

**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA**

COMMON CAUSE, *et al.*,)
)
 Plaintiffs,)
)
 v.)
)
 ROBERT A. RUCHO, in his official)
 capacity as Chairman of the North Carolina)
 Senate Redistricting Committee for the 2016)
 Extra Session and Co-Chairman of the Joint)
 Select Committee on Congressional)
 Redistricting, *et al.*,)
)
 Defendants.)

CIVIL ACTION
 No. 1:16-CV-1026-WO-JEP

 THREE-JUDGE COURT

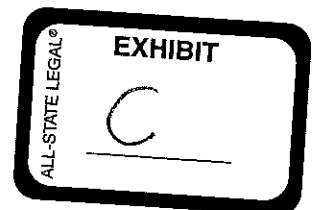
League of Women Voters of North Carolina,)
et al.,)
)
 Plaintiffs,)
)
 v.)
)
 Robert A. Rucho, in his official capacity as)
 Chairman of the North Carolina Senate)
 Redistricting Committee for the 2016 Extra)
 Session and Co-Chairman of the 2016 Joint)
 Select Committee on Congressional)
 Redistricting, *et al.*,)
)
 Defendants.)

CIVIL ACTION
 NO. 1:16-CV-1164-WO-JEP

 THREE JUDGE COURT

Supplemental Expert Report of Sean P. Trende

I, Sean P. Trende, do hereby declare the following:



1. I was asked by counsel to examine and to comment upon the Supplemental Declaration of Jowei Chen, dated July 11, 2018 in the *League of Women's Voters* case ["LWV Decl."], and the Declaration of Jowei Chen in the *Common Cause* case ["CC Decl."].

2. In preparing this report, I have referenced the files provided to counsel that accompanied these reports.

3. Dr. Chen selects his map to examine in the *League of Women's Voters* case as follows: at the direction of counsel, he selects maps (a) from simulation set 2 that (b) contain at least one district with a BVAP above 40 percent that (c) contain seven Republican districts and six Democratic districts using Dr. Hofeller's seven-election average. He then selects the map with the most compact districts, using Reock and Polsby-Popper compactness metrics. LWV Decl. ¶1.

4. Referencing a file provided by counsel for defendants entitled blackvap.set2.csv, this allows Dr. Chen to select 119 maps, with the districts containing the largest BVAP ranging from 40.002% BVAP to 42.05% BVAP.

5. Under Plaintiffs' suggested test, an efficiency gap score of .125 is allowable for a state with 13 congressional districts. In a year like 2016, when Republicans won 53.3 percent of the two-party vote, Republicans could win as many as nine districts without violating any 14th Amendment rights of plaintiffs as described by their test. Expert Report of Sean P. Trende, ¶ 48.

6. Plan 297 of Set 2 nicely illustrates the difficulties utilizing the efficiency gap as a metric for gerrymandering. While it might capture parts of the effects of gerrymandering, it captures much more as well.

7. Using the file entitled Hoff.txt taken from Plan 297, we can see the effects of slight changes in Republican votes shares under this plan. If we take this as a baseline of what to

expect at roughly 50-50 two party vote between Republicans and Democrats, we see that increasing the Republican vote share by a point statewide leads to an 8-5 Republican map, with an efficiency gap of .095. Republicans winning statewide with 53 percent of the vote (which, using Dr. Jackman’s imputations, occurred in 1994, 1996, 2010, 2014, and 2016) leads to an actionable efficiency gap of .132. In a year like 2010, when Republicans won 54.47 percent of the vote statewide, Democrats are made worse off than under the current plan, winning just two congressional district and suffering a .257 efficiency gap.

8. Under the “2010” scenario, the only plaintiffs who would still reside in a district that enacts the candidate of their choice, who do not already reside in a district that elects the candidate of his choice, are the plaintiffs who reside in Wake 20-11 and Wayne 13. The plaintiffs who live in Wake 01-04 and Mecklenburg 20 would be made worse off, having been placed in districts where their preferred candidate would lose (as opposed to today, when they win).

R Vote Share	50%	51%	52%	53%	54%	54.47%	49%	48%	47%	46%	45.53%
District 1	1	1	1	1	1	1	1	1	0	0	0
District 2	1	1	1	1	1	1	1	1	1	1	1
District 3	0	0	0	0	0	1	0	0	0	0	0
District 4	1	1	1	1	1	1	1	1	1	1	1
District 5	1	1	1	1	1	1	1	1	1	1	1
District 6	0	1	1	1	1	1	0	0	0	0	0
District 7	1	1	1	1	1	1	1	0	0	0	0
District 8	0	0	0	0	1	1	0	0	0	0	0
District 9	1	1	1	1	1	1	1	1	0	0	0
District 10	0	0	0	1	1	1	0	0	0	0	0
District 11	0	0	0	0	0	0	0	0	0	0	0
District 12	0	0	0	0	0	0	0	0	0	0	0
District 13	1	1	1	1	1	1	1	1	1	1	0
# R Districts	7	8	8	9	10	11	7	6	4	4	3
Eff. Gap	-0.039	-0.095	-0.075	-0.132	-0.189	-0.257	-0.058	-0.002	0.132	0.113	0.18

9. At the same time, as Republicans' vote shares fall, the map begins to work against them. At 47 percent statewide, they win only four seats, and at 45.53 percent – the inverse of 2010 – they win only three seats, suffering a .18 efficiency gap.

10. While Plaintiffs may conjecture that the “intent” prong of their rest would provide a safe harbor, that would be fact specific. A Republican legislature (or legislator identified by plaintiffs) might note that the Republican vote share has only fallen below 48 percent once in the past 28 years, conclude that it is unlikely to waste net Republican votes, and decide that this map would be actually a relatively good deal for them. Whether a cause of action exists would then depend on the trial court's determination of intent, and the vagaries of the national environment during the first year.

11. Turning to the Common Cause case, Dr. Chen here utilizes all of his plans from simulation set 1 and simulation set 2. Assuming *arguendo* that they represent a randomized sample of fairly drawn districts, they give us a sense of what would occur to plaintiffs if North Carolina were to draw a map that complied with the standard sought by plaintiffs.

12. I aggregated the districts using the files provided by Dr. Chen, and looked at the results for plaintiffs in the various redrawn districts. Under simulation set 1, using all 20 races as the metric for district competition:

a) Plaintiff 1 (Hall) ends up with a more heavily Republican district in 999 of 1000 simulations. His redrawn districts never lean Republican outright, but he lives in a district that currently elects a Democrat.

b) Plaintiff 2 (Berger) ends up with a more heavily Republican district in 18 simulations. The district would lean Republican in 64 of them.

- c) Plaintiff 3 (the Taft plaintiffs) end up in a more Republican district in 16 simulations. The district would lean Republican in 215 of them.
- d) Plaintiff 4 (Bordsen) ends up in a more heavily Republican district in 900 simulations. Her redrawn district leans Republican in 35 simulations, and she lives in a district that currently elects a Democrat.
- e) Plaintiff 5 (Lurie) ends up ends up in a more heavily Republican district in 976 simulations. His redrawn district leans Republican in 10 simulations, and he lives in a district that currently elects a Democrat.
- f) Plaintiff 6 (Freeman) ends up with a more heavily Republican district in 572 simulations. The district would lean Republican in 787 of them.
- g) Plaintiff 7 (Morgan) ends up with a more heavily Republican district in 214 simulations. The district would lean Republican in 345 of them.
- h) Plaintiff 8 (Boylan) ends up with a more heavily Republican district in 275 simulations. The district would lean Republican in 582 of them.
- i) Plaintiff 9 (Brewer) ends up with a more heavily Republican district in 14 simulations. The district would lean Republican in 46 of them.
- j) Plaintiff 10 (McNeil) ends up with a more heavily Republican district in 50 simulations. The district would lean Republican in 169 of them.
- k) Plaintiff 11 (Wolf) ends up with a more heavily Republican district in 30 simulations. The district would lean Republican in 999 of them.
- l) Plaintiff 12 (Byrd) ends up with a more heavily Republican district in no simulations, but the district would also lean Republican in all of them.

m) Plaintiff 13 (Gresham) ends up ends up in a more heavily Republican district in 1000 simulations. His redrawn district leans Republican in 57 simulations, and he lives in a district that currently elects a Democrat.

n) Plaintiff 14 (Walker) ends up with a more heavily Republican district in 57 simulations. The district would lean Republican in 137 simulations.

13. Under simulation set 1, using Hoffeller's metric as the metric for district competition:

a) Plaintiff 1 (Hall) ends up with a more heavily Republican district in 999 of 1000 simulations. His redrawn districts lean a Republican in 2 of the districts, but he lives in a district that already elects a Democrat.

b) Plaintiff 2 (Berger) ends up with a more heavily Republican district in 14 simulations. The district would lean Republican in 118 of them.

c) Plaintiff 3 (the Taft plaintiffs) end up in a more Republican district in 12 simulations. The district would lean Republican in 367 of them.

d) Plaintiff 4 (Bordsen) ends up in a more heavily Republican district in 829 simulations. Her redrawn district leans Republican in 67 simulations, but she lives in a district that presently elects a Democrat.

e) Plaintiff 5 (Lurie) ends up ends up in a more heavily Republican district in 959 simulations. His redrawn district leans Republican in 46 simulations, but he lives in a district that presently elects a Democrat.

f) Plaintiff 6 (Freeman) ends up with a more heavily Republican district in 575 simulations. The district would lean Republican in 851 of them.

g) Plaintiff 7 (Morgan) ends up with a more heavily Republican district in 232 simulations. The district would lean Republican in 452 of them.

h) Plaintiff 8 (Boylan) ends up with a more heavily Republican district in 235 simulations. The district would lean Republican in 786 of them.

i) Plaintiff 9 (Brewer) ends up with a more heavily Republican district in 11 simulations. The district would lean Republican in 147 of them.

j) Plaintiff 10 (McNeil) ends up with a more heavily Republican district in 41 simulations. The district would lean Republican in 359 of them.

k) Plaintiff 11 (Wolf) ends up with a more heavily Republican district in 30 simulations. The district would lean Republican in 1000 of them.

l) Plaintiff 12 (Byrd) ends up with a more heavily Republican district in 0 simulations. The district would lean Republican in all of them.

m) Plaintiff 13 (Gresham) ends up ends up in a more heavily Republican district in 1000 simulations. His redrawn district leans Republican in 122 simulations, but he lives in a district that presently elects a Democrat.

n) Plaintiff 14 (Walker) ends up with a more heavily Republican district in 49 simulations. The district would lean Republican in 319 simulations.

14. As to simulation set 2, I was unable to reproduce Dr. Chen's outcomes for using all 20 races because I did not have maps with the requires "rep.txt" files, and time constraints prohibited me from producing them myself. I was, however, able to reproduce the outcomes using Dr. Hofeller's metric.

a) Plaintiff 1 (Hall) ends up with a more heavily Republican district in 998 of 1000 simulations. His redrawn district leans Republican in one election, but he lives in a district that currently elects a Democrat.

b) Plaintiff 2 (Berger) ends up with a more heavily Republican district in 0 simulations. The district would lean Republican in 24 of them.

c) Plaintiff 3 (the Taft plaintiffs) end up in a more Republican district in 62 simulations. The district would lean Republican in 658 of them.

d) Plaintiff 4 (Bordsen) ends up in a more heavily Republican district in 770 simulations. Her redrawn district leans Republican in 54 simulations, and she lives in a district that currently elects a Democrat.

e) Plaintiff 5 (Lurie) ends up ends up in a more heavily Republican district in 864 simulations. His redrawn district leans Republican in 31 simulations, and he lives in a district that currently elects a Democrat.

f) Plaintiff 6 (Freeman) ends up with a more heavily Republican district in 394 simulations. The district would lean Republican in 832 of them.

g) Plaintiff 7 (Morgan) ends up with a more heavily Republican district in 210 simulations. The district would lean Republican in 483 of them.

h) Plaintiff 8 (Boylan) ends up with a more heavily Republican district in 486 simulations. The district would lean Republican in 979 of them.

i) Plaintiff 9 (Brewer) ends up with a more heavily Republican district in 0 simulations. The district would lean Republican in 979 of them.

j) Plaintiff 10 (McNeil) ends up with a more heavily Republican district in 10 simulations. The district would lean Republican in 250 of them.

k) Plaintiff 11 (Wolf) ends up with a more heavily Republican district in 15 simulations. The district would lean Republican in all of them.

l) Plaintiff 12 (Byrd) ends up with a more heavily Republican district in no simulations, but the district would also lean Republican in all of them.

m) Plaintiff 13 (Gresham) ends up ends up in a more heavily Republican district in 1000 simulations. His redrawn district leans Republican in 156 simulations, and he lives in a district that currently elects a Democrat.

n) Plaintiff 14 (Walker) ends up with a more heavily Republican district in 153 simulations. The district would lean Republican in 403 simulations.

15. Finally, despite the claim that the North Carolina map would necessarily entrench a 10-3 Republican delegation, I note that this year we see as many as four North Carolina districts that are competitive. This illustrates the disjunction between the theoretical underpinning of the efficiency gap – that mapmakers attempt to “waste” votes – and the fact that those votes are not yet cast. It is difficult to predict how political coalitions will play out over the course of a decade; this is why the original McGhee article concludes that gerrymanders tend to fade over time. *See* Eric McGhee, “Measuring Partisan Bias in Single-Member District Electoral Systems,” *Legislative Studies Quarterly* (Feb. 2014), 74.

- a. RealClearPolitics currently rates the 9th Congressional District a tossup. InsideElections currently rates the 9th Congressional District a tossup, with a Republican tilt. Cook Political currently rates the 9th Congressional District as Leans Republican.
- b. RealClearPolitics currently rates the 13th Congressional District as Likely Republican, although it will likely move to Leans Republican pending the

results of the special election in Ohio's 12th Congressional District.

InsideElections currently rates the 13th Congressional District as likely Republican. Cook Political currently rates the 13th Congressional District as Leans Republican.

- c. Cook Political also rates the 2nd and 8th Congressional Districts as competitive, rating them "Likely Republican."

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States that the foregoing statements are true and correct.

This the 7th day of August, 2018.



Sean P. Trende