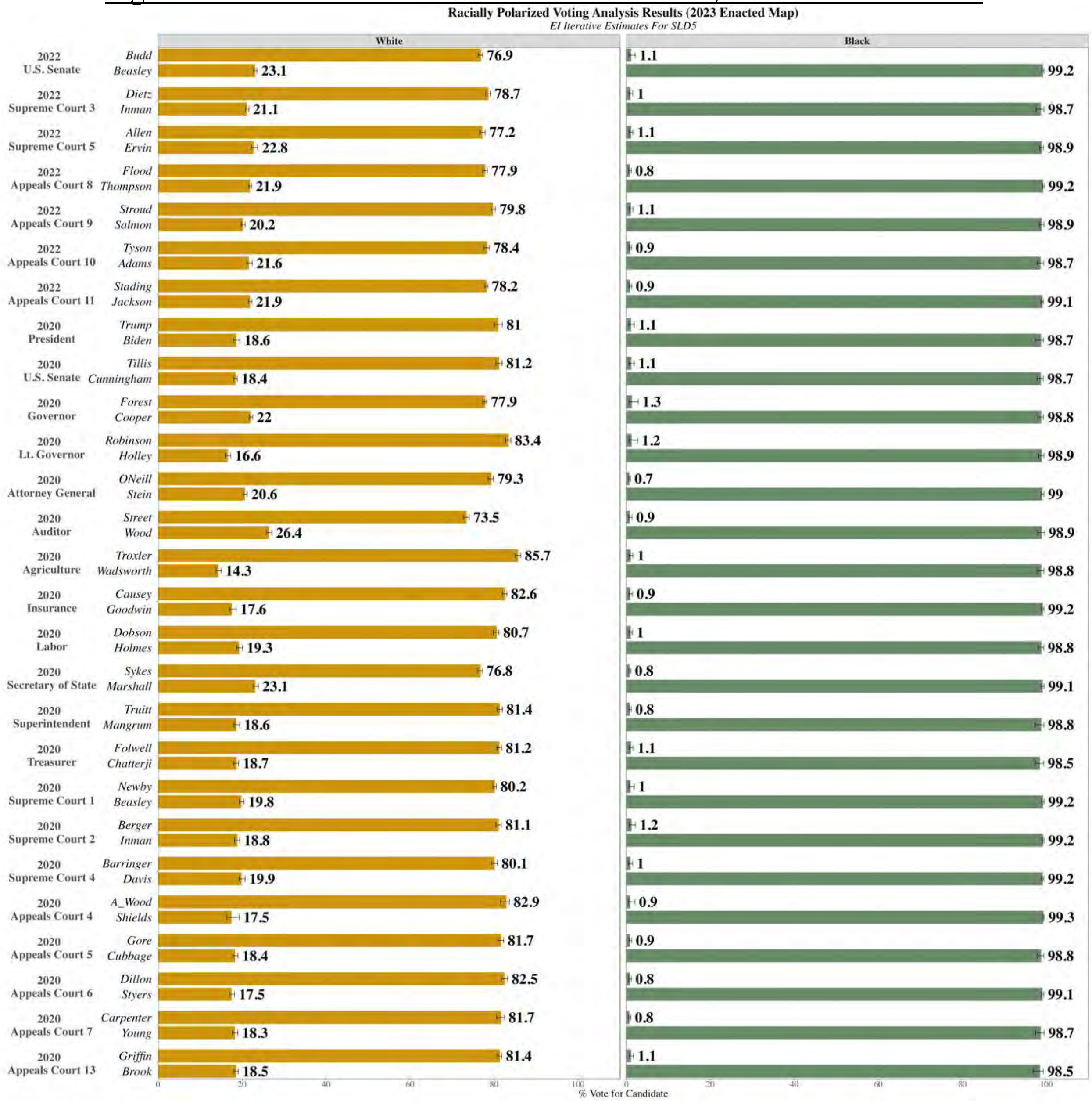
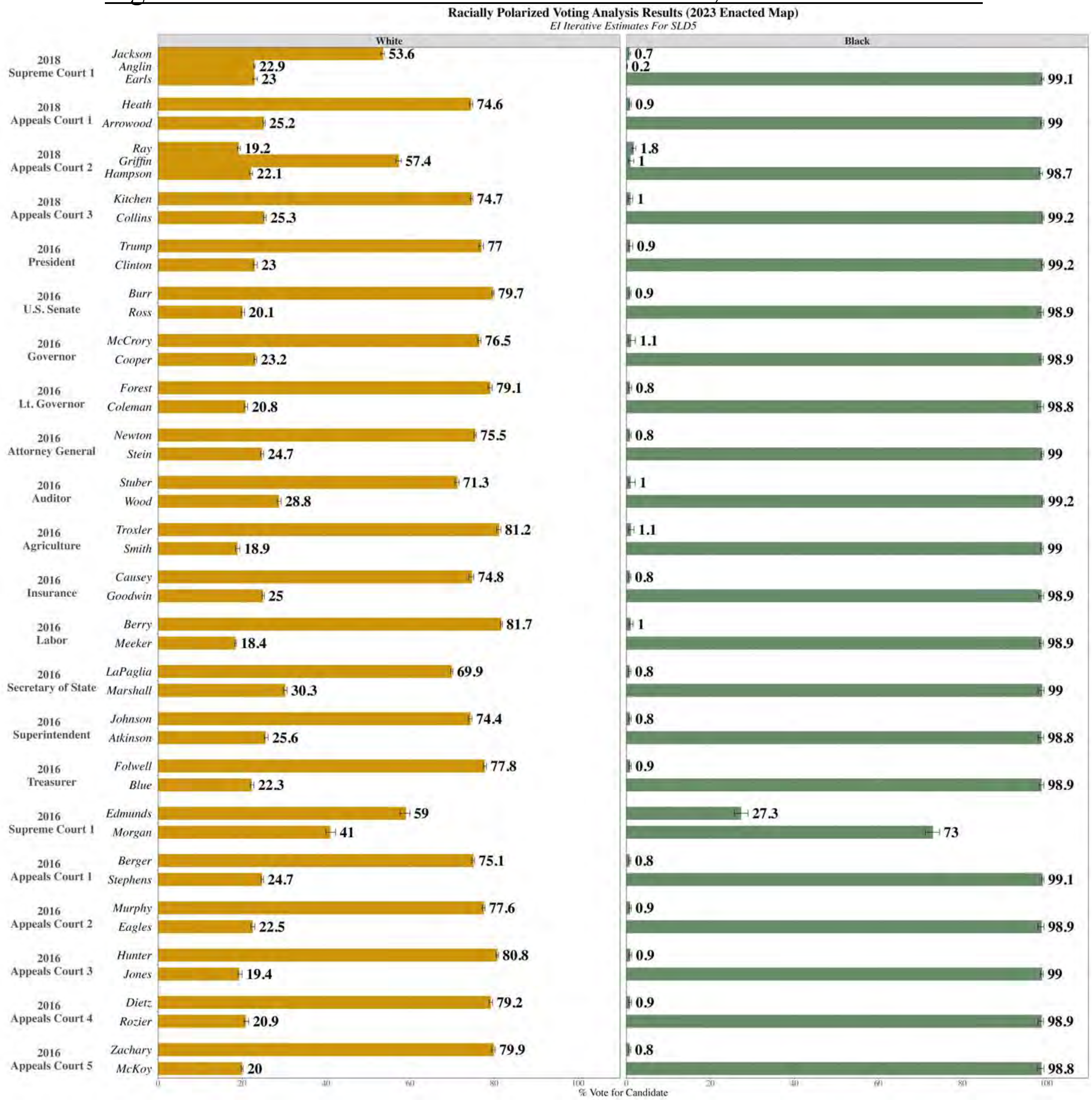


Figure 9: Iterative EI 2018 and 2016 RPV Results, 2023 Enacted SLD 5



80. Based on the individual estimates shown in **Figures 8 and 9**, the average iterative EI estimates for White bloc voting against Black-preferred candidates in SLD 5 are 78.14% in 2022, 80.81% in 2020, 75.58% in 2018, and 76.14% in 2016. For the EI RxC model, shown in **Appendix Figures B-3 and B-4**, the averages are 74.87%, 77.78%, 71.95%, and 73.38%, respectively.

81. Lastly, I performed an RPV analysis of **SLD 11**, approximately half of which is incorporated into Plaintiffs' *Gingles I* demonstrative districts.

82. Analyses of **SLD 11** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

83. The average iterative EI estimates for Black voter support for Black-preferred candidates in SLD 11, with individual estimates shown in **Figures 10 and 11**, are 98.47% in 2022, 98.83% in 2020, 98.82% in 2018, and 97.78% in 2016. For the EI RxC model, shown in **Appendix Figures B-5 and B-6**, the averages are 96.32%, 96.99%, 95.76%, and 95.98%, respectively.

<u>Figure 10: Iterative EI 2022 and 2020 RPV Results, 2023 Enacted SLD 11</u>

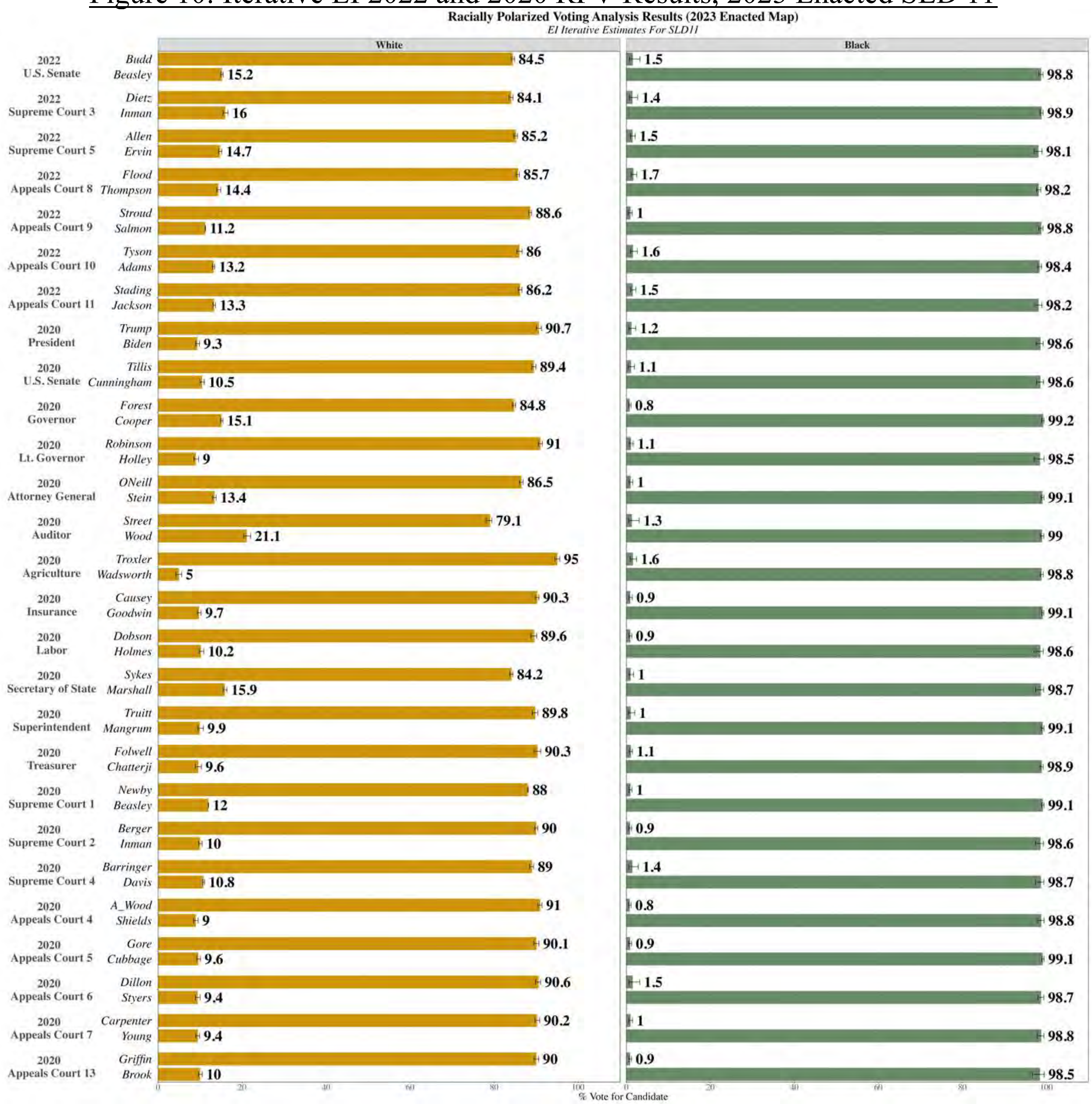
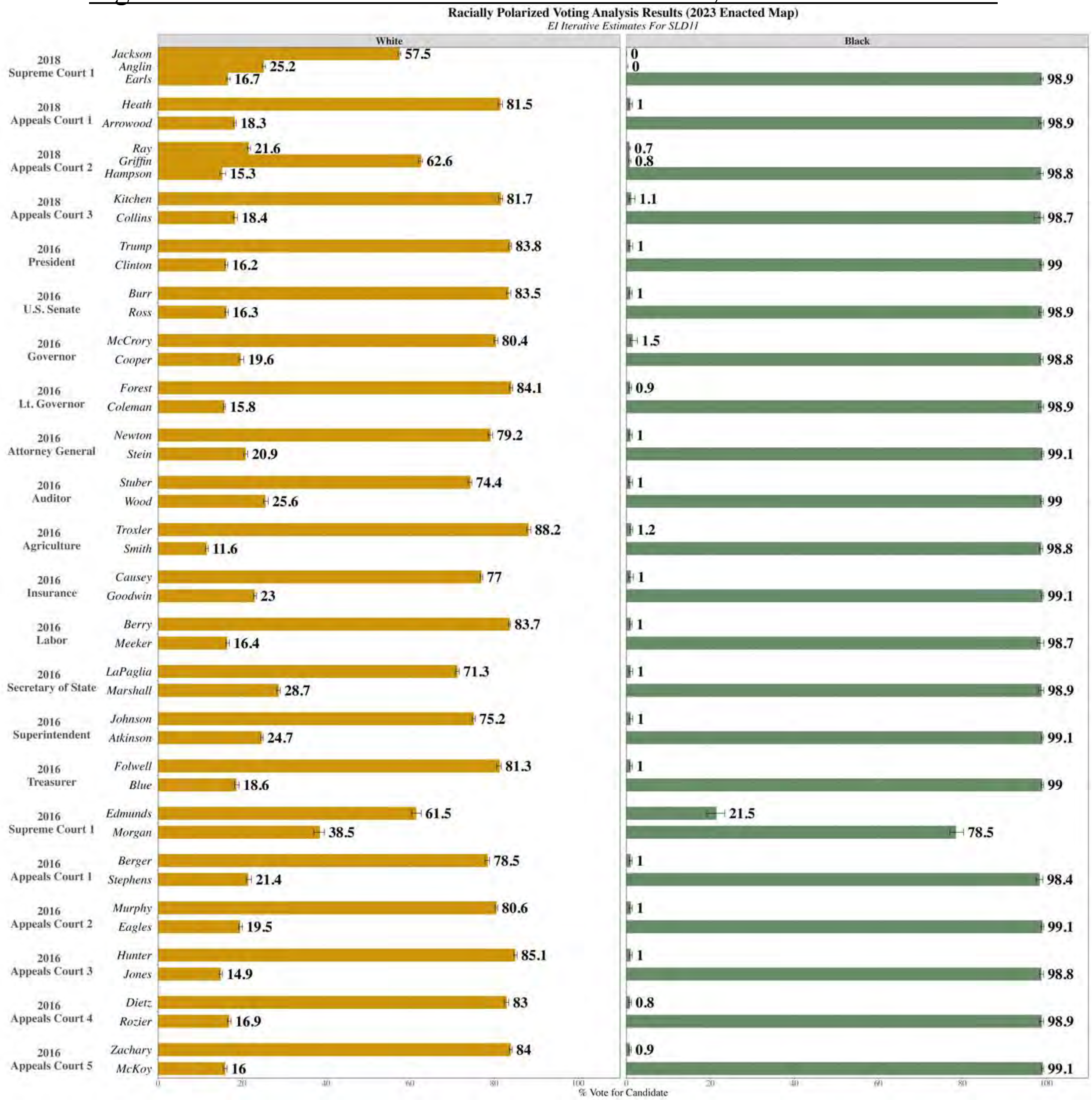


Figure 11: Iterative EI 2018 and 2016 RPV Results, 2023 Enacted SLD 11



84. Based on the individual estimates shown in **Figures 10 and 11**, the average iterative EI estimates for White bloc voting against Black-preferred candidates in SLD 11 are 85.75% in 2022, 88.98% in 2020, 82.53% in 2018, and 79.70% in 2016. For the EI RxC model, shown in **Appendix Figures B-5 and B-6**, the averages are 82.86%, 86.24%, 78.80%, and 77.08%, respectively.

85. Overall, RPV is evident within each individual SLD as illustrated in the average RPV summary **Table 2** below. Furthermore, a comparison of midterm election years to one another and presidential election years to one another suggests a clear trend of

increasing White bloc voting over time.[25] This trend is consistent across both methods of EI and all individual SLDs.

86. In **SLD 1**, White bloc voting increased from 73.61% in 2016 to 79.78% in 2020 according to the iterative EI method, and from 71.84% to 77.42% according to the EI RxC method. A similar pattern is observed in midterm years, with White bloc voting rising from 74.01% in 2018 to 78.75% in 2022 (iterative EI), and from 71.71% to 77.22% (EI RxC).

87. In **SLD 2**, White bloc voting jumped from 76.93% in 2016 to 83.10% in 2020 using the iterative EI method, and from 75.99% to 82.55% using the EI RxC method. The midterm comparison shows an increase from 78.26% in 2018 to 82.44% in 2022 (iterative EI), and from 77.07% to 81.47% (EI RxC).

88. **SLD 5** also exhibits this trend, with White bloc voting increasing from 76.14% in 2016 to 80.81% in 2020 (iterative EI), and from 73.38% to 77.78% (EI RxC). The midterm comparison shows a rise from 75.58% in 2018 to 78.14% in 2022 (iterative EI), and from 71.95% to 74.87% (EI RxC).

89. **SLD 11** shows the highest increase, with White bloc voting jumping from 79.70% in 2016 to 88.98% in 2020 using the iterative EI method, and from 77.08% to 86.24% using the EI RxC method. The midterm comparison reveals an increase from 82.53% in 2018 to 85.75% in 2022 (iterative EI), and from 78.80% to 82.86% (EI RxC).

Table 2: Average White Bloc Voting and Black Cohesion by EI Method, Election Year and Jurisdiction (2023 Enacted SLDs)

2023 Enacted Plan		2022		2020		2018		2016	
		White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion
Average Iterative EI	**1**	78.75%	96.31%	79.78%	98.73%	74.01%	98.33%	73.61%	96.83%
	2	82.44%	98.88%	83.10%	98.58%	78.26%	98.52%	76.93%	97.66%
	5	78.14%	98.95%	80.81%	98.90%	75.58%	98.99%	76.14%	97.51%
	11	85.75%	98.47%	88.98%	98.83%	82.53%	98.82%	79.70%	97.78%
Average EI RxC Estimate	**1**	77.22%	94.93%	77.42%	96.22%	71.71%	95.64%	71.84%	95.27%
	2	81.47%	96.37%	82.55%	96.64%	77.07%	96.34%	75.99%	96.50%
	5	74.87%	95.77%	77.78%	96.81%	71.95%	95.66%	73.38%	95.72%
	11	82.86%	96.32%	86.24%	96.99%	78.80%	95.76%	77.08%	95.98%

Note: White bloc voting estimate represents the average share of White voters who voted against Black-Preferred Candidates

[25] I compare 2016 to 2020 (presidential election years) and 2018 to 2022 (midterm election years) because of differential turnout rates between the two cycles.

B. Black Cohesion Results: Plaintiffs' Demonstrative SLDs 2 and 5

90. In this section I examine whether Black voters within Plaintiffs' *Gingles I* demonstrative SLD districts 2 and 5, shown in **Figure 12**, are politically cohesive.

Figure 12: Boundaries of the Plaintiffs' Demonstrative Plan A, SLDs 2 & 5

91. Using the same two EI methods, I find this to be the case. As shown in the Iterative EI models in **Figures 13 and 14**, and the EI RxC models in **Appendix Figures B-7 and B-8**, Black cohesion is extremely high in both demonstrative districts across all four election cycles.

Figure 13: Iterative EI Black Cohesion Analysis Results for Plaintiffs' SLD Demonstrative Plan A (Districts 2 & 5), 2022 & 2020 Contests

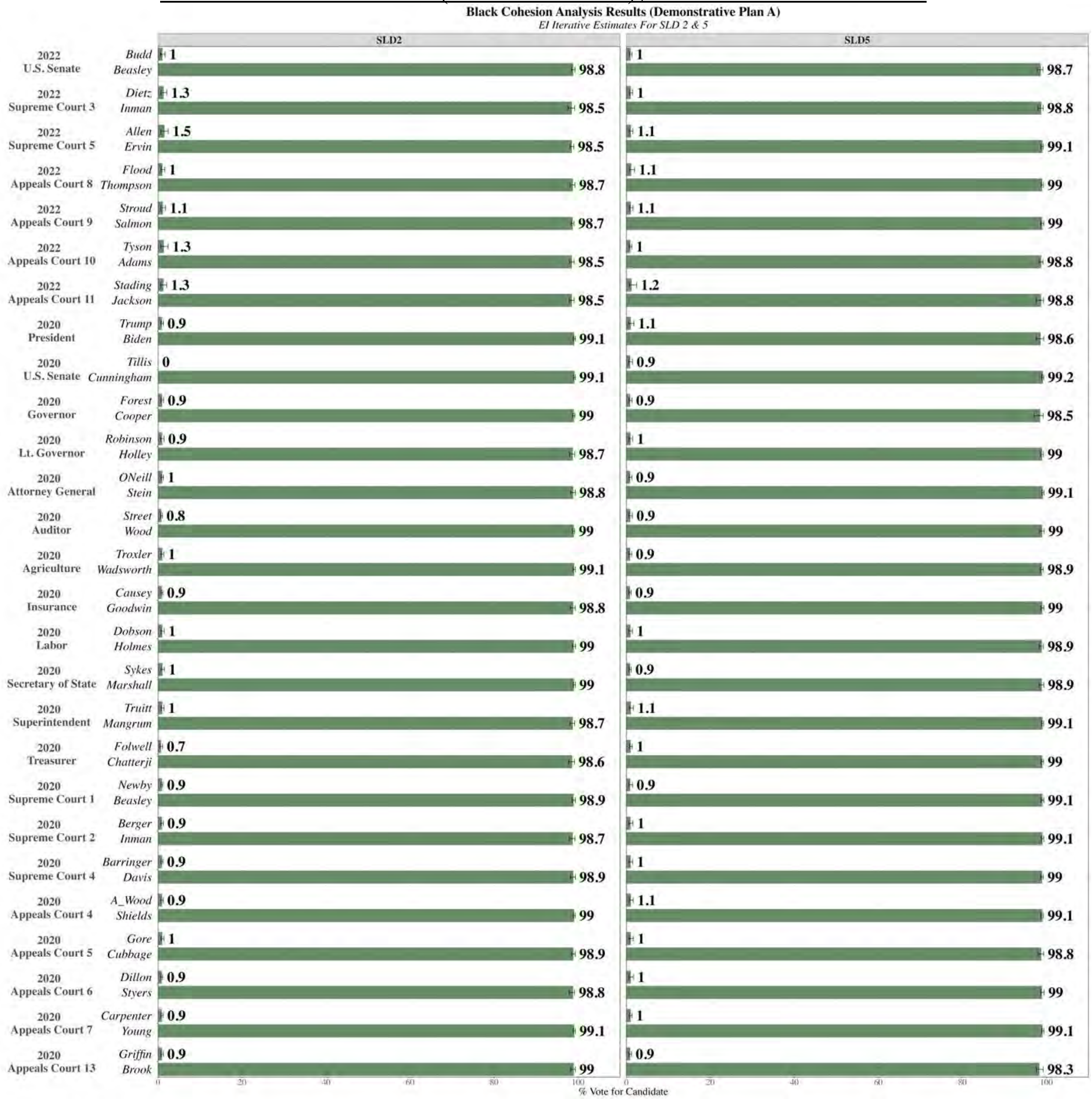
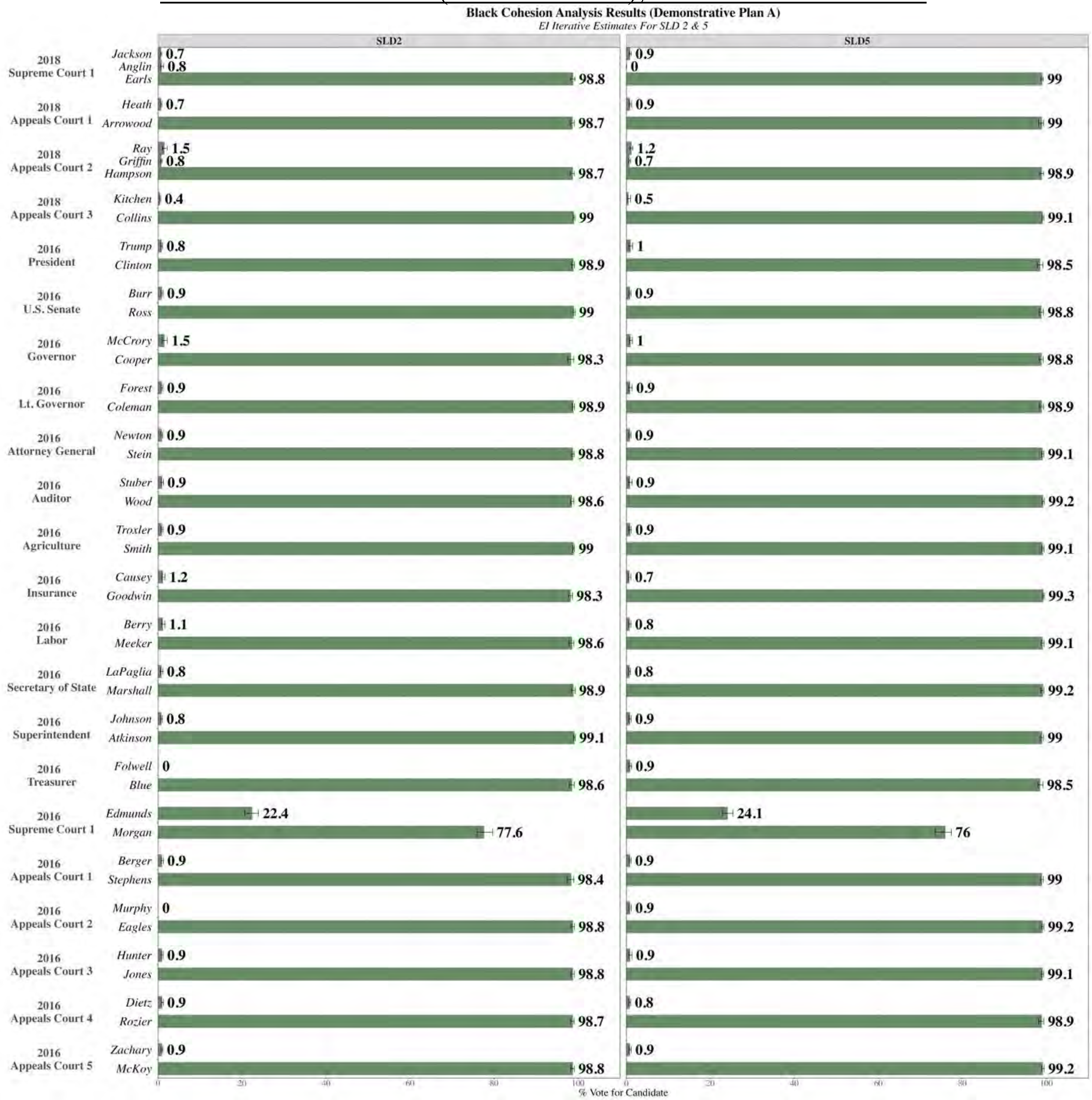


Figure 14: Iterative EI Black Cohesion Analysis Results for Plaintiffs' SLD Demonstrative Plan A (Districts 2 & 5), 2018 & 2016 Contests



92. As shown above in **Figures 13 and 14,** and in **Appendix Figures B-7 and B-8**, estimates for Black cohesion are at least above 97% in all but 1 of the 49 elections analyzed. Furthermore, the level of Black political cohesion is comparable to the levels of political cohesion observed across each of the enacted SLDs under consideration.

108. In the 2023 RPV Analysis, I was asked to examine whether RPV patterns between White and Black voters exist in (a) Senate Legislative Districts (SLDs) 1 and 3 of the 2022 Enacted SLD map and (b) SLDs 1 and 2 of the 2023 Proposed SLD map. Additionally, I was asked to examine the extent to which Black voters in each SLD have the opportunity to elect their candidates of choice. *See* 2023 RPV Analysis, ¶ 7 (**Appendix E** at 4).

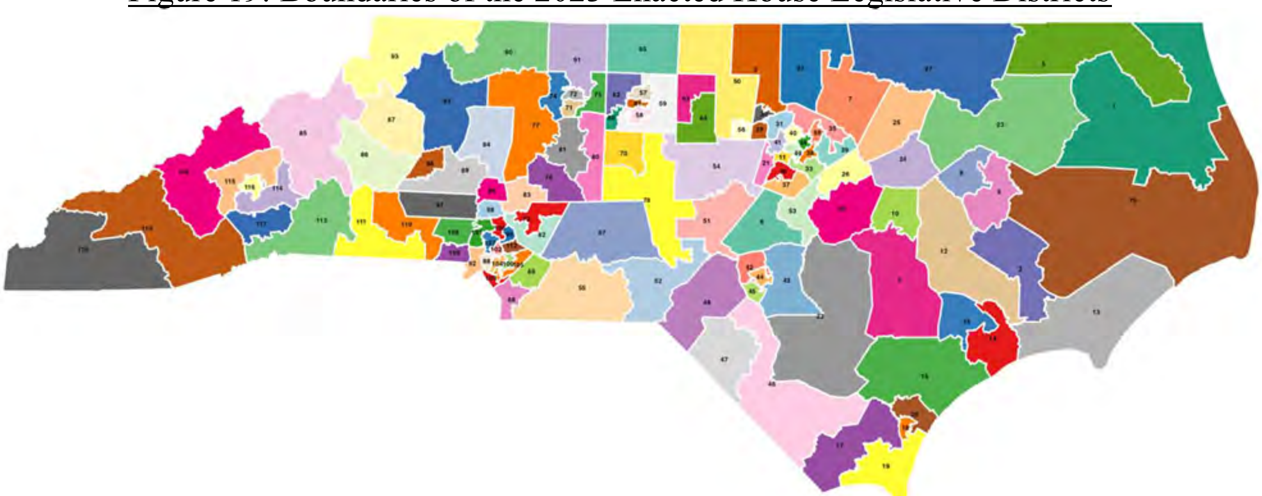
109. Overall, none of the conclusions from my 2023 RPV Analysis are inconsistent with the analysis I performed in 2024 and summarized above for the 2023 Senate Map, and I incorporate the 2023 analysis by reference into this Report.

VI. RPV and Performance Analyses and Results: State House Districts

110. This section reports all the ecological inference estimates across various State House Legislative Districts under different plans. The aim is to determine whether racially polarized voting exists in the challenged region such that Black voters exhibit political cohesiveness and White voters vote as a bloc against or in opposition of Black candidates of choice. I also report the results of a series of electoral performance analyses to evaluate the extent to which Black-preferred candidates usually win or lose under different district boundaries (Enacted and demonstrative).

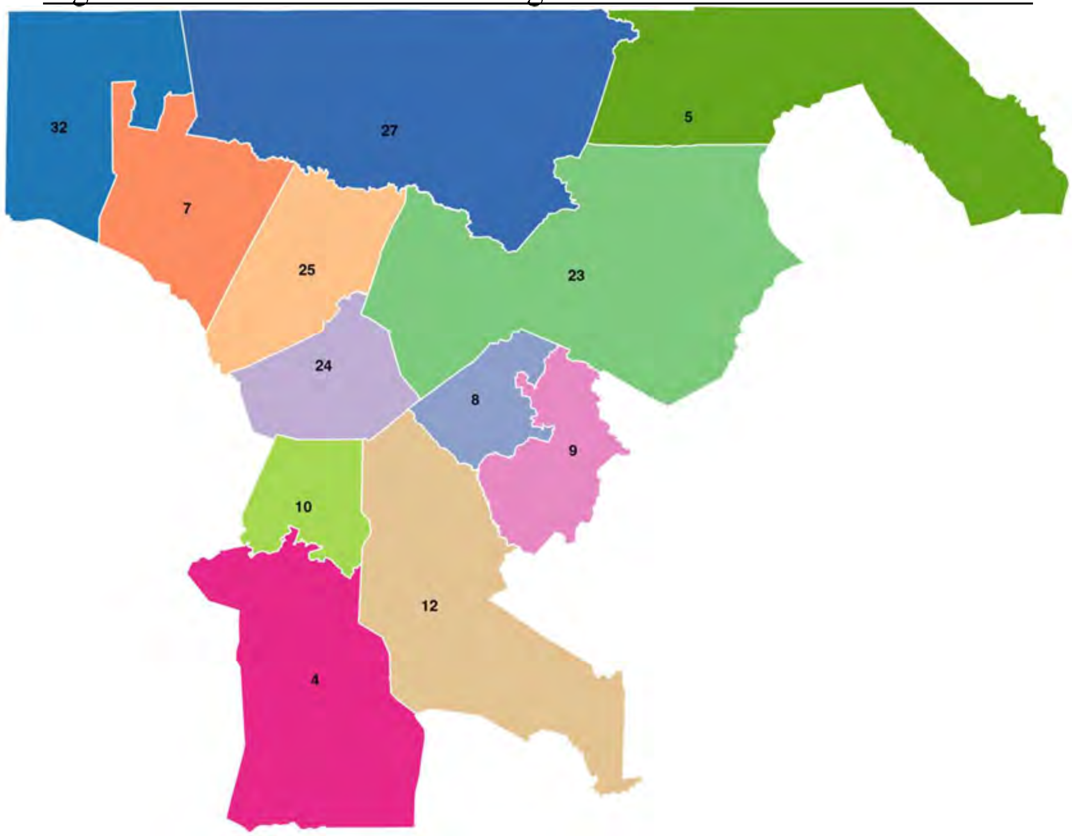
111. I begin with the 2023 Enacted House Legislative Map, shown below in **Figure 19**, before assessing Black voter cohesion in Plaintiffs' demonstrative districts.

Figure 19: Boundaries of the 2023 Enacted House Legislative Districts



112. I take two approaches to assessing RPV patterns for HLDs. First, I examine White and Black vote choice in the region encompassing the challenged area where the Plaintiffs constructed demonstrative districts. This region includes the enacted HLDs 4, 5, 7, 8, 9, 10, 12, 23, 24, 25, 27, and 32, as shown in **Figure 20**, referred to as the HLD "cluster."

Figure 20: 2023 Enacted House Legislative District Cluster Boundaries



113. I begin with a cluster-level analysis for HLDs because individual HLDs have smaller population sizes and significantly fewer precincts as compared to Senate Legislative Districts (SLDs) and Congressional Legislative Districts (CLDs), which can present methodological limitations when analyzing individual districts.[27]

114. Specifically, ecological inference models produce vote choice estimates primarily using information about the total number of precincts in a jurisdiction and the concentration and variation of demographic groups across precincts.[28] Statistical methods for estimating racial voting patterns are more robust with larger datasets that include more precincts and greater variation in racial composition. As larger datasets are broken down into smaller units, generating estimates of racial voting patterns

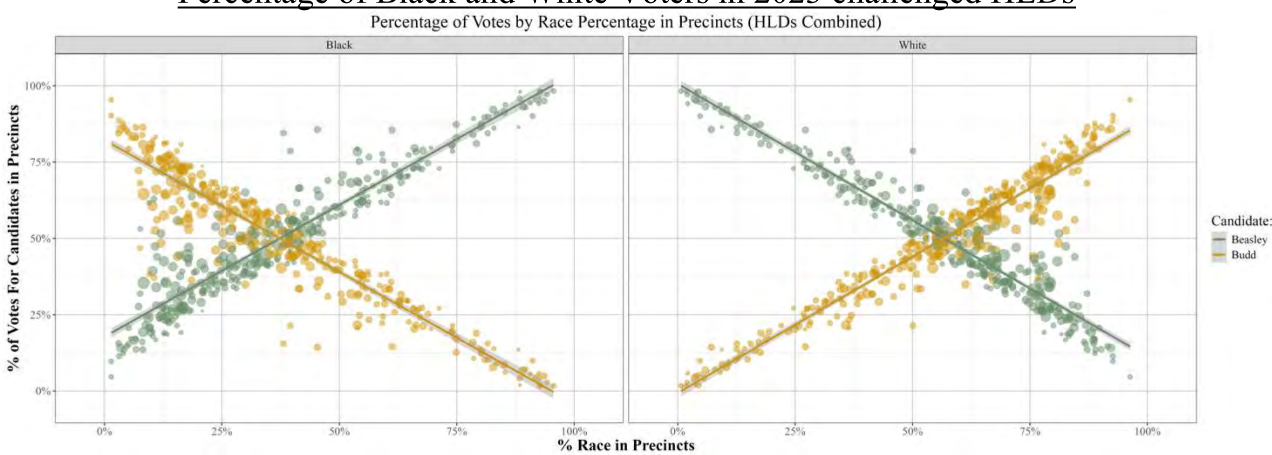
[27] The ideal population sizes for Senate Legislative and Congressional Districts in North Carolina are significantly larger—208,788 and 745,671, respectively—compared to the ideal population size for House Legislative Districts, which is 86,995. Under the 2023 Enacted Plans, the average number of precincts across the 120 House Legislative Districts is 22.2, based on the 2022 precinct shapefile, compared to an average of 53.2 precincts for Senate Legislative Districts and 191 for Congressional Legislative Districts.

[28] Iterative EI and EI RxC methods consider the total votes cast for each candidate across different precincts, as well as the precinct sizes, as measured by the total votes cast in each precinct.

becomes more challenging due to the reduced information available—fewer precincts and potentially less variation in racial composition. Under these conditions, it is often beneficial to aggregate data across multiple units (e.g., district precincts in a cluster) to provide a reference point for understanding the voting patterns of smaller geographic units in a region of interest.

115. To illustrate this, I first plotted all HLD cluster precincts that reported votes for candidates Budd and Beasley, who ran for the U.S. Senate in 2022. **Figure 21** represents over 330 precincts of varying sizes (larger dots indicate more total voters). The x-axis on the left panel shows the varying concentration of Black voters in each precinct, ranging from 1.5% to 96%. The x-axis on the right panel shows the varying concentration of White voters in each precinct, ranging from 0.1% to 96%. The y-axis in each panel shows the percentage of votes each candidate received in each precinct, ranging from 2% to 98%.

Figure 21: Percentage of Votes for 2022 U.S. Senate Candidates Budd and Beasley by the Percentage of Black and White Voters in 2023 challenged HLDs



116. I fitted a linear regression line to depict the relationship between Black/White voter concentration and vote choice for Budd/Beasley across the precincts, with 95% confidence intervals shaded around the regression line. **Figure 21** shows many precincts with varying degrees of Black and White voter concentration and vote percentages for the two candidates.

117. The data shows a clear relationship between the percentage of Black voters in each precinct and the percentage of votes Budd and Beasley received. As the concentration of Black voters increases, Budd's vote percentage decreases. Conversely, as the concentration of Black voters increases, Beasley's vote percentage increases. For White voters, as their percentage increases, so does Budd's vote share. A decline in the percentage of White voters corresponds to a decline in Budd's vote percentage and an increase in Beasley's. The narrow confidence bands around the regression

lines reflect the high precision in estimating this relationship due to the large number of precincts of varying vote totals and demographic concentrations.

118. Estimation generally becomes less precise, although not necessarily problematic, in districts with fewer voters and less demographic variation across precincts, as the model is relying on less information to estimate vote choice for candidates by race or ethnicity.

119. For example, the 2023 enacted HLDs 7 (with 21 total precincts) and 9 (with 20 total precincts) contain the lowest concentration of Black voters (and Black Voting Age Population) in the identified cluster. Consequently, the model is estimating vote choice with fewer total precincts and less precinct-level variation by Black and White voters, as shown in **Figures 22 and 23**.

Figure 22: Percentage of Votes for 2020 U.S. Senate Candidates Budd and Beasley by the Percentage of Black and White Voters in 2023 HLD 7

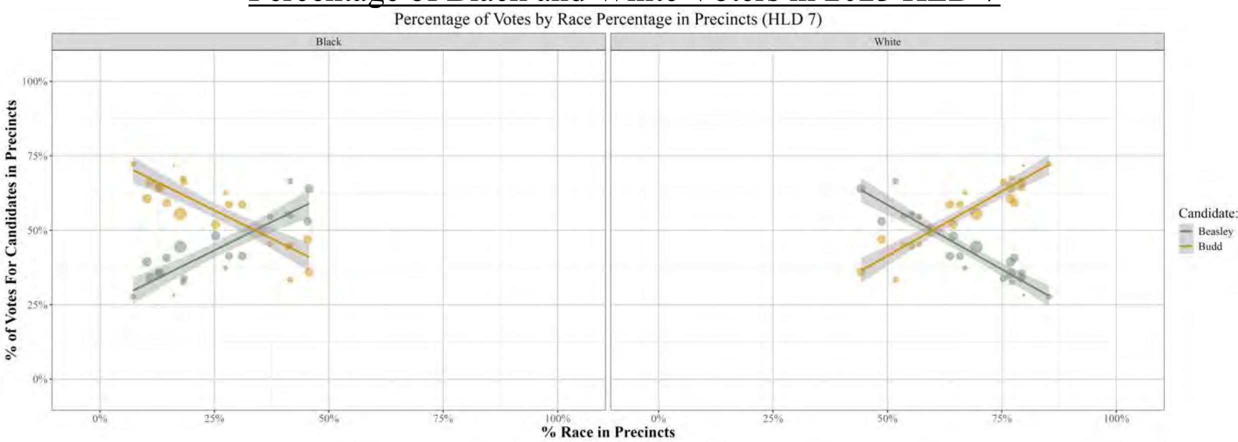
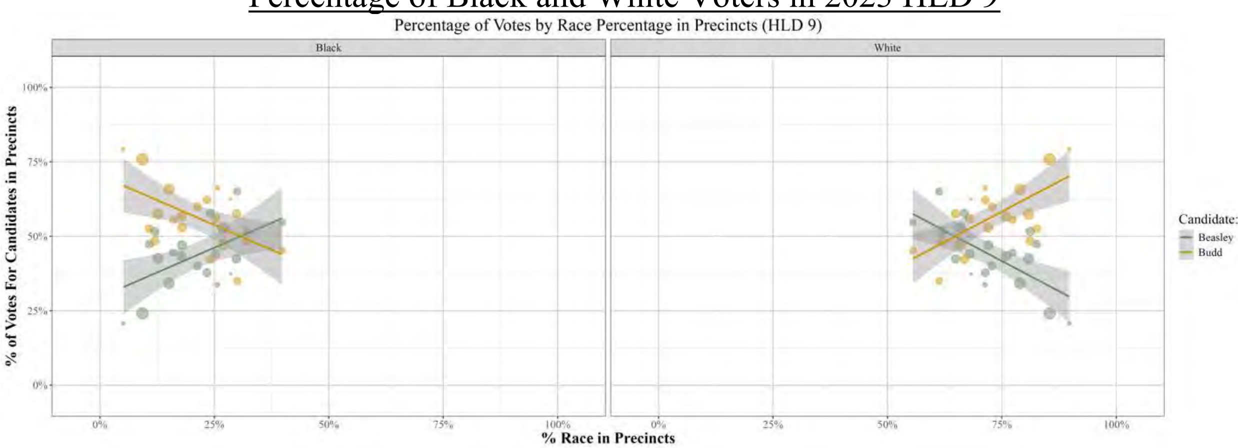


Figure 23: Percentage of Votes for 2020 U.S. Senate Candidates Budd and Beasley by the Percentage of Black and White Voters in 2023 HLD 9



120. **Figures 22 and 23** show that there are no precincts in HLDs 7 and 9 with a Black voter population of at least 50%. Likewise, there are virtually no precincts with a

White voter population of less than 50%. While racially polarized trends are still visible in these districts—White voters preferring Budd and Black voters preferring Beasley—there is much less information compared to the cluster data entailing many more precincts. This reduced information leads to less precise estimates of racial voting patterns in HLDs 7 and 9, as depicted by the wider confidence bands (see the shaded area) around the regression line.

121. This example illustrates that dividing a larger dataset into smaller units can reduce the precision of RPV estimates due to the limited information available in each unit—fewer precincts and less variation in racial composition. Consequently, analyzing a cluster of districts, which encompasses more data, generally yields more robust and reliable estimates. The results from such cluster analysis can provide a benchmark that helps inform and contextualize the individual HLD analyses that rely on fewer precincts that may also exhibit low levels of demographic variation. Therefore, I will first present the cluster analysis for HLDs, followed by the analysis of individual HLDs.

A. RPV Results: HLD Cluster

122. The King's iterative EI analysis cluster results of White vs. Black vote choice for the 27 general election contests held in 2022 and 2020 general election contests are displayed in **Figure 24**. The results of the analysis using the same set of elections and racial groups using the EI RxC method are shown in **Figure 25**. The configuration of these plots is identical to the SLD plots presented in the previous section.

123. The cluster analysis results for the 2022 election cycle shows that voting is consistently and starkly racially polarized. The iterative EI results for the U.S. Senate shows that an estimated 85.4% of White voters preferred candidate Budd, while only 14.6% voted for his opponent, Beasley. In contrast only 1% of Black voters voted for Budd, while an estimated 99% voted for Beasley. The results of the EI RxC estimates are substantively similar, confirming the presence of RPV in the HLD cluster.

124. The pattern of White and Black voters preferring opposing candidates is evident in all seven elections in 2022. Considering all the 2022 elections together, Black voter support for Black-preferred candidates range from 98.7 to 99.2 percent (or 97.8 - 98.2 percent with EI RxC), with an average cohesion of 98.95% (or 98.00% with EI RxC). White voter opposition toward Black-preferred candidates range from 85.3 to 88.6 percent (or 84.9 – 87.9 percent with EI RxC), with an average bloc vote rate of 86.35% (or 85.86 percent with EI RxC).

125. RPV also exists in every 2020 contest. All candidates not supported by White voters received overwhelming support from Black voters. The degree of RPV is extreme is that the highest level of White support for Black-preferred candidates is only 18.1% (Auditor contest) under the EI iterative model and 18.9% under the EI RxC model

(also the Auditor contest), with no more than 2% of Black voters supporting White-preferred candidates in either model.

126. Across the 20 elections held in 2020, the average Black voter support for Black-preferred candidates is 99.07% (or 98.34% with EI RxC), while the average White bloc voting rate against Black-preferred candidates is 88.00% (or 87.95% with EI RxC).

Figure 24: Iterative EI 2022 and 2020 RPV Results, 2023 Enacted HLD Cluster

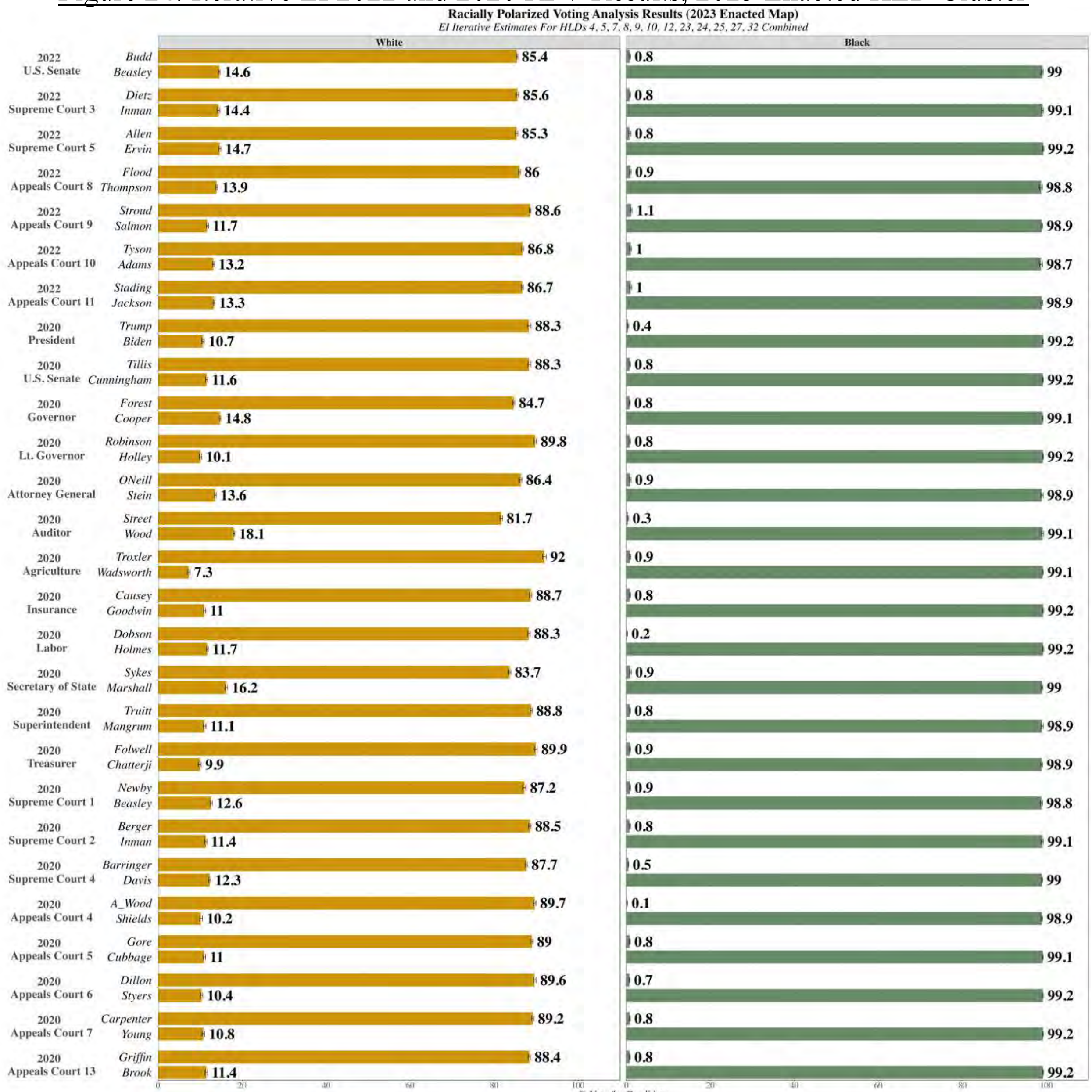
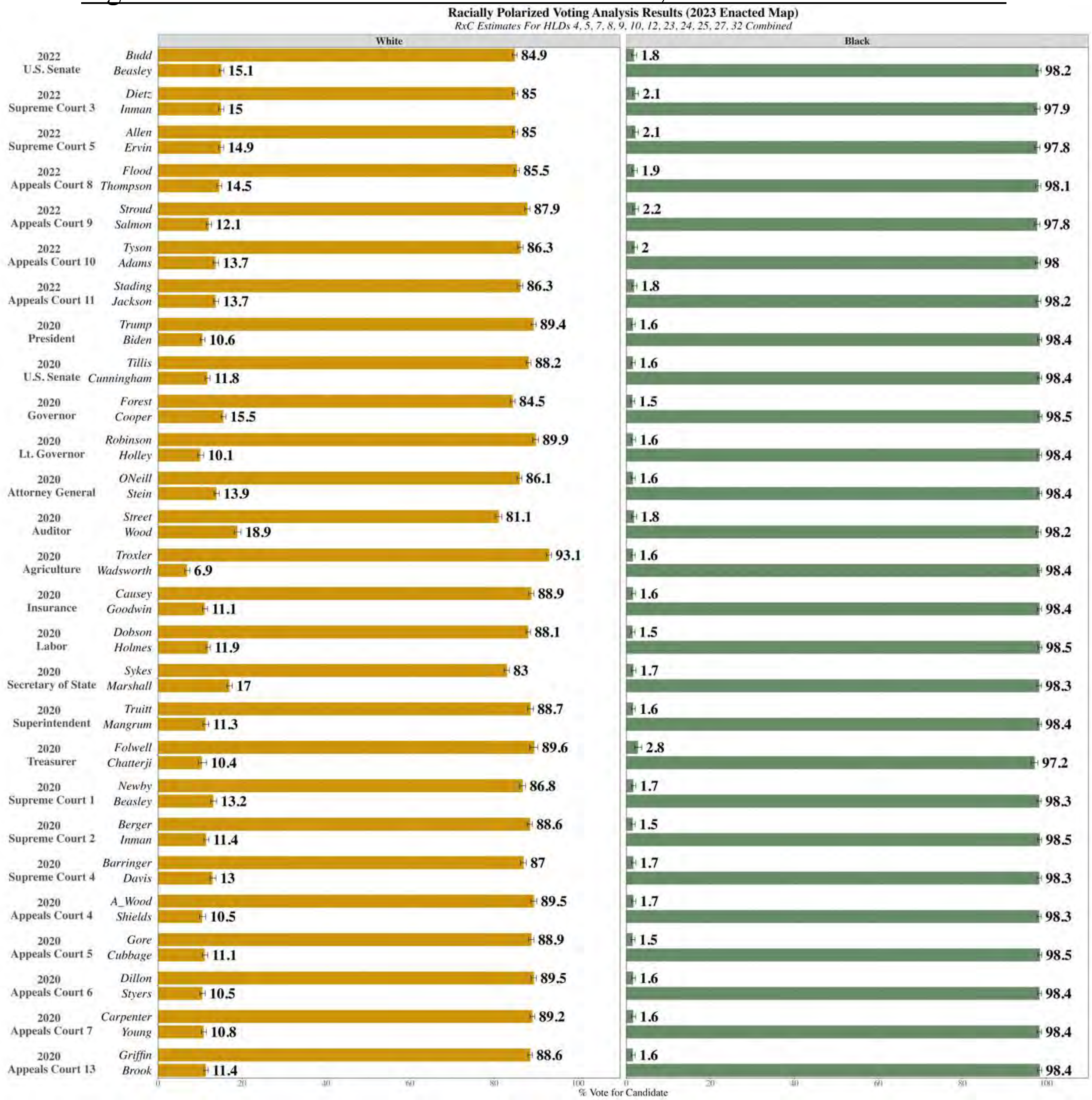


Figure 25: EI RxC 2022 and 2020 RPV Results, 2023 Enacted HLD Cluster



127. **Figures 26** and **27** display the 2018 and 2016 iterative EI and EI RxC estimate by race, respectively.

Figure 26: Iterative EI 2018 and 2016 RPV Results, 2023 Enacted HLD Cluster

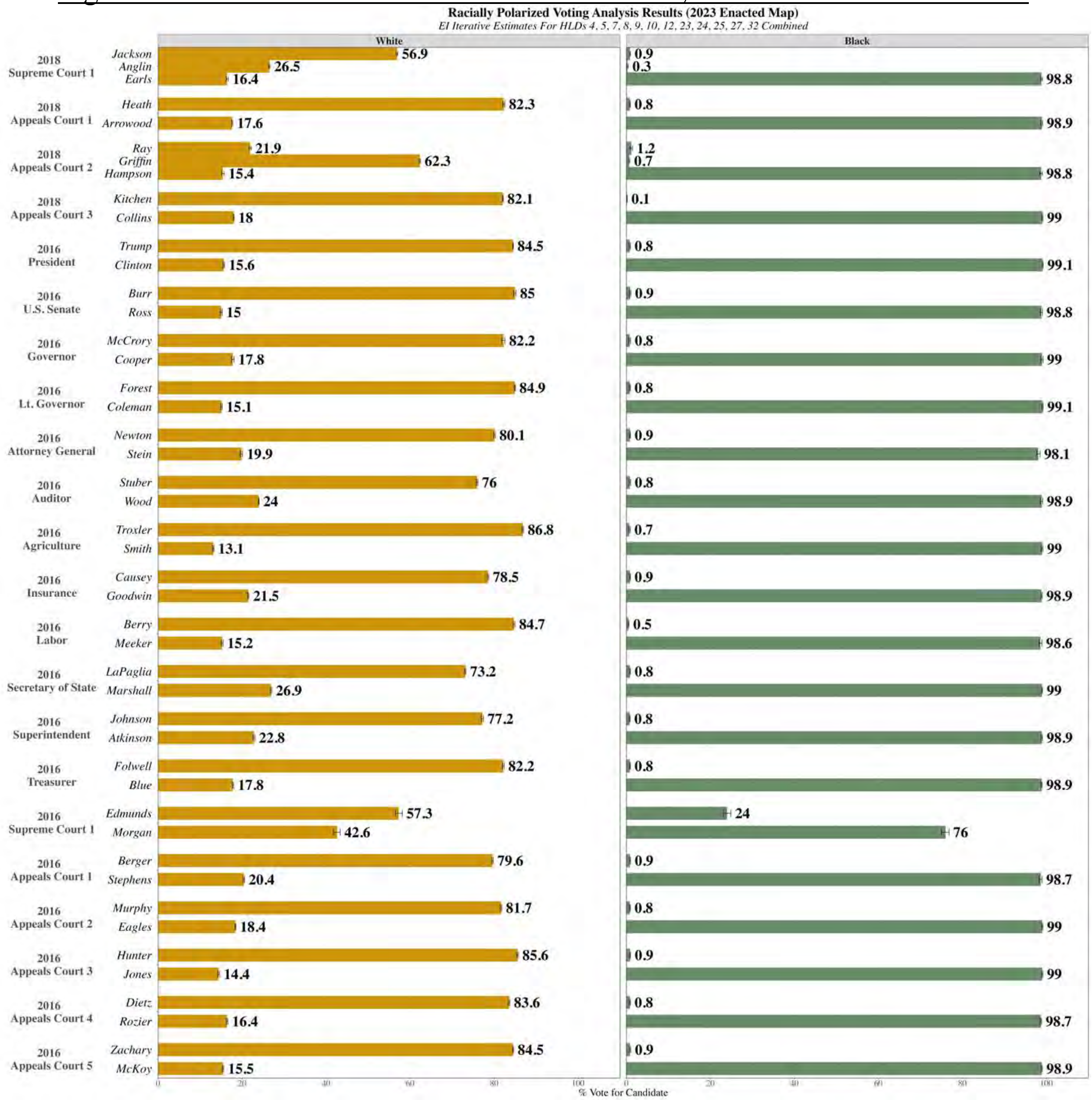
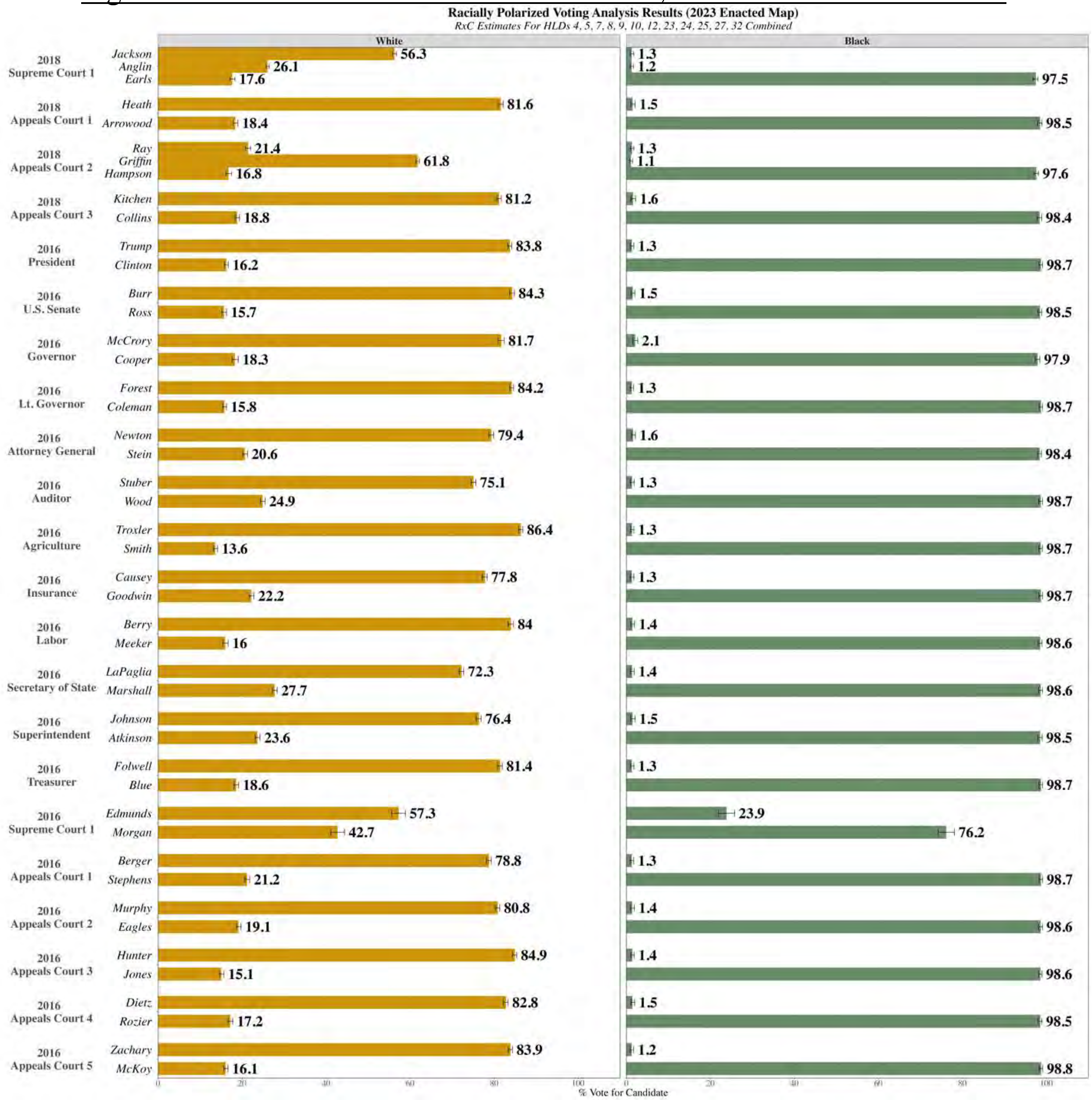


Figure 27: EI RxC 2018 and 2016 RPV Results, 2023 Enacted HLD Cluster



128. In 2018, there are four contests, two of which feature three candidates receiving at least 10% of the statewide vote. In both contests, about 99% (or about 98% with EI RxC) of Black voters coalesced behind a single candidate. In contrast, around 56% to 62% of White voters backed one candidate, with the rest of the White voters supporting the remaining two candidates.

129. The results further show White voters supported the Black-preferred candidates the least in those two contests as reflected by the lower share of votes. Stated differently, 83.4% (or 82.4% with EI RxC) of White voters voted against the Black-preferred candidate (Earls) in the Supreme Court Justice Seat 1 contest, and 84.2% (or 83.2%

with EI RxC) voted against the Black-preferred candidate (Hampson) in the Appeals Court Judge Seat 2 contest.

130. Taking all four 2018 contests together, 98.89% (or 97.99% with EI RxC) of Black voters, on average, voted for Black-preferred candidates, while an average of 83.02% (or 82.09% with EI RxC) of White voters bloc voted against candidates preferred by Black voters.

131. The 2016 election results also show high levels of RPV in the HLD cluster, albeit not as high as the RPV observed more recently in 2020. Across all 18 elections held in 2016, a majority of Black and White voters preferred opposing candidates. The average Black voter support for Black-preferred candidates is 97.58% (or 97.34% with EI RxC), while the average White bloc voting rate against Black-preferred candidates is 80.42% (or 79.74% with EI RxC).

132. Consistent with SLD findings, in only one election contest in 2016 do I observe lower degrees of RPV relative to other contests featuring only two candidates. In the Supreme Court Justice Seat 1 contest between Edmunds and Morgan, a lower portion of Black voters—about 76%—voted for the Black-preferred candidate (Morgan), and a lower majority of White voters—about 57%—voted as a bloc to oppose the Black-preferred candidate. In other words, even this outlier election shows racially polarized voting, albeit at lower levels that the other 48 elections analyzed.

133. Considering all the 49 contests across four election cycles I find undisputable evidence of RPV patterns between White and Black voters in the HLD cluster.

B. RPV Results: Individual HLDs

134. This section reports the RPV results for each individual House Legislative District, in which I summarize the thousands of vote choice estimates across the individual HLDs in **Table 5**. I also provide detailed estimates for each method, district, candidate, election year, and racial group in **Appendix C, Figures C-1 through C-48.**

Table 5: Average White Bloc Voting and Black Cohesion by EI Method, Election year and Jurisdiction (2023 Enacted HLD Plan)

	2023 Enacted Plan	2022		2020		2018		2016	
		White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion	White Bloc Voting	Black Cohesion
Average Iterative EI Estimate	**HLD Cluster**	86.35%	98.95%	88.00%	99.07%	83.02%	98.89%	80.42%	97.58%
	4	93.56%	99.14%	94.61%	99.01%	89.16%	98.51%	85.15%	97.33%
	5	86.34%	98.71%	87.58%	98.82%	80.12%	98.75%	78.86%	97.59%
	7	83.54%	98.76%	88.91%	98.15%	78.69%	98.69%	77.49%	98.01%
	8	70.64%	97.36%	76.13%	98.67%	68.10%	98.48%	71.13%	96.99%
	9	76.45%	94.47%	80.09%	96.42%	75.31%	94.65%	76.11%	94.72%
	10	91.59%	98.47%	94.13%	98.44%	89.73%	98.54%	86.40%	97.20%
	12	92.65%	98.68%	92.96%	98.82%	88.72%	98.87%	83.73%	97.48%
	23	90.21%	98.94%	89.11%	98.91%	85.74%	98.98%	81.69%	97.77%
	24	86.64%	99.00%	88.90%	98.89%	84.36%	98.87%	81.31%	98.03%
	25	88.61%	98.42%	89.37%	98.79%	86.04%	98.57%	82.40%	97.92%
	27	86.43%	98.68%	88.16%	98.66%	83.78%	98.75%	77.73%	97.54%
	32	84.78%	99.03%	87.58%	98.75%	79.00%	98.95%	77.37%	96.86%
Average EI RxC Estimate	**HLD Cluster**	85.86%	98.00%	87.95%	98.34%	82.09%	97.99%	79.74%	97.34%
	4	91.11%	95.22%	93.25%	96.55%	85.03%	94.34%	81.34%	93.70%
	5	82.56%	94.61%	82.74%	95.79%	75.75%	94.74%	74.96%	94.85%
	7	73.14%	83.15%	77.27%	87.40%	69.05%	83.19%	69.36%	86.83%
	8	60.72%	90.71%	64.59%	93.08%	56.12%	89.75%	61.96%	92.40%
	9	65.33%	67.43%	66.58%	75.85%	63.65%	68.29%	67.30%	75.39%
	10	87.26%	94.58%	90.52%	95.75%	84.41%	93.77%	82.33%	93.78%
	12	90.92%	96.81%	91.28%	97.42%	85.40%	95.97%	81.31%	95.64%
	23	88.40%	97.90%	87.63%	98.25%	83.19%	97.65%	79.60%	96.87%
	24	82.11%	95.11%	84.33%	96.19%	79.48%	94.95%	77.56%	95.32%
	25	83.56%	94.75%	84.08%	95.45%	79.68%	93.64%	77.51%	94.19%
	27	85.84%	97.23%	86.80%	97.37%	81.51%	97.32%	76.88%	96.96%
	32	77.88%	93.53%	80.52%	95.13%	72.20%	93.46%	71.84%	94.30%

Note: White bloc voting estimate represents the average share of White voters who voted against Black-Preferred Candidates

135. Analyses of **HLD 4** in **Appendix Figures C-1** through **C-4** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

136. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 4 are 99.14% in 2022, 99.01% in 2020, 98.51% in 2018, and 97.33% in 2016. For the EI RxC model, the figures are 98.00%, 98.34%, 97.99%, and 97.34%, respectively.

137. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 4 are 93.56% in 2022, 94.61% in 2020, 89.16% in 2018, and 85.15% in 2016. For the EI RxC model, the figures are 91.11%, 93.25%, 85.03%, and 81.34%, respectively.

138. Analyses of **HLD 5** in **Appendix Figures C-5** through **C-8** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

139. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 5 are 98.71% in 2022, 98.82% in 2020, 98.75% in 2018, and 97.59% in 2016. For the EI RxC model, the figures are 94.61%. 95.79%, 94.74%, and 94.85%, respectively.

140. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 5 are 86.34% in 2022, 87.58% in 2020, 80.12% in 2018, and 78.86% in 2016. For the EI RxC model, the figures are 82.56%, 82.74%, 75.75%, and 74.96%, respectively.

141. Analyses of **HLD 7** in **Appendix Figures C-9** through **C-12** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

142. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 7 are 98.76% in 2022, 98.15% in 2020, 98.69% in 2018, and 98.01% in 2016. For the EI RxC model, the figures are 83.15%, 87.40%, 83.19%, and 86.83%, respectively.

143. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 7 are 83.54% in 2022, 88.91% in 2020, 78.69% in 2018, and 77.49% in 2016. For the EI RxC model, the figures are 73.14%, 77.27%, 69.05%, and 69.36%, respectively.

144. Analyses of **HLD 8** in **Appendix Figures C-13** through **C-16** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%) under the EI iterative model and 47 out of 49 contests (or 96%) under the RxC model.

145. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 8 are 97.36% in 2022, 98.67% in 2020, 98.48% in 2018, and

96.99% in 2016. For the EI RxC model, the figures are 90.71%, 93.08%, 89.75%, and 92.40%, respectively.

146. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 8 are 70.64% in 2022, 76.13% in 2020, 68.10% in 2018, and 71.13% in 2016. For the EI RxC model, the figures are 60.72%, 64.59%, 56.12%, and 61.96%, respectively.

147. Analyses of **HLD 9** in **Appendix Figures C-17** through **C-20** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

148. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 9 are 94.47% in 2022, 96.42% in 2020, 94.65% in 2018, and 94.72% in 2016. For the EI RxC model, the figures are 67.43%, 75.85%, 68.29%, and 75.39%, respectively.

149. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 9 are 76.45% in 2022, 80.09% in 2020, 75.31% in 2018, and 76.11% in 2016. For the EI RxC model, the figures are 65.33%, 66.58%, 63.65%, and 67.30%, respectively.

150. Analyses of **HLD 10** in **Appendix Figures C-21** through **C-24** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

151. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 10 are 98.47% in 2022, 98.44% in 2020, 98.54% in 2018, and 97.20% in 2016. For the EI RxC model, the figures are 94.58%, 95.75%, 93.77%, and 93.78%, respectively.

152. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 10 are 91.59% in 2022, 94.13% in 2020, 89.73% in 2018, and 86.40% in 2016. For the EI RxC model, the figures are 87.26%, 90.52%, 84.41%, and 82.33%, respectively.

153. Analyses of **HLD 12** in **Appendix Figures C-25** through **C-28** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 48 out of 49 contests (or 98%).

154. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 12 are 98.68% in 2022, 98.82% in 2020, 98.87% in 2018, and 97.48% in 2016. For the EI RxC model, the figures are 96.81%, 97.42%, 95.97%, and 95.64%, respectively.

155. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 12 are 92.65% in 2022, 92.96% in 2020, 88.72% in 2018, and 83.73% in 2016. For the EI RxC model, the figures are 90.92%, 91.28%, 85.40%, and 81.31%, respectively.

156. Analyses of **HLD 23** in **Appendix Figures C-29** through **C-32** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

157. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 23 are 98.94% in 2022, 98.91% in 2020, 98.98% in 2018, and 97.77% in 2016. For the EI RxC model, the figures are 97.90%. 98.25%, 97.65%, and 96.87%, respectively.

158. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 23 are 90.21% in 2022, 89.11% in 2020, 85.74% in 2018, and 81.69% in 2016. For the EI RxC model, the figures are 88.40%, 87.63%, 83.19%, and 79.60%, respectively.

159. Analyses of **HLD 24** in **Appendix Figures C-33** through **C-36** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

160. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 24 are 99.00% in 2022, 98.89% in 2020, 98.87% in 2018, and 98.03% in 2016. For the EI RxC model, the figures are 95.11%. 96.19%, 94.95%, and 95.32%, respectively.

161. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 24 are 86.64% in 2022, 88.90% in 2020, 84.36% in 2018, and 81.31% in 2016. For the EI RxC model, the figures are 82.11%. 84.33%, 79.48%, and 77.56%, respectively.

162. Analyses of **HLD 25** in **Appendix Figures C-37** through **C-40** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

163. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 25 are 98.42% in 2022, 98.79% in 2020, 98.57% in 2018, and 97.92% in 2016. For the EI RxC model, the figures are 94.75%, 95.45%, 93.64%, and 94.19%, respectively.

164. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 25 are 88.61% in 2022, 89.37% in 2020, 86.04% in 2018, and 82.40% in 2016. For the EI RxC model, the figures are 83.56%. 84.08%, 79.68%, and 77.51%, respectively.

165. Analyses of **HLD 27** in **Appendix Figures C-41** through **C-44** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

166. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 27 are 98.68% in 2022, 98.66% in 2020, 98.75% in 2018, and 97.54% in 2016. For the EI RxC model, the figures are 97.23%, 97.37%, 97.32%, and 96.96%, respectively.

167. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 27 are 86.43% in 2022, 88.16% in 2020, 83.78% in 2018, and 77.73% in 2016. For the EI RxC model, the figures are 85.84%, 86.80%, 81.51%, and 76.88%, respectively.

168. Analyses of **HLD 32** in **Appendix Figures C-45** through **C-48** reveal clear patterns of RPV. Black voters are politically cohesive in all 49 contests (or 100%), while White voters vote as a bloc against Black-preferred candidates in 49 out of 49 contests (or 100%).

169. The average iterative EI estimates for Black voter support for Black-preferred candidates in HLD 32 are 99.03% in 2022, 98.75% in 2020, 98.95% in 2018, and 96.86% in 2016. For the EI RxC model, the figures are 93.53%, 95.13%, 93.46%, and 94.30%, respectively.

170. The average iterative EI estimates for White bloc voting against Black-preferred candidates in HLD 32 are 84.78% in 2022, 87.58% in 2020, 79.00% in 2018, and 77.37% in 2016. For the EI RxC model, the figures are 77.88%, 80.52%, 72.20%, and 71.84%, respectively.

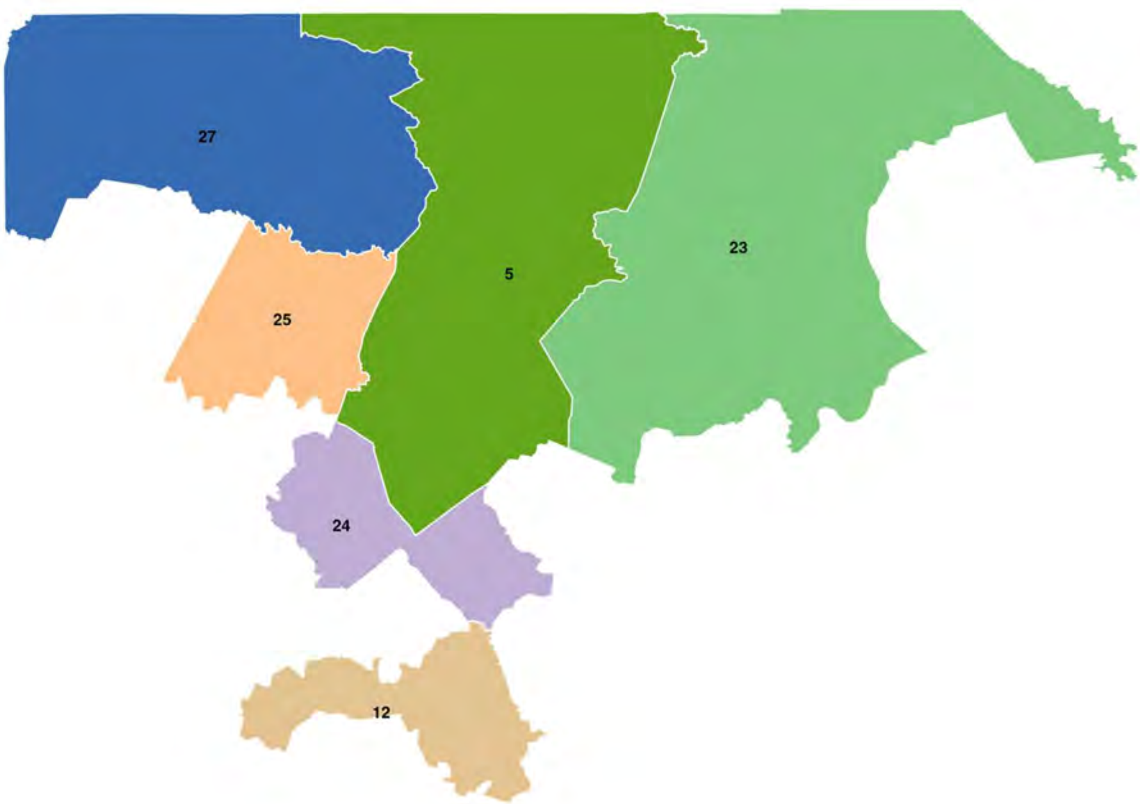
171. In summary, I find conclusive evidence of RPV in the HLD cluster and within each individual HLD. Once again, comparing midterm election years to one another and presidential election years to one another suggests that White bloc voting is increasing. For instance, the average cluster White bloc voting for iterative EI rose

from 80.42% in 2016 to 88.00% in 2020, an increase of 7.58 percentage points. Similarly, White bloc voting increased between midterm election cycles, rising from an average of 83.02% in 2018 to 86.35% in 2022, an increase of 3.3 percentage points. This trend is noticeable in the EI RxC results and generally holds in individual HLDs.

C. Black Cohesion Results: Demonstrative Plan A, HLDs 5, 12, 23, 24, 25 and 27

172. In this section I examine whether Black voters within Plaintiffs' *Gingles I* demonstrative HLD Plan A districts 5, 12, 23, 24, 25, and 27, shown in **Figure 28**, are politically cohesive.

Figure 28: District Boundaries of the Plaintiffs' HLD Demonstrative Plan A Districts



173. The results of the iterative models from 2016 to 2022 reported in **Figures 29 through 32** show that Black voters in each of the demonstrative districts are highly politically cohesive. The results of the RxC models from 2016 to 2022 are substantially similar, and are included in **Appendix Figures C-49 through C-52.**

174. The level of Black political cohesion is comparable to or higher than the level of political cohesion observed in the enacted HLD cluster and across each of the enacted HLDs in consideration.

Figure 29: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan A (Districts 5, 12, & 23), 2022 & 2020 Contests

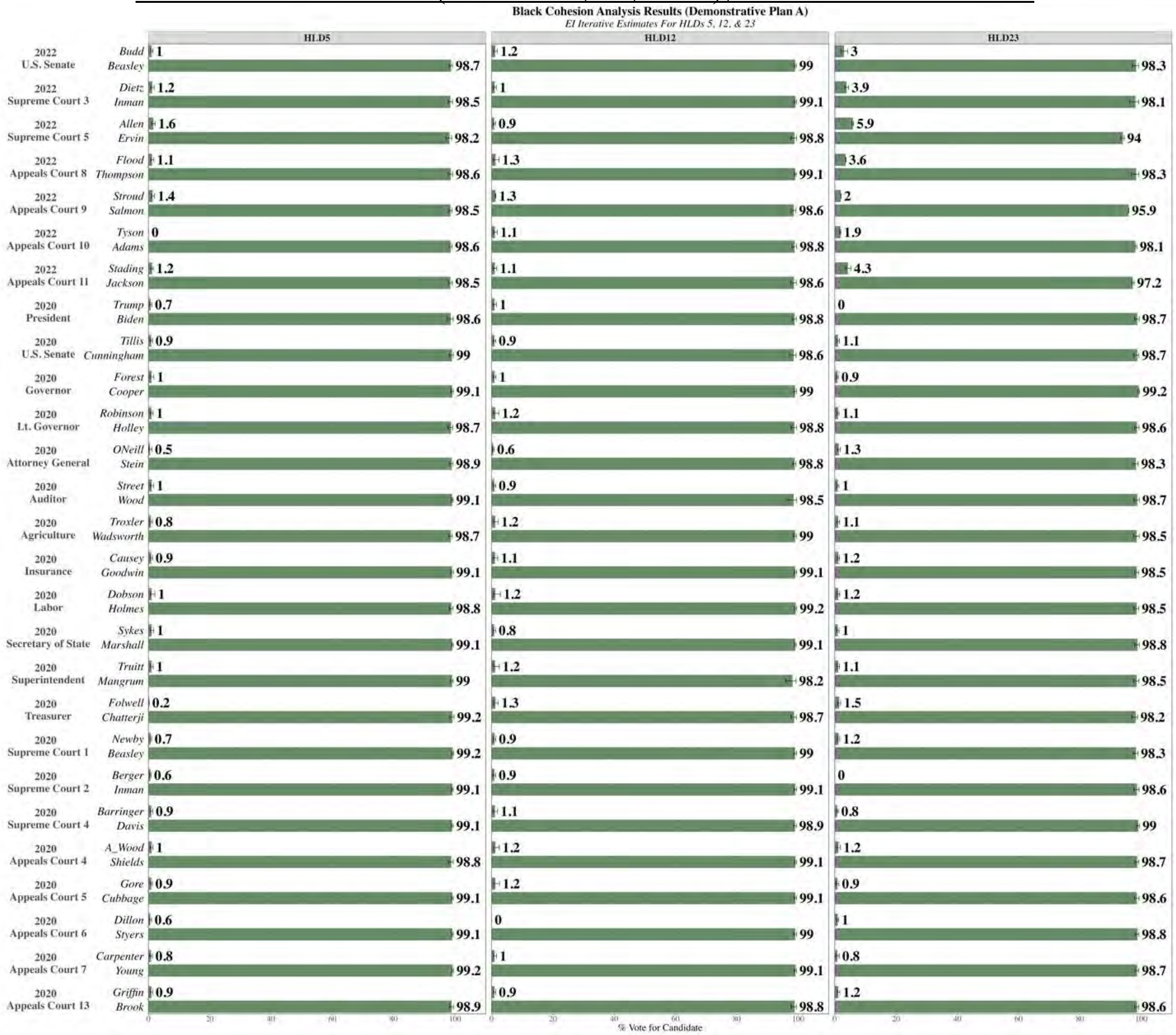


Figure 30: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan A (Districts 24, 25, & 27), 2022 & 2020 Contests

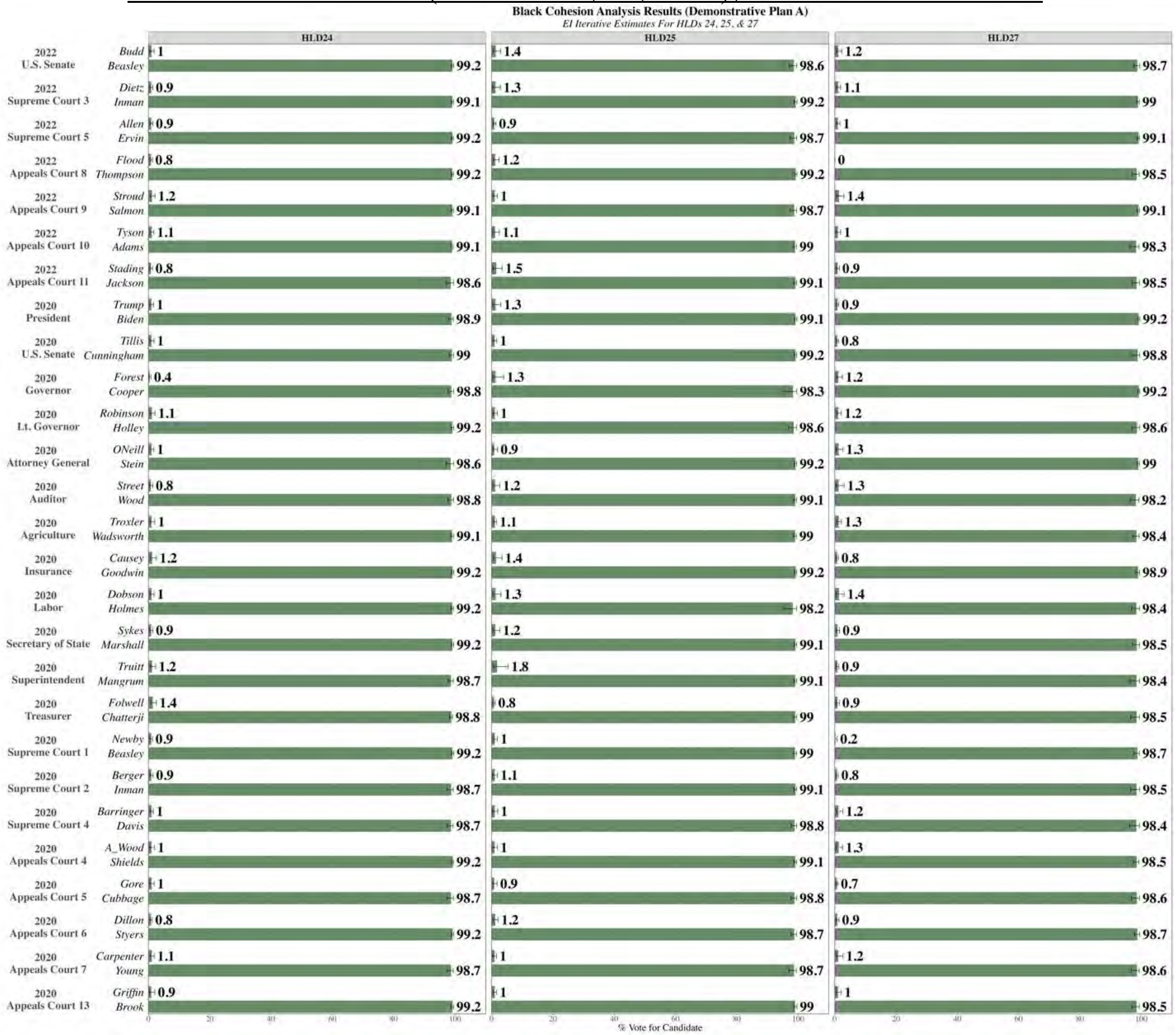


Figure 31: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan A (Districts 5, 12, & 23), 2018 & 2016 Contests

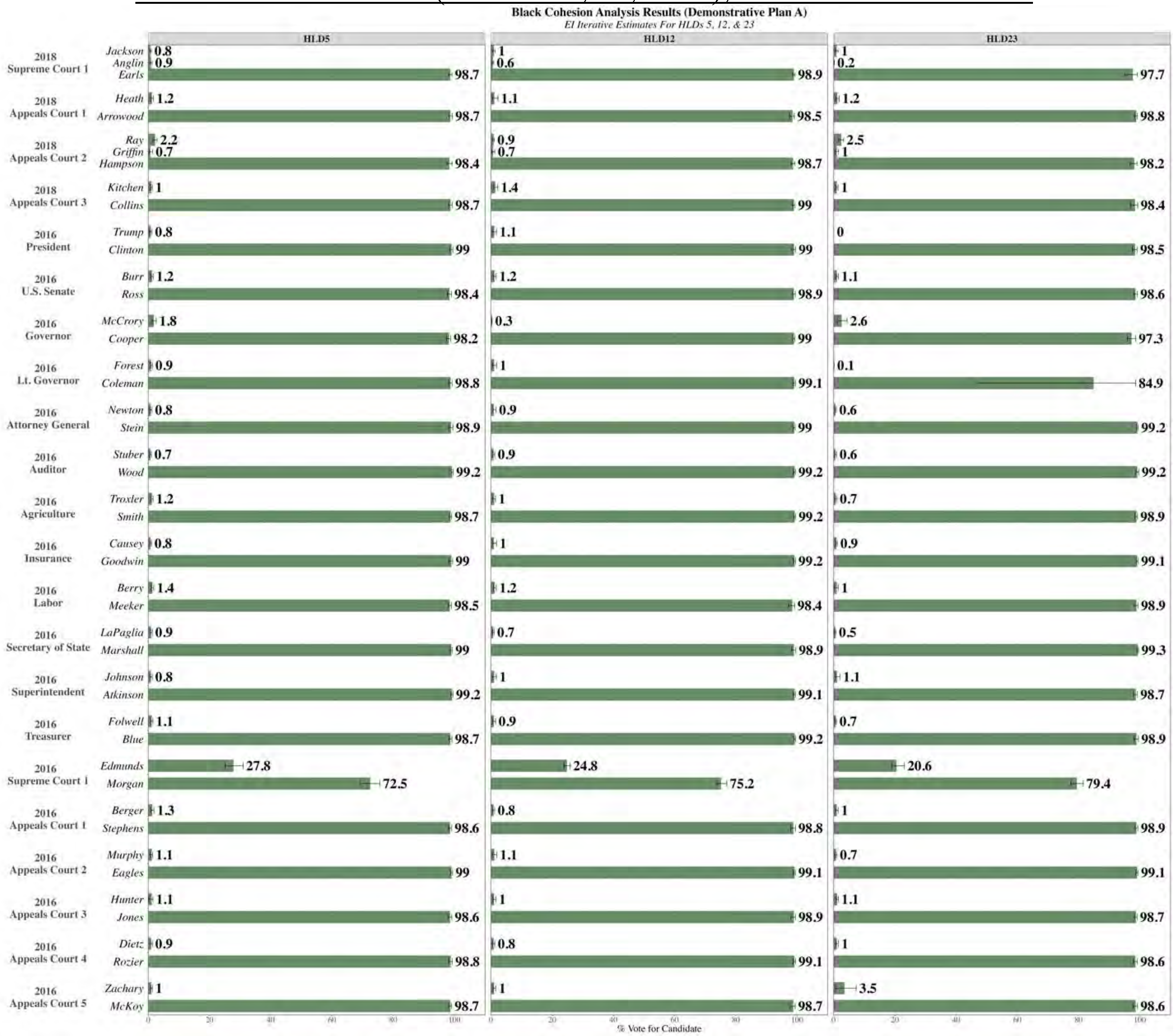


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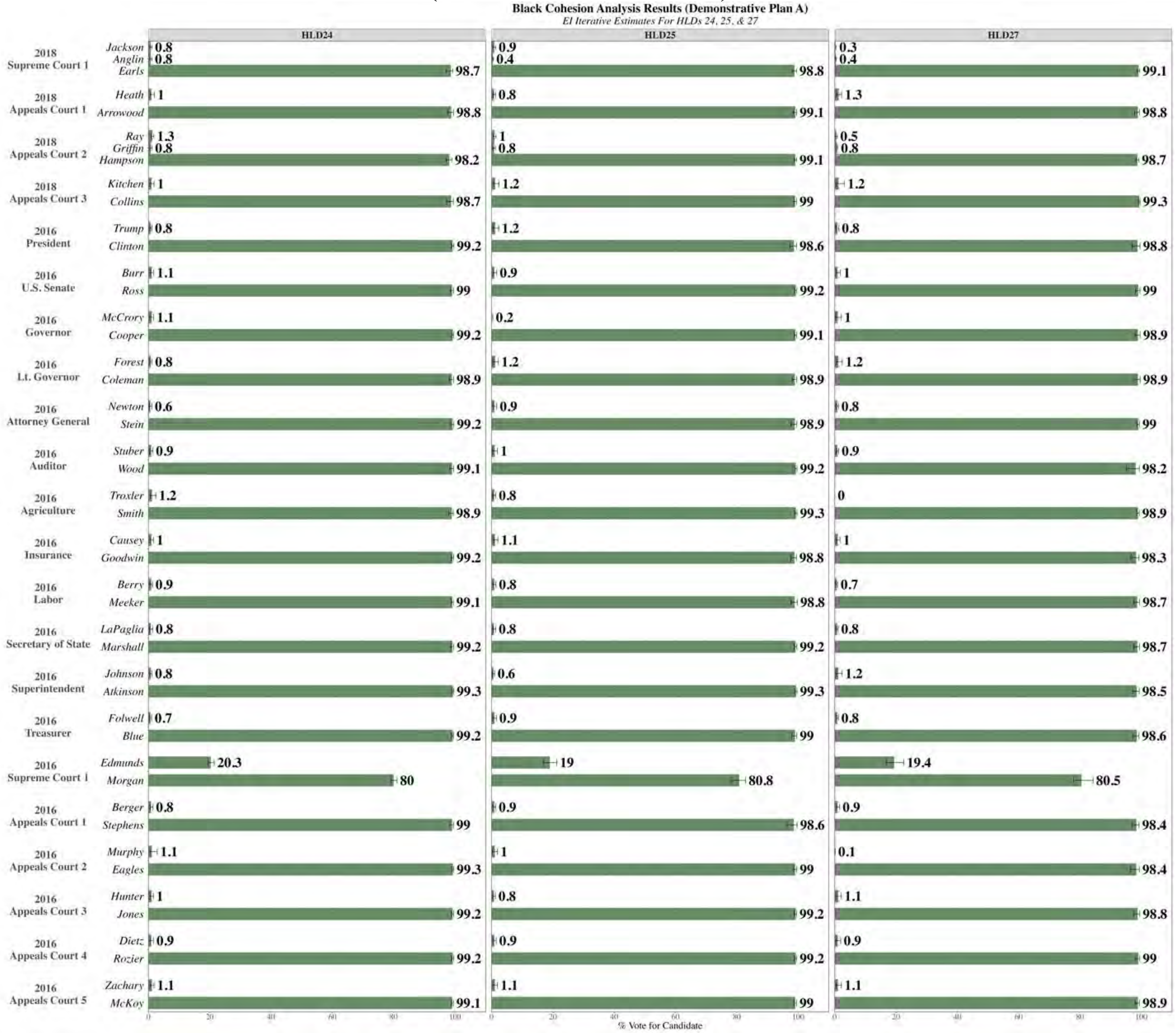
Figure 32: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan A (Districts 24, 25, & 27), 2018 & 2016 Contests



D. Black Cohesion Results: Demonstrative Plan B, HLDs 5, 8, 23, 24, 25, and 27

175. In this section I examine whether Black voters within Plaintiffs' *Gingles I* demonstrative HLD Plan B districts 5, 8 23, 24, 25, and 27, shown in Figure 33, are politically cohesive.

Figure 33: District Boundaries of the Plaintiffs' HLD Demonstrative Plan B

176. The results of the iterative models from 2016 to 2022 reported in **Figures 34 through 37** show that Black voters in each of the demonstrative districts are highly politically cohesive. The results of the RxC models from 2016 to 2022 are substantially similar, and are included in **Appendix Figures C-53 through C-56.**

177. Once again, the level of Black political cohesion is comparable to or higher than the level of political cohesion observed in the enacted HLD cluster and across each of the enacted HLDs in consideration.

Figure 34: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan B (Districts 5, 8, & 23), 2022 & 2020 Contests

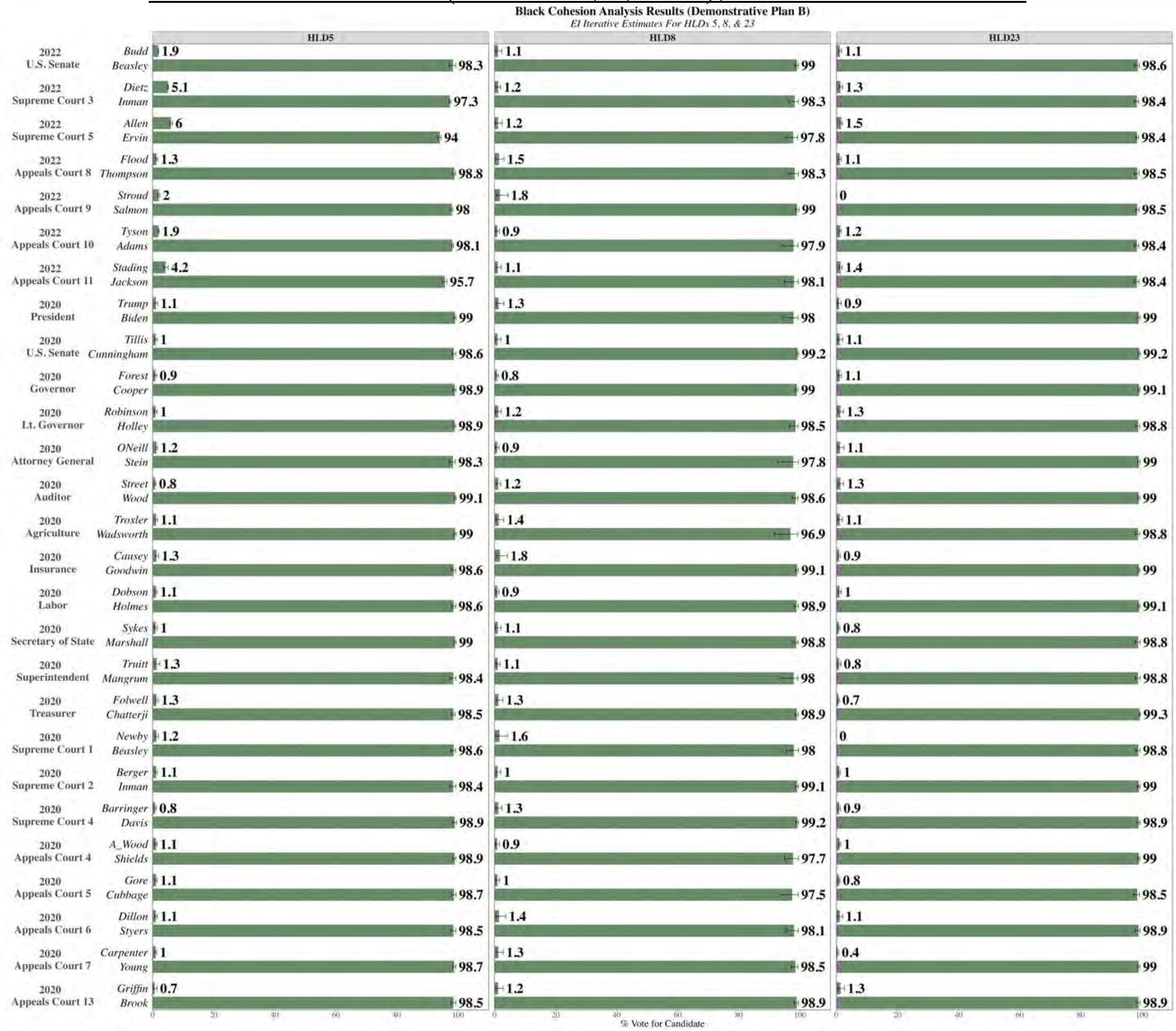


Figure 35: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan B (Districts 24, 25, & 27), 2022 & 2020 Contests

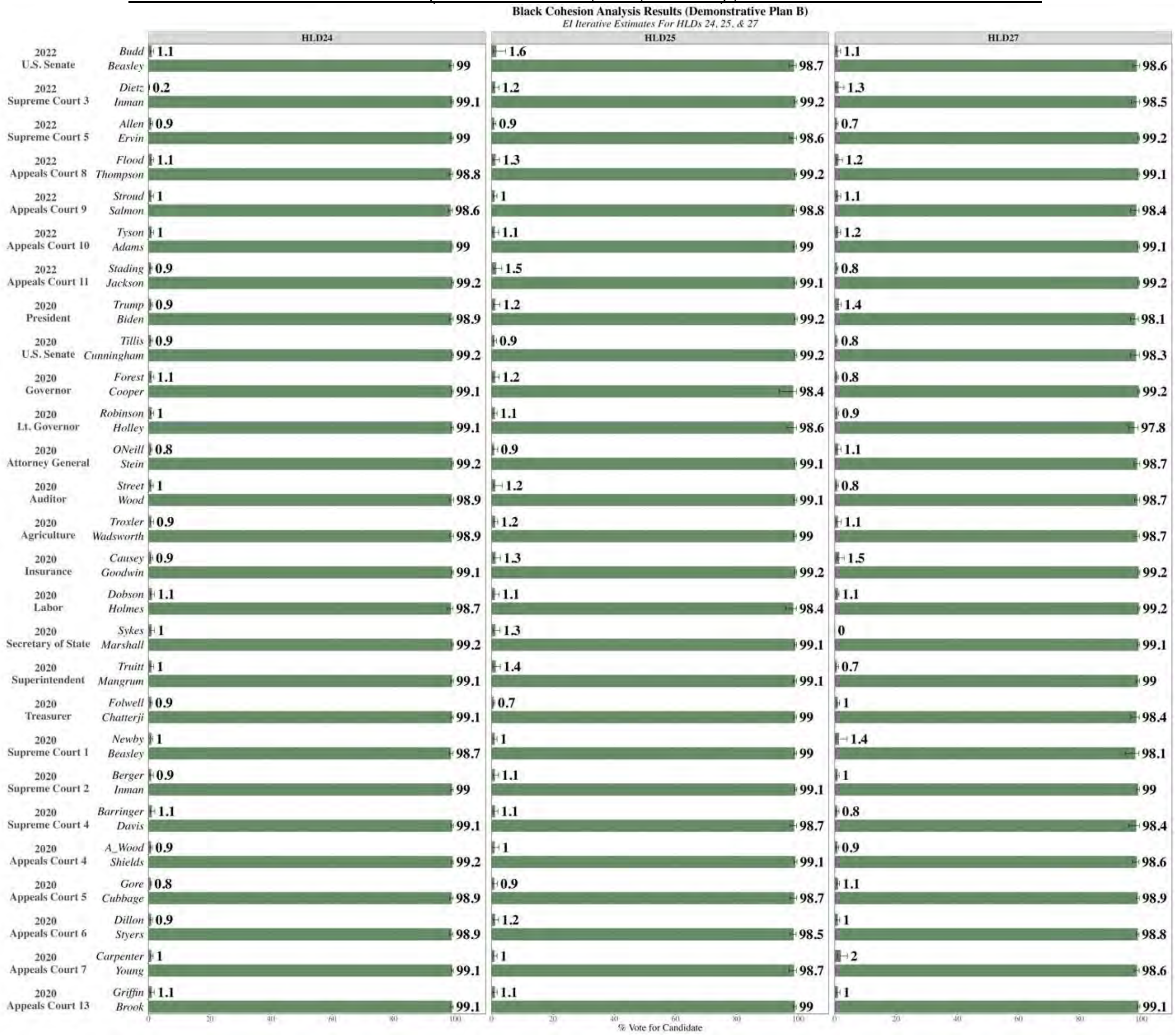


Figure 36: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan B (Districts 5, 8, & 23), 2018 & 2016 Contests

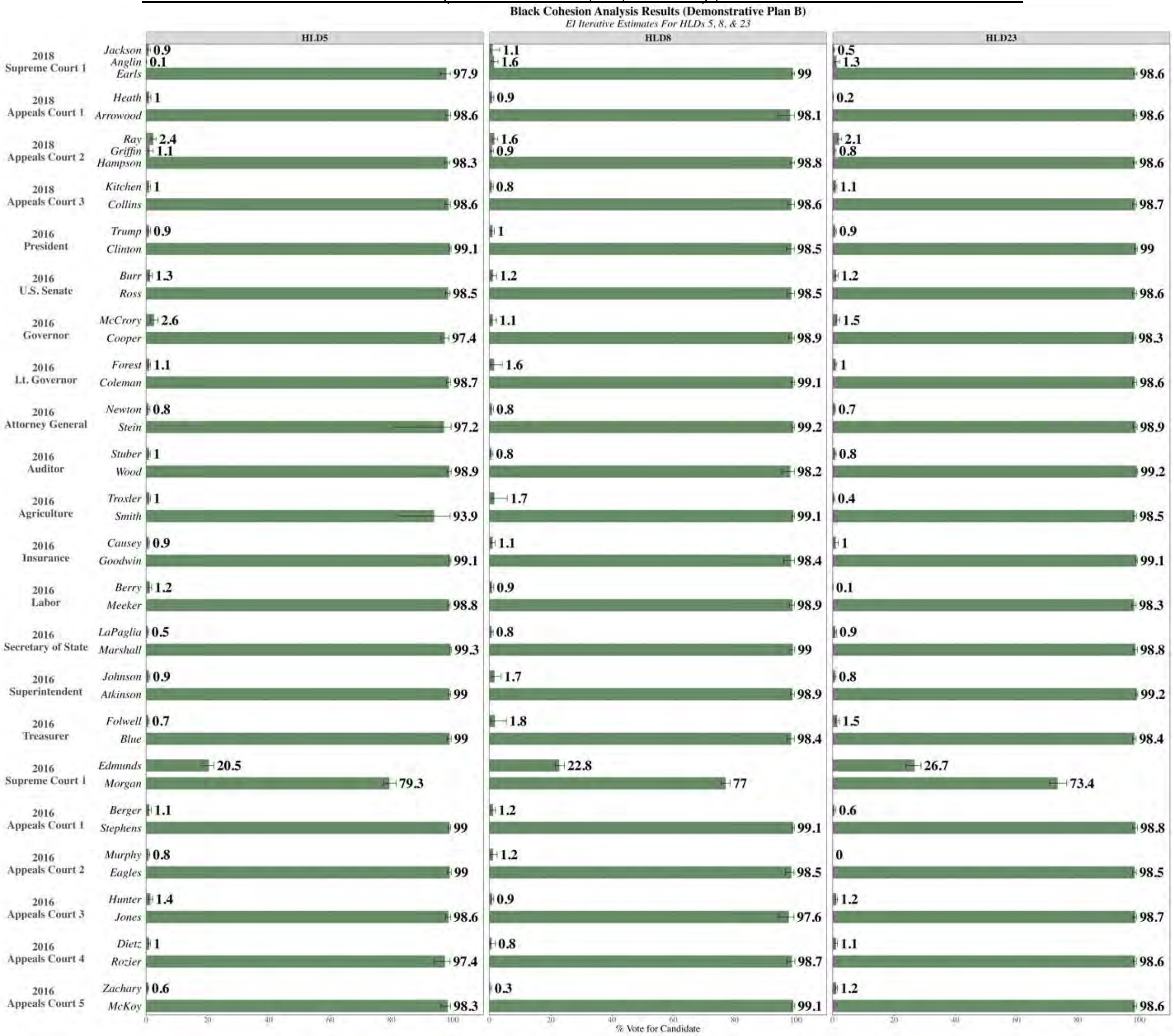
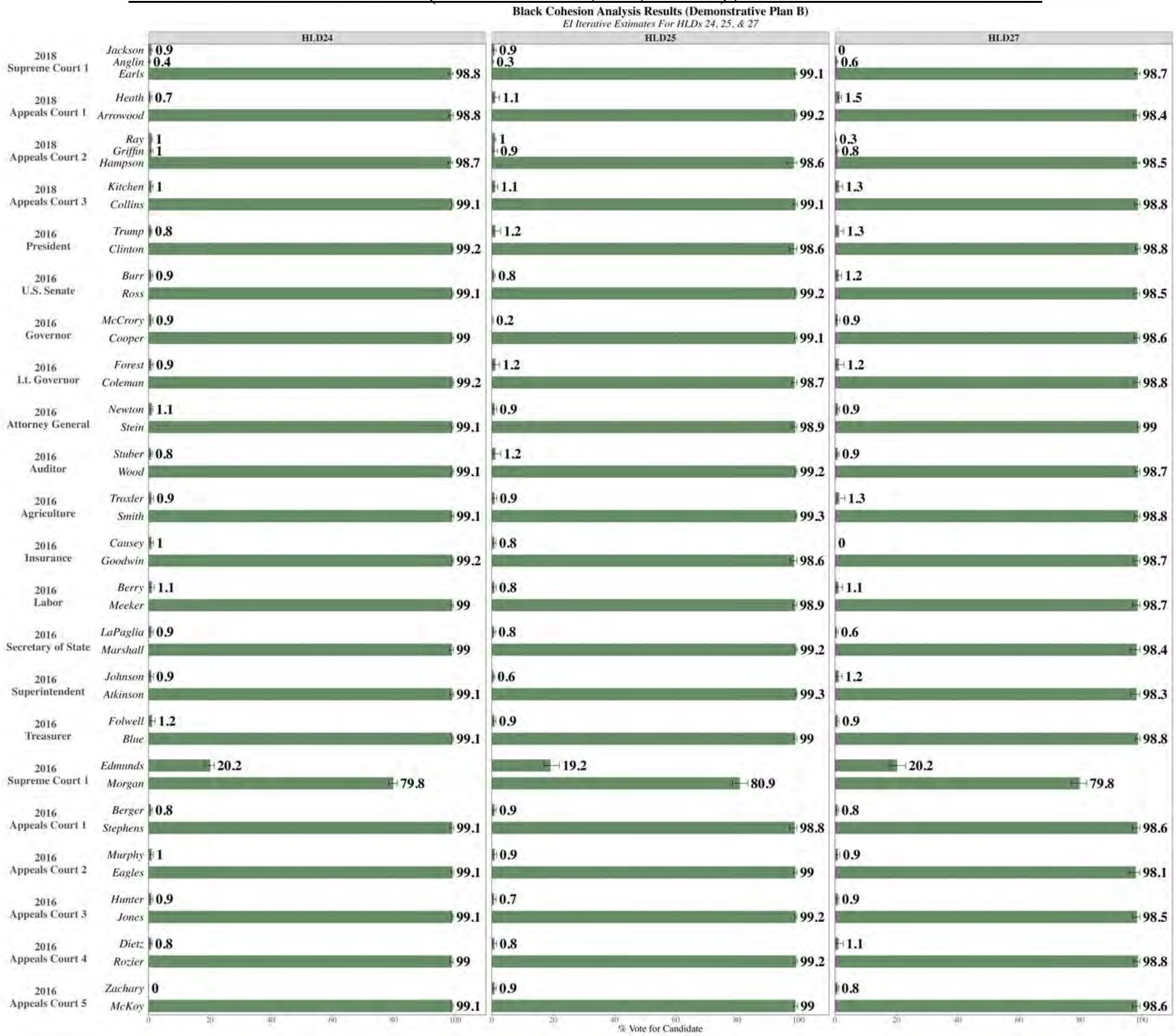


Figure 37: Iterative EI Black Cohesion Analysis Results for Plaintiffs' HLD Demonstrative Plan B (Districts 24, 25, & 27), 2018 & 2016 Contests



E. Electoral Performance Analysis Results

178. To examine the extent to which Black voters can overcome the high levels of bloc voting documented in the previous section, I report electoral performance results for the 2023 Enacted House Plan and compare these results with the two *Gingles I* demonstrative plans proposed by the Plaintiffs. Through this comparative analysis, I assess whether the 2023 Enacted House Plan diminished the opportunity for Black voters to elect their candidates of choice.

179. In examining the results, I consider the full slate of contests from 2016 to 2022 but place more weight on the most recent 2022 elections as recent contests are typically more indicative of future outcomes.

could be influenced by the varying types and numbers of elections included or excluded. Additionally, Dr. Lewis sets an arbitrary cutoff, including any elections where "at least 80 percent of voters in the district participated in the contest." This choice excludes up to 20 percent of voters, which could meaningfully alter the results. However, he does not provide any further analysis or justification for this decision, leaving the impact of this exclusion unexplored.

258. Taking these observations together, it is my opinion that it is not possible to determine with a reasonable degree of scientific certainty whether the Voting Rights Act requires majority-Black districts anywhere in North Carolina using the analysis described and set forth in the December 2021 Lewis Report.

259. The second report, the February 2022 Lewis Report, relies on even more assumptions, making it also difficult to judge with a reasonable degree of scientific certainty the likelihood that Black-preferred candidates could prevail in general elections within the districts he examined. In addition to the above assumptions, paragraph 9 of the February 2022 Lewis Report further acknowledges that he did not have sufficient time to reallocate all electoral precincts into the newly presented districts and rerun the RPV (Racially Polarized Voting) and reconstituted election analyses from his previous report for the new districts. As a result, his second report includes rough approximations, which he admits are "imperfect," and lack the necessary specificity for making reliable judgments. It is therefore still insufficient to determine with a reasonable degree of scientific certainty whether, and how many, majority BVAP (Black Voting Age Population) districts need to be drawn to comply with the Voting Rights Act.

IX. Conclusion

260. The findings and conclusions in this Report are based upon information that has been made available to me or known by me to date. My work in this matter is ongoing and I reserve the right to modify, update, or supplement my analyses, findings, and any conclusions as additional information is made available to me or as I perform further analysis.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury of the laws of the United States that the foregoing is true and correct according to the best of my knowledge, information and belief.

Kassra A.R. Oskooii
08/01/2024