Exhibit 2

SUPREME COURT OF THE STATE OF NEW YORK

COUNTY OF STEUBEN

----------X

TIM HARKENRIDER, GUY C. BROUGHT, LAWRENCE CANNING, PATRICIA CLARINO, GEORGE DOOHER, JR., STEPHEN EVANS, LINDA FANTON, JERRY FISHMAN, JAY FRANTZ, LAWRENCE GARVEY, ALAN NEPHEW, SUSAN ROWLEY, JOSEPHINE THOMAS, and MARIANNE VOLANTE,

Index No. E2022-0116CV

Petitioners,

-against-

GOVERNOR KATHY HOCHUL, LIEUTENANT GOVERNOR AND PRESIDENT OF THE SENATE BRIAN A. BENJAMIN, SENATE MAJORITY LEADER AND PRESIDENT PRO TEMPORE OF THE SENATE ANDREA STEWART-COUSINS, SPEAKER OF THE ASSEMBLY CARL HEASTIE, NEW YORK STATE BOARD OF ELECTIONS, and THE NEW YORK STATE LEGISLATIVE TASK FORCE ON DEMOGRAPHIC RESEARCH AND REAPPORTIONMENT,

Respondents.

----------X

REMEDIAL MAP EXPERT REPORT

OF SEAN P. TRENDE

April 22, 2022

I. Introduction and Qualifications

I have been retained by Troutman Pepper Hamilton Sanders LLP on behalf of their clients, Petitioners in the above-titled action, to evaluate Petitioners' Proposed Remedial Map ("Proposed Map" or "Proposed Plan") and determine whether it comports with pertinent requirements of the United States Constitution and New York Constitution. I have been asked to compare it to the 2022 Congressional map, 2021–2022 N.Y. Reg. Sess. Leg. Bills S.8196, A.9039-A, A.9040-A, and A.9168, enacted by the New York State Legislature and signed by Governor Kathy Hochul, ("Legislative Map" or "Legislative Plan"). I have also been asked to compare it to the New York Congressional Map for the preceding decade ("Benchmark Map" or "Benchmark Plan"). My qualifications have been laid out in this case in my Expert Report of Sean P. Trende, attached as Exhibit A.

Contiguity and Equal Population

The districts in the Proposed Plan are contiguous. As Table 1 demonstrates, they are also as close to equipopulous as possible under the latest census.

Table 1: Equipopulous Districts

DISTRICT	POPULATION	DEVIATION	DISTRICT	POPULATION	DEVIATION
1	776,971	0	14	776,971	0
2	776,971	0	15	776,971	0
3	776,971	0	16	776,971	0
4	776,971	0	17	776,971	0
5	776,971	0	18	776,972	1
6	776,971	0	19	776,971	0
7	776,971	0	20	776,971	0
8	776,971	0	21	776,971	0
9	776,971	0	22	776,971	0
10	776,971	0	23	776,971	0
11	776,971	0	24	776,971	0
12	776,971	0	25	776,972	1
13	776,971	0	26	776,972	1

County Splits

The districts in the Proposed Plan split a small number of counties. In total, it splits just 19 counties. This compares favorably to the Legislative Plan, which splits 34 counties, and is comparable to the Benchmark Map, which splits 19 counts as well.

Table 2: Number of Split Counties

PROPOSED MAP	BENCHMARK MAP	LEGISLATIVE MAP
19	19	34

It also splits those counties comparably few times. Given that there are 26 districts, the smallest number of times counties could be split is 25. The Proposed Plan splits counties 37 times. This is comparable to the Benchmark Plan, which splits counties 36 times. It compares favorably to the Legislative Map, which split counties 56 times.

Table 3: Total County Splits

PROPOSED MAP	BENCHMARK MAP	LEGISLATIVE MAP
37	36	56

Compactness

While various metrics have been proposed to define compactness, defining how much non-compactness is "too much" remains elusive. Nevertheless, it is possible to compare the compactness scores to those found in the Benchmark Plan, as well as those found in the Legislative Map. Table 4 provides average compactness score across all 26 districts, utilizing a variety of metrics commonly employed by individuals evaluating redistricting plans. The districts in the Proposed Plan are more compact than those found in the Legislative Plan regardless of the metric employed. They are comparable to those in the Benchmark Plan.

Table 4: Average Compactness

METRIC	PROPOSED	BENCHMARK	LEG. MAP
Reock	0.384	0.383	0.324
Polsby-Popper	0.360	0.348	0.252
I. Schwartzberg	0.591	0.579	0.493
Convex Hull	0.772	0.757	0.700

I also look at the least compact district in each plan. The least compact district in the Proposed Plan is more compact than the least compact district in the Benchmark Plan across metrics. It is also more compact than the least compact district in the Legislative Plan across metrics, at times substantially so.

Table 5: Minimum Compactness

METRIC	PROPOSED	BENCHMARK	LEG. MAP
Reock	0.170	0.160	0.131
Polsby-Popper	0.143	0.093	0.052
I. Schwartzberg	0.378	0.306	0.228
Convex Hull	0.519	0.431	0.403

It also contains just two "fracks," where a district enters a county more than once; District Seven enters Queens County at two points, while District 14 enters Bronx County at two points. This compares favorably to the Legislative Map, which has six fracks (Districts 3, 5, 7 (two counties), 14, and 24) and the Benchmark Map, which has five (Districts 5 (twice), 7, 14, and 27).

Finally, we can also look at individual districts. This table is admittedly "busy," but provides a useful comparison of the various plans. Once again, regardless of the metric, the Proposed Plan is typically more compact than the Legislative Plan across districts. Note that because district cores don't always completely line up, District 4 in the Proposed Plan is compared to District 5 in the Legislative Plan (and vice-versa), District 10 is compared to District 12 (and vice-versa), and District 22 is compared to District 24 (and vice-versa). Regardless of the metric, the individual districts in the Proposed Map are typically more compact than their counterparts in the legislative map.

Table 6: Comparison of Compactness, Proposed and Legislative Maps

	Reock			Polsby-Popper			I. Schwartz			Convex Hull		
DISTRICT	PROPOSED	LEG. 2022	DIFFERENCE	PROPOSED	LEG. 2022	DIFFERENCE	PROPOSED	LEG. 2022	DIFFERENCE	PROPOSED	LEG. 2022	DIFFERENCE
1	0.297	0.182	0.115	0.476	0.270	0.206	0.690	0.520	0.170	0.941	0.765	0.176
2	0.242	0.220	0.022	0.300	0.270	0.030	0.548	0.519	0.028	0.795	0.787	0.008
3	0.421	0.342	0.079	0.481	0.267	0.214	0.693	0.517	0.176	0.892	0.701	0.191
4	0.305	0.252	0.053	0.288	0.285	0.002	0.536	0.534	0.002	0.751	0.669	0.082
5	0.373	0.583	-0.210	0.342	0.430	-0.088	0.585	0.656	-0.071	0.765	0.871	-0.105
6	0.363	0.324	0.039	0.398	0.318	0.080	0.631	0.564	0.067	0.804	0.783	0.021
7	0.170	0.192	-0.022	0.143	0.156	-0.013	0.378	0.395	-0.017	0.519	0.536	-0.017
8	0.221	0.340	-0.119	0.209	0.251	-0.043	0.457	0.501	-0.044	0.598	0.607	-0.009
9	0.513	0.366	0.147	0.334	0.345	-0.011	0.578	0.587	-0.009	0.786	0.772	0.014
10	0.274	0.340	-0.066	0.243	0.328	-0.085	0.493	0.572	-0.080	0.758	0.786	-0.028
11	0.433	0.363	0.071	0.580	0.337	0.242	0.761	0.581	0.181	0.875	0.828	0.047
12	0.648	0.131	0.517	0.400	0.052	0.347	0.632	0.228	0.404	0.816	0.403	0.413
13	0.294	0.326	-0.032	0.274	0.257	0.017	0.523	0.507	0.016	0.625	0.708	-0.083
14	0.256	0.262	-0.006	0.176	0.142	0.034	0.419	0.377	0.042	0.530	0.540	-0.011
15	0.669	0.409	0.260	0.561	0.163	0.397	0.749	0.404	0.344	0.892	0.647	0.246
16	0.539	0.258	0.281	0.483	0.131	0.351	0.695	0.362	0.332	0.852	0.554	0.298
17	0.357	0.227	0.130	0.335	0.198	0.138	0.579	0.445	0.135	0.739	0.677	0.061
18	0.422	0.414	0.008	0.438	0.161	0.277	0.662	0.401	0.261	0.850	0.663	0.187
19	0.346	0.267	0.079	0.231	0.189	0.042	0.481	0.434	0.046	0.685	0.605	0.080
20	0.446	0.342	0.104	0.350	0.220	0.130	0.592	0.469	0.122	0.760	0.687	0.073
21	0.456	0.551	-0.096	0.414	0.249	0.166	0.644	0.499	0.145	0.857	0.826	0.032
22	0.322	0.232	0.090	0.236	0.163	0.073	0.486	0.404	0.082	0.697	0.627	0.070
23	0.190	0.180	0.010	0.285	0.245	0.040	0.534	0.495	0.039	0.734	0.802	-0.068
24	0.390	0.476	-0.087	0.301	0.351	-0.049	0.549	0.592	-0.043	0.751	0.815	-0.063
25	0.597	0.398	0.198	0.622	0.345	0.277	0.788	0.587	0.201	0.955	0.748	0.207
26	0.427	0.443	-0.016	0.474	0.431	0.042	0.688	0.657	0.031	0.855	0.803	0.052

Core retention

The Proposed Map also exhibits a high degree of core retention. On average, the districts in the Legislative Map retained 76.9% of their core populations. This districts in the Proposed Map retain 79.1% of their core populations. You can see individual districts below. Note that the district numbers are changed somewhat with respect to the Benchmark Plan: districts 4 and 5 are swapped in the Proposed Plan, as are 22 and 27, whereas with the previous Legislative Map districts 22 and 24 are swapped, as are 24 and 27.

Table 7: Core Retention in Proposed and Legislative Maps

DISTRICT	PROPOSED	LEG
1	100.0%	55.9%
2	80.6%	60.9%
3	83.0%	75.9%
4	17.4%	100.0%
5	60.8%	95.4%
6	93.1%	96.5%
7	97.9%	67.9%
8	64.1%	79.7%
9	82.3%	80.5%
10	55.8%	67.4%
11	92.1%	75.8%
12	55.5%	79.7%
13	100.0%	87.5%
14	61.6%	86.0%
15	100.0%	78.3%
16	75.5%	78.2%
17	74.4%	74.9%
18	76.8%	73.5%
19	59.4%	52.8%
20	100.0%	88.1%
21	100.0%	68.9%
22	45.3%	44.3%
23	93.6%	72.4%
24	87.3%	59.4%
25	100.0%	98.3%
26	100.0%	100.0%

Ability-to-Elect Districts

A complete polarized voting analysis is beyond the scope of this report. Instead, here we draw maps which perform similarly to those promulgated by the legislature, since those presumably did not diminish minority voters' ability to elect their candidates of choice. Both the Legislative Map and the Proposed Map include eight districts where non-White voters represent at least a plurality of the voters in the district.

Of those eight remaining districts, the Legislative Map produces four districts with Hispanic[1] pluralities: 15 (64.05%), 13 (48.9%), 14 (39.9%), and 7 (36.9%). The Proposed map performs similarly, with Hispanic pluralities in Districts 15 (58.5%), 13 (53.1%), 14 (45.08%) and 7 (35.9%). The Legislative Map produces three districts with Black pluralities: 8 (52.1%), 5 (45.3%) and 9 (52.1%). The Proposed Map performs similarly once again, with Black pluralities in Districts 5 (51%), 9 (48%) and 8 (48.6%). Finally, both the Legislative Map and Proposed Map create the 6th District as an Asian plurality district, with a 46.9% Asian plurality in the Legislative Map and a 45.8% plurality in the Proposed Map.

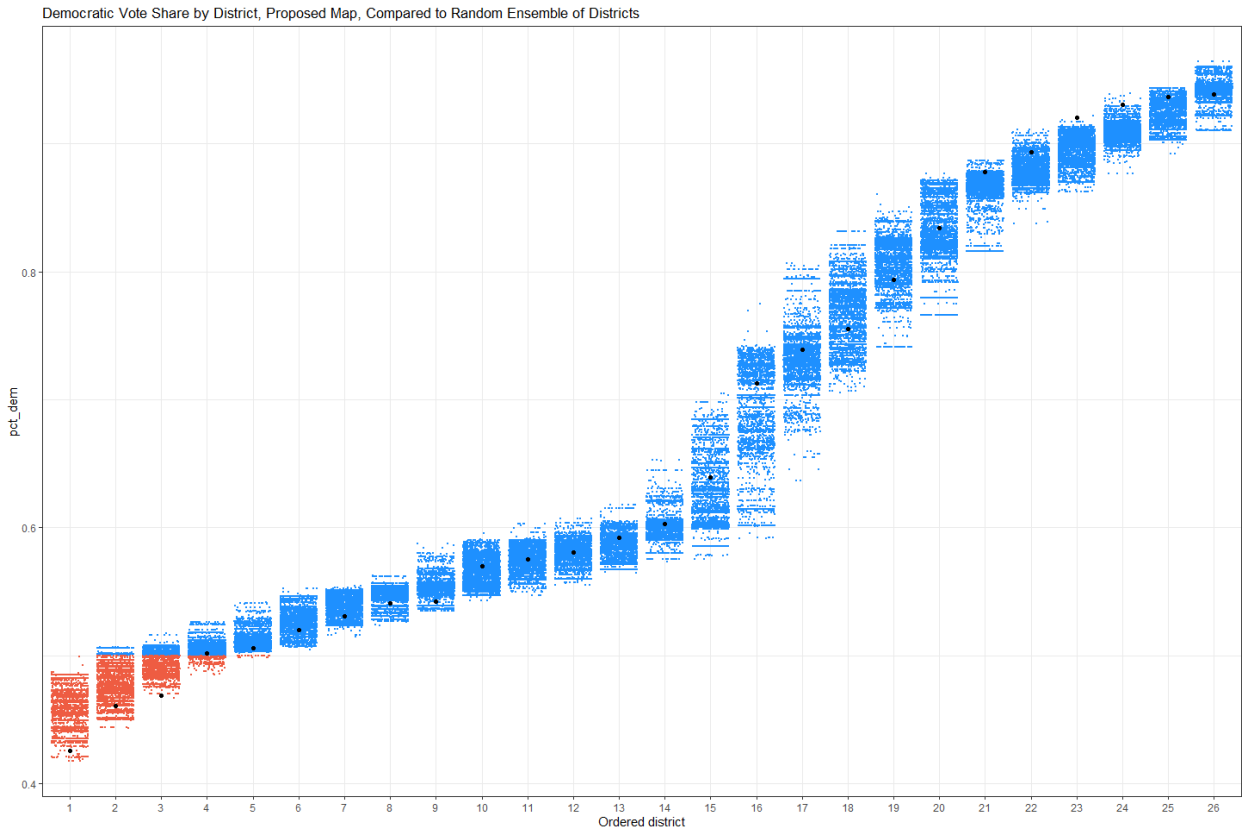
Partisanship

Finally, unlike the Legislative Map, the Proposed Map exhibits no evidence of partisan intent in the drawing. This process is explained in greater detail in Exhibit A, but in the course of the litigation, Petitioners created an ensemble of congressional maps drawn without respect to politics. Petitioners also calculated the Democratic vote share (calculated by averaging the votes of statewide Democratic candidates taken from a widely utilized, publicly available database) in each district in the ensemble and then demonstrated that the Legislative Plan frequently fell well outside of expectations, particularly where we would expect to see competitive districts in a map drawn without respect to politics. These districts were consistently made substantially more favorable for the Democratic Party than we would expect to see in a map drawn without substantial reference to politics.

The Proposed Map suffers from no such infirmity. The dotplot below takes each map in the ensemble and orders the districts from most-to-least Republican. It then plots the partisanship

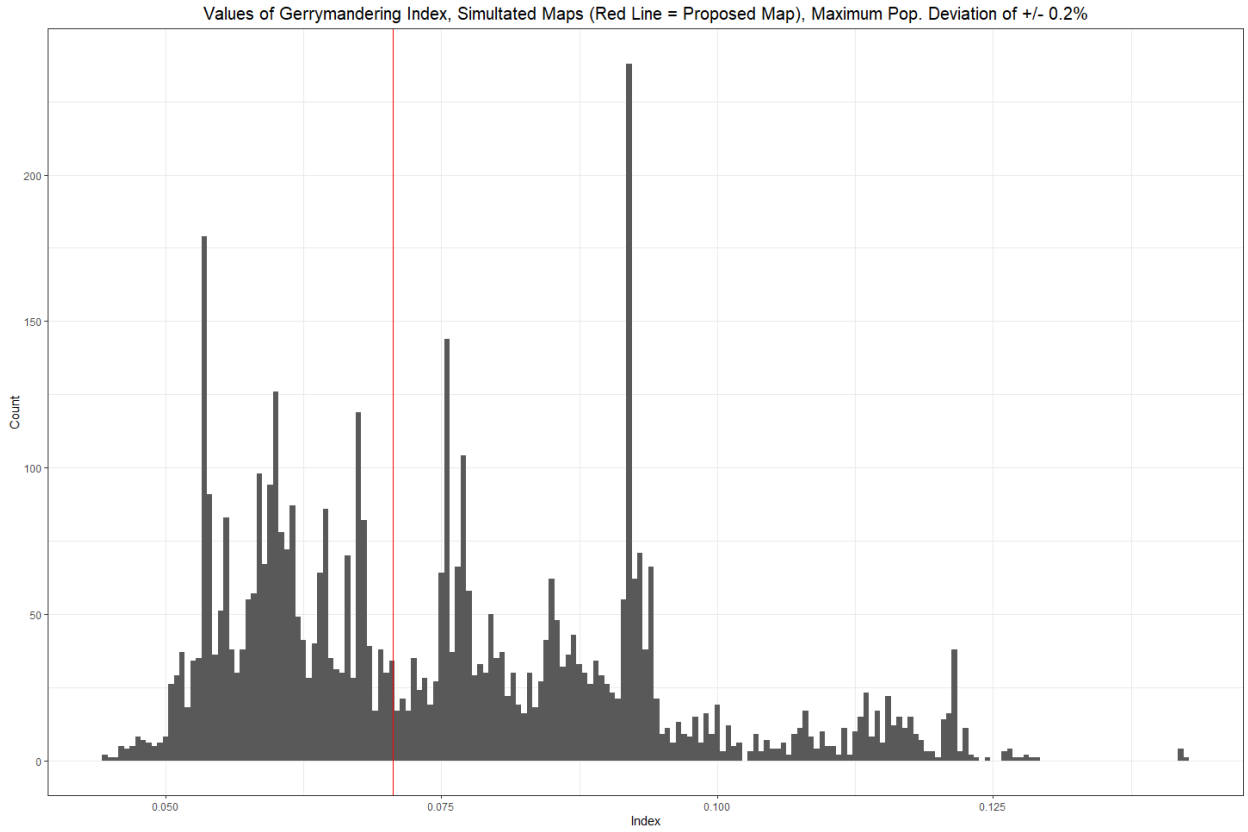
[1] Individuals can identify with multiple races under the census, which can lead to differing counts of racial groupings. Also, individuals of any race can identify as "Hispanic." For purposes of this Report, I utilize "any part Black, any ethnicity" as my definition of "Black," Hispanic of any race as my definition of Hispanic, and any part Asian as my definition of Asian.

of each district on the chart. So, in all the maps, the most Republican district ranges somewhere between around 43% and 50% in average statewide Democratic vote share, the second-most Republican district ranges somewhere between around 45% and 51% in average statewide Democratic vote share, and so forth. The dotplot suggests that, for the Proposed Map, all districts fall within the ranges that we would expect from a map drawn without reference to politics and ensure a substantial number of competitive districts. Republicans could likely expect to compete in 9 of the state's 26 districts (34%) in a typical year, which is comparable to the vote share they typically win in the state.



In the litigation, Petitioners also proposed utilizing a Gerrymandering Index. This effectively summarizes the dotplot above, with more weight given to larger deviations. It is conceptually similar to the root mean squared error statistic.

The following chart shows the Gerrymandering Index for the ensemble, and also shows the Gerrymandering Index for the Proposed Map. The Gerrymandering Index for the Proposed Map is 0.0705, which is comparable to the average Gerrymandering Index from the ensemble of 0.0754.



Conclusion

The Proposed Map succeeds where the map struck down by this Court fails. It produces very few county splits, is compact, and retains district cores to a higher degree than that map did. It performs as well in providing an opportunity for minorities to elect their candidate of choice. Most importantly, however, it is not infused with the Legislature's partisan intent. It treats the parties fairly and proportionally, and the partisanship it produces strongly resembles that produced from maps drawn without respect to politics. It would be an outstanding choice for this Court to replace the previous map.

Dated: April 22, 2022

SEAN P. TRENDE

Exhibit A

SUPREME COURT OF THE STATE OF NEW YORK

COUNTY OF STEUBEN

----------X

TIM HARKENRIDER, GUY C. BROUGHT, LAWRENCE CANNING, PATRICIA CLARINO, GEORGE DOOHER, JR., STEPHEN EVANS, LINDA FANTON, JERRY FISHMAN, JAY FRANTZ, LAWRENCE GARVEY, ALAN NEPHEW, SUSAN ROWLEY, JOSEPHINE THOMAS, and MARIANNE VOLANTE,

Index No. E2022-0116CV

Petitioners,

-against-

GOVERNOR KATHY HOCHUL, LIEUTENANT GOVERNOR AND PRESIDENT OF THE SENATE BRIAN A. BENJAMIN, SENATE MAJORITY LEADER AND PRESIDENT PRO TEMPORE OF THE SENATE ANDREA STEWART-COUSINS, SPEAKER OF THE ASSEMBLY CARL HEASTIE, NEW YORK STATE BOARD OF ELECTIONS, and THE NEW YORK STATE LEGISLATIVE TASK FORCE ON DEMOGRAPHIC RESEARCH AND REAPPORTIONMENT,

Respondents.

----------X

EXPERT REPORT

OF SEAN P. TRENDE

FEBRUARY 14, 2021

Expert Report of Sean P. Trende

I. Qualifications

Professional Experience:

I joined RealClearPolitics in January of 2009 after practicing law for eight years. I assumed a full-time position with RealClearPolitics in March of 2010. My title is Senior Elections Analyst. RealClearPolitics is a company of around 50 employees, with offices in Washington D.C. It produces one of the most heavily trafficked political websites in the world, which serves as a one-stop shop for political analysis from all sides of the political spectrum and is recognized as a pioneer in the field of poll aggregation. It produces original content, including both data analysis and traditional reporting. It is routinely cited by the most influential voices in politics, including David Brooks of *The New York Times*, Brit Hume of *Fox News*, Michael Barone of *The Almanac of American Politics*, Paul Gigot of *The Wall Street Journal*, and Peter Beinart of *The Atlantic*.

My main responsibilities with RealClearPolitics consist of tracking, analyzing, and writing about elections. I collaborate in rating the competitiveness of Presidential, Senate, House, and gubernatorial races. As a part of carrying out these responsibilities, I have studied and written extensively about demographic trends in the country, exit poll data at the state and federal level, public opinion polling, and voter turnout and voting behavior. In particular, understanding the way that districts are drawn and how geography and demographics interact is crucial to predicting United States House of Representatives races, so much of my time is dedicated to that task.

Publications and Speaking Engagements:

I am currently a Visiting Scholar at the American Enterprise Institute, where my publications focus on the demographic and coalitional aspects of American Politics. There, I have written on the efficiency gap, a metric for measuring the fairness of redistricting plans.

I am the author of *The Lost Majority: Why the Future of Government Is Up for Grabs and Who Will Take It.* In this book, I explore realignment theory. It argues that realignments are a poor concept that should be abandoned. As part of this analysis, I conducted a thorough analysis of demographic and political trends beginning in the 1920s and continuing through the modern times, noting the fluidity and fragility of the coalitions built by the major political parties and their candidates.

I co-authored the 2014 *Almanac of American Politics.* The Almanac is considered the foundational text for understanding congressional districts and the representatives of those

districts, as well as the dynamics in play behind the elections. PBS's Judy Woodruff described the book as "the oxygen of the political world," while NBC's Chuck Todd noted that "[r]eal political junkies get two *Almanacs*: one for the home and one for the office." My focus was researching the history of and writing descriptions for many of the newly-drawn districts, including tracing the history of how and why they were drawn the way that they were drawn.

I have spoken on these subjects before audiences from across the political spectrum, including at the Heritage Foundation, the American Enterprise Institute, the CATO Institute, the Bipartisan Policy Center, and the Brookings Institution. In 2012, I was invited to Brussels to speak about American elections to the European External Action Service, which is the European Union's diplomatic corps. I was selected by the United States Embassy in Sweden to discuss the 2016 elections to a series of audiences there, and was selected by the United States Embassy in Spain to fulfil a similar mission in 2018. I was invited to present by the United States Embassy in Italy, but was unable to do so because of my teaching schedule.

In the winter of 2018, I taught American Politics and the Mass Media at Ohio Wesleyan University. I taught Introduction to American Politics at The Ohio State University for three semesters from Fall of 2018 to Fall of 2019, and again in Fall of 2021. In the Springs of 2020 and 2021, I taught Political Participation and Voting Behavior at The Ohio State University. This course spent several weeks covering all facets of redistricting: how maps are drawn, debates over what constitutes a fair map, measures of redistricting quality, and similar topics. I am teaching this course this semester as well.

It is my policy to appear on any major news outlet that invites me, barring scheduling conflicts. I have appeared on both Fox News and MSNBC to discuss electoral and demographic trends. I have been cited in major news publications, including *The New York Times*, *The Washington Post*, *The Los Angeles Times*, *The Wall Street Journal*, and *USA Today*.

I sit on the advisory panel for the "States of Change: Demographics and Democracy" project. This project is sponsored by the Hewlett Foundation and involves three premier think tanks: the Brookings Institution, the Bipartisan Policy Center, and the Center for American Progress. The group takes a detailed look at trends among eligible voters and the overall population, both nationally and in key states, to explain the impact of these changes on American politics, and to create population projections, which the Census Bureau abandoned in 1995. In 2018, I authored one of the lead papers for the project: "In the Long Run, We're All Wrong,"

available at https://bipartisanpolicy.org/wp-content/uploads/2018/04/BPC-Democracy-States-of-Change-Demographics-April-2018.pdf.

Education:

I received a Master's in Applied Statistics as part of my coursework. My coursework for my Ph.D. and M.A.S. included, among other things, classes on G.I.S. systems, spatial statistics, issues in contemporary redistricting, machine learning, non-parametric hypothesis tests and probability theory. I have completed my coursework and have passed comprehensive examinations in both methods and American Politics. I expect to receive my Ph.D. in May of 2022, and have filed my application to graduate. My dissertation focuses on applications of spatial statistics to political questions, including an article on redistricting simulations and the effect of communities of interest on partisan bias. I am currently a doctoral candidate in political science at The Ohio State University.

Prior Engagements as an Expert:

In 2021, I served as one of two special masters appointed by the Supreme Court of Virginia to redraw the districts that will elect the commonwealth's representatives to the House of Delegates, Senate of Virginia, and U.S. Congress in the following decades. The Supreme Court of Virginia accepted those maps and were praised by observers from across the political spectrum. "New Voting Maps, and a New Day, for Virginia," *The Washington Post* (Jan. 2, 2022), available at https://www.washingtonpost.com/opinions/2022/01/02/virginia-redistricting-voting-maps-gerrymander/; Henry Olsen, "Maryland Shows How to do Redistricting Wrong. Virginia Shows How to Do it Right," *The Washington Post* (Dec. 9, 2021), available at https://www.washingtonpost.com/opinions/2021/12/09/maryland-virginia-redistricting/; Richard Pildes, "Has VA Created a New Model for a Reasonably Non-Partisan Redistricting Process," *Election Law Blog* (Dec. 9, 2021), available at https://electionlawblog.org/?p=126216.

I previously authored an expert report in *Dickson v. Rucho,* No. 11-CVS-16896 (N.C. Super Ct., Wake County), which involved North Carolina's 2012 General Assembly and Senate maps. Although I was not called to testify, it is my understanding that my expert report was accepted without objection. I also authored an expert report in *Covington v. North Carolina,* Case No. 1:15-CV-00399 (M.D.N.C.), which involved almost identical challenges in a different forum. Due to what I understand to be a procedural quirk, where my largely identical report from *Dickson*

had been inadvertently accepted by the plaintiffs into the record when they incorporated parts of the *Dickson* record into the case, I was not called to testify.

I authored two expert reports in *NAACP v. McCrory*, No. 1:13CV658 (M.D.N.C.), which involved challenges to multiple changes to North Carolina's voter laws, including the elimination of a law allowing for the counting of ballots cast in the wrong precinct. I was admitted as an expert witness and testified at trial. My testimony discussed the "effect" prong of the Voting Rights Act claim. I did not examine the issues relating to intent.

I authored reports in *NAACP v. Husted*, No. 2:14-cv-404 (S.D. Ohio), and *Ohio Democratic Party v. Husted*, Case 15-cv-01802 (S.D. Ohio), which dealt with challenges to various Ohio voting laws. I was admitted and testified at trial in the latter case (the former case settled). The judge in the latter case ultimately refused to consider one opinion, where I used an internet map-drawing tool to show precinct locations in the state. Though no challenge to the accuracy of the data was raised, the judge believed I should have done more work to check that the data behind the application was accurate.

I served as a consulting expert in *Lee v. Virginia Board of Elections*, No. 3:15-cv-357 (E.D. Va. 2016), a voter identification case. Although I would not normally disclose consulting expert work, I was asked by defense counsel to sit in the courtroom during the case and review testimony. I would therefore consider my work *de facto* disclosed.

I filed an expert report in *Mecinas v. Hobbs*, No. CV-19-05547-PHX-DJH (D. Ariz. 2020). That case involved a challenge to Arizona's ballot order statute. Although the judge ultimately did not rule on a motion in limine in rendering her decision, I was allowed to testify at the hearing.

I authored two expert reports in *Feldman v. Arizona*, No. CV-16-1065-PHX-DLR (D. Ariz.). Plaintiffs in that case challenged an Arizona law prohibiting the collection of voted ballots by third parties that were not family members or caregivers and the practice of most of the state's counties to require voters to vote in their assigned precinct. My reports and testimony were admitted. Part of my trial testimony was struck in that case for reasons unrelated to the merits of the opinion; counsel for the state elicited it while I was on the witness stand and it was struck after Plaintiffs were not able to provide a rebuttal to the new evidence.

I authored expert reports in *A. Philip Randolph Institute v. Smith*, No. 1:18-cv-00357-TSB (S.D. Ohio), *Whitford v. Nichol*, No. 15-cv-421-bbc (W.D. Wisc.), and *Common Cause v. Rucho*,

NO. 1:16-CV-1026-WO-JEP (M.D.N.C.), which were efficiency gap-based redistricting cases filed in Ohio, Wisconsin and North Carolina.

I also authored an expert report in the cases of *Ohio Organizing Collaborative, et al v. Ohio Redistricting Commission, et al* (No. 2021-1210); *League of Women Voters of Ohio, et al v. Ohio Redistricting Commission, et al* (No. 2021-1192); *Bria Bennett, et al v. Ohio Redistricting Commission, et al* (No. 2021-1198). These cases were consolidated and are presently pending in original action before the Supreme Court of Ohio.[1]

In 2019, I was appointed as the court's expert by the Supreme Court of Belize. In that case I was asked to identify international standards of democracy as they relate to malapportionment claims, to determine whether Belize's electoral divisions (similar to our congressional districts) conformed with those standards, and to draw alternative maps that would remedy any existing malapportionment.

I currently serve as the voting rights act expert to counsel for the Arizona Independent Redistricting Commission.

II. Scope of Engagement

I have been retained by Troutman Pepper Hamilton Sanders LLP on behalf of their clients, Petitioners in the above-titled action, to evaluate the 2022 state Senate and Congressional maps, 2021–2022 N.Y. Reg. Sess. Leg. Bills S.8196, A.9039-A, A.9040-A, and A.9168, enacted by the New York State Legislature and signed by Governor Kathy Hochul. I have been retained and am being compensated at a rate of $400.00 per hour to provide my expert analysis of incumbent protection and partisan gerrymandering factors in the state Senate and Congressional maps and to determine if the maps violate the prohibitions against partisan and incumbent-favoring/disfavoring gerrymandering found in Article III, Section 4(c)(5) of the New York Constitution and New York Legislative Law § 93(2)(e). Using computerized simulations, I analyzed whether the 2022 Congressional and state Senate maps (respectively, "Enacted Congressional Map" and "Enacted Senate Map," or collectively, "Enacted Maps") were drawn with partisan intent. My analysis is based on my review of the Enacted Maps in light of New York's political geography.

[1] I have only been excluded as an expert once, in *Fair Fight v. Raffensperger*, 1:18-CV-5391-SCJ (N.D. Ga.). The judge concluded that I lacked sufficient credentials to testify as an expert in election administration, and that case did not deal with redistricting.

III. Summary of Opinions

Based on the work performed as addressed in the following sections of the report, I hold to the following opinions to a reasonable degree of professional certainty:

- The Enacted Congressional Map was clearly drawn to discourage competition and for the purpose of favoring the Democratic Party and disfavoring the Republican Party.
- The Enacted Senate Map was clearly drawn to discourage competition and for the purpose of favoring the Democratic Party and disfavoring the Republican Party.

IV. Exhibits

- Exhibit 1: Map of New York's 2022 Legislature-Enacted Congressional Districts
- Exhibit 2: Map of New York's 2022 Legislature-Enacted State Senate Districts
- Exhibit 3: *Curriculum vitae* of Sean P. Trende

V. Method

For this litigation, I have conducted a simulation analysis of the Enacted Maps. Simulation analysis is widespread in political science and is the subject of one of my dissertation papers. The simulation approach to redistricting has been accepted in multiple courts, including state courts in Ohio, North Carolina and Pennsylvania. *See League of Women Voters of Ohio v. Ohio Redistricting Commission* (2021); *Harper v. Hall* (2021); *Common Cause v. Lewis* (2019); *Harper v. Lewis* (2019); *League of Women Voters of Pennsylvania v. Com.* (2018). For this report, I have employed a broadly accepted "package" in R called "redist," which generates a representative sample of districts. *See, e.g.*, Benjamin Fifeld, et. al, "Automated Redistricting Simulation using Markov Chain Monte Carlo," 29 *Jrnl. Computational and Graphical Statistics* 715 (2020).

There are a variety of proposed simulation techniques, but they all proceed from the same basic principle: precincts are aggregated together in a random fashion, potentially subject to a variety of parameters, to form districts in hundreds or thousands of maps. This creates an "ensemble" of maps that reflect what we would expect in a state if maps were drawn without respect to partisan criteria. If the map is drawn without partisan intent, its partisan features should match those that appear in the ensemble. The more the map deviates from what we observed in the ensemble, the more likely it becomes that partisan considerations played a heavy role.

To better understand how this works, imagine the following cluster of seven hexagons as a cluster of precincts, with each hexagon representing an individual precinct. The precincts are

connected when they share adjacent sides. Those adjacencies are reflected in the image below by the lines that connect the hexagons. The top precinct therefore shares a border with the center, top right, and top left precincts; the top left hexagon shares a border with the top, center, and bottom left precincts; and so forth.

It is possible, however, to "break" adjacencies, using the computer, by removing one of these lines. One can continue to do so until there is only one path from any precinct to any other precinct. This is called a "spanning tree," *e.g.*, Kruskal, J.B., "On the Shortest Spanning Tree of a Graph and the Traveling Salesman Problem," 7 *Proc. Amer. Math Soc*. 48 (1956), and it lies at the heart of the redistricting algorithm.

For any set of more than two precincts, there will be multiple spanning trees, but the number of such trees is finite. I have illustrated two such trees for our cluster of seven hexagons.

Once you have reduced the number of connections between precincts to a minimum, removing one additional connection will create two distinct clusters of precincts. This is exactly what a district is: a collection of contiguous (adjacent) precincts that is separated from other precincts on the map. In the following illustration I have removed the connection between the center hexagon and the lower right hexagon, and then illustrated the two districts this creates in the right panel.

This, then, is a microcosm of the approach that the redist package takes. To simplify greatly, by sampling spanning trees of New York's precincts and then removing 25 connections, the software produces 26 randomly drawn districts. While the math is quite complicated, this approach produces a random sample of maps that mirrors the overall distribution of maps, much as a high-quality poll will produce a random sample of respondents that reflects the overall population. While the process is complicated, it can be run on a laptop computer. Indeed, these simulations were run at home on a Dell XPS 17 computer with an i9 processor and 64G of RAM, using a free, widely employed computer programming language (R version 4.1.2).

Importantly, these maps are drawn without providing the software with any political information. In other words, these maps help inform an analyst what maps would tend to look like in New York if they were drawn without respect politics.

Of course, other features, such as respect for county lines, compactness, or respect for geographic features could play a role in the drawing of district lines as well; these traditional redistricting criteria are almost always viewed as valid considerations by courts. To account for this, when removing the connections that create districts, the algorithm can be instructed to favor the removal of connections that will result in districts that remain within specified parameters when deciding which connections to remove. It can be instructed to remove connections in such a way that equally populated districts will be created, or to prefer breaks that will create compact districts, or will respect county boundaries, or any number of other factors.

Here, the simulation was instructed to follow federal and state law by drawing districts that will be largely equipopulous. The simulation allows a population tolerance of +/- 1%. This is because the simulations cannot split precincts, and because New York City in particular has

heavily populated precincts (the mean population of a precinct in New York County is 1,354 residents). Orange County has two precincts with populations in excess of 20,000 residents. This is a reasonable allowance not because we assume a court would accept this deviation, but rather because reducing the population deviations in these districts by splitting precincts at the block level can almost always be achieved, but cannot alter the political orientation of these districts substantially. In fact, in my experience drawing redistricting maps, this is exactly how mapmakers proceed: the general layout of the maps is agreed upon first, while the time-consuming process of 'zeroing-out' districts is saved until later. *See* Bernard Grofman, Ph.D. & Sean Trende, *Memorandum re Redistricting Maps*, Dec. 27, 2021, at 8, available at https://www.vacourts.gov/courts/scv/districting/2021_virginia_redistricting_memo.pdf. Political scientists have generally accepted this concept to the simulated approach as well. *See* Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography & Electoral Bias in Legislatures*, 8 *Quar. J. Pol. Sci.* 239, (2013) (accepting 5% deviations). Finally, courts have accepted this limitation in the simulations. *See* Expert Report of Kosuke Imai, Dec. 9, 2021, *League of Women Voters of Ohio v. Ohio Redistricting Commission*, No. 2021-1449 (Ohio 2021) ("For all simulations, I ensure districts fall within a 0.5% deviation from population parity. Although this deviation is greater than the population deviation used in the enacted plan, it only accounts for less than 4,000 people and hence has no impact on the conclusions of my analysis."); Wesley Pegden, "Pennsylvania's Congressional Districting is an Outlier: Expert Report," Nov. 27, 2017, *League of Women Voters of Pennsylvania v. Wolf*, at 3-4 (Pa. 2018) (employing a 2% threshold and explaining that a 1% would be sufficient to replicate what we might expect from a 0% threshold).

The simulation was also instructed to draw reasonably compact districts and to avoid county splits, pursuant to the commands of the New York Constitution.

VI. Analysis of the 2022 Congressional Map

Gov. Kathy Hochul signed the drafted congressional maps into law on Feb. 3, 2022. The reaction was swift, negative, and largely focused on the partisan nature of the lines:

- After the Assembly passed the map, David Wasserman, U.S. House editor of the Cook Political Report, and one of the premier elections analysts in the country, called it a "[f]irst step towards NY Dems passing their 22D-4R gerrymander." https://twitter.com/Redistrict/status/1488940238177288195. Upon its signature into law, he observed "New York becomes the 30th state to adopt a new

congressional map, and Dems' gerrymander could lead to the single biggest seat shift in the country (19D-8R to 22D-4R)." *See also* Grace Ashford & Nicholas Fandos, "N.Y. Democrats Could Gain 3 House Seats Under Proposed District Lines," N.Y. Times (Jan. 30, 2022), available at https://www.nytimes.com/2022/01/30/nyregion/new-york-redistricting-congressional-map.html (all websites last visited on Feb. 8, 2022).

- Nathaniel Rakich, Senior Elections Analyst at the nonpartisan elections analysis company FiveThirtyEight, called the map "skewed toward Democrats," "egregious," and "representing a failure for the new redistricting process." Nathanial Rakich, *New York's Proposed Congressional Map Is Heavily Biased Toward Democrats. Will It Pass?*, FiveThirtyEight (Jan. 31, 2022), available at https://fivethirtyeight.com/features/new-yorks-proposed-congressional-map-is-heavily-biased-toward-democrats-will-it-pass/.

- Nick Reisman, an attorney for the Brennan Center for Justice, called the map "a master class in gerrymandering, . . . tak[ing] out a number of Republican incumbents very strategically." Nick Reisman, *How the Proposed Congressional Lines Could Alter New York's Politics*, Spectrum News 1 (Feb. 1 2022), available at https://spectrumlocalnews.com/nys/central-ny/ny-state-of-politics/2022/02/01/how-the-proposed-congressional-lines-could-alter-ny-s-politics.

- Duncan Hosie, an attorney for the American Civil Liberties Union who wants Democrats to win "as many seats as possible," called the maps "dangerous," and asked "what is a worse sin than weaponizing the machinery of government against political opponents?" Duncan Hosie, "New York's Gerrymander is an Affront to Democratic Principles," *The Wall Street Journal* (Feb. 6, 2022), available at https://www.wsj.com/articles/new-yorks-gerrymander-is-an-affront-to-democratic-principles-republican-votes-disctricts-maps-hypocrisy-11644176113.

- *The Washington Post* titled its lead article on the maps "New York Lawmakers Draw Redistricting Map that Boosts Democrats." Colby Itkowitz & Adrian Blanco, available at https://www.washingtonpost.com/politics/2022/01/30/redistricting-new-york/.

It is not difficult to see why this was the reaction. The New York maps carefully take Republican voters and press them into a few Republican-leaning districts, while spreading Democratic voters as efficiently as possible.

To conduct the simulations, I gathered and joined publicly available data with political and demographic data at the census block and precinct levels. After unifying the data at the precinct level, I instructed the simulation to create 5,000 sets of 26 reasonably compact districts, which

respect county subdivisions. I was then able to compare the partisanship of the enacted districts to the ensemble of maps.[2]

We can think of this approach as answering the questions, "What would happen if we selected 5,000 individuals, gave them basic instructions to keep districts modestly compact and to keep populations equal, withheld political information from them, and then sent them out to draw maps? What sorts of maps would they produce?"

Once the simulation creates our 5,000 maps, it calculates the racial demography, compactness, and partisan lean of the districts. We can then compare the simulated districts to the Enacted Congressional Map to ensure that they perform comparably well on traditional redistricting criteria. That is to say, we ensure that the Legislature would not have to sacrifice traditional redistricting criteria in order to achieve more balanced maps.

To best illustrate the degree to which the Enacted Congressional Map reflects outliers when compared to maps drawn without partisan information, I employed the "gerrymandering index," proposed by Bangia et al (2017) and endorsed by McCartan & Imai in their paper setting forth the algorithm used to generate the districts in this report. *See* Cory McCartan & Kosuke Imai, "Sequential Monte Carlo for Sampling Balanced and Compact Redistricting Plans," at 25, available at https://arxiv.org/pdf/2008.06131.pdf.

It is conceptually similar to the idea of root mean squared error (used throughout statistics). To calculate the index, we take each of the 5,000 simulated maps and rank the districts from most heavily Democratic to least heavily Democratic. We then average Democratic vote shares across ranks. This tells us, generally speaking, what percentage Democratic vote share we would expect the most heavily Democratic district to have in a map drawn without respect to politics, what we would expect the second-most heavily District to have, and so forth.

Of course, some areas might be conducive to a wide range of partisan outcomes depending how the map is drawn. Other areas, like Manhattan, are so heavily Democratic that the districts that are drawn there are likely to vary very little from that average. Put differently, we might be very surprised, due to simple geography, if a map's most Democratic district varies from that

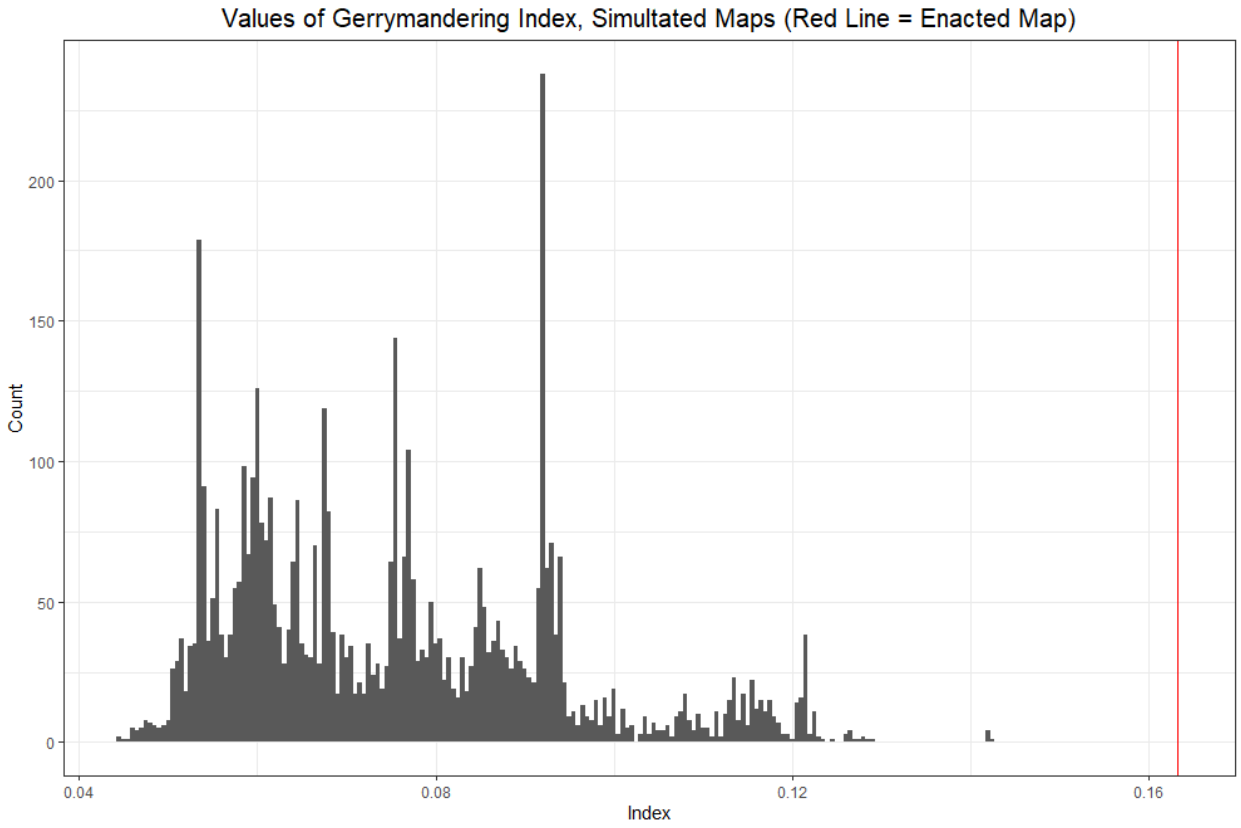
[2] There are any number of ways to calculate partisanship. The simulation approach tends not to be as sensitive to the choice of elections as other metrics, unless political coalitions in a state vary radically from election-to-election. Regardless, to remove my discretion, I have simply used the calculation of partisanship contained in the dataset that I downloaded from the ALARM project, which is an average of the performance in a precinct across the 2016 presidential election in New York, the 2016 New York senate election, the 2018 New York governor election, the 2018 New York attorney general election, and the 2020 presidential election in New York.

average by more than a few points; we might be less surprised if some districts in the middle of the distribution exhibited more variability.

To help account for this, we then calculate the deviations in each map in the ensemble from the mean for each "bin." To make this less abstract: the most heavily Democratic district in the ensemble, on average, gives the Democrats 93.9% of the vote. A district in the ensemble whose most heavily Democratic district was 92% Democratic would have a deviation of 1.9% for that rank, while one whose most heavily Democratic district was 97% Democratic would have a deviation of 3.1%. The second most heavily Democratic district in maps in the ensemble is, on average, 92.2% Democratic. A map whose second most heavily Democratic district has a Democratic vote share of 87% would have a deviation of 5.2%, and so forth. To emphasize large deviations (and to make them all positively signed) these values are then squared and added together to give us a sense of how far maps drawn without respect to political data will tend to naturally vary from expectations.

In simplified terms, this gives us the total deviation from the ensemble for all the districts in the maps, while giving more weight to particularly large misses. The square root is then taken, which effectively puts everything back on a percentage scale. We then engage in the same exercise for the Enacted Congressional Map and compare these scores to those in the ensemble.

The utility of this exercise is that it looks at maps as a whole, rather than in isolation. The results here are particularly striking:



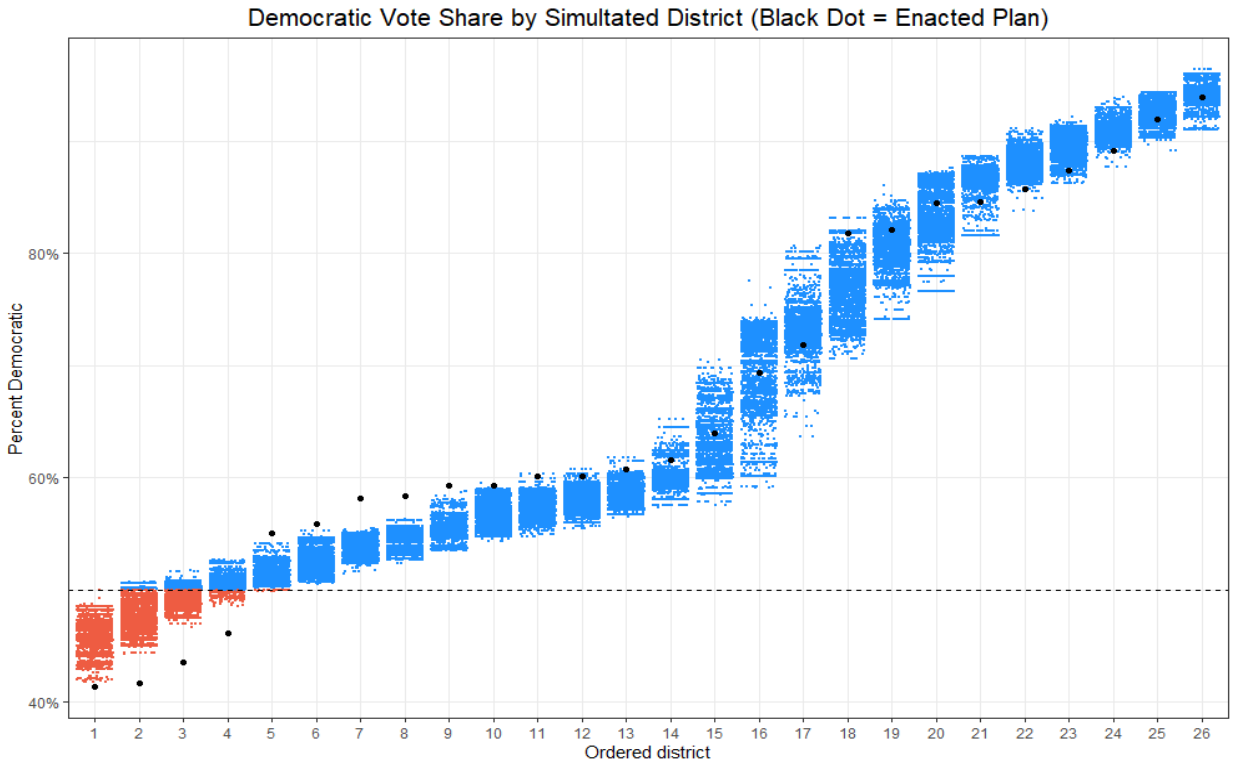
The ensemble maps have, on average, a Gerrymandering Index of around 7.5%. The Enacted Congressional Map, on the other hand, has a Gerrymandering Index of 17%, almost six standard deviations from the mean. The probability that the Enacted Congressional Map would be drawn by map drawers who cared only about the constitutional mandates for compactness and avoiding undue partisan influence is vanishingly small. Put simply, it is implausible, if not impossible, that this map was drawn without a heavy reliance upon political data and was likely drawn to favor or disfavor a political party. All of this means that the Enacted Congressional Map is obviously partisan gerrymandered, and that it favors Democratic interests more than any of these 5,000 computer-generated maps, all drawn without partisan considerations.

Interrogating the maps from a different angle makes clear that the party that the Legislature intended to favor was the Democratic Party, and the one that it intended to disfavor was the Republican Party. Moreover, the Legislature did so in a way to discourage the creation of what would otherwise be competitive districts.

To see this, consider the following dotplot. In this plot, all 26 districts in each of the 5,000 simulated maps were sorted from most Democratic to least Democratic. Each of these districts then received a dot in the plot. At the far right, above the number 26, you will notice a large cluster

of blue dots spread between 90% and 97%. That means in every plan, the most heavily Democratic district fell somewhere between 90% and 97% Democratic.

The next cluster to the left, hovering above the number 25, consists of blue dots ranging between 90% and 95%, with a few dots below 90%. This means that in all of the 5,000 simulated maps, the second-most Democratic district typically fell between 90% and 95% Democratic, although a handful of maps produced districts that fell below 90% Democratic.



If Democrats received less than 50% of the vote in a simulated district, I coded the dot as red. As you can see, in some areas there is quite a bit of variation in what the maps draw. In the 16th most Democratic district, for example, Democratic performance ranges from just below 60% to just below 80% Democratic. Other districts have a much tighter range; district 11 falls between around 55% to just above 60% Democratic. I have overlaid these dots from the simulated maps with dots from the Enacted Congressional Map. This allows us to compare the partisanship of the Enacted Congressional Map directly to that of the simulations. If the Enacted Congressional Map was not drawn to favor or disfavor a political party, or did so only moderately, it should hew closely to the results produced by the simulated maps (which were, of course, drawn blind to partisanship). On the other hand, if map drawers relied heavily upon politics when drawing the lines, we should expect significant deviations.

In fact, the pattern with which districts deviate from expectations plainly reveals how the Legislature disfavored Republicans and competitive districts here. The only place where the Enacted Congressional Map falls within expectations is in safely Democratic districts—those where Democrats would win over 60% of the vote. This 60% threshold, however, is significant, as political scientists and elections analysts will begin to classify elections as competitive below that threshold. *See* Gary C. Jacobson, "The Marginals Never Vanished: Incumbency & Competition in Elections to the U.S. House of Representatives," 31 *Am. J.Poli Sci.* 126 (1987). As is apparent from the chart, around district number 13, the simulation expects to see multiple districts that fall into the potentially competitive range. This is also the exact point at which the values of the Enacted Maps begin to fall outside of the expected ranges.

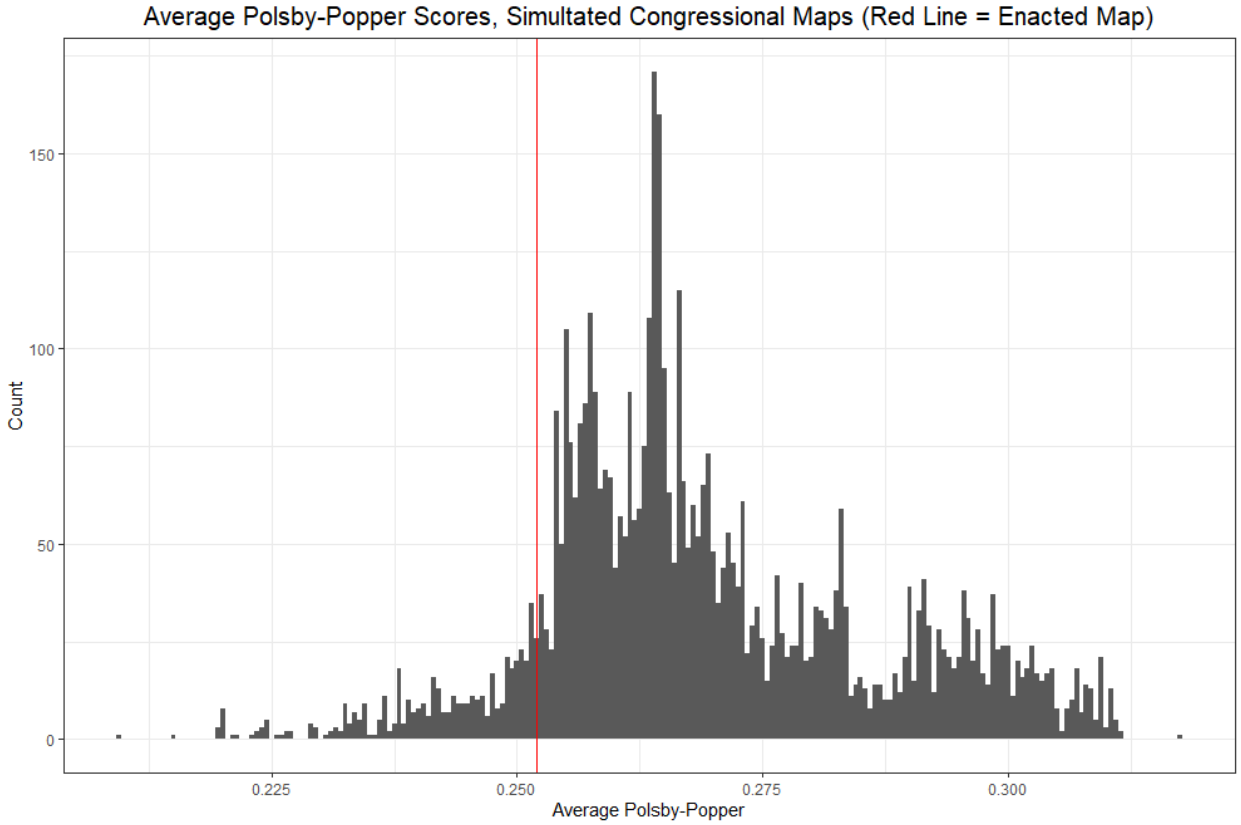
Around district number 11, the districts in the Enacted Congressional Map quickly begin to appear as outliers as the Enacted Congressional Map attempts to keep districts as close to the uncompetitive range as they possibly can. The 5th to the 9th most Republican districts are districts with higher Democratic vote shares than in *any* of the 5,000 simulated maps, often by substantial margins.

On the other hand, the first through fourth most heavily Republican districts are all drawn much more heavily Republican than we would expect from the simulations. The second and third most heavily Republican districts in particular are far more heavily Republican than we would expect to see from a politically naïve map drawing.

Overall, the most heavily Republican district in the Enacted Congressional Map is more heavily Republican than that found in any of the 5,000 simulated maps by about 0.4%. This is also true of the second (by 2.6%), third (by 3.1%) and fourth (by 2.4%) most Republican districts in the Enacted Congressional Map. At the same time, the 5th most Republican district in the Enacted Congressional Map is more heavily *Democratic* than the 5th most Republican district in any of the ensemble maps (by 0.8%). The same is true of the 6th (by 0.6%), 7th (by 2.7%), 8th (by 2.1%) and 9th (by 0.5%) most Republican districts in the Enacted Congressional Map versus their respective sets of ensemble districts.

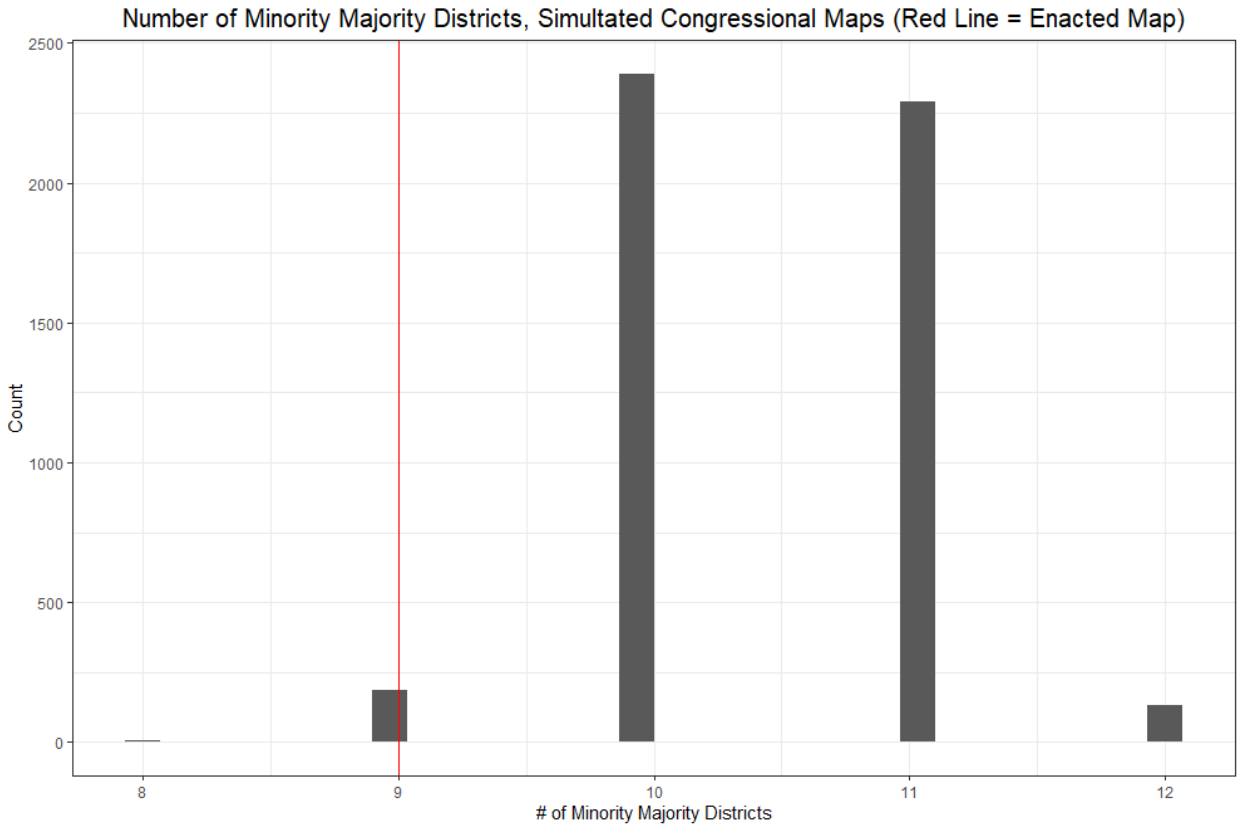
This is the DNA of a gerrymander: mapmakers pack votes from one party into as few districts as possible, and then spread the remainder of these voters over as many districts as possible to reduce their political effectiveness.

We can also check to make certain that the maps do not sacrifice traditional redistricting criteria. The following histogram examines the compactness of the 5,000 simulated maps, and compares the compactness of those maps to that of the Enacted Congressional Map. For measuring compactness, I have opted to examine the Polsby-Popper score. This score looks at the ratio of the area of a district to the area of a circle that has the same perimeter as the district. Daniel D. Polsby & Robert D. Popper, "The Third Criterion: Compactness as a Procedural Safeguard Against Partisan Gerrymandering," 9 *Yale L. & Pol. Rev.* 301 (1991). To understand the motivation behind Polsby-Popper, sketch out a circle. Then erase some of the edge of the circle, and have a narrow tendril snake into the district toward the center. Other common redistricting metrics that are based on area, such as the Reock score would not change much. The Polsby-Popper score, however, would fall significantly, since the perimeter of the district would be greatly increased. A "perfect" Polsby-Popper score is 1, while a theoretical perfectly non-compact district would score a zero.

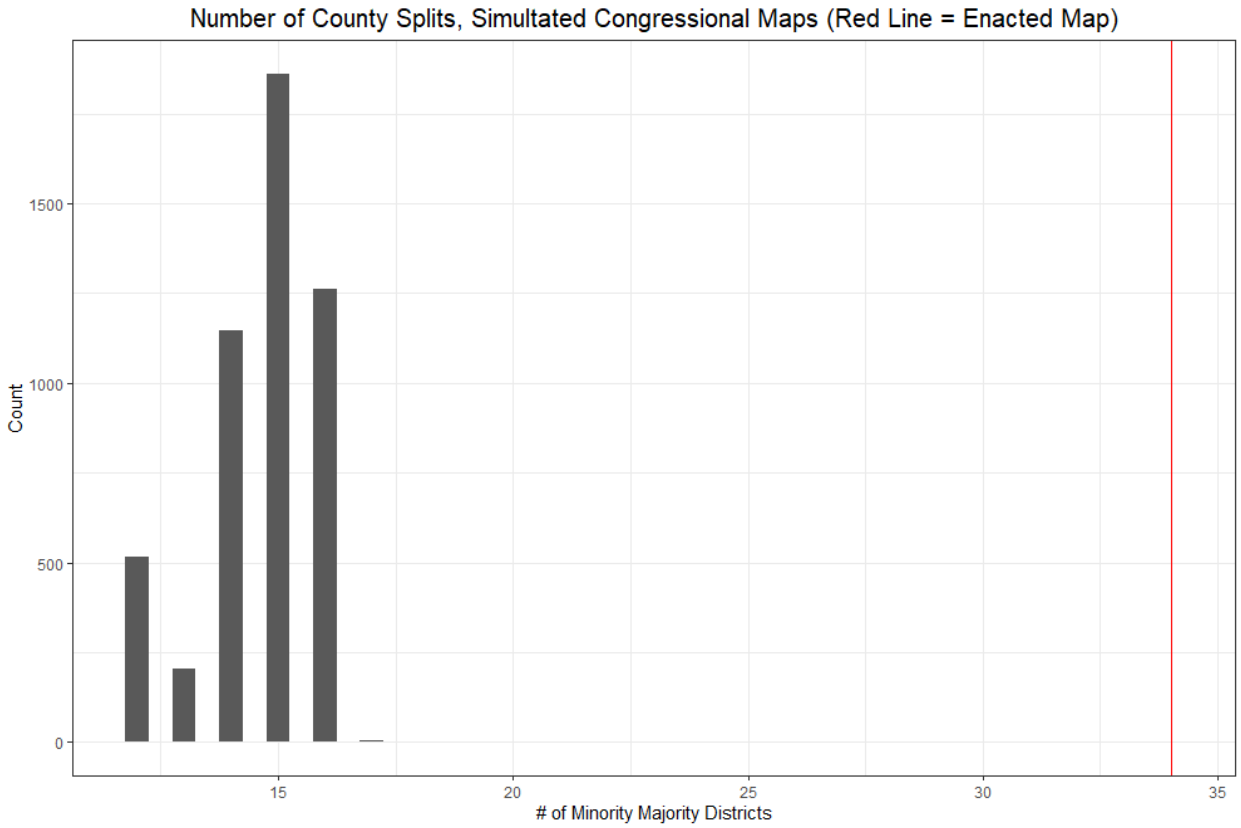


As you can see, the Polsby-Popper score for the simulated maps ranges between 0.2095 and 0.3177, with the largest cluster falling between 0.2579 and 0.2799. This is comparable to the Enacted Congressional Map, which has a Polsby-Popper score of 0.252.

Next, I ensured that the simulated maps did not eliminate minority-majority districts that are potentially protected by the Voting Rights Act. The Enacted Congressional Map has 9 such districts. The simulated maps range from 8 such districts to 12, with most boasting 10 or 11 minority-majority districts. To be clear, these simulated maps are not drawn with any racial data available to the simulation; these districts are naturally occurring minority-majority districts.



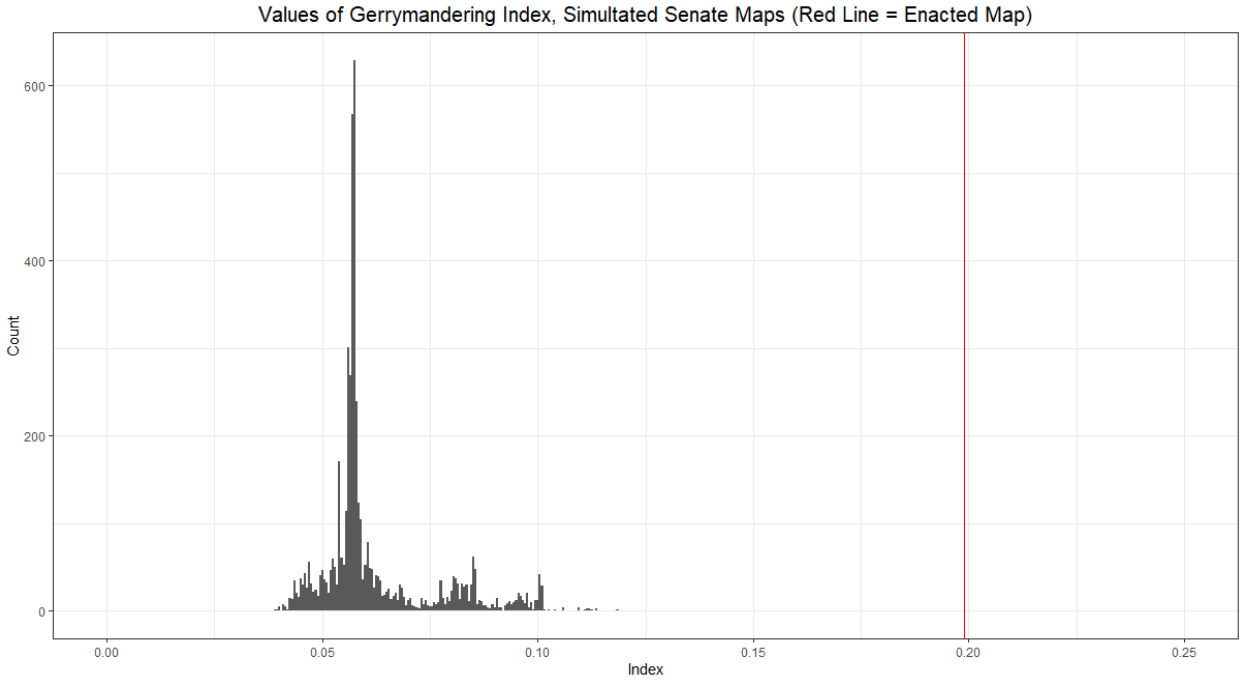
I then compared the number of county splits in the Enacted Congressional Map to the number of county splits in our ensemble. The Enacted Congressional Map features 34 split counties. The simulated maps split between 12 and 16 counties. In other words, it is implausible to claim the Enacted Congressional Map was drawn in a way that disfavors Republicans and competitive districts by chance, or out of a desire to respect county lines or other redistricting criteria. New York's geography does not demand such a tradeoff.



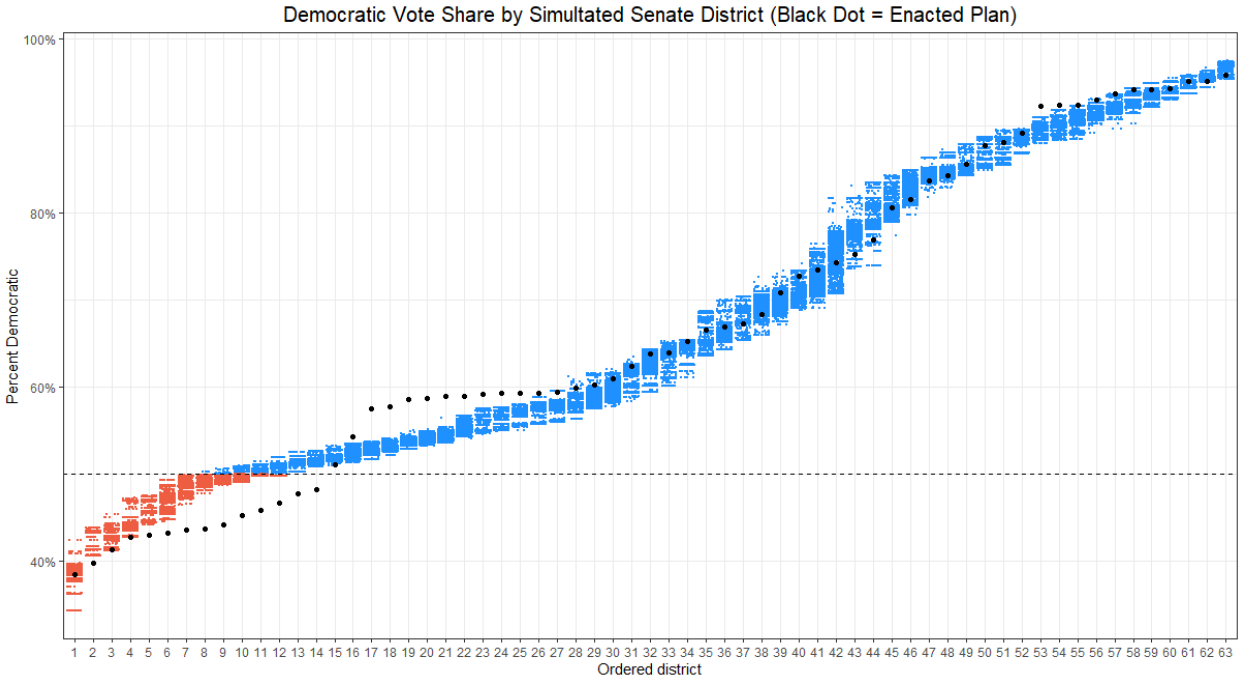
VII. Analysis of the 2022 State Senate Map

I was also asked to evaluate the Enacted Senate Map for New York. I engaged in a similar exercise: simulation software drew 5,000 maps with reasonably compact senate districts without reference to partisanship. These simulated maps were then compared to the Enacted Senate Map to help evaluate whether partisan aims dominated over the Enacted Senate Map.

The Enacted Senate Map is an extreme outlier when compared to what we would expect from a map drawn without respect to politics. Once again, it is implausible, if not impossible, that this map was drawn without a heavy reliance upon political data and was likely drawn to favor or disfavor a political party. Thus, here too, the Enacted Senate Map is obviously partisan gerrymandered, and it too favors Democratic interests more than any of these 5,000 computer-generated maps, all drawn without partisan considerations.

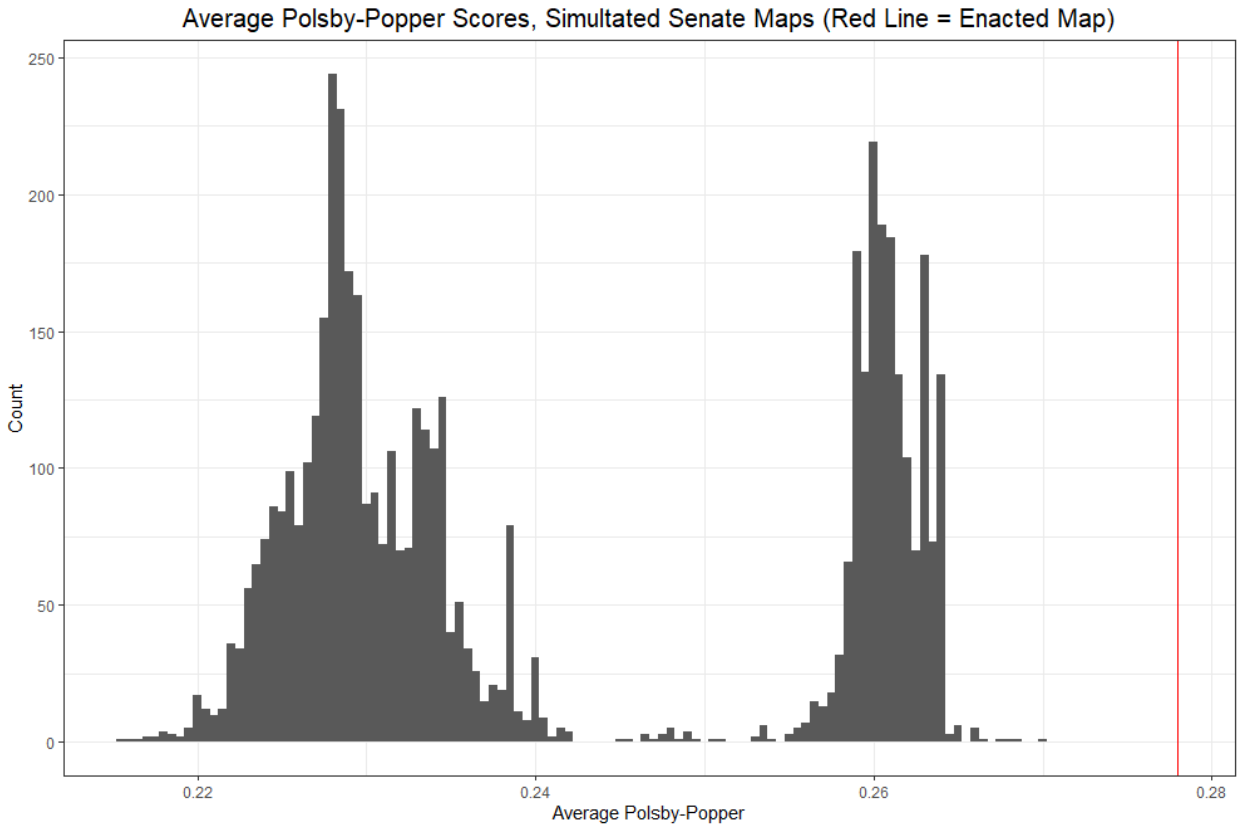


When we examine districts individually, we once again see the same pattern we saw with the Enacted Congressional Map. The districts track the simulations closely in heavily Democratic districts where partisanship is not as important. Where the map drawers could afford to avoid partisanship, they did. However, once we approach the 60% threshold, map drawers once again sought to ensure that Democratic performance in the districts remained as close to that threshold as possible. Democrats draw 42 districts up against that threshold. Perhaps not coincidentally, that is exactly two-thirds of the districts.

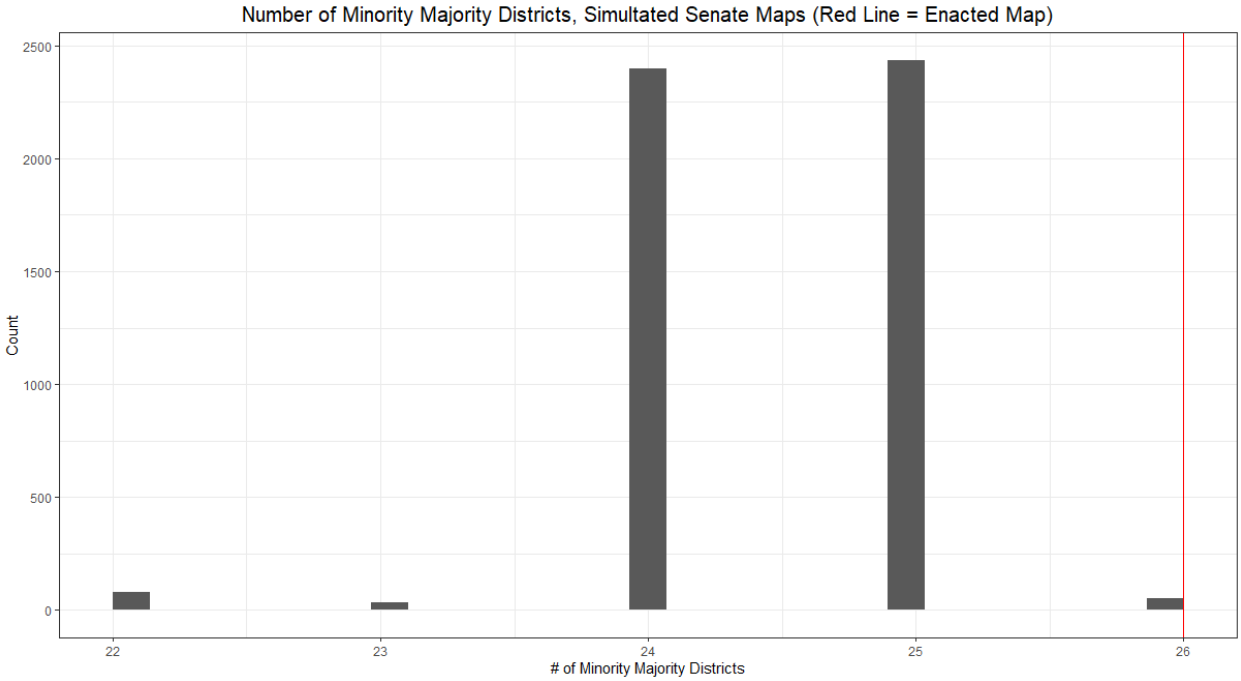


Democratic vote share begins to decline there, although a handful of districts still appear well above expectations. Democratic performance then drops precipitously, as districts become substantially more Republican than we see in the ensemble. The DNA of a gerrymander is very much alive in this map.

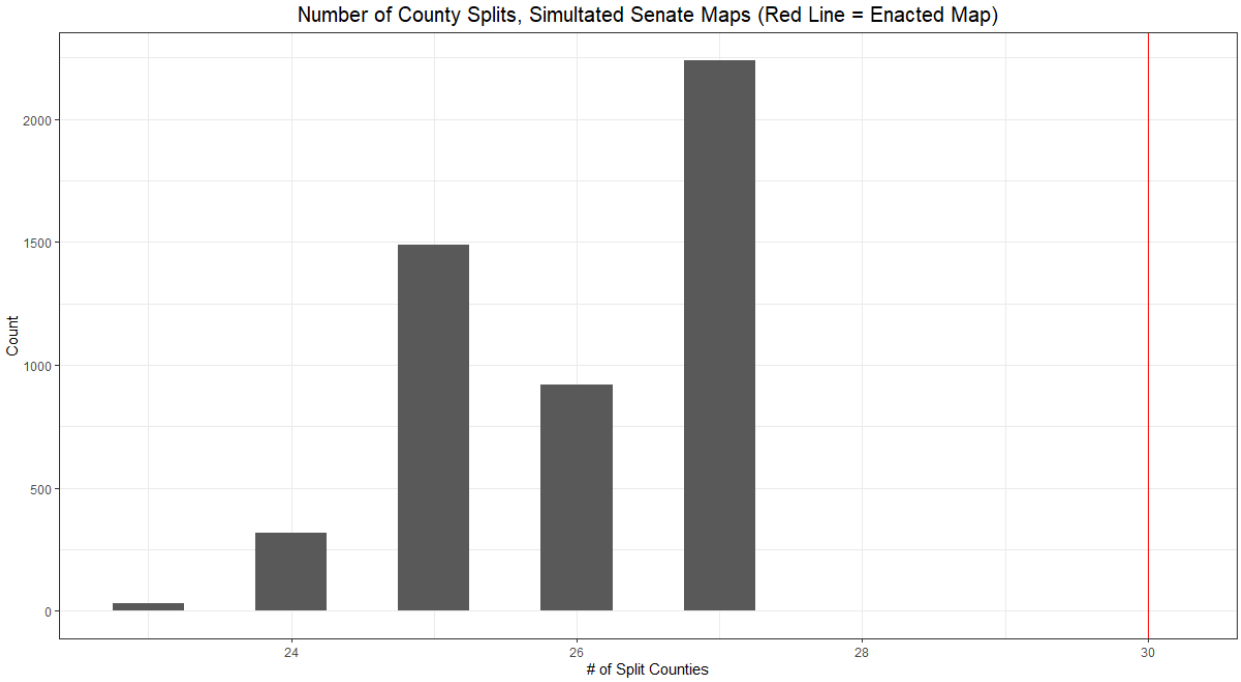
Once again, we can run a few diagnostics. The Polsby-Popper scores of the simulated maps are comparable to those of the Enacted Senate Map.



Similarly, the simulated maps involve approximately as many minority-majority districts as the Enacted Senate Map.



It has a similar number of county splits as well.



VIII. Analysis of Population Deviations in the Existing Maps

Finally, I was asked by counsel to review the 2012 maps and evaluate their population deviations. This information is directly available for Congress at the Redistricting Data Hub. *See* Redistricting Data Hub, New York, available at https://redistrictingdatahub.org/state/new-york. For the State Senate, the shapefiles are available at the same source and can be quickly aggregated in R. *See id.*

The 2012 Congressional districts have substantial population deviations today, with some of them entering double-digit percentages.

DISTRICT	DEVIATION	PERCENT DEV.	DISTRICT	DEVIATION	PERCENT DEV.
1	−36,652	−4.7%	15	−9,636	−1.2%
2	−48,815	−6.3%	16	−6,570	−0.8%
3	−37,774	−4.9%	17	−13,220	−1.7%
4	−25,539	−3.3%	18	−28,529	−3.7%
5	1,809	0.2%	19	−78,298	−10.1%
6	−7,724	−1.0%	20	−30,681	−3.9%
7	−14,138	−1.8%	21	−71,930	−9.3%
8	27,429	3.5%	22	−80,361	−10.3%
9	−21,129	−2.7%	23	−83,462	−10.7%
10	26,832	3.5%	24	−59,664	−7.7%
11	−10,735	−1.4%	25	−43,930	−5.7%
12	34,717	4.5%	26	−34,520	−4.4%
13	−40,623	−5.2%	27	−56,879	−7.3%
14	−26,946	−3.5%			

Likewise, the 2012 Senate districts are badly malapportioned:

DISTRICT	DEVIATION	PERCENT DEV.	DISTRICT	DEVIATION	PERCENT DEV.
1	20,446	6.4%	33	10,083	3.1%
2	−7,520	−2.3%	34	18,408	5.7%
3	−5,230	−1.6%	35	8,434	2.6%
4	−1,959	−0.6%	36	17,407	5.4%
5	325	0.1%	37	5,257	1.6%
6	5,354	1.7%	38	3,849	1.2%
7	10,405	3.2%	39	−2,703	−0.8%
8	369	0.1%	40	−13,027	−4.1%
9	13,316	4.2%	41	−12,273	−3.8%
10	25,843	8.1%	42	−17,519	−5.5%
11	22,373	7.0%	43	−19,162	−6.0%
12	34,507	10.8%	44	−19,150	−6.0%
13	10,550	3.3%	45	−26,298	−8.2%
14	23,347	7.3%	46	−23,825	−7.4%
15	22,584	7.0%	47	−28,658	−8.9%
16	21,901	6.8%	48	−30,068	−9.4%
17	23,494	7.3%	49	−22,321	−7.0%
18	20,243	6.3%	50	−20,041	−6.3%
19	26,105	8.1%	51	−45,131	−14.1%
20	13,845	4.3%	52	−36,425	−11.4%
21	4,278	1.3%	53	−33,969	−10.6%
22	20,749	6.5%	54	−26,059	−8.1%
23	19,369	6.0%	55	−24,816	−7.7%
24	13,222	4.1%	56	−24,900	−7.8%
25	57,419	17.9%	57	−42,639	−13.3%
26	41,625	13.0%	58	−32,482	−10.1%
27	38,992	12.2%	59	−16,188	−5.0%
28	21,707	6.8%	60	−21,573	−6.7%
29	13,718	4.3%	61	−20,402	−6.4%
30	17,170	5.4%	62	−34,132	−10.6%
31	−7,109	−2.2%	63	−13,725	−4.3%
32	22,594	7.0%			

SEAN P. TRENDE

Dated: February 14, 2022

Exhibit 1

Congressional Districts

Upstate New York

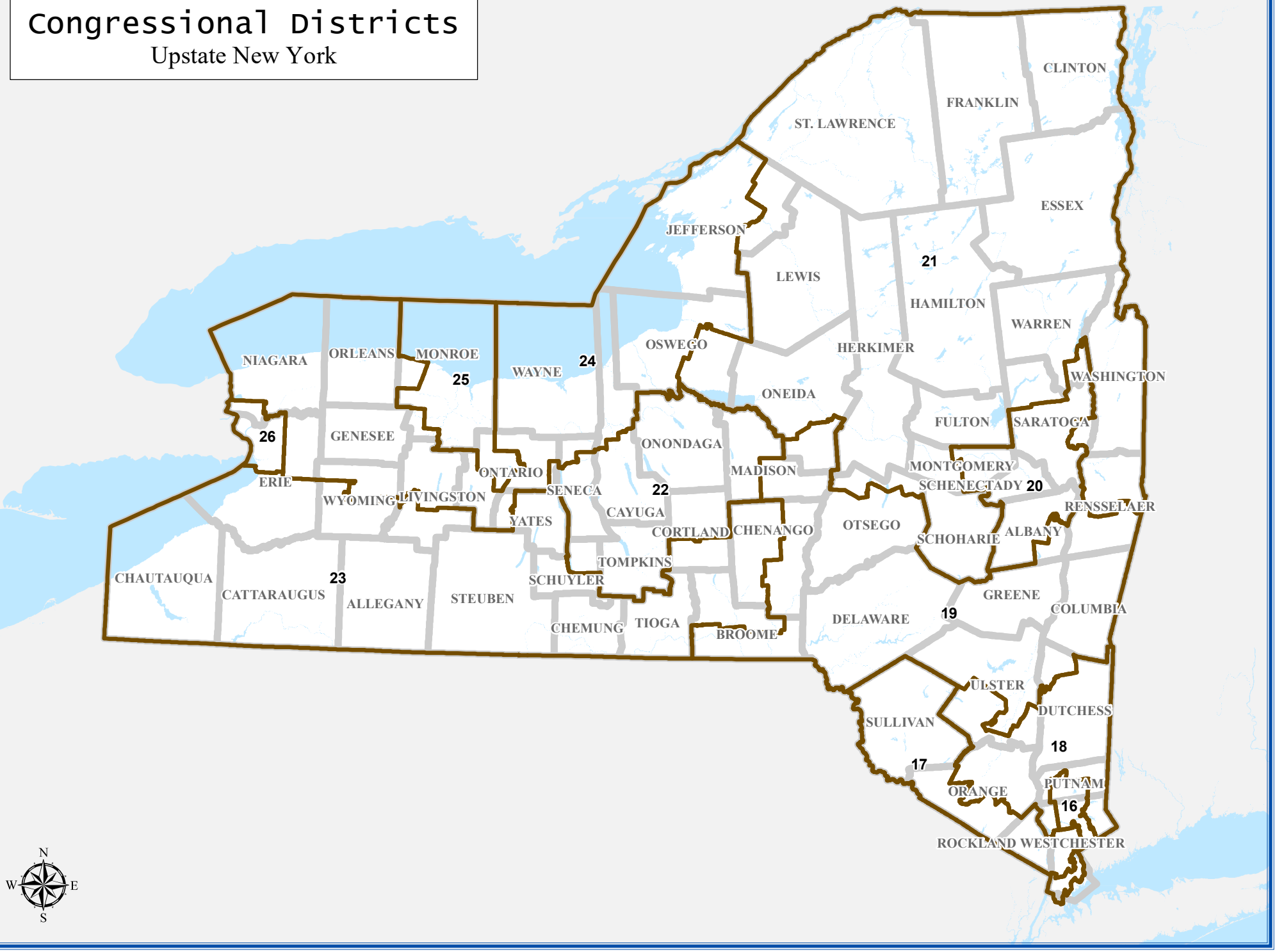


Exhibit 2

Senate Districts
Upstate New York

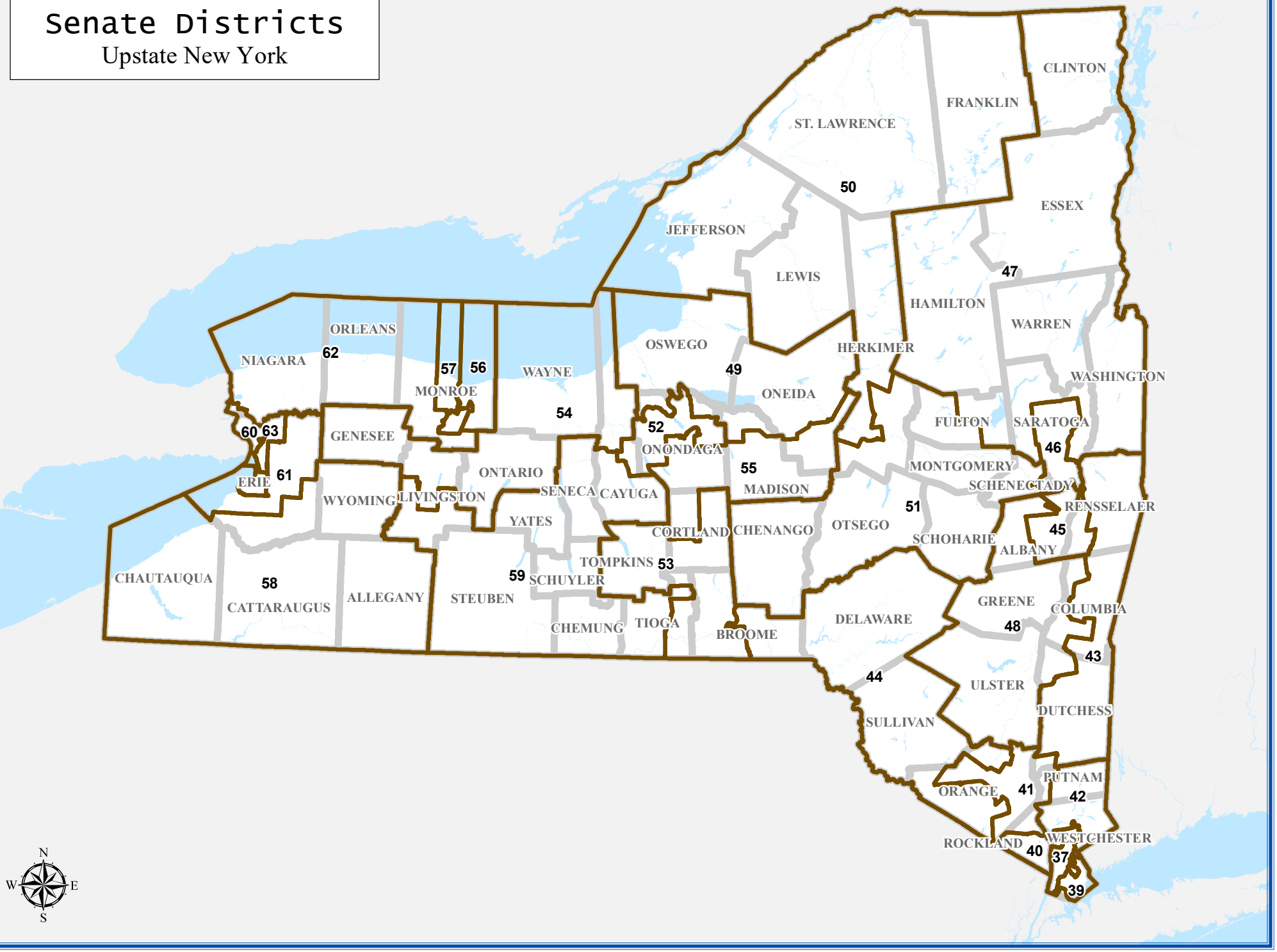


Exhibit 3

SEAN P. TRENDE
1146 Elderberry Loop
Delaware, OH 43015
strende@realclearpolitics.com

EDUCATION

Ph.D., The Ohio State University, Political Science, expected 2022.

M.A.S. (Master of Applied Statistics), The Ohio State University, 2019.

J.D., Duke University School of Law, *cum laude*, 2001; Duke Law Journal, Research Editor.

M.A., Duke University, *cum laude*, Political Science, 2001. Thesis titled *The Making of an Ideological Court: Application of Non-parametric Scaling Techniques to Explain Supreme Court Voting Patterns from 1900-1941*, June 2001.

B.A., Yale University, with distinction, History and Political Science, 1995.

PROFESSIONAL EXPERIENCE

Law Clerk, Hon. Deanell R. Tacha, U.S. Court of Appeals for the Tenth Circuit, 2001-02.

Associate, Kirkland & Ellis, LLP, Washington, DC, 2002-05.

Associate, Hunton & Williams, LLP, Richmond, Virginia, 2005-09.

Associate, David, Kamp & Frank, P.C., Newport News, Virginia, 2009-10.

Senior Elections Analyst, RealClearPolitics, 2009-present.

Columnist, Center for Politics Crystal Ball, 2014-17.

Gerald R. Ford Visiting Scholar, American Enterprise Institute, 2018-present.

BOOKS

Larry J. Sabato, ed., *The Blue Wave*, Ch. 14 (2019).

Larry J. Sabato, ed., *Trumped: The 2016 Election that Broke all the Rules* (2017).

Larry J. Sabato, ed., *The Surge:2014's Big GOP Win and What It Means for the Next Presidential Election*, Ch. 12 (2015).

Larry J. Sabato, ed., *Barack Obama and the New America*, Ch. 12 (2013).

Barone, Kraushaar, McCutcheon & Trende, *The Almanac of American Politics 2014* (2013).

The Lost Majority: Why the Future of Government is up for Grabs – And Who Will Take It (2012).

PREVIOUS EXPERT TESTIMONY

Dickson v. Rucho, No. 11-CVS-16896 (N.C. Super. Ct., Wake County) (racial gerrymandering).

Covington v. North Carolina, No. 1:15-CV-00399 (M.D.N.C.) (racial gerrymandering).

NAACP v. McCrory, No. 1:13CV658 (M.D.N.C.) (early voting).

NAACP v. Husted, No. 2:14-cv-404 (S.D. Ohio) (early voting).

Ohio Democratic Party v. Husted, Case 15-cv-01802 (S.D. Ohio) (early voting).

Lee v. Virginia Bd. of Elections, No. 3:15-cv-357 (E.D. Va.) (early voting).

Feldman v. Arizona, No. CV-16-1065-PHX-DLR (D. Ariz.) (absentee voting).

A. Philip Randolph Institute v. Smith, No. 1:18-cv-00357-TSB (S.D. Ohio) (political gerrymandering).

Whitford v. Nichol, No. 15-cv-421-bbc (W.D. Wisc.) (political gerrymandering).

Common Cause v. Rucho, No. 1:16-CV-1026-WO-JEP (M.D.N.C.) (political gerrymandering).

Mecinas v. Hobbs, No. CV-19-05547-PHX-DJH (D. Ariz.) (ballot order effect).

Fair Fight Action v. Raffensperger, No. 1:18-cv-05391-SCJ (N.D. Ga.) (statistical analysis).

Pascua Yaqui Tribe v. Rodriguez, No. 4:20-CV-00432-TUC-JAS (D. Ariz.) (early voting).

Ohio Organizing Collaborative, et al v. Ohio Redistricting Commission, et al (No. 2021-1210) (Ohio) (political gerrymandering)

NCLCV v. Hall, (No. 21-CVS-15426) (N.C. Sup. Ct.)

COURT APPOINTMENTS

Appointed as Voting Rights Act expert by Arizona Independent Redistricting Commission (2020)

Appointed special Master by the Supreme Court of Virginia to redraw maps for the Virginia House of Delegates, the Senate of Virginia, and for Virginia's delegation to the United States Congress for the 2022 election cycle.

Appointed redistricting expert by the Supreme Court of Belize in *Smith v. Perrera*, No. 55 of 2019 (one-person-one-vote).

INTERNATIONAL PRESENTATIONS AND EXPERIENCE

Panel Discussion, European External Action Service, Brussels, Belgium, *Likely Outcomes of 2012 American Elections.*

Selected by U.S. Embassies in Sweden, Spain, and Italy to discuss 2016 and 2018 elections to think tanks and universities in area (declined Italy due to teaching responsibilities).

Selected by EEAS to discuss 2018 elections in private session with European Ambassadors.

TEACHING

American Democracy and Mass Media, Ohio Wesleyan University, Spring 2018.

Introduction to American Politics, The Ohio State University, Autumn 2018, 2019, 2020, Spring 2018.

Political Participation and Voting Behavior, Spring 2020, Spring 2021.

REAL CLEAR POLITICS COLUMNS

Full archives available at http://www.realclearpolitics.com/authors/sean_trende/