

Declaration of Dr. Moon Duchin

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December 12, 2023

1 Background and qualifications

I am a Professor of Mathematics and a Senior Fellow in the Jonathan M. Tisch College of Civic Life at Tufts University. At Tisch College, I am the director and principal investigator of an interdisciplinary research group called the MGGG Redistricting Lab, focused on geometric and computational aspects of redistricting. My areas of research and teaching include the structure of census data, the design and implementation of randomized algorithms for generating districting plans, and the analysis of redistricting more broadly.

I have previously submitted reports and/or provided testimony by deposition, a hearing, or at trial in North Carolina, Pennsylvania, Wisconsin, Alabama, South Carolina, Texas, and in a different lawsuit in Georgia.¹

2 Summary

In December 2023, the Georgia General Assembly passed three proposed remedial maps—for Congress, state Senate, and state House. These were adopted in response to the October 26 Court Order finding that the 2021 redistricting plans violated Section 2 of the Voting Rights Act and requiring the state to create several additional districts that provided an effective opportunity for Black voters to elect candidates of choice: one in Congress, two in the state Senate, and five in the state House.

The timeline for responding to these new maps is too short for a detailed study of racial gerrymandering, so I am not able to provide a comprehensive analysis.² But in this short declaration, I can establish two simple facts.

First, the state has chosen numbering for its new plans that departs from the previous plan, with no justification in geography. The numbering creates an intense challenge for those analyzing the plan, because it invites comparisons between districts that do not correspond in geographic or demographic terms. In this report I provide a **crosswalk** from the state's new numbers to the best geographical match in the previous map (Tables [1-3](#)).

Second, I provide an **effectiveness analysis** based on standard and accepted methodology, showing that the state did not create the required number of additional districts in any of the three proposed remedial maps. The net change was -1 in the Congressional map, $+1$ in the Senate map, and -1 in the House map, falling short of the court order in each case, and indeed actually *reducing* the number of effective districts in two out of three maps.

¹*NC League of Conservation Voters, et al. v. Hall, et al.* No. 21-cvs-500085 (Wake Cnty. Sup. Ct. 2021); *Carter v. Chapman*, No. 7 MM 2022, [2022 WL 702894](#) (Pa. Mar. 9, 2022); *Johnson v. Wis. Elections Comm'n*, No. 2021AP1450-OA, [2022 WL 621082](#) (Wis. Mar. 3, 2022); *Milligan, et al. v. Merrill, et al.*, Case No. 2:21-cv-01530-AMM and *Thomas, et al. v. Merrill, et al.*, Case No. 2:21-cv-01531-AMM (N.D. Ala. 2021); *SC NAACP et al. v. Alexander, et al.*, Case No. 3-21-cv-03302-MBS-TJH-RMG (D.S.C.) (three-judge ct.); *TX NAACP et al. v. Abbott*, Case No. 1:21-CV-00943-RP-JES-JVB; *Georgia State Conference of the NAACP et al. v. State of Georgia*, 1:21-CV-5338-ELB-SCJ-SDG (N.D. Ga. 2021).

²I have included data products with this report for the court's use, including an analysis of county splits and precinct splits, showing whether race/ethnicity or partisan data has a larger differential across the pieces in each split.

3 District numbering in the 2023 plans

3.1 Congressional

CD	State numbers 2023	7	13	6
	Best match to 2021	6	7	13

Table 1: Numbering in the state's newly enacted Congressional plan shows that three districts had their numbers permuted, rather than applying the best geographical match to previous districts. Compare Figure 1.

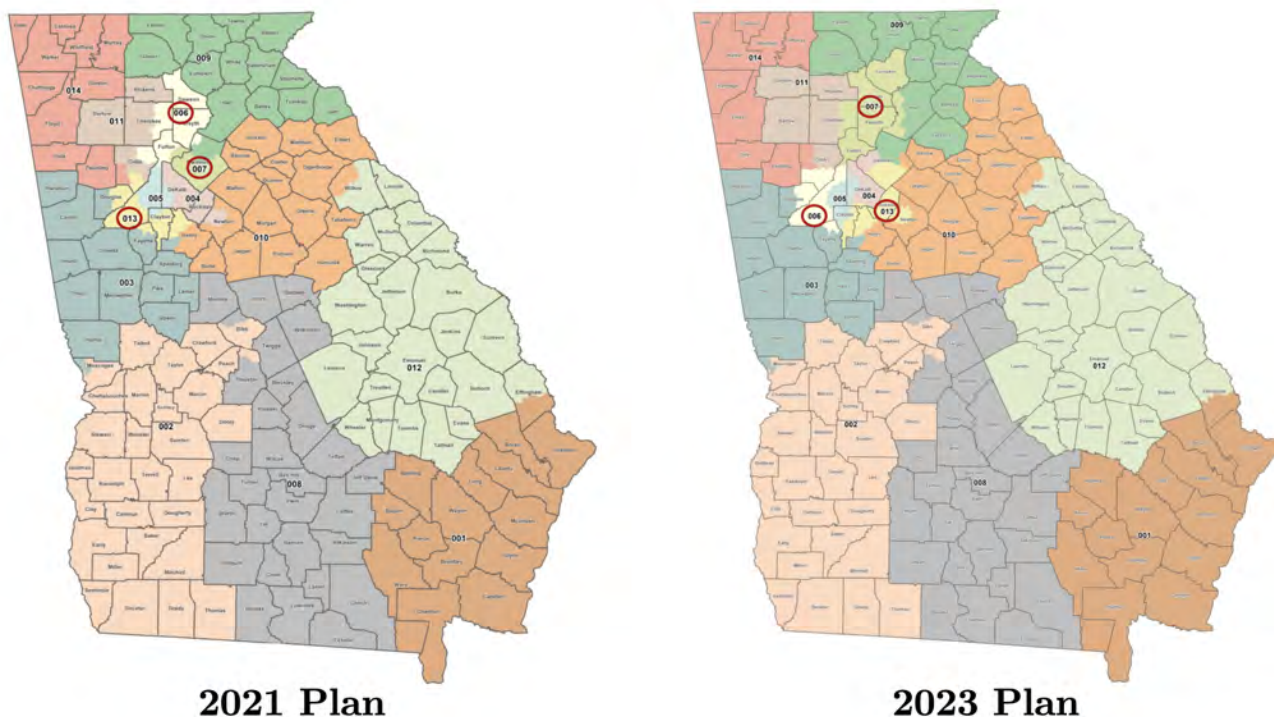


Figure 1: Congressional district numbering swaps are visible in the state's published District Packets (<https://www.legis.ga.gov/joint-office/reapportionment>). The numbering creates the impression that CD 6 has been made a majority-Black district. Instead, the name "CD 6" has now been attached to what was formerly CD 13, which was already a majority-Black district.

3.2 State Senate

SD	State numbers 2023	38	42	6	28	35	44	17
	Best match to 2021	6	17	28	35	38	42	44

Table 2: Numbering in the state's newly enacted Senate plan showing seven districts that were given labels mismatched to their location.

Two Senate districts moved to locations completely disjoint from their previous positions: the ones in the enacted map numbered SD 6 and SD 42.

The Court Order of October 26, 2023 required that the state re-draw the Senate plan to create two additional opportunity-to-elect districts for Black voters in a particular area in which vote dilution had been identified. That area comprises 10, 16, 17, 25, 28, 30, 34, 35, 43, and 44, as they were numbered in the 2021 enacted plan. Note that several districts from this area (17, 28, 35, 44) are among the ones listed in Table 2, which means that the renumbering materially impacts the ability to track whether the new plan complies with the court order.

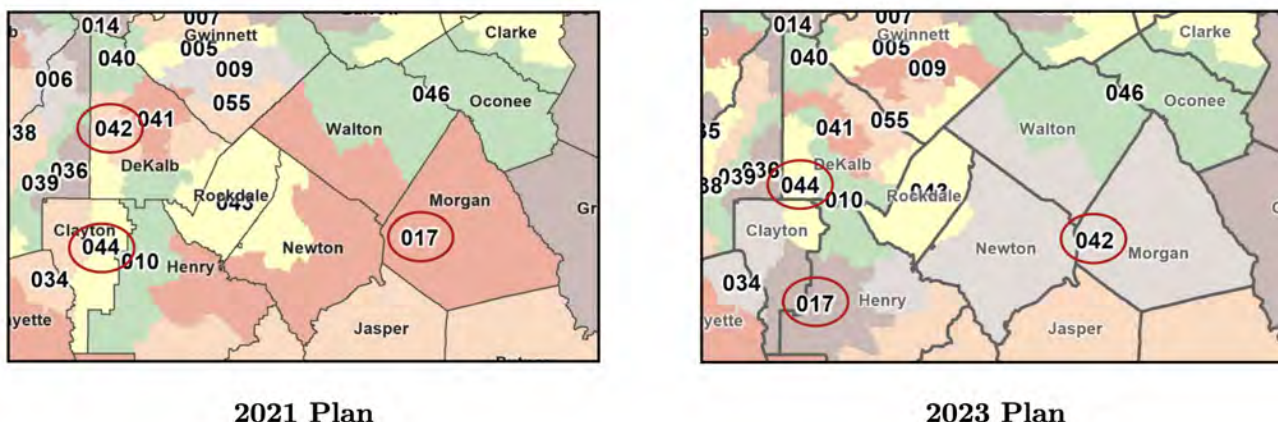


Figure 2: Senate district numbering swaps are visible in these insets drawn from the state's published District Packets (<https://www.legis.ga.gov/joint-office/reapportionment>). So while the state's numbers report that SD 17 has been raised from 32.01% BVAP to 63.61%, this is an artifact of the renumbering that makes it difficult to track the changes. The new SD 42 has 32.56%, a close match to previous SD 17.

As a final remark on the mismatch of new numbers to old, it is also notable that the geographical extension of the new ten districts overlaps only partially with the previous locations. In particular, instead of remedying the vote dilution in that area of the state, the new majority-Black districts are made possible by bringing in Black voters from outside the designated region.

3.3 State House

HD	State numbers 2023	61	64	40	82	74	101	84	115	116	91	92
	Best match to 2021	40	61	64	74	78	81	82	84	91	92	93

HD	State numbers 2023	107	93	106	117	78	81	149	135	134	133
	Best match to 2021	101	106	107	115	116	117	133	134	135	149

Table 3: The impact of renumbering in the 2023 House plan is extensive, with 21 districts not assigned the number that gives the best geographic match to the 2021 plan.

Seven House districts moved to locations completely disjoint from their earlier positions: HD 40, 81, 82, 101, 133, 134, 149. In fact, the district previously called HD 149 has not changed by a single person—the exact grouping of 58,893 people has been kept together as a district—but that district has been renumbered as 133.

4 Net effects of new maps

To explain the net effects on the opportunity of Black voters to elect their candidates of choice in Georgia, I will use a simple but well-established method to label districts as *effective* or not.

Both in litigation and in peer-reviewed scholarship, the principal method to study the likely properties of new districts is to use past elections as a test.³ In Georgia, I selected eight general elections and four primary elections as being especially probative for an effectiveness analysis. I consider a district to be *effective* if it would have elected the Black voters' candidate of choice in at least three out of four primaries and at least five out of eight general elections. More discussion of this effectiveness standard can be found in Appendix A.

4.1 Congress

The 2021 enacted plan had **five** districts that earn the label of effective (CD 2, 4, 5, 7, and 13). The 2023 replacement plan only has **four**, which means the net change is -1 .

CD 2 did not change at all. Changes to CD 4 are significant, but the geographical location remains similar, and the newly configured district is still effective. The best matches to 2021 districts 7 and 13, now renumbered 13 and 6, are still effective.

However, CD 5, currently represented by Nikema Williams, has been weakened in its electoral alignment with the preferences of Black voters, falling below the threshold for an effective district. Though it remains solidly Democratic, it is now aligned with the preferences of Black voters in only two out of four primary elections; the previous configuration was aligned in three out of four. This means that this district maintains its partisanship but it has become measurably harder for a Black-preferred candidate to secure the Democratic nomination. The other changes push demographic numbers around, but are electorally insignificant.

4.2 State Senate

Statewide, the 2021 enacted plan had **19** out of 56 districts that were labeled effective as Black opportunity-to-elect districts. The court ordered the creation of two additional districts. However, the new plan has **20** effective districts, for a net addition of $+1$ rather than the two that were required.

The label of effective described here maps very successfully onto actual performance in subsequent Congressional elections: 18 out of 19 Senate districts marked effective in the 2021 plan turned out to elect people of color in 2022, and only 1 out of 37 districts without the effective label performed in this sense. The only overperforming district was SD 6 from the 2021 map—it was performing for Black voters already, despite having a majority of White voters (about 58% of adults) and not earning the label of effective. A strong Afro-Latino candidate named Jason Esteves won in 2022 despite the less favorable district configuration. That this district is now re-drawn to be more favorable—now called SD 38, it has become majority-Black and now elects preferred candidates in all four probative primaries and all eight probative general elections. This accounts for the net increase of one labeled "effective" district, but does not improve on the expected performance of the map, since the district was already performing.

³This is sometimes called a "reconstituted" election analysis.

4.3 State House

The massive renumbering scheme in the House plan makes analysis of the new plan much more difficult, but the effectiveness numbers are unmistakable. Though the court ordered the creation of five additional opportunity-to-elect districts, the net change in effective districts is actually negative. Where the previous plan had **69** effective districts, and the state was instructed to add five opportunity districts, the new plan actually reduces the effective district count with a -1 change, to **68**.

Two districts shift in a positive direction. What used to be HD 133 is now called HD 149 and has become effective; this is a genuine plus-one, both becoming majority-Black and electorally effective for Black preferences. HD 145 retained its label and became effective; this is also a genuine pickup, becoming majority-Black as well as newly effective.

By contrast, HD 86, 105, 108 were effective, but now are not. HD 86 is still Democratic but is now more likely to elect White-preferred candidates. (It used to align with Black voters' preferences in three of four primaries; that number has dropped to just one out of four.) HD 105 was turned from Democratic- to Republican-favoring, while retaining its status as a diverse district without a single-race majority. It is the clearest example of a performing coalition district that was essentially dismantled in the re-draw. HD 108 is a second performing coalition district that was notably weakened in partisan terms and no longer meets the standard of an effective district. The incumbent, Jasmine Clark, is a PhD microbiologist and an active member of the Georgia Legislative Black Caucus. The district now elects the Black candidate of choice in only four out of eight general elections from the probative dataset, down from six before the re-draw.

A Defining an effective district

To keep this declaration self-contained, I am including a recap of the definition of effectiveness from my report in *NAACP v. Georgia*.

A.1 Identifying probative elections

In the voting rights sphere, it is well understood that certain past elections are more probative—that is, provide better and clearer evidence of polarization patterns and preferences—than others. Elections are more suitable for an effectiveness analysis when they are more recent, when they have a viable minority candidate on the ballot, and when we can make confident statistical inferences about each group’s preference. They are less suitable when they are blowouts (or, of course, uncontested).

I have selected the following eight general elections and four Democratic primary elections (Tables 4⁴) as especially probative for analyzing effective electoral opportunity for Black voters in Georgia. All are recent statewide elections (held since 2018), most have a Black candidate on the ballot, and most are quite close on a statewide basis.⁴

Year	Contest	R Candidate	D Candidate	D share
2016	President	Trump-Pence	Clinton-Kaine	.4734
2018	Governor	Brian Kemp	Stacey Abrams (B)	.4930
2018	Super. Pub. Instruc.	Richard Woods	Otha Thornton (B)	.4697
2020	President	Trump-Pence	Biden-Harris (B)	.5013
2020	Public Serv. Commiss.	Lauren McDonald	Daniel Blackman (B)	.4848
2021	Senate Runoff	David Perdue	Jon Ossoff	.5061
2021	Senate Runoff Special	Kelly Loeffler	Raphael Warnock (B)	.5104
2022	Governor	Brian Kemp	Stacey Abrams (B)	.4620

Year	Contest	BH-Preferred Candidate	D share (outcome)
2018	Lt. Governor	Triana Arnold James (B)	.4475 (L)
2018	Super. Primary	Otha Thornton (B)	.4387 (1st of 3)
2018	Super. Runoff	Otha Thornton (B)	.5914 (W)
2018	Insurance Commiss.	Janice Laws Robinson (B)	.6286 (W)

Table 4: Eight general elections and four primaries and primary runoffs are chosen for the score of effectiveness.

A.2 Electoral alignment as a measure of district effectiveness

Using the four primary and eight general elections listed here, I will deem a district to be *effective* if it is electorally aligned with the preferences of Black and Latino voters in at least three out of four primaries and at least five out of eight general elections. This standard ascertains that minority-preferred candidates can be both nominated and elected from the district, and it distinguishes minority preferences from (related, but distinct) Democratic party preferences. This same core idea of measuring district effectiveness—keyed to electoral history, not to demographics of the district—appears frequently in the peer-reviewed literature, for instance in a recent piece in the *Election Law Journal* for which I was a co-author.⁵

⁴Even Robinson’s primary election, which was won with nearly 63% of the statewide vote, shows substantial district-level variation. By contrast, in the Democratic primary for Governor in 2018, Abrams won with 76.4% and with little regional variation, making it a less informative contest, which explains why it is not included.

⁵Amariah Becker, Moon Duchin, Dara Gold, and Sam Hirsch, *Computational Redistricting and the Voting Rights Act*, *Election Law Journal*, Volume 20, Number 4 (2021), 407–441.

B Overall maps of boundary changes

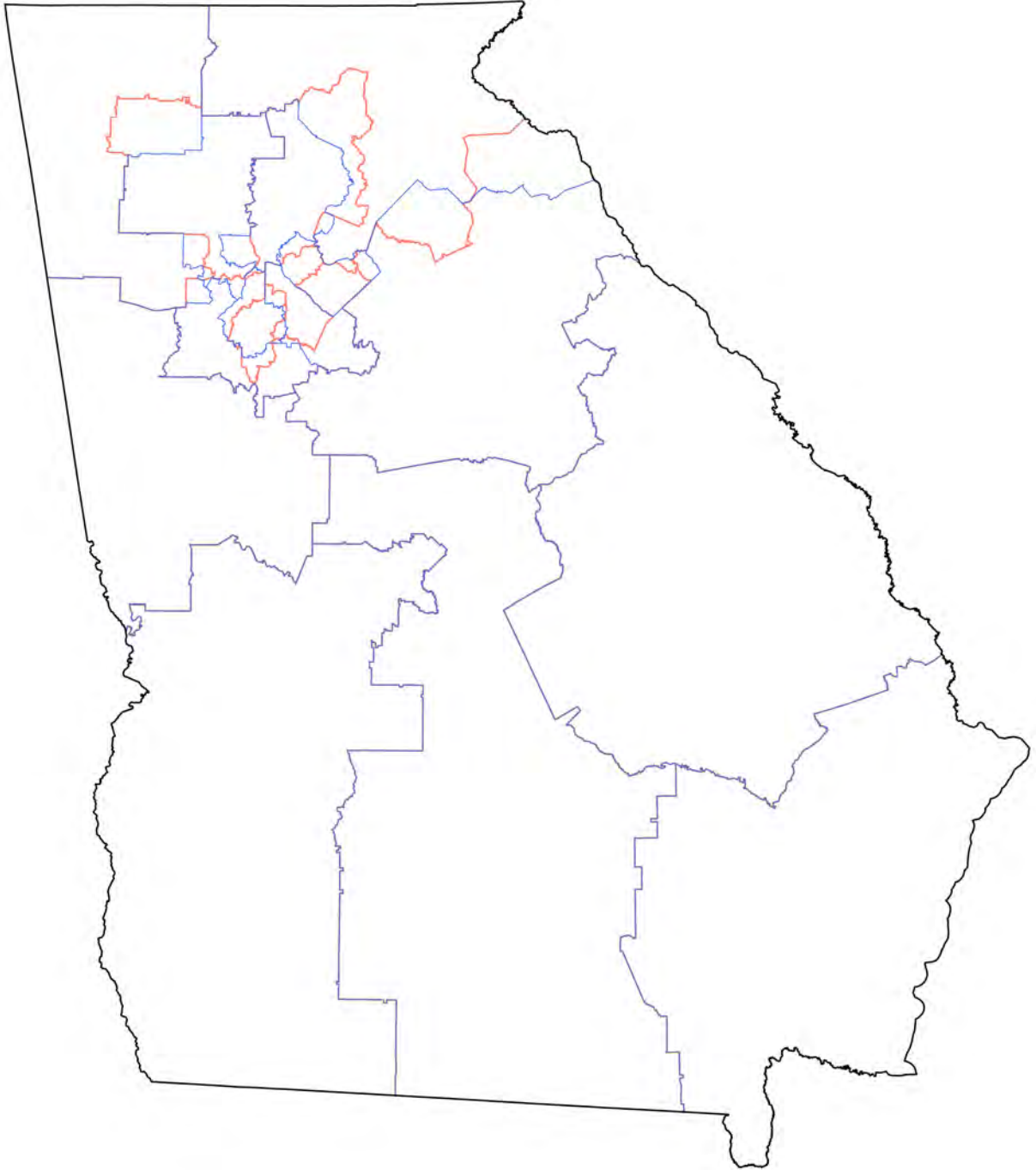


Figure 3: Changes to Congressional districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

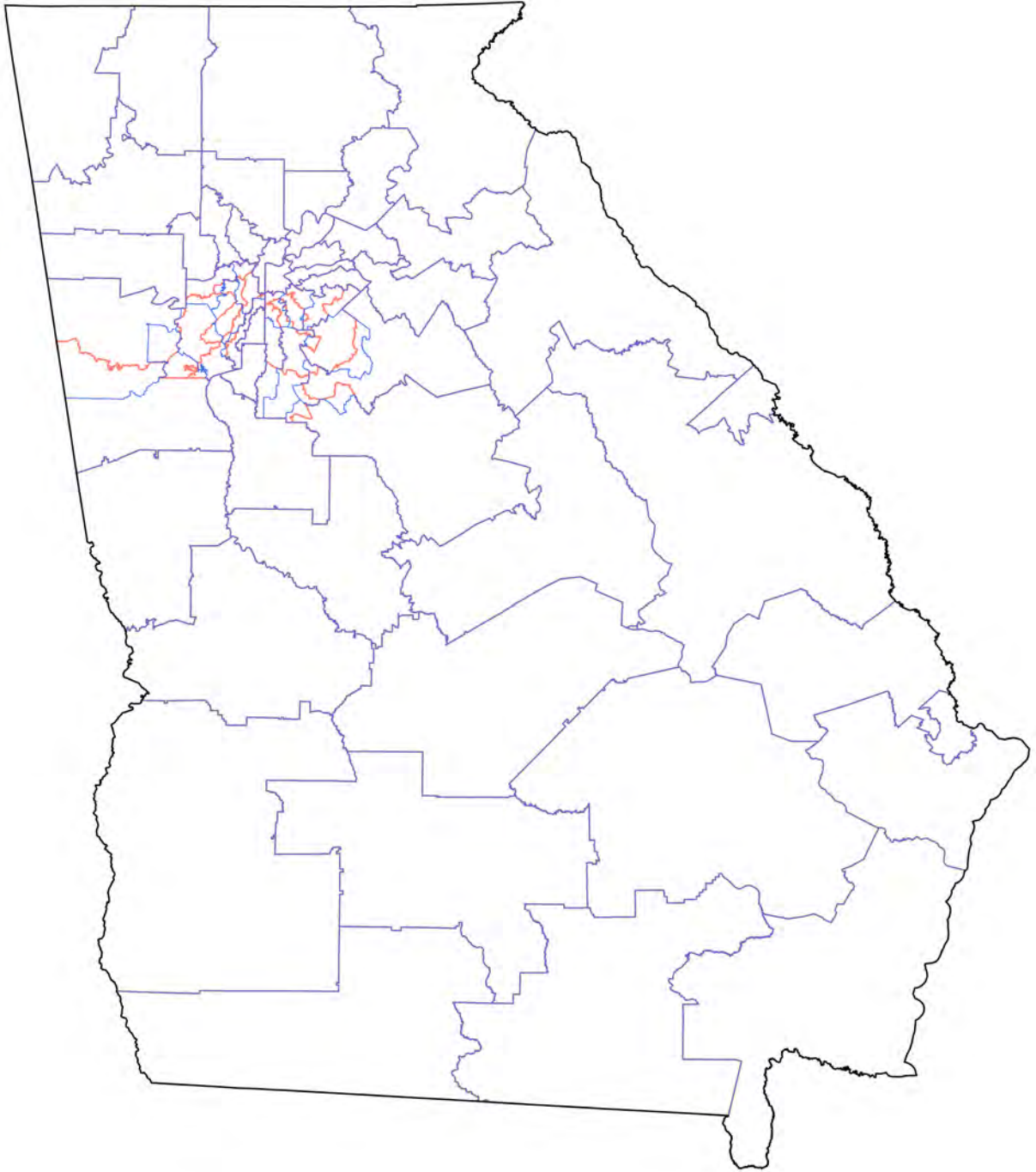


Figure 4: Changes to state Senate districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

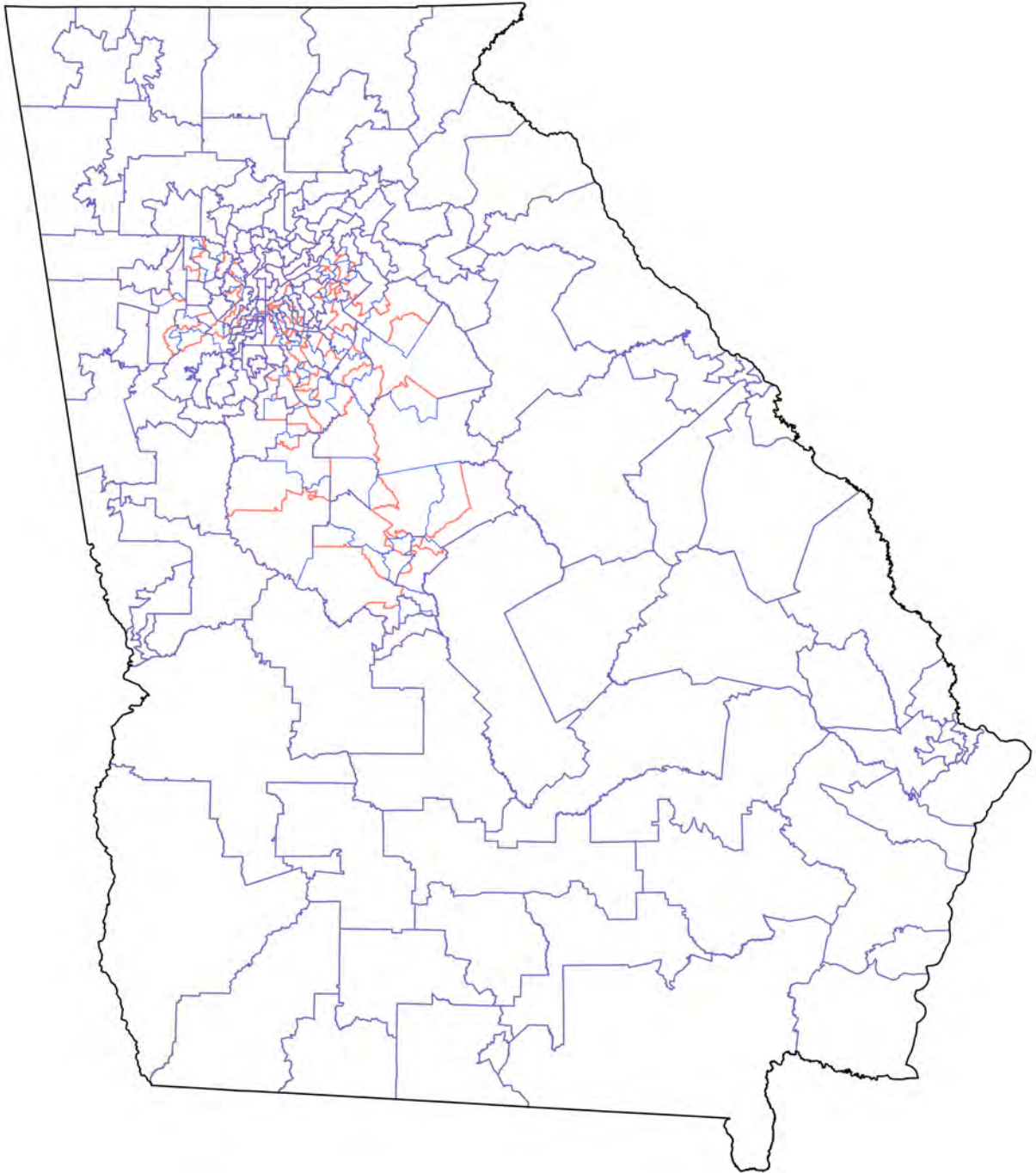


Figure 5: Changes to state House districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

I reserve the right to continue to supplement my report in light of additional facts, testimony and/or materials that may come to light. 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.

Executed this 12th day of December, 2023.

A handwritten signature in black ink, appearing to read 'Moon Duchin', written over a horizontal line.

Dr. Moon Duchin

State	District	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warnock21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrim	NumCOCGen	Effective?
	Match	0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169			
1	1	0.41490643	0.424509318	0.410488169	0.432172486	0.419264182	0.43794081	0.438624967	0.394954771	0.499234903	0.499702788	0.715041898	0.696664871	3	0	0
2	2	0.54633626	0.550796059	0.535355461	0.55235373	0.544459736	0.561059548	0.562433866	0.518759972	0.551535109	0.472009484	0.637887049	0.742951982	4	8	1
3	3	0.316845516	0.328676992	0.311855255	0.347563512	0.331240314	0.352399341	0.356424547	0.313037462	0.417749085	0.418493716	0.538849312	0.617839693	3	0	0
4	4	0.784582716	0.799701022	0.769584947	0.791941793	0.781497791	0.795238823	0.800614952	0.76275068	0.475190016	0.45081048	0.581765912	0.625006886	3	8	1
5	5	0.869020955	0.88018533	0.833976449	0.868119517	0.849901193	0.863595923	0.870090599	0.851421126	0.365282653	0.401135087	0.528552331	0.502594674	2	8	0
7	6	0.342400868	0.367537443	0.331102343	0.40263858	0.3647001	0.386782053	0.394607418	0.336385489	0.287481947	0.340738036	0.470634172	0.485085356	0	0	0
13	7	0.650840027	0.693755387	0.67183437	0.704917379	0.701735512	0.724068422	0.727573024	0.700085709	0.531333461	0.486207673	0.641533989	0.694206404	4	8	1
8	8	0.343036616	0.342732037	0.328012988	0.360421702	0.347288097	0.364794564	0.36643621	0.318461189	0.486090206	0.440307325	0.627325661	0.694033871	3	0	0
9	9	0.289349399	0.310460269	0.293829313	0.336534429	0.318299054	0.338409727	0.34292408	0.281947683	0.366222593	0.392786447	0.56183663	0.575149107	3	0	0
10	10	0.360027034	0.374967125	0.361585733	0.392259679	0.376628863	0.397627767	0.401212271	0.3593355	0.416132818	0.434097335	0.648645118	0.59236221	3	0	0
11	11	0.336033592	0.363011864	0.334676677	0.388483728	0.360354019	0.381026195	0.388388825	0.33516469	0.295868324	0.370577697	0.462065828	0.499895621	0	0	0
12	12	0.432372579	0.431851279	0.41738314	0.448657676	0.433084389	0.451113646	0.452567074	0.402285004	0.492772153	0.419559836	0.646177768	0.762552719	3	0	0
6	13	0.718942437	0.743549445	0.708646693	0.750153613	0.729993678	0.743751208	0.750790676	0.723098946	0.497329892	0.493165395	0.645313012	0.65231455	3	8	1
14	14	0.267851688	0.288993209	0.276843843	0.309743723	0.295978117	0.315919551	0.318712875	0.274077672	0.381279122	0.378271715	0.489275693	0.58876325	2	0	0

Senate

State	District	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warnock21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrim	NumCOCGene	Effective?
	Match	0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169			
1	1	0.397656842	0.416462196	0.396250058	0.433881511	0.409893473	0.431119931	0.433099014	0.385785664	0.443252003	0.495691354	0.713872083	0.675209267	3	0	0
2	2	0.7277763046	0.744670773	0.724826901	0.730422618	0.722089295	0.741980505	0.74342658	0.71469271	0.5567776	0.537440579	0.76154341	0.724487595	4	8	1
3	3	0.322948638	0.328530274	0.316317984	0.339865889	0.327306164	0.338240721	0.337891668	0.29631488	0.458430767	0.456582855	0.616576636	0.664683584	3	0	0
4	4	0.311684437	0.313172797	0.298786565	0.334206791	0.318114973	0.337733447	0.337867831	0.291067433	0.462347945	0.417040919	0.642149666	0.679982588	3	0	0
5	5	0.748620203	0.776747576	0.750276816	0.734733983	0.739530571	0.769846296	0.772726768	0.703407307	0.493585851	0.460396761	0.626972071	0.632879757	3	8	1
38	6	0.770342153	0.775004489	0.731730429	0.785145143	0.753958261	0.761161801	0.770810773	0.743784955	0.479196443	0.474510674	0.651566404	0.654215481	3	8	1
7	7	0.521158505	0.562144334	0.524973897	0.585472627	0.561839387	0.584837375	0.590894256	0.530825222	0.393755382	0.432716186	0.582196574	0.570882221	3	8	1
8	8	0.333861632	0.336173199	0.325348681	0.352041388	0.340680234	0.350653954	0.35074256	0.300893828	0.527880435	0.422300733	0.614608909	0.718206551	4	0	0
9	9	0.527746882	0.57227682	0.542557472	0.603534631	0.587329326	0.615802111	0.61490898	0.570215803	0.453820218	0.448561976	0.613874083	0.623237363	3	8	1
10	10	0.838930793	0.860803521	0.834319185	0.853074419	0.850358127	0.863541901	0.867322432	0.85096566	0.476331134	0.457875357	0.626262209	0.625047374	3	8	1
11	11	0.34835592	0.335981602	0.32361354	0.352640589	0.341816795	0.351222073	0.351062899	0.303884958	0.528816199	0.421896932	0.547802198	0.709845599	4	0	0
12	12	0.580485626	0.577101919	0.561840927	0.581609029	0.574551684	0.589411809	0.590262253	0.544842081	0.579918244	0.477058094	0.641213907	0.763379962	4	8	1
13	13	0.283558192	0.279078315	0.262250293	0.296374522	0.282069339	0.302265372	0.303606087	0.258128744	0.517859787	0.435407719	0.614506784	0.69559205	4	0	0
14	14	0.542058433	0.562413761	0.507707193	0.601154637	0.552764258	0.566559571	0.576250028	0.53144386	0.30383806	0.370349989	0.469827586	0.457045768	0	8	0
15	15	0.664965964	0.671406841	0.654364323	0.66800349	0.662096815	0.680131671	0.682165733	0.646145965	0.598603875	0.450189444	0.584984714	0.733803209	4	8	1
16	16	0.319918218	0.333247581	0.312572543	0.358643894	0.337149535	0.356820571	0.361496315	0.322497143	0.406667691	0.396526538	0.507908612	0.606501698	3	0	0
42	17	0.351497623	0.381867226	0.368081703	0.406810309	0.396357233	0.419303781	0.422335451	0.39939181	0.471564772	0.454947264	0.641386872	0.674541874	3	0	0
18	18	0.365571027	0.374317477	0.360818184	0.389313837	0.376635747	0.396508346	0.398963335	0.355940936	0.463958658	0.489104968	0.668172873	0.693176878	3	0	0
19	19	0.245786066	0.23449611	0.231432315	0.251618071	0.245934184	0.256753266	0.257350991	0.210910027	0.505406914	0.399668854	0.65745646	0.721363839	4	0	0
20	20	0.325093587	0.323788777	0.312244678	0.343664949	0.331101248	0.349898721	0.352253856	0.309414802	0.492677592	0.492146519	0.691449291	0.70500136	3	0	0
21	21	0.286531967	0.304093667	0.272116911	0.336905461	0.300850615	0.32349903	0.331579724	0.277250649	0.29628253	0.343523929	0.512380687	0.515726717	2	0	0
22	22	0.691134906	0.707978632	0.688358466	0.712253257	0.701294838	0.716791822	0.718869821	0.685482474	0.516625334	0.437677459	0.683349161	0.822714007	4	8	1
23	23	0.406909414	0.407829839	0.396201932	0.425368332	0.412508803	0.430702412	0.432163145	0.386389232	0.496846335	0.424914067	0.600841701	0.745644349	3	0	0
24	24	0.301034457	0.298982126	0.290691966	0.327364466	0.303368848	0.32403547	0.324933055	0.274008037	0.412968724	0.446258503	0.70775463	0.669346562	3	0	0
25	25	0.357381017	0.364705185	0.351484158	0.378777559	0.366818234	0.390518444	0.393369428	0.353376542	0.455487701	0.419065952	0.679745005	0.694159464	3	0	0
26	26	0.641005492	0.647911677	0.63256209	0.643425602	0.639874815	0.655968029	0.658475927	0.615661943	0.477361857	0.44390107	0.641215067	0.731163743	3	8	1
27	27	0.230645174	0.261223028	0.235950993	0.307605426	0.276774814	0.29746556	0.303933227	0.25110591	0.249626592	0.316157929	0.410637538	0.490427618	0	0	0
6	28	0.266332564	0.273152885	0.255598986	0.294133086	0.274685109	0.29392537	0.298758302	0.254594592	0.369032132	0.387635691	0.441005778	0.596014214	1	0	0
29	29	0.350069362	0.35490641	0.337830717	0.374860014	0.356860303	0.37733267	0.379819529	0.337209014	0.468800399	0.436422112	0.542916249	0.663854051	3	0	0
30	30	0.319591503	0.338728802	0.326984144	0.352233521	0.345330387	0.369195525	0.372838947	0.328497836	0.426925117	0.435626856	0.537046336	0.605514566	3	0	0
31	31	0.276774826	0.310139739	0.302862795	0.332840526	0.324375716	0.345879227	0.348963119	0.313161521	0.42401181	0.446012984	0.519129919	0.623744275	3	0	0
32	32	0.363413884	0.406076288	0.374415003	0.435465814	0.408160605	0.428661906	0.436347822	0.383641981	0.319412211	0.395165638	0.522185242	0.522950922	3	0	0
33	33	0.609104687	0.640552987	0.60783602	0.653419429	0.633097837	0.646063659	0.652350062	0.606748147	0.421644142	0.46683925	0.520386756	0.587102787	3	8	1
34	34	0.820089707	0.847209987	0.830401292	0.827087817	0.833130241	0.849842366	0.851787376	0.827991473	0.544206154	0.491229624	0.609594096	0.721371709	4	8	1
28	35	0.694085489	0.737645844	0.713788348	0.746384656	0.742289079	0.760052333	0.764748329	0.740357786	0.563476363	0.532919006	0.707689413	0.696286925	4	8	1
36	36	0.906907904	0.916383242	0.868612266	0.896199824	0.877128473	0.892502906	0.899594772	0.884564356	0.369450947	0.41335009	0.548268353	0.505023424	3	8	1
37	37	0.374233068	0.412009028	0.383790054	0.445343011	0.417680711	0.43868215	0.446203912	0.400183003	0.38444957	0.449537851	0.560905939	0.579599587	3	0	0
35	38	0.775458443	0.797779608	0.763664321	0.788950337	0.76937444	0.785933851	0.792421413	0.763623737	0.503538083	0.504013486	0.688989241	0.668990071	4	8	1
39	39	0.861983025	0.869965073	0.822637016	0.859487187	0.835465553	0.849292397	0.857151545	0.832824123	0.42370025	0.432763522	0.602334446	0.596440754	3	8	1
40	40	0.598008484	0.615156328	0.559162076	0.648280462	0.599691472	0.614079698	0.625523411	0.580811776	0.268194607	0.332662798	0.424142885	0.409912361	0	8	0
41	41	0.843688522	0.856153779	0.822503698	0.84775341	0.838047286	0.848765716	0.85418011	0.825599606	0.432904848	0.427187423	0.546355819	0.580274206	3	8	1
44	42	0.899811359	0.90970031	0.867746938	0.899055293	0.885984542	0.898643151	0.903604839	0.886982159	0.359213106	0.382794449	0.509125822	0.465680095	1	8	0
43	43	0.683546683	0.731315755	0.71361257	0.748643664	0.748636282	0.767381238	0.769563302	0.752507349	0.565630159	0.509544241	0.694222124	0.716151008	4	8	1
17	44	0.689257486	0.735767469	0.717127081	0.744403137	0.747192946	0.767306381	0.769969531	0.754958199	0.558714744	0.496664224	0.634629976	0.722995037	4	8	1
45	45	0.33670815	0.377455458	0.352473644	0.413922594	0.393215268	0.41696996	0.42291309	0.377282141	0.417954262	0.438671393	0.60421092	0.603098633	3	0	0
46	46	0.375146407	0.388881563	0.366568651	0.40776159	0.381643299	0.403367171	0.408827905	0.355458951	0.348538116	0.394607793	0.539021805	0.495802311	1	0	0
47	47	0.395884205	0.405243665	0.390433629	0.407172744	0.391182976	0.41555903	0.419863747	0.366819036	0.393574581	0.441924028	0.631734384	0.537769461	3	0	0
48	48	0.400997769	0.43634328	0.392011994	0.48358662	0.441092428	0.468496371	0.476190476	0.413079168	0.319309169	0.348802466	0.499995158	0.514376966	1	0	0
49	49	0.233521048	0.252969716	0.234980477	0.27631997	0.252314951	0.271828738	0.277271519	0.221135981	0.288779862	0.340227428	0.409931948	0.526904413	1	0	0
50	50	0.171579454	0.16724043	0.162604274	0.185527893	0.17095967	0.186739224	0.189770662	0.144341809	0.280969728	0.321968408	0.472644995	0.549663405	1	0	0
51	51	0.156817373	0.155800482	0.150268798	0.175122587	0.161709995	0.175937805	0.17901156	0.142040545	0.208610621	0.266731025	0.333897842	0.443707183	0	0	0
52	52	0.244967297	0.254976389	0.243727984	0.265854388	0.251919896	0.272325739	0.27665719	0.224125096	0.329870804	0.327136021	0.470374617	0.579184596	1	0	0

53	53	0.183712246	0.185819315	0.182573062	0.201201489	0.191643036	0.205370621	0.204523397	0.16275259	0.350880802	0.238477277	0.349786023	0.572850668	1	0	0
54	54	0.219292247	0.216750235	0.209750704	0.234555364	0.224688192	0.237111339	0.23737016	0.174488292	0.370259051	0.267940943	0.398172443	0.520751901	1	0	0
55	55	0.753260885	0.778008946	0.755252179	0.782923214	0.778571087	0.793223984	0.79738548	0.766932289	0.507325498	0.477508361	0.629033073	0.646391223	4	8	1
56	56	0.363928871	0.394412174	0.350326247	0.437347927	0.389409268	0.410829976	0.421008154	0.373754223	0.227296172	0.327667829	0.42825929	0.443238104	0	0	0

	District	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warrick21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrime	NumCOCGene	Effective?
State	Matched	0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169			
1	1	0.193335405	0.196431157	0.193808519	0.210421288	0.200901512	0.215978935	0.214622842	0.173592641	0.346810616	0.27732596	0.402929398	0.580637817	1	0	0
2	2	0.169562976	0.166999475	0.163546913	0.190058152	0.176762907	0.189483783	0.187649028	0.142458933	0.355779922	0.265017959	0.366987682	0.547632048	1	0	0
3	3	0.190797463	0.201827612	0.19429166	0.222094609	0.209943693	0.223270178	0.22219441	0.181564515	0.329397875	0.29368932	0.394495413	0.533007335	1	0	0
4	4	0.358907205	0.363309425	0.34399393	0.383528859	0.367179718	0.380571518	0.380818981	0.290584388	0.360131164	0.272102273	0.518684909	0.522859676	2	0	0
5	5	0.171612162	0.173299665	0.1685	0.185540705	0.178540437	0.192596108	0.195016611	0.148222878	0.382440476	0.2760181	0.407643312	0.526555387	1	0	0
6	6	0.156356875	0.145715216	0.148136091	0.164133668	0.158585394	0.167896291	0.167119295	0.117663424	0.366804952	0.249647442	0.320562448	0.543028853	1	0	0
7	7	0.166093616	0.162931821	0.157476523	0.180721442	0.168681672	0.181512826	0.185000988	0.14692359	0.215668203	0.257228315	0.335195531	0.417322835	0	0	0
8	8	0.165914425	0.159962963	0.157593445	0.181864594	0.170109612	0.181513231	0.184001989	0.142172879	0.202205882	0.264404104	0.359504132	0.471698113	0	0	0
9	9	0.1472749	0.15231347	0.14568916	0.1694994	0.1521623	0.170462647	0.173248995	0.139056222	0.183179246	0.270094467	0.334513241	0.449588065	0	0	0
10	10	0.167184445	0.167527905	0.158764862	0.185947912	0.168840008	0.186405704	0.191326306	0.148514775	0.225151758	0.31625431	0.447199535	0.50306053	1	0	0
11	11	0.146058458	0.155037883	0.144586094	0.1867689	0.169361788	0.186321961	0.191171702	0.155163879	0.266195459	0.296091566	0.340094057	0.456842233	0	0	0
12	12	0.197827925	0.18950859	0.188662815	0.194489873	0.19063888	0.206945862	0.208323802	0.160741275	0.367056497	0.169157694	0.311704597	0.622716846	1	0	0
13	13	0.329778155	0.343704201	0.321489126	0.353688977	0.331021905	0.357071642	0.362928068	0.30148728	0.317900657	0.326022318	0.463045505	0.566993809	1	0	0
14	14	0.170799447	0.176788966	0.170325166	0.191573663	0.180857367	0.194126304	0.198392873	0.16037025	0.325608327	0.331665256	0.503995974	0.521823078	2	0	0
15	15	0.254197444	0.274913899	0.263438017	0.28627015	0.274888764	0.294867158	0.299268258	0.241738525	0.32928436	0.351842235	0.444460716	0.581101598	2	0	0
16	16	0.201574627	0.20830024	0.20469315	0.223706223	0.215172124	0.230541257	0.233228821	0.194126292	0.355810326	0.373049734	0.523952647	0.608649066	3	0	0
17	17	0.278367941	0.326419903	0.317016002	0.358007095	0.349847363	0.374667918	0.377996359	0.341071371	0.40200607	0.436290985	0.49906062	0.614513916	2	0	0
18	18	0.159768597	0.147912431	0.144070794	0.159786835	0.156258218	0.16527077	0.167825721	0.131366867	0.310335386	0.309074122	0.504682473	0.551144681	2	0	0
19	19	0.341079652	0.387325675	0.371536669	0.414714667	0.397597854	0.421870818	0.425660143	0.397603822	0.466500823	0.48965197	0.573805345	0.631619065	3	0	0
20	20	0.26075213	0.297510901	0.26956216	0.334853541	0.30550493	0.326064956	0.333231945	0.281512089	0.283422509	0.378486367	0.38553371	0.52745748	1	0	0
21	21	0.209588607	0.239782416	0.214762938	0.277206136	0.245476977	0.26573355	0.272010227	0.230438548	0.288318169	0.332590439	0.338413058	0.519436392	1	0	0
22	22	0.34977693	0.400441896	0.376022703	0.416266755	0.396668856	0.420583492	0.426369257	0.375634335	0.359290965	0.412906739	0.512934845	0.563457139	3	0	0
23	23	0.201650552	0.220974695	0.203885786	0.256253564	0.233980471	0.253473101	0.259099432	0.212936363	0.288947332	0.320391087	0.362073044	0.570910426	1	0	0
24	24	0.290074649	0.33244101	0.29882174	0.372728247	0.33857272	0.362245518	0.367840156	0.298927974	0.276708573	0.354138474	0.419357397	0.525912663	1	0	0
25	25	0.354128542	0.388223066	0.344765626	0.440929079	0.39617647	0.422360799	0.429847227	0.365523717	0.276435182	0.292769342	0.460326095	0.4944791	0	0	0
26	26	0.242231166	0.270883131	0.24351472	0.323509966	0.28956331	0.311331322	0.318939305	0.270998351	0.239849031	0.298637383	0.420948075	0.473482725	0	0	0
27	27	0.156426406	0.16326091	0.149645857	0.188400088	0.166663373	0.184143765	0.189274807	0.145158285	0.232721236	0.304430303	0.251699094	0.514839124	1	0	0
28	28	0.176695592	0.198528169	0.181471442	0.235652009	0.211008457	0.227273324	0.232935924	0.189334033	0.249236407	0.322033163	0.37584715	0.468273114	0	0	0
29	29	0.392039748	0.424011577	0.399008825	0.42387923	0.401493405	0.425509492	0.430692966	0.355705335	0.335187749	0.379530601	0.54418675	0.56095961	2	0	0
30	30	0.225213724	0.250148004	0.233122828	0.284052498	0.260307377	0.278494824	0.28377744	0.229965979	0.307721678	0.35298939	0.452520504	0.495815811	0	0	0
31	31	0.200374593	0.212570583	0.202855039	0.240939129	0.222577124	0.244181771	0.248795871	0.192537943	0.308663056	0.339985416	0.483748371	0.596260561	1	0	0
32	32	0.159197652	0.154557669	0.152918468	0.170183497	0.156395122	0.173059398	0.175030578	0.134537202	0.34460273	0.319548172	0.519247242	0.632957273	2	0	0
33	33	0.19906635	0.174256339	0.176531893	0.194835603	0.179869635	0.195877004	0.195251555	0.148551758	0.339478057	0.424441605	0.656454108	0.579373172	3	0	0
34	34	0.363722241	0.397067359	0.36444471	0.44011152	0.404965172	0.425642049	0.436075045	0.391380757	0.380363516	0.460461251	0.542639745	0.589300732	3	0	0
35	35	0.541405214	0.595645548	0.564302726	0.606697085	0.590509393	0.613905775	0.619685451	0.569329094	0.390872612	0.44374621	0.607866013	0.567733784	3	8	1
36	36	0.321327714	0.356505072	0.332098384	0.394998934	0.367938335	0.386900352	0.393388919	0.348027697	0.356748398	0.431976299	0.577300624	0.558255813	3	0	0
37	37	0.549293505	0.58092481	0.538123181	0.599408759	0.56769805	0.580256076	0.590787884	0.531752922	0.355731597	0.44415253	0.562134643	0.544684909	3	8	1
38	38	0.676545481	0.722908289	0.70528789	0.724291581	0.725319256	0.745348717	0.7472608	0.71740506	0.536732625	0.51676018	0.673015545	0.690251856	4	8	1
39	39	0.761353244	0.768206259	0.768206075	0.787574405	0.784626313	0.799128507	0.804852761	0.770311475	0.53562488	0.534539141	0.710600918	0.679637707	4	8	1
61	40	0.757227019	0.785599856	0.751056096	0.788982783	0.763866549	0.779000465	0.786601071	0.762698417	0.508375194	0.528774652	0.722865635	0.679239429	4	8	1
41	41	0.688721238	0.71985314	0.695075412	0.710506988	0.710603486	0.725555052	0.729564414	0.685604467	0.516420383	0.53174617	0.649162425	0.638445349	4	8	1
42	42	0.646531421	0.687788213	0.647060205	0.689292498	0.657035146	0.676958194	0.685458856	0.639533965	0.423710337	0.472129092	0.56781124	0.560911618	3	8	1
43	43	0.603439544	0.626197218	0.587792341	0.637601308	0.606332373	0.616481426	0.624685034	0.579128635	0.355964252	0.427433436	0.529450614	0.521991175	3	8	1
44	44	0.382029316	0.423645017	0.390706308	0.459788243	0.430481443	0.453648478	0.461262987	0.409649561	0.305206392	0.386899622	0.533740647	0.51945769	2	0	0
45	45	0.403928457	0.423022336	0.363687372	0.479192166	0.413365647	0.435390563	0.4476899	0.399728741	0.173228346	0.302139891	0.375205931	0.367587706	0	0	0
46	46	0.377350441	0.409783383	0.368193565	0.449474063	0.403889917	0.425419953	0.435127916	0.389466021	0.238165091	0.341063795	0.451500843	0.444006633	0	0	0
47	47	0.386830168	0.404828666	0.359455377	0.44397516	0.396320306	0.417102232	0.427649332	0.368826438	0.315940252	0.354153612	0.533865938	0.505349109	2	0	0
48	48	0.438148409	0.462542945	0.411991234	0.514732189	0.462375823	0.477851204	0.488549159	0.434446244	0.294738668	0.358175926	0.474267721	0.467867098	0	1	0
49	49	0.409183891	0.433033863	0.380608631	0.480089798	0.424643667	0.441988358	0.453840714	0.402921599	0.267515406	0.334326607	0.48874905	0.486314305	0	0	0

50	50	0.518541988	0.555821193	0.502607794	0.593893814	0.552092051	0.578411664	0.586133501	0.515369082	0.326723735	0.376665505	0.500438465	0.515074755	2	8	0
51	51	0.55089998	0.572806966	0.527443206	0.608223714	0.568278616	0.58113775	0.589898753	0.540678201	0.339433644	0.385231188	0.4881505	0.473732047	0	8	0
52	52	0.575881684	0.59378152	0.529129449	0.636095183	0.580062396	0.595655195	0.608107119	0.569699037	0.267906126	0.33866032	0.432828283	0.405326405	0	8	0
53	53	0.497160021	0.499199719	0.428130532	0.547807974	0.474514124	0.484323737	0.499789912	0.45476486	0.227296018	0.304827031	0.434190053	0.391010307	0	1	0
54	54	0.553977031	0.564145438	0.494649989	0.610386422	0.545541658	0.555540902	0.567288063	0.544259468	0.255010748	0.34435606	0.452385741	0.408052362	0	7	0
55	55	0.814549412	0.811443727	0.755566629	0.809383799	0.766887276	0.783150266	0.794601371	0.764357621	0.419092953	0.45807184	0.658947012	0.627458117	3	8	1
56	56	0.920567528	0.937233365	0.901097687	0.910374171	0.898516562	0.916032196	0.92195985	0.898580354	0.474005865	0.48731918	0.68755526	0.664889722	3	8	1
57	57	0.79567823	0.803466141	0.718227679	0.810250395	0.755961475	0.773721219	0.785720639	0.763712781	0.307691793	0.386297353	0.301043323		0	8	0
58	58	0.924430156	0.935173382	0.890261594	0.909709403	0.893134804	0.909075066	0.915792547	0.899733566	0.410784994	0.430977877	0.609180902	0.563269855	3	8	1
59	59	0.950304617	0.960289836	0.929107355	0.93370604	0.929215684	0.942519516	0.946572913	0.93072788	0.468347436	0.463219081	0.653141624	0.638250458	3	8	1
60	60	0.73396715	0.730087979	0.676836957	0.746813182	0.707001841	0.715814082	0.72751667	0.694093686	0.425560648	0.420894808	0.613833458	0.620419535	3	8	1
64	61	0.57796075	0.631442042	0.607520085	0.658853132	0.653639741	0.6821135	0.685481556	0.669110791	0.580723542	0.525516055	0.673704415	0.703358736	4	8	1
62	62	0.935399792	0.943378664	0.912713836	0.925448094	0.922263668	0.934147795	0.938224355	0.918840164	0.455852205	0.46159196	0.62974292	0.620089924	3	8	1
63	63	0.919679506	0.927949649	0.896712267	0.908451513	0.907112718	0.918242832	0.924279606	0.901689708	0.422722685	0.439639324	0.571169346	0.600229334	3	8	1
40	64	0.31284745	0.350069529	0.338603119	0.383670099	0.375277919	0.401530752	0.40485486	0.38251903	0.475966214	0.474624614	0.477522667	0.651870347	2	0	0
65	65	0.748020114	0.77360744	0.757880334	0.762025684	0.761532993	0.77411447	0.777337702	0.750742504	0.59490062	0.543868902	0.723110744	0.728195949	4	8	1
66	66	0.63815534	0.686397549	0.667064974	0.702634385	0.701943667	0.722319322	0.726339247	0.695610019	0.572458791	0.512727273	0.655826558	0.708869814	4	8	1
67	67	0.628927128	0.663334311	0.647320539	0.661694089	0.655971387	0.676984396	0.679753524	0.648818623	0.578281487	0.522467726	0.726116428	0.727463957	4	8	1
68	68	0.599050834	0.630510888	0.606717201	0.650223328	0.63949854	0.646794827	0.6521016	0.621549153	0.514156988	0.510428155	0.643911132	0.689798393	4	8	1
69	69	0.703366606	0.738840798	0.719027725	0.740912054	0.735015365	0.754992421	0.758597971	0.738006254	0.519584469	0.516551473	0.683121019	0.707859175	4	8	1
70	70	0.37581419	0.387764394	0.366345634	0.383004127	0.365539884	0.390444642	0.39526996	0.348372674	0.430811694	0.435115874	0.504565755	0.64313357	3	0	0
71	71	0.304649305	0.320907843	0.310701391	0.328617705	0.319166453	0.346643408	0.351041044	0.304543274	0.344465873	0.412467606	0.556026486	0.5555714	3	0	0
72	72	0.298187775	0.286641579	0.270311752	0.285846177	0.271342558	0.287344106	0.292835807	0.234981326	0.318120623	0.359833756	0.404040147	0.502973699	1	0	0
73	73	0.281380627	0.301175487	0.276364894	0.36116553	0.330631982	0.350856132	0.357192426	0.312461421	0.341182871	0.384427185	0.465866265	0.578967632	2	0	0
82	74	0.332616905	0.345715985	0.326033538	0.368329701	0.349264289	0.369683658	0.37329737	0.345391529	0.44150594	0.404357399	0.515802654	0.610174976	3	0	0
75	75	0.866661225	0.890557584	0.873944986	0.864383402	0.875546219	0.892923887	0.895188642	0.873300979	0.566686068	0.473171713	0.543890231	0.72731036	4	8	1
76	76	0.863146273	0.879585003	0.863889298	0.849946949	0.860665553	0.880784719	0.881135942	0.860975461	0.572555661	0.453179503	0.577367613	0.74832865	4	8	1
77	77	0.90744908	0.923558106	0.90831879	0.894447127	0.907077419	0.92208197	0.922505584	0.903704668	0.537164963	0.483376698	0.625899281	0.73763502	4	8	1
74	78	0.70933115	0.750793937	0.734908402	0.754827376	0.759799234	0.783138752	0.784808552	0.766889276	0.577212063	0.504745715	0.618294529	0.725167771	4	8	1
79	79	0.897255499	0.912328589	0.897957839	0.88058336	0.889702569	0.905600669	0.907637232	0.883101852	0.556053812	0.455418909	0.571261682	0.724006116	4	8	1
80	80	0.560759676	0.577654845	0.51974405	0.616160667	0.567684475	0.582653225	0.595374583	0.547298733	0.250676988	0.30751557	0.390392486	0.4082822	0	8	0
101	81	0.699066745	0.715863329	0.657087994	0.739555382	0.69916515	0.707676581	0.717763387	0.692887622	0.220949981	0.318350902	0.373985847	0.324954864	0	8	0
84	82	0.913757723	0.92042608	0.879755691	0.911679331	0.898731703	0.90931623	0.913976451	0.896204216	0.336676153	0.382926473	0.511034799	0.445368033	1	8	0
83	83	0.612428817	0.63285881	0.566402758	0.658550526	0.597911978	0.617841872	0.630168213	0.595114607	0.249871737	0.332816337	0.432233111	0.425751131	0	8	0
115	84	0.796729788	0.825396825	0.807855405	0.821648724	0.823742983	0.840013714	0.84283177	0.830634668	0.554020546	0.513116996	0.690202518	0.722636664	4	8	1
85	85	0.869916038	0.881095805	0.84422508	0.867107134	0.861616332	0.873462428	0.878354516	0.854311105	0.381669703	0.409144241	0.529523653	0.514537315	3	8	1
86	86	0.833076163	0.850611384	0.811439281	0.84178524	0.831990496	0.845292841	0.850424604	0.817013102	0.373172287	0.395971926	0.499212102	0.5139407	1	8	0
87	87	0.784703285	0.79929681	0.768192452	0.800608747	0.793607104	0.806810584	0.81180688	0.774615911	0.413463419	0.418386313	0.513997333	0.56667687	3	8	1
88	88	0.809411693	0.826476407	0.803888015	0.818432367	0.817943157	0.830225818	0.834857444	0.802449547	0.478251288	0.461275585	0.605549562	0.621077068	3	8	1
89	89	0.928408991	0.932926427	0.89274786	0.924830401	0.909624149	0.918985103	0.924581748	0.908503766	0.352003541	0.390535993	0.541871384	0.46611494	1	8	0
90	90	0.918239476	0.927505429	0.877317047	0.919941526	0.901961861	0.911215167	0.917979549	0.903556041	0.342018234	0.373819437	0.534911304	0.439918958	1	8	0
116	91	0.794678347	0.824743651	0.807195385	0.819834253	0.823439318	0.841362162	0.843729472	0.825797174	0.559886249	0.488700555	0.675244872	0.721957693	4	8	1
91	92	0.747162284	0.785610679	0.770400117	0.795980602	0.797175196	0.810558802	0.813309812	0.803199308	0.584197595	0.504376319	0.692891423	0.711326798	4	8	1
92	93	0.723694045	0.76221012	0.74126417	0.776945206	0.778296735	0.797361018	0.799136192	0.783071375	0.566590855	0.516965212	0.675665019	0.723463316	4	8	1
94	94	0.723749	0.75386787	0.731539398	0.759514472	0.7530403	0.77062369	0.775103197	0.743649954	0.520226629	0.485117197	0.670542429	0.672300607	4	8	1
95	95	0.785166688	0.82153466	0.802343273	0.818105116	0.819213328	0.836801358	0.839404133	0.809355126	0.57348496	0.509106328	0.702050821	0.709057156	4	8	1
96	96	0.651266482	0.683080214	0.65153079	0.668715863	0.661968287	0.683627099	0.687444194	0.624692401	0.440740489	0.453262115	0.604757889	0.576209251	3	8	1
97	97	0.603343872	0.632324262	0.595636506	0.639670253	0.621131883	0.637556719	0.644655676	0.58537403	0.38512196	0.425986165	0.56364352	0.543954448	3	8	1
98	98	0.775992532	0.794922704	0.76687242	0.746467283	0.754318024	0.782479967	0.783845732	0.717403688	0.463754031	0.451567221	0.647503885	0.582933202	3	8	1
99	99	0.446519868	0.486109113	0.446559608	0.527781494	0.493392888	0.520491681	0.527725433	0.467114866	0.382734175	0.446634094	0.599299327	0.563728498	3	3	0
100	100	0.313356593	0.348539964	0.317463648	0.398793192	0.365202133	0.391207969	0.397133525	0.339228121	0.326800232	0.335586873	0.494654723	0.548898069	1	0	0

107	101	0.558751311	0.605316181	0.572457102	0.615595578	0.60210877	0.628875712	0.633327521	0.572491261	0.446812456	0.443076962	0.597659587	0.601074812	3	8	1
102	102	0.626579213	0.669106809	0.643179715	0.670914089	0.666117966	0.699388936	0.70254388	0.645517482	0.494198793	0.48080568	0.63632716	0.665190688	3	8	1
103	103	0.359569965	0.403342655	0.377526158	0.433058423	0.407609656	0.430838075	0.437489444	0.380938747	0.398855351	0.40936301	0.585710062	0.590219652	3	0	0
104	104	0.277106127	0.314919705	0.29288448	0.36173845	0.340236222	0.364959608	0.371709435	0.333176568	0.420177155	0.444476858	0.593129657	0.616551259	3	0	0
105	105	0.415037926	0.468591249	0.441045597	0.501565385	0.486982663	0.51043956	0.515756452	0.471056658	0.433976885	0.447155393	0.642076885	0.62666992	3	3	0
93	106	0.723567544	0.760532208	0.742816362	0.765536913	0.764776294	0.780225264	0.782985643	0.758809586	0.568080029	0.504975179	0.707701678	0.702082932	4	8	1
106	107	0.576293702	0.615660654	0.585543828	0.624596279	0.61711475	0.643936304	0.648931425	0.587908085	0.463590904	0.441052347	0.608644186	0.629156036	3	8	1
108	108	0.449588761	0.485008256	0.449833546	0.538552828	0.509601905	0.537118757	0.545064312	0.425446115	0.373122816	0.425493326	0.553229074	0.550349464	3	4	0
109	109	0.801008969	0.826833721	0.805865689	0.768087459	0.776318369	0.813697249	0.816132517	0.746478873	0.501190476	0.464487744	0.595121951	0.64789604	4	8	1
110	110	0.501236	0.573385681	0.552943134	0.61742975	0.607138832	0.634553812	0.638243655	0.616844016	0.536482626	0.483799369	0.680293312	0.6915417	4	8	1
111	111	0.270791766	0.318435768	0.306864251	0.362416368	0.35131485	0.370691982	0.373761735	0.346033367	0.438518968	0.457833512	0.63372497	0.626011416	3	0	0
112	112	0.275127551	0.292728055	0.28340733	0.308674315	0.298744538	0.315820391	0.318495666	0.278518638	0.45130814	0.437833715	0.572016461	0.633460076	3	0	0
113	113	0.672978059	0.717282265	0.704558982	0.716557769	0.720635476	0.745869001	0.748323427	0.727653683	0.557688996	0.499418678	0.67035804	0.62325114	4	8	1
114	114	0.282411726	0.286893514	0.270725544	0.30181554	0.284754365	0.306825221	0.309835401	0.269301123	0.353022377	0.377675187	0.537327717	0.618985481	2	0	0
117	115	0.634492154	0.692871354	0.676529564	0.723779586	0.723176624	0.74567994	0.748727576	0.731725075	0.552803578	0.514773941	0.725428028	0.718617772	4	8	1
78	116	0.670223602	0.719173621	0.699271131	0.722540437	0.725039531	0.740122659	0.742959271	0.729502506	0.546935597	0.493699916	0.607294886	0.721314979	4	8	1
81	117	0.255167215	0.297816801	0.283742941	0.351835049	0.339726473	0.369184417	0.372022976	0.379079071	0.485330681	0.47425897	0.680478821	0.699329551	3	0	0
118	118	0.324420594	0.333832218	0.32623432	0.33722527	0.330979733	0.354921157	0.357722107	0.322499621	0.485564711	0.4220632	0.537540236	0.689778198	3	0	0
119	119	0.23360936	0.245737378	0.23572857	0.257206088	0.257364833	0.279742801	0.28369734	0.242176179	0.365424229	0.39976194	0.478533557	0.557736336	2	0	0
120	120	0.432373303	0.435252958	0.413376361	0.449048827	0.416850455	0.444026764	0.450307131	0.396394585	0.330962173	0.398163403	0.549924878	0.509860232	2	0	0
121	121	0.438313471	0.438178135	0.407733617	0.459818777	0.419399763	0.442517688	0.450332613	0.385219883	0.305629486	0.360992553	0.463406668	0.431841982	0	0	0
122	122	0.782920964	0.798241378	0.768872354	0.787717535	0.771953115	0.795837644	0.80098019	0.765468225	0.446967808	0.48278219	0.731612289	0.533632619	3	8	1
123	123	0.314528127	0.302333237	0.315256357	0.319462228	0.308538967	0.319256059	0.320114166	0.27358224	0.448229494	0.475930972	0.821002387	0.679481241	3	0	0
124	124	0.391102562	0.384129788	0.367482333	0.398036644	0.377178869	0.393638241	0.397704515	0.339500613	0.392878764	0.394544532	0.513355262	0.615794421	2	0	0
125	125	0.31244735	0.338008115	0.325193861	0.374982145	0.354943455	0.378397739	0.379866253	0.342297983	0.497931714	0.448401293	0.55318938	0.729034408	3	0	0
126	126	0.619522818	0.621192128	0.611541322	0.619683874	0.616985644	0.629838373	0.630552046	0.589373699	0.571306234	0.465270348	0.713561889	0.843053766	4	8	1
127	127	0.322473097	0.338884045	0.315848076	0.374876531	0.341453422	0.364943266	0.36703493	0.317425647	0.388495348	0.414591376	0.560127497	0.675889699	3	0	0
128	128	0.510483612	0.498866774	0.485768823	0.502530167	0.495365486	0.509821463	0.512052877	0.454525878	0.483556902	0.357222844	0.681927711	0.729199549	2	4	0
129	129	0.672590252	0.673317113	0.64962387	0.685630121	0.666910903	0.683521419	0.685774302	0.63419695	0.478764997	0.426185165	0.682900477	0.787612877	3	8	1
130	130	0.662745857	0.68131901	0.666482236	0.683851484	0.6796869	0.694697333	0.696074932	0.673006349	0.529105092	0.432216831	0.667598275	0.829987734	4	8	1
131	131	0.293234928	0.321721628	0.299739853	0.367011421	0.335742675	0.363930695	0.364086398	0.323187457	0.456080363	0.456353937	0.607114579	0.698750367	3	0	0
132	132	0.697489191	0.706540315	0.691818058	0.702392984	0.698609654	0.7174983	0.719002418	0.67240363	0.511386065	0.453401939	0.707157597	0.830777391	4	8	1
149	133	0.609517037	0.605813703	0.590598652	0.599689626	0.592853225	0.614188986	0.616437851	0.56213004	0.478449781	0.487655592	0.735343086	0.748356743	3	8	1
135	134	0.252257536	0.251387338	0.241194809	0.261114193	0.251854248	0.265931429	0.268761046	0.231984905	0.408639599	0.31470583	0.451631024	0.617422494	1	0	0
134	135	0.324159407	0.325261444	0.317166616	0.327837222	0.319414598	0.340134431	0.342989986	0.291709666	0.451612903	0.419006479	0.546134663	0.692307692	3	0	0
136	136	0.350853304	0.354939083	0.339460605	0.349929452	0.33721345	0.357106114	0.36018829	0.305557624	0.411949666	0.449763942	0.576981915	0.66394531	3	0	0
137	137	0.580536832	0.588272447	0.569750585	0.589662445	0.583066331	0.59986244	0.601140787	0.565601688	0.583124173	0.449736809	0.621002587	0.719553729	4	8	1
138	138	0.276134197	0.272907498	0.25483058	0.298510823	0.272617328	0.294883492	0.298407465	0.254631792	0.408685306	0.405977584	0.464208243	0.608722741	1	0	0
139	139	0.334341223	0.347320699	0.330780194	0.391490975	0.368880422	0.387196237	0.38898431	0.347450143	0.480097089	0.399892194	0.454494558	0.647308114	2	0	0
140	140	0.751150518	0.769234685	0.751855742	0.747135973	0.741100015	0.765443198	0.769013152	0.74508316	0.601994577	0.442569564	0.527694581	0.729821998	4	8	1
141	141	0.721725602	0.741896633	0.721974699	0.737048822	0.731014457	0.7494043	0.751229594	0.728038962	0.642356642	0.459932807	0.580065691	0.753293937	4	8	1
142	142	0.557939354	0.573777359	0.546421029	0.594036372	0.571742924	0.591787002	0.596041941	0.549976774	0.436161305	0.441260346	0.625045852	0.685798881	3	8	1
143	143	0.604965718	0.618552837	0.601271869	0.615974888	0.610886822	0.629265608	0.631673558	0.600609	0.462760865	0.498804562	0.679385322	0.727381598	3	8	1
144	144	0.295103235	0.289342667	0.277341967	0.299093773	0.282245273	0.302232476	0.304543529	0.259418883	0.426338219	0.403923608	0.593159543	0.653987214	3	0	0
145	145	0.553907094	0.554372389	0.538146387	0.554705437	0.5465782	0.562596237	0.56490423	0.508304406	0.462051467	0.46051661	0.659995294	0.731009061	3	8	1
146	146	0.330638991	0.355758353	0.340173968	0.383965478	0.369330975	0.393004831	0.395281194	0.357004158	0.516594813	0.559425502	0.764876561	0.693019262	4	0	0
147	147	0.379582774	0.419133936	0.405735174	0.446176602	0.434749837	0.458350573	0.460191627	0.421027794	0.511124528	0.557387208	0.706848189	0.694402535	4	0	0
148	148	0.328259236	0.316717013	0.297970165	0.327627786	0.310557303	0.328642986	0.331263609	0.291251319	0.518487841	0.487938464	0.681509862	0.695614765	4	0	0
133	149	0.342298943	0.325637692	0.317595376	0.334837931	0.329217594	0.344144612	0.346870005	0.296366033	0.456989247	0.382376718	0.511023622	0.689378758	2	0	0
150	150	0.559454096	0.549589432	0.533907945	0.545509201	0.538591928	0.554299608	0.556169258	0.510674188	0.542049062	0.512037412	0.73762934	0.750728535	4	8	1
151	151	0.483813755	0.471954911	0.457669257	0.480942439	0.474007987	0.487718117	0.488699276	0.445225919	0.546506729	0.485051121	0.672537566	0.714958977	4	0	0

152	152	0.273846726	0.285477169	0.275815499	0.301698699	0.290883386	0.312260095	0.312861511	0.279275889	0.554240048	0.470126088	0.616416019	0.72919785	4	0	0
153	153	0.672765181	0.679787129	0.65971917	0.68248684	0.674057198	0.688651649	0.689876102	0.659314737	0.606892658	0.480408536	0.639188607	0.799901376	4	8	1
154	154	0.546445735	0.538286675	0.528020566	0.537715335	0.532086239	0.550366692	0.549998445	0.493146431	0.567890067	0.463591738	0.611168191	0.754342785	4	7	1
155	155	0.345691998	0.327929784	0.320616288	0.348937608	0.339050028	0.354074821	0.356132174	0.313014827	0.478991597	0.430993877	0.651741294	0.68448439	3	0	0
156	156	0.294511932	0.282894235	0.2766954	0.297578844	0.288051211	0.301219636	0.303518186	0.248621253	0.528252126	0.436247451	0.662000294	0.735562571	4	0	0
157	157	0.248145685	0.236994524	0.232031631	0.251102464	0.244279443	0.257181943	0.257071669	0.207579766	0.48853211	0.388973966	0.693939394	0.720215219	3	0	0
158	158	0.353142713	0.341227607	0.327101233	0.349207455	0.334163047	0.351157324	0.351795475	0.304709106	0.488864217	0.391422355	0.625270488	0.709841256	2	0	0
159	159	0.300297324	0.292779177	0.279979667	0.304476675	0.292963392	0.310407928	0.310947059	0.265088608	0.459551621	0.394707862	0.605628982	0.696454973	2	0	0
160	160	0.326453291	0.305178295	0.288363933	0.317821408	0.297314769	0.312078346	0.313537641	0.255951283	0.411665258	0.391114983	0.545454545	0.633187773	2	0	0
161	161	0.324559428	0.367911812	0.359455022	0.406808326	0.395780833	0.419962619	0.420056564	0.389734428	0.554283908	0.519472475	0.713534582	0.703587221	4	0	0
162	162	0.650399594	0.686970683	0.674150374	0.672134807	0.66779147	0.689267673	0.690072097	0.657569997	0.604277044	0.56363639	0.787382789	0.751743745	4	8	1
163	163	0.721397566	0.731311264	0.705934126	0.726590145	0.711453097	0.729062226	0.731394186	0.700788472	0.494527148	0.514763393	0.741287834	0.681105196	3	8	1
164	164	0.363497759	0.419020971	0.403421161	0.42855853	0.411323653	0.434729644	0.434662179	0.406207242	0.499511809	0.52896246	0.758471495	0.696327361	3	0	0
165	165	0.789585306	0.789875194	0.768546441	0.780310443	0.773462031	0.785062715	0.786326967	0.75396833	0.568896018	0.535933547	0.76605231	0.738101914	4	8	1
166	166	0.311572215	0.313517299	0.283386915	0.347004837	0.304497184	0.330049735	0.333164208	0.284434901	0.275482894	0.410264041	0.631348954	0.52193143	3	0	0
167	167	0.304458287	0.312500819	0.300391888	0.326780105	0.318924747	0.337682865	0.337909603	0.30075772	0.483960061	0.476491862	0.697969976	0.724117836	3	0	0
168	168	0.60980371	0.635030033	0.624548845	0.622503467	0.621162556	0.645952449	0.647857122	0.602395463	0.550534006	0.542481668	0.783365571	0.788629663	4	8	1
169	169	0.274300114	0.264139699	0.24642646	0.276723639	0.266634471	0.280646159	0.281841915	0.237035575	0.506274842	0.368616631	0.559172735	0.699105011	3	0	0
170	170	0.273340379	0.2609803	0.244078704	0.284566814	0.267604994	0.288125699	0.289457055	0.236223045	0.450963956	0.427226027	0.502040816	0.667808219	3	0	0
171	171	0.392632781	0.381894237	0.371002468	0.395719263	0.390447474	0.395343334	0.395715096	0.346875	0.504876916	0.427166276	0.586419753	0.727358048	4	0	0
172	172	0.273420064	0.256362297	0.246247113	0.273246777	0.261114074	0.276027041	0.276839095	0.227254062	0.55191768	0.413434248	0.587155963	0.654390935	4	0	0
173	173	0.405792616	0.400788374	0.383981892	0.419149497	0.40307399	0.413339576	0.412950987	0.370614349	0.551106428	0.450937155	0.601593625	0.740781508	4	0	0
174	174	0.213691093	0.198412807	0.197744242	0.207631953	0.202579311	0.208521843	0.208067166	0.199440635	0.523771063	0.375237755	0.556597249	0.671581437	3	0	0
175	175	0.353262243	0.35243498	0.339676636	0.35654416	0.344561387	0.354097201	0.354041359	0.309956534	0.539249912	0.39883155	0.525296435	0.735044441	4	0	0
176	176	0.284814371	0.280642473	0.273388823	0.286630462	0.279345328	0.2936341	0.294397263	0.250457524	0.546376829	0.406106676	0.606451462	0.729219158	4	0	0
177	177	0.521123717	0.537519511	0.51689791	0.571826198	0.555267445	0.569703793	0.570053944	0.489173429	0.544818028	0.444975854	0.637047575	0.74068558	4	7	1
178	178	0.158893193	0.144698845	0.145252945	0.158453638	0.152747203	0.16236938	0.161099653	0.127159397	0.462709351	0.404514968	0.69200643	0.693969294	3	0	0
179	179	0.394509904	0.393661972	0.375606499	0.420313155	0.400237883	0.403	0.403871315	0.352351207	0.415138693	0.462121212	0.594455852	0.630976096	3	0	0
180	180	0.321039396	0.337274983	0.326166587	0.342310665	0.328603836	0.343821331	0.342032229	0.295455687	0.460857726	0.458689459	0.625482625	0.653437279	3	0	0