

STATE OF NORTH CAROLINA
COUNTY OF WAKE

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION

COMMON CAUSE; *et al.*

Plaintiffs,

v.

DAVID R. LEWIS, *et al.*

Defendants.

Case No. 18 CVS 014001

MOTION TO EXCLUDE FILES AND MATERIALS PRODUCED BY

STEPHANIE LIZON

Legislative Defendants respectfully move the Court to exclude all files allegedly recovered from storage devices produced by Stephanie Lizon (the “Lizon Files¹”) that she represents were Dr. Thomas Hofeller’s files, including particularly the rebuttal reports of Drs. Jowei Chen and Christopher Cooper to the extent they contain completely new analysis of the Lizon Files.

First, this material should be stricken—and all evidence produced by Ms. Lizon should be excluded from evidence—given that the materials are the tainted fruit from a poisonous tree. Plaintiffs obtained this material through surreptitious discussions with Ms. Lizon, who apparently tortiously converted the Lizon Files. As a result of this dubious conduct, Plaintiffs obtained thousands of privileged documents. What’s worse, Legislative Defendants recently learned that many of the Lizon Files contain a “Last Modified” or “Last Written” date *after* Dr. Hofeller died,

¹ Legislative Defendants refer to the files produced by Ms. Lizon as the “Lizon Files” because they can no longer be certain that these files were the same files in Dr. Hofeller’s possession prior to his death on August 16, 2018.

rendering their authenticity impossible to establish—and raising new questions about Ms. Lizon’s and Plaintiffs’ conduct. Compounding the misconduct in this case is the fact that Plaintiffs have refused to provide chain-of-custody information for the materials. That refusal is entirely at odds with industry standards for document verification. None of the Lizon Files should be admitted in this case.

But, the merits of that dispute aside, the Court should strike the new Lizon Files, and related analysis, from Plaintiffs’ rebuttal reports because the material is not within the scope of rebuttal expert testimony. Instead, it represents a bad faith attempt by Plaintiffs to “sandbag” Legislative Defendants—one that grossly violates due process and fundamental fairness. Although Plaintiffs had the Lizon Files nearly four weeks before their expert reports were due, Plaintiffs waited to present that information until their rebuttal expert reports. Meanwhile, as Legislative Defendants prepared their responsive expert reports, Plaintiffs refused to allow the other parties in this case the opportunity to inspect or copy all of the Lizon Files. Then, after the Court ordered the documents to be produced and *after* Legislative Defendants’ reports were served, Plaintiffs served a combined 111 pages of expert opinion focused solely on dozens of files produced by Ms. Lizon.

This violates the Court’s Case Management Order. The expert reports relying on the Lizon Files are not *rebuttal* reports under any conceivable definition, and they are highly prejudicial. Plaintiffs’ experts present an entirely new playing field that none of Legislative Defendants’ experts even knew existed when they prepared their reports. Further, Plaintiffs’ reports contain inaccuracies and were prepared by experts unqualified in the requisite specialties to render the relevant opinions. The adversarial process needed to vet their highly speculative and uninformed opinions cannot play out when Plaintiffs only revealed this information at the very end of the expert discovery process.

Due process requires that Legislative Defendants have the opportunity to respond in kind to provide expert analysis to rebut expert analysis. But, because Plaintiffs demanded that this case proceed to trial on a highly expedited basis, there is no time for more expert discovery unless the Court extends the time for expert discovery and postpones the trial accordingly. The Court therefore has no option but to exclude the rebuttal reports, any testimony founded on them, and the accompanying files from evidence in this case. If the Court chooses to admit them, then it should make time for the opinions to be vetted. Plaintiffs chose this course of action; they should be made to wait for trial on the merits (assuming the Court allows them to continue pressing their claims).

FACTUAL BACKGROUND

A. The Case Management Orders

On February 15, 2019, the parties to this case filed a stipulated proposed case management order, which the Court adopted on February 22, 2019 (“CMO”). The Court issued amendments to the CMO on March 25, 2019, May 1, 2019, and May 22.

Pursuant to the CMO as amended, Plaintiffs’ expert reports were due on April 8, 2019. Legislative Defendants’ expert reports were due on April 30, 2019, with the opportunity for supplementation on May 7, 2019. Plaintiffs’ rebuttal expert reports were due on June 7, 2019. As a result, as of May 7, 2019, Legislative Defendants’ opportunity for expert opinion was complete, and all that remained was the opportunity for Plaintiffs to serve rebuttal reports.

B. The Lizon Files

As these reports were being prepared and exchanged, a separate set of events was unfolding. On March 13, Plaintiffs’ received (according to their representations) a package of four external hard drives and eighteen thumb drives from Stephanie Lizon, daughter of the late

redistricting expert, Dr. Thomas Hofeller. Dr. Hofeller passed away on August 16, 2018, and the files Ms. Lizon provided were purportedly his redistricting files, including hundreds or even thousands of privileged documents. The troubling circumstances under which Plaintiffs came into possession of these files is the subject of Legislative Defendants' June 17, 2019 *Response to Motion to Direction* (the "Response").

Ms. Lizon testified at her deposition that she opened Dr. Hofeller's computer and accessed the files after he died, and that appears to be an understatement. A large number of files have "Last Modified" or "Last Written" dates after Dr. Hofeller's death, including over 150 files modified only days after his death (August 25, 2018). Affidavit of Michael Kunkel, attached as Exhibit 7 at ¶¶10-11.

The circumstances surrounding Plaintiffs' acquisition of these files remains to some extent a mystery, but what Legislative Defendants have been able to discern is set forth in their Response. As noted there, Legislative Defendants have deep concerns about the circumstances of Plaintiffs having obtained from Ms. Lizon documents possibly tortiously converted (at best) from third parties and privileged information.

Nor did Plaintiffs themselves timely turn over the Lizon Files. North Carolina Rule of Civil Procedure 45(d1) provides that a party obtaining materials in response to a subpoena "shall, within five business days after receipt of [the] material...provide all other parties a reasonable opportunity to copy and inspect such material..." Plaintiffs, however, treated this command—"shall"—as optional. They declined to make all of the materials available, contending that some documents, chosen solely by them, should not be turned over to the other parties in this case.

After meet-and-confer efforts failed, the parties took the dispute to the Court, and it was not resolved until May 1, 2019, after Legislative Defendants had already served initial versions of

their expert reports. The Court found that Plaintiffs' choice not to allow inspection violated "the plain language of Rule 45(d1)" and ordered that "[p]laintiffs must provide all other parties a reasonable opportunity to copy and inspect the hard drives *in their entirety as originally received...*" 5/1/2019 Order at 2. Legislative Defendants did not receive the materials until May 6—nearly two months after Plaintiffs received them—and, due to their size, an index was not available until May 15, and no review of documents could occur until June 1.

By that time, Legislative Defendants had already served their expert reports. Dr. Hofeller's files were not available for Legislative Defendants' experts to use and Legislative Defendants had already served their initial reports prior to the Court's enforcement of Legislative Defendants' rights to all of the materials.

C. The Lizon Files in Plaintiffs' "Rebuttal" Reports

On June 7, 2019, Plaintiffs served their rebuttal reports. Two of those, the reports of Dr. Jowei Chen and Dr. Christopher Cooper, relied heavily on new data and new analysis purportedly obtained from Dr. Hofeller's files that is outside the scope of legitimate rebuttal. Dr. Chen's rebuttal report is 185 pages long, and approximately 76 pages of that are devoted to an analysis of files from Dr. Hofeller. Dr. Cooper's rebuttal report is 52 pages, and approximately 35 pages of that are devoted to an analysis of Dr. Hofeller's files.

1. Dr. Chen's Rebuttal Report.

In his rebuttal report (and *only* in his rebuttal report), Dr. Chen presents 76 pages of new analysis into Dr. Hofeller's files, including various "backup folders that came from Dr. Hofeller's hard drive," which consist of nine backup folders hosted on the redistricting software program

“Maptitude,” *See* Deposition of Dr. Jowei Chen² (“Chen Dep.”) at 324:2–25, 325:17–20, 327:3–14, and “a pretty lengthy number of Microsoft Excel files and [Chen] believe[d] one Microsoft Word documents,” Chen Dep. 348:5–7. He did all of this purportedly to “rebut” specific statements made in the expert reports of Dr. M.V. Hood, III and Dr. Janet Thornton that the 2017 Plans complied with the 2017 adopted criteria. (Chen Report³ at 2, citing Hood Report⁴ at 2-3, 9, and Thornton Report⁵ at ¶ 33-56). He “rebut[s]” these statements by arguing that the enacted 2017 Plans did not comply with the adopted criteria because (1) Dr. Hofeller supposedly drafted plans on his personal computer before the criteria were adopted, and (2) Dr. Hofeller allegedly had access to racial demographic data on his personal computer when he was supposedly working on drafts of plans.

In no way, however, is the 76-pages of new analysis in his rebuttal an actual rebuttal to any analysis in the reports of Drs. Hood and Thornton. Dr. Hood offered opinions only on the 2017 Plans’ compliance with certain adopted criteria governing district compactness, reducing VTD splits, protecting incumbents, and the county grouping and traversal rules. (Hood Rep. 9). Dr. Thornton’s criticism of Dr. Chen’s analysis was similarly focused on the fact that Dr. Chen’s simulation algorithm was built using *different* criteria for compactness, VTD and municipality splits, and the manner in which Dr. Chen attempted to implement incumbency protection. (Thornton Rep. ¶ 37-49). Neither Dr. Thornton nor Dr. Hood offered an expert opinion in this case as to whether racial data were considered in crafting the plans. And neither Dr. Thornton nor Dr. Hood opined on whether the 2017 Plans were drafted before or after the criteria were announced

² Excerpts of Dr. Chen’s Deposition can be found at Exhibit 1 attached to this Motion.

³ Excerpts of Dr. Chen’s report can be found at Exhibit 2 attached to this Motion.

⁴ Excerpts of Dr. Hood’s report can be found at Exhibit 3 attached to this Motion.

⁵ Excerpts of Dr. Thornton’s report can be found at Exhibit 4 attached to this Motion.

to which their expert reports were directed. Their reports cannot, therefore, serve as a springboard for Dr. Chen to smuggle in 76 pages of new analysis as “rebuttal.”

Moreover, Dr. Chen’s new analysis was premised on an amateurish attempt to present cherry-picked data he was unqualified to analyze, as though it was a forensic analysis of Dr. Hofeller’s files to deduce what was on Dr. Hofeller’s computer screen (and, thus, in his mind) when he was allegedly tinkering with draft plans on his personal computer. For instance, Dr. Chen purported to be able to discern what “Dr. Hofeller had up on the screen when he last was working with this particular Maptitude folder.” Chen Dep. 339:5–7. But this is impossible. Dr. Chen had no way to know what Dr. Hofeller was doing up to, and until, he was “last” working with the specific folder. Dr. Chen conceded that many other folders existed, including “previous backup versions,” on Dr. Hofeller’s computer that might shed light on Dr. Hofeller’s activities. Chen Dep. 340:13–21. Dr. Chen “did not look at every draft map from Dr. Hofeller’s hard drive to be able to identify which was the...first draft map”; he “looked at some maps,” not “at every single Maptitude backup.” Chen Dep. 341:22–342:1. Dr. Chen opined that “[t]here are other maps in this same sort of series” and “may well be earlier versions of” the draft maps he reviewed. Chen Dep. 341:4–10. Dr. Chen did not look for any such versions and, of course, did not find or review any.

To the contrary, Plaintiffs’ counsel cherry-picked which files Chen would receive. Chen Dep. 311:22–312:2; Chen Dep. 325:2–9. As to the Lizon Files, Dr. Chen “didn’t do any research of my own aside from the information I was given by plaintiffs’ counsel....” Chen Dep. 349:14–17. Dr. Chen did not have access to the hard drives or devices on which the documents were received, “no ability to myself go and access them or download any files from them,” and he received no files except from Plaintiffs’ data vendor. Chen Dep. 314:12–318:13. Dr. Chen did not know whether he received all files produced by Ms. Lizon or merely a subset of them, and

Plaintiffs' counsel observed on the record that he had only been provided a subset. Chen Dep. 322:21–323:5. As Plaintiffs' counsel explained, “He doesn't know what he doesn't know.” Chen Dep. 323:3–5. And what he does not know includes which files were excluded from his review—and why. Indeed, it was unclear to Dr. Chen exactly what he was looking at, whether, for example, he was reviewing files from Dr. Hofeller's “personal” computer or from an official work computer. Chen Dep. 311:7–18. Dr. Chen did not obtain a chain of custody from Plaintiffs' counsel (or even know what that is). Chen Dep. 358:5–25.

Many of the files Dr. Chen examined were maps generated by the map-drawing software Maptitude. Dr. Chen, however, does not own a Maptitude license, Chen Dep. 319:17–24, and does “not exactly remember” when he last had Maptitude on his computer; “It would have been more than a few years ago.” Chen Dep. 322:3–6. He has never drawn a redistricting map on Maptitude, and his experience is limited to trying “to edit a districting plan or some other kind of map.” Chen Dep. 321:19–23. He “might have edited some shape files, something along those lines.” Chen Dep. 321:22–24.

To work with the software, Dr. Chen relied on Plaintiffs' non-testifying expert, Blake Esselstyn, who executed the Maptitude activities germane to Dr. Chen's rebuttal report. Dr. Esselstyn, in turn, “does a lot of stuff that has nothing to do with redistricting.” Chen Dep. 320:13–15. Dr. Chen “think[s] he's an urban planner or city planning, something like that, architecture, something along those lines,” but he is sure it is “something that's unrelated to redistricting.” Chen Dep. 320:10–19. Dr. Chen accessed Dr. Esselstyn's computer remotely in “a program called Google Hangouts,” where “basically I would look at Dr. Esselstyn's computer screen, and I would tell him to open this file, scroll over here, click on that, things of that nature.” Chen Dep. 321:3–

15. Dr. Chen also “instructed Dr. Esselstyn to” take “screenshots” of what they saw on Maptitude. Chen Dep. 329:14–17; Chen Dep. 329:23–330:2.

Together, this pair worked in the native file on a Windows platform, opening files and looking at metadata fields. Chen Dep. 326:14–22. Based on his purported “knowledge of just generally how GIS software works and knowing that these folders came from Dr. Hofeller’s hard drive,” Dr. Chen concluded that to reverse engineer what Dr. Hofeller was doing in creating the files—but not in creating *other* files Dr. Chen did *not* look at—became “just a matter of putting two and two together.” Chen Dep. 330:25:331:10. Dr. Chen, however, conceded that he has no background in computer forensics, has no certification in that field, and was not retained to perform any forensic analysis. Chen Dep. 313:9–20.

Dr. Chen formed an opinion about the “data that Dr. Hofeller possessed...in these Maptitude files or Maptitude folders,” Chen Dep. 312: 18–22, but, as noted, conceded he had no way to know at what point in the process Dr. Hofeller accessed the information. Dr. Chen also formed the opinion that Dr. Hofeller had “already completed” the 2017 plans “by late June” 2017. Chen Dep. 312:6–12. But he used statewide percentages for this conclusion. Chen Dep. 365:2–11. Dr. Chen also conceded he had no information about whether Senator Hise or other legislators had knowledge of (what Dr. Chen believed to be) Dr. Hofeller’s work. Chen Dep. 368:11–19. Dr. Chen referenced statements in his report made in the *Covington v. North Carolina* litigation because “Plaintiffs’ counsel directed me to” the information. Chen Dep. 369:8–12.

2. Dr. Cooper's Rebuttal Report

Dr. Cooper's approach to the Lizon Files resembles Dr. Chen's in all material respects. Dr. Cooper presents his report as a "rebuttal"⁶ to statements in Drs. Hood's and Dr. Doug Johnson's reports explaining how North Carolina's county-grouping rules constrain the ability of a map-maker to use partisanship. (Cooper Rebuttal Report. 3). Like Dr. Chen, however, Dr. Cooper fails to respond to the substantive analysis that Drs. Hood and Johnson present. To the contrary, Dr. Cooper simply uses those statements as a launchpad to introduce extensive new analysis into the fact that Dr. Hofeller allegedly considered political data when working on draft maps on his personal computer. The relevant question addressed by Drs. Hood and Johnson's analysis was not whether partisanship was used, but rather the degree to which partisanship could practically affect map-drawing given the constraints imposed under North Carolina law.

Dr. Cooper's analysis is similarly amateurish in nature. Dr. Cooper does not use Maptitude in his professional work, does not have the program installed on any computer he uses, has never received any training on the program, and has never even used Maptitude. *See* Deposition of Dr. Christopher Cooper⁷ "Cooper Dep." at 31:15-32:11. Dr. Cooper does not even know what Maptitude files are called, and he only learned how Maptitude saves files from watching Plaintiffs' non-testifying expert, the same Blake Esselstyn who performed basic Maptitude functions for Dr. Chen. Cooper Dep. 33:25-34:25.

Nevertheless, by performing operations alongside Dr. Esselstyn, Dr. Cooper arrived at the view that the "Hofeller files pretty clearly indicate that he had partisan knowledge when he created

⁶ Excerpts of Dr. Cooper's rebuttal report can be found at Exhibit 5 attached to this Motion.

⁷ Excerpts of Dr. Cooper's Deposition can be found at Exhibit 6 attached to this Motion.

the maps.” Cooper Dep. 154:18-20. Dr. Esselstyn “stood there in front of [Dr. Cooper] and pulled up...files,” and Dr. Cooper watched. Cooper Dep. 155:8-11. Like Dr. Chen, Dr. Cooper made a host of inferences based on “the last thing [Dr. Hofeller] had saved right before [closing the file],” which is “what appears in the report.” Cooper Dep. 196:6-18. And like Dr. Chen, Dr. Cooper can say nothing of what happened until that last moment before saving because “was not in the room with him.” Cooper Dep. 196:22. There was no “Dear Diary section” to allow anyone to “give...an indication as to why he had prepared these maps.” Cooper Dep. 215:16-216:3.

Like Dr. Chen, Dr. Cooper relied on the maps he received from Plaintiffs’ counsel “about three weeks before [he] submitted this” rebuttal report.” Cooper Dep. 197:10–19. What did he understand about the source of the maps or their history and context? “Not much.” Cooper Dep. 197:25-198:2.

Like Dr. Chen, Dr. Cooper’s methodology consisted of instructing Dr. Esselstyn to perform various functions and then to take screen shots of what they saw. Cooper Dep. 198:15-201:25. Dr. Esselstyn “was clicking as [Dr. Cooper] was standing.” Cooper Dep. 205:22-24.

Dr. Cooper also made inferences about the files from their names. For example, Dr. Cooper concluded that files ostensibly saved on July 5, 2017, and August 7, 2017, with the term “J-24” in the title Dr. Hofeller assigned them, were backups from files of June 24 because it “[s]tands to reason that J would be June.” Cooper Dep. 208:21-209:2; Cooper Dep. 202:18-203:14; Cooper Dep. 208:21-210:21.

ARGUMENT

I. The Lizon Files Were Improperly Obtained and Should Be Excluded in Full

As discussed in Legislative Defendants’ response to Plaintiffs’ motion for direction (filed June 17, 2019), Plaintiffs obtained Dr. Hofeller’s files after giving legal advice to an

unrepresented, potentially adverse third party who had a transparently defective claim of title to them. The documents contained potentially thousands of privileged items, and Plaintiffs were disingenuous at best in representing how they came upon these materials.

And there is even more cause for concern than what Legislative Defendants were aware of a mere five days ago. In particular, the chain of custody of the Hofeller documents is in doubt, as is their authenticity. Dr. Hofeller died on August 16, 2018. But many files Ms. Lizon produced to Plaintiffs were accessed and possibly altered after that date. A forensic specialist at Setec Security Technologies, Inc., employed as outside litigation-support specialist to Legislative Defendants in this case, reviewed metadata from the files and identified information he found “unusual.”⁸ *See* Exhibit 7, Affidavit of Michael Kunkel “Kunkel Aff.” ¶ 9. Many files on Dr. Hofeller’s computer were accessed and possibly changed after he died, including “150 files with a ‘Last Written’ timestamp on August 25, 2018,” and “[n]umerous forensic images contain[ing] files and folders with ‘Entry Modified’ timestamps on various dates between August 25, 2018, and December 24, 2018.” Kunkel Aff. ¶¶ 11, 13. This means that many documents on Dr. Hofeller’s files were tampered with and potentially changed after he died.

Equally concerning is the fact that the “recycle bin” on the drive also has an “entry modified” time stamp on August 25, 2018, nine days after Dr. Hofeller passed away. Kunkel Aff. ¶ 15. This means that, between the time Dr. Hofeller last accessed his files and today, someone

⁸ Any claim by Plaintiffs that this information is prejudicial to them in some way only underscores the reasons for excluding the Hofeller files. Had they been timely disclosed, this information could be handled within the CMO. Having violated the CMO, Plaintiffs cannot seriously contend that expert evaluation of their filings is unfair or prejudicial. *See* § II, below.

apparently deleted files from Dr. Hofeller's hard drives. There is no way to know the contents of the deleted documents. *Id.*

It is unknown who was accessing Dr. Hofeller's computer between August and December 2018, and that cannot be known from the metadata. Tellingly, however, one of the files accessed is called "Trusts-Wills-Powers." Kunkel Aff. ¶ 13. As described in Legislative Defendants' brief filed June 17, 2019, Ms. Lizon was accused of wrongdoing against her mother, Kathleen Hofeller, wife of Dr. Hofeller, and these accusations were at issue in a competency proceeding. Another file accessed during this time frame is called "Dales Papers." Kunkel Aff. ¶ 13. Dale Oldham is now—over the vigorous objection of Plaintiffs—seeking to intervene in this case to protect property rights, for which Plaintiffs have shown no regard.

Of further alarm is Plaintiffs' inexplicable refusal to produce a chain of custody accounting for the possession of the digital media from August 16, 2018, through March 20, 2019, the last date Plaintiffs' counsel's electronic discovery vendor imaged the media. Kunkel Aff. ¶ 16. For this reason, Legislative Defendants' forensic expert is "unable to assess who accessed, modified, copied" the materials and "what occurred to the files" in the several month period between the time Dr. Hofeller died and when the files were uploaded on Plaintiffs' vendor's computer system. Kunkel Aff. ¶ 16.

Legislative Defendants' computer forensic examiner has never even "heard of a firm turning down a request for chain of custody documentation." Kunkel Aff. ¶ 17. That is not for lack of experience. The examiner has 15 years of experience in the field; has worked with government entities, local, state, and federal law enforcement agencies, private attorneys, and corporations; and "has been involved in over 1,000 computer forensic investigations and electronic discovery engagements surrounding theft of intellectual property, trade secret misappropriation, financial

fraud, email and Internet abuse, employee disputes, copyright infringement, industrial espionage, disputed dismissals, software code reviews, spoliation, and large data set management among other engagements.” Kunkel Aff. ¶ 2. Plaintiffs are failing to comply with the “industry standard for this information.” Kunkel Aff. ¶ 17. Their conduct is not just odd; it is unheard of.

Legislative Defendants have gone out of their way to assume the best intentions of Plaintiffs and their counsel. *See* Legislative Defendants’ Response to Plaintiffs’ Motion for Clarification Pursuant to Rule 45 at 4 (April 11, 2019) (“No one need doubt the good intentions of Plaintiffs’ counsel....”). Without explaining these gaping discrepancies, Plaintiffs cannot lay foundation or establish authenticity for these files. And all of this is further evidence in support of Legislative Defendants concerns that the property was tortiously or otherwise converted and should be excluded in full.

As explained in Legislative Defendants’ prior brief, the minimum sanction in a case like this is exclusion of the improperly obtained, and improperly handled, materials. *See Fayemi v. Hambrecht & Quist, Inc.*, 174 F.R.D. 319, 326 (S.D.N.Y. 1997). Legislative Defendants incorporate their prior arguments on these points by reference here. For reasons stated there, the Court should exclude from evidence *all* files produced in response to Plaintiffs’ subpoena to Ms. Lizon.

II. The Experts’ Discussion of Hofeller Materials Exceeds the Scope of Proper Rebuttal Reports and Prejudices Legislative Defendants

Moreover, the Court should exclude the portions of Plaintiffs’ rebuttal reports that rely on the Lizon Files. Their extensive discussion of this information is not properly rebuttal material and violates the CMO deadlines for disclosing new expert opinion. The information should also be

excluded because the expert opinion does not meet the threshold requirements of reliability that are the predicate to admissibility.

A. Discussion of the Lizon Files Exceeds the Scope of Rebuttal Reports

In setting deadlines for Plaintiffs' expert reports, Defendants' expert reports, and Plaintiffs' rebuttal reports, the CMO "established a system for exchanging expert reports that placed a full up-front disclosure duty upon the party with the burden of proof on a given issue." *Oracle Am., Inc. v. Google Inc.*, 2011 WL 5572835, at *3 (N.D. Cal. Nov. 15, 2011). "This system contemplated a narrowing of issues through the service of opening, then opposition, then reply reports (if at all), similar to the order of proof at trial or the examination of a particular witness at trial." *Id.* This well-known system "was designed to forestall 'sandbagging' by a party with the burden of proof who wishes to save its best points for reply, when it will have the last word, a common litigation tactic." *Id.*; see also *Boles v. United States*, 2015 WL 1508857, at *3–9 (M.D.N.C. Apr. 1, 2015) (striking four reports as exceeding the scope of rebuttal reports); *Insight Health Corp. v. Marquis Diagnostic Imaging of N. Carolina, LLC*, 2017 WL 806432, at *16 (N.C. Super. Feb. 24, 2017) (quoting *Boles* for the well-known limit on rebuttal reports).

In relying extensively on the Lizon Files, Plaintiffs' rebuttal reports violate the established rule that such reports "may not advance new arguments or new evidence outside the scope of the opposing expert's testimony." *Bentley v. Highlands Hosp. Corp.*, 2016 WL 5867496, at *5 (E.D. Ky. Oct. 6, 2016) (quotations omitted, collecting cases). Plaintiffs introduced a combined 111 pages of expert analysis and dozens of files that were not produced in the initial reports and that were unavailable to Legislative Defendants when they prepared and served their reports. Because "the deadline for such disclosures" of new expert analysis has passed, "the report[s] [are] untimely." *Id.* at *5. Legislative Defendants currently have no way to adequately respond to this

surprise, and they could not conceivably have anticipated entirely new opinions based on entirely new underlying data—especially when Plaintiffs themselves were responsible in part for the delay.

Although these purported rebuttal reports mention assertions in the Legislative Defendants' expert reports, *see* Cooper Rebuttal Rep. 3, Chen Rebuttal Rep.⁹ 1, they do not engage with those reports in a meaningful way and instead use these references as a launching pad to take their analyses in an entirely different direction. “[S]ubstance triumphs over form,” and the Court should “look past the party’s label and construe” these reports for what they are: entirely new expert reports. *Bentley*, 2016 WL 5867496, at *5; *Vu v. McNeil–PPC, Inc.*, 2010 WL 2179882 (C.D. Cal. May 7, 2010) (finding that such a broad meaning would all but nullify the distinction between an initial “affirmative expert” and a “rebuttal expert”). Thus, even though the rebuttals purport to respond to points made in Legislative Defendants’ reports, it was beyond the scope of rebuttal testimony to respond with an enormous body of entirely new evidence—tangentially related to the 2017 enacted plans and unavailable to Legislative Defendants’ experts.

This violation of the CMO, alone justifies precluding Plaintiffs’ rebuttal reports—and any testimony in reliance on them—from evidence. *See Allen Smith Inv. Properties, LLC v. Barbary Properties, LLC*, 2013 WL 57048, at *11 (N.C. Super. Jan. 3, 2013) (striking evidence that was untimely under a case management order). But, even if the Court believes an inquiry into prejudice or justification is appropriate, *see Calvert v. Ellis*, 2014 WL 3897949, at *4 (D. Nev. Aug. 8, 2014), this is an egregious case of abuse and prejudice.

⁹ Excerpts from Dr. Chen’s rebuttal report can be found at Exhibit 8 attached to this Motion.

This was a self-evident tactic to flood the record with deeply flawed opinion by experts unqualified to give it and to circumvent the adversarial process that would expose those flaws. It was also an effort to score news headlines based on grossly misrepresented facts.

Plaintiffs had all Dr. Hofeller's files nearly four weeks before their reports were served. Had they provided opinions on those files earlier, Legislative Defendants could have responded. And that response would have been a problem for Plaintiffs. Their expert approach amounted to several people with generic computer skills bumbling through a program they barely knew (or did not know at all) on a Windows platform making guesses as to what one of the nation's most experienced experts was doing two years ago—based on incomplete and cherrypicked information. This could not withstand scrutiny when vetted by adversarial experts. (Nor should it even be admitted. *See* § I.B, below.) In a transparent effort to avoid that scrutiny, Plaintiffs withheld the evidence and gave it to their experts for their reply reports, allowing them to have the last word.

Indeed, the sheer quantity of new material and analysis proves that the new opinions are not rebuttal opinions. *See Calvert*, 2014 WL 3897949, at *10 (finding prejudice where the rebuttal report presented “entirely new methodology and opinions” and there was no practical ability to respond (quotations omitted)). Thus, even if the evidence were not available to Plaintiffs when they served their opening reports, these expert opinions would still not qualify as timely under the CMO. Dr. Chen and Dr. Cooper conducted their opening-report analysis on the 2017 enacted plans, presenting a combined 314 pages of expert opinion on those plans. Legislative Defendants responded in kind, analyzing the enacted plans under various social-science methodologies. To come back with an analysis of *different plans* is entirely unfair, especially when it is in hot dispute whether these plans are meaningfully related to the 2017 enacted plans, as explained below.

Worse, unless the Court departs from the CMO, it has no opportunity to remedy Plaintiffs' violation by means less severe than exclusion. To remedy the surprise, the Court must provide Legislative Defendants an opportunity for expert review of Dr. Chen's and Dr. Cooper's reports and the Lizon Files. These are complex expert analyses involving calculations requiring expert review; attorney arguments are insufficient. Moreover, one concern with their approach is that it relies on cherry-picked files provided by Plaintiffs' counsel. To vet whether these reports offer an incomplete picture, Legislative Defendants' experts must have time to survey the 75,000 files produced by Ms. Lizon to assess whether other files are relevant. They must, in turn, present that and other information in new reports.

Any prejudice Plaintiffs believe the exclusion prejudices is a problem of their own making. Plaintiffs demanded lightning-speed resolution of this case, demanding a trial immediately in a case they waited years to bring. By contrast, Legislative Defendants warned of "a scenario where claims in the case will not rise or fall on merits, but on the speed of discovery and production of expert reports and Plaintiffs' litigation gamesmanship." Statement of Position of Scheduling (filed Jan. 29, 2019). This concern has now materialized. The only option for the Court to admit this new evidence is to extend case deadlines to allow full adversarial review of the enormous volume of new material. This includes the trial date. If Plaintiffs or the Court are amenable to an extension of the trial, Legislative Defendants will be willing to reconsider their position on exclusion. If not, Dr. Chen's and Cooper's reports must be excluded.

B. Plaintiffs' Rebuttal Reports Fail To Meet the Threshold Requirements of Reliability

For expert testimony to be admissible, the expert must have "scientific, technical or other specialized knowledge" to "assist the trier of fact," the testimony must be "based upon sufficient

facts or data,” it must be “the product of reliable principles and methods,” and the witness must have applied the principles and methods reliably to the facts of the case.” N.C. R.C.P 702(a). This rule incorporates the *Daubert* standards under its federal counterpart. *State v. McGrady*, 368 N.C. 880, 888, 787 S.E.2d 1, 8 (2016). Plaintiffs’ rebuttal reports, to the extent they rely on the Lizon Files, fail under all the relevant criteria.

1. The Experts Lack the Requisite Specialization

Because Rule 702 “clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify,” *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589 (1993), the Court “must determine whether the witness is qualified as an expert in the subject area about which that individual intends to testify.” *Howerton v. Arai Helmet, Ltd.*, 358 N.C. 440, 461, 597 S.E.2d 674, 688 (2004).

Here, the Court’s duty can be discharged quite easily because Plaintiffs’ experts have effectively *disclaimed* the requisite level of expertise to conduct their analyses. Both analyses involve making elaborate inferences of Dr. Hofeller’s past work on the program Maptitude, but neither witness qualifies as an expert in Maptitude or in making forensic inferences about user’s prior work on the program. Dr. Cooper knows practically nothing about Maptitude. He had never even used it prior to preparing his rebuttal report, Cooper Dep. 31:15-32:11, and did not so much as know what Maptitude files are called or how they are saved, Cooper Dep. 33:25-34:25. Dr. Chen and does “not exactly remember” when he last had Maptitude on his computer and concedes “[i]t would have been more than a few years ago.” Chen Dep. 322:3–6. Dr. Chen has never drawn a redistricting map on Maptitude, and his experience is limited to trying “to edit a districting plan or some other kind of map.” Chen Dep. 321:19–23. He “might have edited some shape files, something along those lines.” Chen Dep. 321:22–24. That is woefully insufficient to opine on the

meaning of Maptitude files and to make forensic inferences regarding actions taken on Maptitude over two years ago. *See United States v. Welch*, 945 F.2d 1378, 1383 (7th Cir. 1991) (affirming exclusion of expert purporting to conduct forensic analysis who had never been qualified to testify on forensic matters and “was unfamiliar with the use of technological instruments” relevant to the inquiry). And, even if these purported experts had the requisite understanding of the Maptitude software that would not qualify them to render forensic opinions about its prior use. *Holloway v. Ameristar Casino St. Charles, Inc.*, 2009 WL 5169535, at *6 (E.D. Mo. Dec. 18, 2009) (concluding that expert knowledgeable in video technology could not be certified as an expert in “issues of video editing or tampering”); *Graves v. City of Waterloo, Iowa*, 2011 WL 4007324, at *5 (N.D. Iowa Sept. 8, 2011) (“While Knapp is an experienced videographer, editor, and producer of videos, he has no training, experience, or expertise in analyzing aberrations found in a video to determine whether they are a noise or compression anomaly, a reflection, or have some other origin.”); *United States v. Jones*, 77 F.3d 491 (table), 1996 WL 68236 (9th Cir. Feb. 16, 1996) (finding an audio engineer with professional experience in recording and editing music, but with no formal training in forensic tape analysis, was not qualified to testify as an expert that one of the surveillance tapes had been edited); Chen Dep. 313:9–20 (conceding no expertise in forensic science).

Nor can Plaintiffs rely on any expertise of their non-testifying expert, Blake Esselstyn. “A scientist, however well credentialed he may be, is not permitted to be the mouthpiece of a scientist in a different specialty.” *Dura Auto. Sys. of Indiana, Inc. v. CTS Corp.*, 285 F.3d 609, 614 (7th Cir. 2002). Dr. Chen and Dr. Cooper are proffered as the experts here; *they* must be qualified as experts in the Maptitude software and in forensics. The expertise of Esselstyn is no substitute—or else he was untimely disclosed. An assistant’s role is limited to “merely collect[ing] data for [the expert] to massage or apply concededly appropriate techniques in a concededly appropriate manner.” *Id.*

at 615. Dr. Chen and Cooper's method of tinkering with native files on a program they had barely (or never) used is not concededly appropriate, and, if they are relying on Dr. Esselstyn's expertise to establish the reliability of this method, then *he* should have been disclosed as the witness and produced the report.

Besides, Mr. Esselstyn is plainly unqualified to rummage through Dr. Hofeller's computer to identify information relevant to redistricting. He "does a lot of stuff that has nothing to do with redistricting," Chen Dep. 320:13–15. It is unclear what Mr. Esselstyn is—perhaps "an urban planner" or "something like that"; maybe he is in "architecture." Chen Dep. 320:10–19. Or maybe not. Who knows? Not Plaintiffs' experts. An assistant must be made available for a deposition "to make sure they performed their tasks competently." *Dura Auto.*, 285 F.3d at 613. It is not at all obvious that this work was competently performed because two persons with no Maptitude expertise were supervising someone who "does a lot of stuff that has nothing to do" with this redistricting case.

2. The Reports Are Not Based on Sufficient Facts or Data

Plaintiffs' rebuttal reports also must be excluded because they are not "based on sufficient facts or data" to support their conclusions. *McGrady*, 368 N.C. at 892, 787 S.E.2d at 10.

First, as described above, the authenticity and chain of custody of the Lizon Files is not, and cannot be, established. The rebuttal reports can only be based on sufficient data if the data, which purports to be evidence related to this case, is authentic. That is in serious doubt here, and Plaintiffs have refused to provide proper authenticating material.

Second, Dr. Chen and Dr. Cooper did not actually examine the files on Dr. Hofeller's storage devices before rendering their opinions. Instead, they concede they only looked at a small

number of maps curated for them (i.e., cherry-picked) by Plaintiffs' counsel. There are many draft maps on Dr. Hofeller's computer, and Dr. Chen and Dr. Cooper relied entirely on Plaintiffs' counsel to provide them. They themselves knew very little about the documents. Cooper Dep. 197:25-198:2. This matters because the "rebuttal" analyses purport to infer what information Dr. Hofeller used in map-drawing based *entirely* on the state of the files at the very last moment they were used. They provide no insight into all the moments of work completed prior to that last moment. One way to assess what was occurring in those moments would be to review "previous backup versions," on Dr. Hofeller's computer. Chen Dep. 340:13-21. Dr. Chen testified that the maps he was provided "go along in a series," and there "may well be earlier versions of this draft map." Chen Dep. 341:2-10.

Without reviewing all the maps, the reports do not provide the full picture. *See McGrady*, 368 N.C. at 898-99, 787 S.E.2d at 14-15 (affirming exclusion of expert opinion that did not account for the full range of relevant facts). It is entirely unknown what Dr. Hofeller had on his screen until the very last second he accessed the materials, and additional maps, including prior backup versions, would shed light on this information. And the fact that Plaintiffs' counsel, not the experts, chose which maps would be reviewed raises further red flags, as Plaintiffs' counsel lacks the expertise and incentive to be complete, and their choices are beyond the scope of discovery. Their involvement creates the inference of cherry-picking. *Lachney v. Target Corp.*, 2010 WL 11570518, at *5 (W.D. Okla. Apr. 12, 2010) (excluding an expert because the expert's opinion was based on a cherry-picked data set); *Sanchez v. Bos. Sci. Corp.*, 2014 WL 4851989, at *22 (S.D.W. Va. Sept. 29, 2014) (excluding expert testimony because it relied on a limited set of reports that had been "hand-selected" and provided by counsel); *Perez v. State Farm Mut. Auto. Ins. Co.*, 2012 WL 3116355, at *6 (N.D. Cal. July 31, 2012) (finding an expert's "methodology

for choosing which sources to rely upon [wa]s particularly troubling” because the expert “rel[ied] primarily on documents that he had on hand or that were sent to him by Plaintiffs’ counsel”); *Munoz v. Orr*, 200 F.3d 291, 301–02 (5th Cir. 2000) (affirming exclusion of expert testimony that relied on a party’s “compilations of data” because that “gives rise to a ‘common-sense skepticism’ regarding the expert’s evaluation,” especially when the expert “did not seek to verify the information presented to him”).

3. The Reports Are Not Based on Reliable Methodology

For similar reasons, the reports’ analyses of the Hofeller documents are not based on reliable methodology. Factors relevant to this reliability element include whether a “theory or technique can be (and has been) tested,” whether it “has been subjected to peer review and publication,” whether there is a “known or potential rate of error,” and whether the technique “enjoys general acceptance within a relevant scientific community.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 150 (1999) (quotation and edit marks omitted).

There is not the slightest indicia of reliable method in Dr. Chen and Dr. Cooper’s analyses. Their approach resembles rummaging through a dead man’s pockets to look for loose change. They opened files on Maptitude in native format, asked Esselstyn to click on items and open them (which they did not even know how to do) and take screen shots of what they saw. This was “no more than a superficial visual examination” of what passed their fancy to review at any given moment while they had the files open. *Ollier v. Sweetwater Union High Sch. Dist.*, 768 F.3d 843, 860 (9th Cir. 2014). They lacked “a systematic assessment,” recognized in any particular field, in determining what should be reviewed and how and what it means. *Id.* at 861 (quotations omitted). Simply opening one’s eyes and making speculative statements about what is there and why is not reliable methodology. *See O’Conner v. Commonwealth Edison Co.*, 13 F.3d 1090, 1106 (7th Cir.

1994); *United States v. Brewer*, 783 F.2d 841, 843 (9th Cir. 1986); *Heller v. Shaw Indus., Inc.*, 167 F.3d 146, 152 (3d Cir. 1999).

What's more, Dr. Chen and Dr. Cooper proceeded to engage in extensive speculation about Dr. Hofeller's motive. "[S]peculative inferences about intent" is improper expert testimony. *In re Rezulin Prod. Liab. Litig.*, 309 F. Supp. 2d 531, 547 (S.D.N.Y. 2004).

4. The Reports Are a Mismatch for the Facts of This Case

In addition to being reliable and performed by a qualified expert on a reliable data set, expert testimony must be tied with a "reliable link" to "the facts at issue in the case." *Phillips v. Am. Honda Motor Co.*, 238 F. App'x 537, 540 (11th Cir. 2007). This is a higher standard than the Rule 401 standard applicable to all evidence. *McGrady*, 368 N.C. at 889, 787 S.E.2d at 8. An expert who looks at the wrong facts, even facts just slightly different from those at issue, provides nothing useful for the finder of fact. *Guillory v. Domtar Industries, Inc.*, 95 F.3d 1320, 1331 (5th Cir. 1996) (affirming exclusion of analysis "not based upon the facts in the record but on altered facts and speculation designed to bolster [a party's] position"); *Phillips*, 238 F. App'x at 540 (similar holding).

Dr. Cooper and Dr. Chen fail to address the relevant question here, which is whether the North Carolina legislature violated various provisions of the North Carolina Constitution, which all contain a state-action requirement. An analysis of Dr. Hofeller's computer is not linked to the relevant case issues because Dr. Hofeller had no ability to pass a map and impose it on North Carolina voters. That responsibility lies with the legislature.

True, if Dr. Hofeller was acting at the legislature's direction and under its control, and thus was implementing its will, when creating the maps Dr. Cooper and Dr. Chen analyzed, then the case for relevance would be stronger. But Legislative Defendants are aware of no evidence of that

connection. Rep. Lewis in 2017 denied any knowledge of map-drawing by Dr. Hofeller, and he stands by that denial to this day. The record on this is clear. The legislature loaned Dr. Hofeller a state-owned computer and instructed him to carry out his duties on behalf of the legislature on that computer. Without evidence of the legislature's approval of work Dr. Hofeller may have performed on his own computer, Plaintiffs cannot establish any meaningful connection between the privately created maps analyzed and the issues here.

They attempt to do this principally with an analysis purporting to show that Dr. Hofeller's maps were virtually identical to the enacted plans. Here, the prejudice to the untimely disclosure of this opinion becomes readily apparent. As shown below, this opinion is highly flawed. Understood correctly, the overlap between Dr. Hofeller's maps and the enacted plans is far lower than Dr. Chen and Dr. Cooper opine.

Dr. Chen and Dr. Cooper go further afield in commenting extensively about Dr. Hofeller's supposed use of racial data. Plaintiffs asserted no racial-gerrymandering claim. Nor is it relevant whether Dr. Hofeller's maps complied with the 2017 redistricting criteria when there is no dispute that the enacted plans *do* comply with those criteria. If, as Plaintiffs say, Dr. Hofeller's maps do not—an opinion reached with no examination, Chen Dep. 351:8–352:20 (testifying that he assumed Dr. Hofeller's maps did not comply with the 2017 criteria, but did not analyze the question)—then that only underscores that Dr. Hofeller's private work and his work for the legislature are unrelated.

III. The Court Should, at a Minimum, Allow a Reasonable Time Period for a Sur- Rebuttal

Plaintiffs' surprise "rebuttal" reports are inconsistent with due process. If the Court chooses to admit the reports anyway (it should not), it should at least allow Legislative Defendants an

opportunity to serve a sur-rebuttal report vetting Dr. Cooper's and Dr. Chen's claims. Based on an initial review, a sur-rebuttal report would show at least the following:

Dr. Chen and Dr. Cooper overstate the similarity between Dr. Hofeller's draft maps and the enacted plan. Most significantly, they ignore that most counties and most of the state's population were drawn into districts because of the whole county and traversal rules or because 2011 districts within a county were carried over from 2011. The map drawer had no discretion whatsoever regarding these districts.

For example, while the 2017 adopted Senate map keeps 95.7% of the population assigned to the same districts as found in the Hofeller draft Senate plan, the Covington plaintiffs Senate map has 88.0% of the population in the same districts as the Hofeller Senate map and the Common Cause Senate map keeps 89.2% of the population in the Hofeller draft Senate plan in the same districts. (Expert Rebuttal Report of Douglas Johnson, Ph.D¹⁰.) ("Johnson Rebuttal") p. 7).

This substantial overlap between the Hofeller draft and maps drawn by adversaries is the result of the county grouping and traversal rule and because of the districts carried over from 2011. This is demonstrated by Dr. Johnson's Rebuttal Map 1 which shows that 88 counties were drawn into districts by virtue of these non-partisan, legally required criteria. (Johnson Rebuttal, p. 4). Because of this criteria, 63.3% of the state's population resides in districts that could not be changed by any map drawer —Dr. Hofeller, Dr. Chen, Dr. Cooper, Common Cause or the Covington Plaintiffs. Thus, only 36.7% of the state's population resides in districts drawn based upon the discretion of a map drawer. (Johnson Rebuttal p. 4) Dr. Chen's statewide comparison of

¹⁰ In the very limited time available, Legislative Defendants obtained a preliminary analysis and present Dr. Johnson's rebuttal as a proffer of the beginnings of what a rebuttal report would like, without prejudice to Legislative Defendant's right to submit an amended/supplemental report within a suitable time frame. Dr. Johnson's Expert Rebuttal Report can be found at Exhibit 9 attached to this Motion.

similar population between the Hofeller draft Senate plan and the 2017 Adopted Senate plan completely ignores that almost two-thirds of the state-wide population was assigned to a district by virtue of legal requirements, not discretionary decisions.

Diving more deeply, using a generally accepted academic similarity index to compare populations between different redistricting maps, out of the population that could be drawn into different districts, 81% of the population assigned to districts in the Hofeller draft Senate plan matches the 2017 Adopted Senate plan while 19% of the population was placed in different districts. By way of comparison, 59% of the population assigned by the Common Cause Senate map is identical to the Hofeller draft senate map and 56% of the Covington plaintiffs' Senate map is identical. Johnson Rebuttal, pp. 6, 7. Certainly, no one would argue that Dr. Hofeller drew the maps drawn by adverse parties despite this significant overlap and no one would seriously argue that the Hofeller draft Senate map is identical to the Adopted 2017 Senate map when almost 20% of the persons who could be moved and assigned to a different district were in fact moved to a different district.

These comparisons are even more revealing for Dr. Hofeller's draft House plan. Over 70 of North Carolina's 100 counties were drawn into districts because of the grouping or traversal rules or because the 2011 districts were carried over into the 2017 Adopted House Plan. Johnson Rebuttal, Rebuttal Map 2, p. 5. Largely because of the operation of the non-discretionary criteria, 74.5% of the population in the Hofeller draft House plan is assigned to the same district in the 2017 Adopted House Map while 25.5% of the population in the Hofeller draft is assigned to a different district. Remarkably, 67.4% of the population assigned to House districts in the Covington Plaintiffs' House map is assigned to the same districts in the Hofeller draft while 82.17% of the population assigned to house districts in the Common Cause House map is identical

to the population assigned in the Hofeller draft. In other words, a larger percentage of the population in the Hofeller draft House map is shifted to different districts in the 2017 Adopted House plan than the amount of population found in the Common Cause House map. These comparisons not only show the complete irrelevance of the comparisons done by Dr. Chen and Dr. Cooper, but also show the voluntary restrictions limiting the General Assembly discretion resulting from its decision to reduce the number of divided VTDs, show more respect for municipal lines, and to increase the compactness of districts as compared to the 2011 maps which did not follow these additional restrictions on the map maker's discretion.

Because Legislative Defendants have only begun to review this surprise material, further flaws in Dr. Chen and Dr. Cooper's reports may emerge.

By far the best avenue for the Court to follow in light of these facts is to exclude Plaintiffs' rebuttal opinions, based on, the Lizon Files. But if it chooses to admit this material, it should allow Legislative Defendants the opportunity for a sur-rebuttal limited to those opinions and data. To allow proper discovery to proceed, the Court should, in that event, continue the trial and allow another 45 days for expert discovery.

CONCLUSION

The Court should exclude all files and materials produced by Stephanie Lizon from evidence in this case. Alternatively, it should exclude Plaintiffs' rebuttal reports and expert opinion testimony to the extent it relies on such files and materials. Alternatively, it should continue the trial date of July 15 and allow the parties another 45 days of expert discovery.

This the 21st day of June, 2019.

Respectfully submitted,

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CERTIFICATE OF SERVICE

This is to certify that the undersigned has this day served the foregoing in the above titled action upon all other parties to this cause by:

- Hand delivering a copy hereof to each said party or to the attorney thereof;
- Transmitting a copy hereof to each said party via facsimile transmittal;
- By email transmittal;
- Depositing a copy here of, first class postage pre-paid in the United States mail, properly addressed to:

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This the 21st day of June, 2019.


By: 
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Exhibit 1

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JOWEI CHEN, Ph.D.,

having been first duly sworn or affirmed by the
Certified Shorthand Reporter and Notary Public
to tell the truth, the whole truth and nothing
but the truth, testified as follows:

EXAMINATION

BY MR. FARR:

Q. Good morning.

A. Good morning, Mr. Farr.

Q. Could you state your name for the record.

A. Jowei Chen.

Q. And, Dr. Chen, you won't object if I refer to
you as Dr. Chen during the course of the
deposition.

A. No, sir.

Q. You've had your deposition taken before. I'm
not going to go through some of the standard
questions I know you've heard before, but I just
do want to make a couple statements.

If you need to take a break at any
time, let me know, and that's fine, or if your
attorney wants to take a break, that's fine.
I'd like for you to not break if there's a
question pending. Is that okay?

A. Yes, sir.

1 my report which is page 2, the first full
2 paragraph, and this is the best of my
3 information. This is all the information I have
4 about the files that I received, at least with
5 respect to their providence. So I said -- I
6 wrote here:

7 "...which I understand
8 Plaintiffs' counsel received through
9 a subpoena to Dr. Hofeller's daughter.
10 I received the files containing
11 Dr. Hofeller's draft maps directly
12 from Plaintiffs' forensic vendor,
13 Stroz Friedberg. "

14 So I understand they're backups. You
15 added the word personal, and that's not within
16 my information. You may well be right, but it's
17 not within my information to either affirm or
18 deny.

19 Q. What's your source for the information you're
20 aware of for what you received? Is it the
21 attorneys in the case or anyone else?

22 A. Well, from plaintiffs' counsel. The sentence
23 that I just read to you, that second
24 paragraph -- that first full paragraph from
25 page 2, the source of that information, as I

1 wrote down in that paragraph, is, of course,
2 from plaintiffs' counsel.

3 Q. Okay. Did you use this information to form
4 opinions about when Dr. Hofeller created drafts
5 of the 2017 plans?

6 A. Yeah, I formed the opinion which I think is
7 basically what you're saying. I formed the
8 opinion that, quote, Dr. Hofeller had already
9 completed drafting the vast majority of House
10 Bill 927, Senate Bill 691 plans by late
11 June 2014, and that was obviously based on these
12 draft plans that I received.

13 Q. Did you mean June 20, 2017?

14 MR. JACOBSON: You said 2014.

15 THE WITNESS: I'm sorry. Obviously I
16 meant June 2017.

17 BY MR. FARR:

18 Q. And did you use the information to form opinions
19 about the data he considered, Dr. Hofeller?

20 A. I formed opinions about the data that
21 Dr. Hofeller possessed, possessed in these
22 Maptitude files or Maptitude folders.

23 Q. Okay. So you don't know whether he considered
24 the data or not. You just know it was in his
25 folders?

1 MR. JACOBSON: Object to form.

2 THE WITNESS: Yeah, if you want to
3 point to specific data that you want me to
4 answer that question I'll be able to answer it
5 more clearly. It's just a little bit general
6 and vague and I'm not sure I can really wrap my
7 head around.

8 BY MR. FARR:

9 Q. All right. Dr. Chen, do you have a background
10 in computer forensics?

11 A. No.

12 Q. Do you have any professional certification in
13 the field of computer forensics?

14 A. No.

15 Q. Have you ever been retained to perform a
16 forensic analysis of computer data?

17 A. Could you just repeat.

18 Q. Have you ever been retained to perform a
19 forensic analysis of computer data?

20 A. No.

21 Q. Okay. You just mentioned this about page 2 on
22 your rebuttal report about the information was
23 obtained through a subpoena to Dr. Hofeller's
24 daughter.

25 A. Yes.

1 Q. What other facts were you provided regarding the
2 receipt of the data?

3 A. I think I just about listed it out here in this
4 paragraph. I was told that there was a
5 subpoena, and I was told that Dr. Hofeller's
6 daughter turned over hard drives in response to
7 that subpoena. That's about all the information
8 I have here.

9 Q. Do you know whether the data was recovered off a
10 computer, a USB storage device, a portable hard
11 drive or some other medium?

12 A. I gather that those are specific forms of what
13 hard drive can represent and I don't know the
14 specific form. I don't know the model. I don't
15 know the type of hard drive, and I think that's
16 what -- those are different things you're
17 listing there.

18 Q. Do you know when -- do you know who received
19 Dr. Hofeller's devices?

20 A. Well, I know that plaintiffs' counsel received
21 the hard drives and the files through a
22 subpoena, so I know that generally. If you're
23 asking me physically, I'm not sure I can give
24 you a more precise answer than that.

25 Q. That's good. Do you know when the plaintiffs'

1 counsel received the devices?

2 A. Plaintiffs' counsel didn't tell me, but I can
3 logically gather that it was before the time
4 that I received copies of files from that --
5 from that subpoena or from those hard drives.

6 Q. That would make sense.

7 Do you know when you received the
8 devices or the data?

9 A. I did not receive any devices. I did receive
10 files, and I can give you a general range. So
11 sometime in early May I started receiving files
12 from -- from -- I forget the names -- Stroz
13 Friedberg, and then there were a couple of
14 different deliveries of files. And I recall --
15 the latest one, I can't specifically recall if
16 it was in late May or early June, somewhere in
17 that time period.

18 Q. Did you ever personally -- I don't know what the
19 right word is, Dr. Chen, I'll say download files
20 yourself from Hofeller's devices, from
21 Dr. Hofeller's devices?

22 A. No, I don't know what these devices or hard
23 drives look like. I've had no physical access
24 to them. I would have no ability to myself go
25 and access them or download any files from them.

1 Q. So the files you received were from this
2 plaintiffs' vendor named Stroz Friedberg?

3 A. Stroz Friedberg, yes, sir.

4 Q. So they're the ones -- so who decided what files
5 you were going to receive? Do you know?

6 A. Well, I'm happy to answer that question with
7 respect to specific files, and so I'm prepared
8 to go through and talk about those with you if
9 you'd like, but you're just going to have to ask
10 me about specific files. And it would be more
11 useful to talk about that in specific sections
12 in my response report if you want to go that
13 way.

14 Q. Did you receive data from anyone other than
15 Stroz Friedberg?

16 A. Well, you're going to have to limit -- you know,
17 you're going to have to explain what data you're
18 talking about. Obviously I have before received
19 data from people other than Stroz Friedberg and
20 for my original expert report obviously, but --

21 Q. I'm sorry.

22 A. -- I think you're trying to limit the question
23 to a certain class of data.

24 Q. I'm sorry. It was my mistake.

25 Did you receive data from

1 Dr. Hofeller's devices from anyone other than
2 Stroz Friedberg?

3 MR. JACOBSON: Objection. To the
4 extent you're asking about attorney-client
5 communications beyond facts, data or assumptions
6 that are relied upon or in the report, I'm going
7 to instruct Dr. Chen not to answer.

8 THE WITNESS: So what I'm going to
9 do -- can I start answering.

10 BY MR. FARR:

11 Q. Yes, sure.

12 A. So I'm going to follow Mr. Jacobson's
13 instruction, and so within those confines I'm
14 going to answer your question.

15 And my answer is that the files that
16 originated from Dr. Hofeller's backups or hard
17 drives that I relied upon in my report I
18 received directly from the forensic vendor, from
19 Stroz Friedberg.

20 Q. Did you ask --

21 A. Actually, I want to just go back and make sure
22 I've thought about and responded to your
23 question exactly as possible. And could I just
24 ask the court reporter to read back me the
25 question that I just gave a response to and I

1 will think about if I need to add anything. Is
2 that all right? Is that all right, Mr. Farr?

3 Q. Oh, sure.

4 A. I'm going to ask the court reporter to repeat
5 the question and I'm going to think about if I
6 need to add anything.

7 (Record Read.)

8 THE WITNESS: Okay. I think the
9 literal answer to your question is, no, I did
10 not receive any files that were copies of files
11 from Dr. Hofeller's backups or hard drives that
12 I relied upon in my report from anybody other
13 than Stroz Friedberg.

14 I just want to add to that, even though
15 I don't think this technically falls within what
16 your question is asking. I do explain how there
17 were various screenshots and various shape files
18 that I analyzed. These were not screenshots or
19 shape files that were copies of files from
20 Dr. Hofeller's hard drives but instead were
21 created by Mr. Esselstyn by opening up files
22 that were on -- were on Dr. Hofeller's backup
23 files.

24 So I don't think that really falls
25 within the question that you were asking, but I

1 just wanted to be as completely -- as complete
2 as possible.

3 BY MR. FARR:

4 Q. Did you ask for the data you received, or did
5 you simply receive data which you were then
6 asked to opine on?

7 A. In some cases former, in some cases the latter,
8 and I'm prepared to go through individual files
9 and tell you about them, but that's the general
10 answer.

11 Q. Okay. I hope I'm going to ask this the right
12 way. Do you own a Maptitude license?

13 A. I personally right now do not have an active
14 Maptitude license.

15 Q. So in doing this report, did you use a Maptitude
16 program yourself?

17 A. So I don't have -- I don't personally, on my own
18 personal computer, have a Maptitude license so
19 what instead happened is that when I wanted to
20 look at a Maptitude folder, I looked at
21 Mr. Esselstyn's computer. And Mr. Esselstyn, on
22 his computer, does in fact have an active,
23 updated, whatever you want to call it, latest
24 Maptitude license.

25 Q. Mr. --

1 A. Mr. Esselstyn. I'll just tell you where
2 that -- this is first mentioned. If you'll look
3 at the bottom of page 2 of my report, I think
4 this is the first time that I mention
5 Mr. Esselstyn. So he is plaintiffs' consulting
6 expert.

7 Q. Who does he work for? Does he have his -- does
8 he work for the same company, the Stroz
9 Friedberg?

10 A. No. Mr. Esselstyn has nothing to do with Stroz
11 Friedberg. Mr. Esselstyn, I believe to the best
12 of my knowledge, he's self-employed, he runs his
13 own consulting firm. He does a lot of stuff
14 that has nothing to do with redistricting. I
15 think he's an urban planner or city planner,
16 something like that, architecture, something
17 along those lines. I'm not remembering it quite
18 correctly, but I sort of have that recollection
19 of something that's unrelated to redistricting.

20 Q. And where does he reside?

21 A. Oh, he resides I believe in Asheville, if I'm
22 remembering correctly.

23 Q. When you were consulting with him, were you in
24 person or --

25 A. I wasn't physically -- I'm sorry, I didn't mean

1 to cut you off.

2 Q. That's all right.

3 A. I wasn't physically in Asheville. At all times
4 that I needed to look at a Maptitude -- a
5 computer with Maptitude and open up a Maptitude
6 folder, a Maptitude backup, I would get on
7 to -- it's just a program called Google
8 Hangouts, but basically I would look at
9 Mr. Esselstyn's computer screen, and I would
10 tell him open this file, scroll over here, click
11 on that, things of that nature. So basically he
12 would be on his computer, I would remotely be
13 looking at the same computer, and then telling
14 him open this file, look over there, things
15 along those lines.

16 Q. Have you ever personally used Maptitude?

17 A. I have.

18 Q. Have you drawn maps with Maptitude?

19 A. I may have tried to edit a districting plan or
20 some other kind of map. Maptitude does a lot of
21 things outside of redistricting. It's a GIS
22 program basically, so I might have edited some
23 shape files, something along those lines.

24 So in the past I've had Maptitude on my
25 computer before. I don't any more. I don't

1 have the current or updated license or latest
2 version.

3 Q. When is the last time you had a Maptitude
4 license on your computer?

5 A. I don't exactly remember. It would have been
6 more than a few years ago.

7 Q. Did you receive any Hofeller files that had --
8 Dr. Hofeller files that had a label saying that
9 they were privileged or confidential or attorney
10 work product?

11 A. I don't recall seeing that.

12 Q. Have you ever worked with Stroz Friedberg
13 before?

14 A. I had no idea who they were until recently.

15 Q. Did you get all the documents from
16 Dr. Hofeller's daughter or just a subset?

17 MR. JACOBSON: Do you want to reframe
18 the question. It was confusing. Or if not,
19 it's up to you. I was confused by it.

20 BY MR. FARR:

21 Q. Did you get everything that was produced by
22 Dr. Hofeller's daughter or just a subset?

23 A. I don't have a basis to know the answer to that
24 just logically thinking about it. If I received
25 a certain set of files, how would I know if --

1 logically how would I know if this is all the
2 files or just a subset of them.

3 MR. JACOBSON: Tom, if I could just
4 jump in and clarify. It's a subset. He doesn't
5 know what he doesn't know.

6 MR. FARR: Okay. That's fine.

7 BY MR. FARR:

8 Q. Who decided what information you received? Was
9 that your decision or was it someone else's
10 decision?

11 A. So like I said, you've asked me this question
12 generally and I've told you I'm happy to go file
13 by file or section by section and I'll answer
14 that question specifically, and I'm prepared to
15 give you the best of my recollection for all
16 these files here. You asked me that question
17 earlier and I said sometimes it's the former and
18 sometimes it's the latter. So I'm happy to go
19 file by file and help you to understand my
20 recollection.

21 Q. Can you just go through your report right now
22 and tell me?

23 A. That's what I was just suggesting.

24 Q. Why don't you just do that.

25 A. Okay. Sure. You want me to just kind of walk

1 through the different sections and then I'll
2 tell you for each section's files --

3 Q. Right.

4 A. -- how those files came to be in my possession.

5 Q. Right.

6 A. Sure. Okay. So the first section that we'll
7 start with -- and this is not the level of
8 detail or if I'm going in a different direction,
9 you should feel free to cut me off and redirect
10 me. I think I know what you're trying to ask
11 and I'm going to tell you everything that I
12 remember here.

13 So the first section here is a section
14 which I am comparing two draft Maptitude
15 folders, Maptitude backup folders that came from
16 Dr. Hofeller's hard drive. And this first
17 section goes through I believe it is page 38 of
18 my report where I'm looking at these two draft
19 maps. And one of them I start talking about on
20 page 3. It's in a folder named, quote, NC House
21 J-25003.bak.zip. And ".bak" just means this was
22 a backup file, it was a zipped backup file.

23 So that one, as well as the next draft
24 Maptitude folder that I analyzed, which is the
25 Senate map called NC Senate J-24001 .bak.zip,

1 these were ones that were last modified in June
2 of 2017, and these -- Mr. Jacobson selected
3 these to direct my attention towards.

4 So I did not obviously know of the
5 existence. I didn't ask for them by name.
6 Plaintiffs' counsel made the decision to convey
7 those files to me, and they were -- they were
8 transmitted or delivered to me through Stroz
9 Friedberg.

10 Q. So that's the House and the Senate plan?

11 A. Correct, these first two House and Senate plans.

12 Q. Okay.

13 A. So that's the first section of my report. And
14 then now we can move to the next section that
15 starts on page 39 which -- in which I start
16 discussing racial data.

17 And in this section I discuss I believe
18 it's six different Maptitude folders, backup
19 folders, so six different backups of those draft
20 plans. And before I tell you about them, I'm
21 going to try to point you to the list of them so
22 that we can know what I'm talking about.

23 The first one of these six I think is
24 listed at the bottom of page -- and I'm going to
25 group these six together because I'm going to

1 give you a unified answer about all six of
2 these.

3 So if you look at the bottom of
4 page 39, I think I mentioned the first of these
5 six, a draft plan titled, quote, NC House
6 J-25003.bak.zip which was last modified and
7 backed up on August 14, 2017. That's the first
8 of the six. I'm going to list out all six of
9 them before I tell you how I got them.

10 Q. Can I stop you for a second.

11 How did you know when it was last
12 backed up? Is that something you determined or
13 did someone else determine that?

14 A. Oh, okay. Yeah, good question. I determined
15 that, and the way that that was determined is
16 that I looked at the metadata of the file. So
17 if you have these files on a folder in Windows
18 you can look at the metadata and you can see the
19 last modified date of the file. So everywhere
20 I'm talking about, last modified date in my
21 report for these various files, that's the basis
22 of me determining those last modified dates.

23 So that was the first of the six. And
24 I'm just going to go through this list of six
25 before I tell you how I came to have these

1 files.

2 Q. Okay.

3 A. The next one is going to be several pages later
4 and it appears on the last paragraph on page 45.
5 This is a Maptitude backup -- plan backup
6 called, quote, NC Senate J-23005.bak.zip, last
7 modified on August 13th. And just to make sure
8 I list them all completely, I'm going to -- and
9 I'm happy to give this to you after I finish,
10 but I'm going to keep a running list here of the
11 files that I've mentioned just to make sure I've
12 got everything straight as I'm telling you about
13 them. So if you'll just bear with me and give
14 me a moment.

15 So I've listed two of the six this I
16 was going to mention. And then the remaining
17 four are listed in the first paragraph on
18 page 47. So you'll see a list there of four
19 files. I won't read them out, but I'm going to
20 write them down here on my -- on this piece of
21 paper, so just give me a second

22 Q. Can we make that as an exhibit?

23 A. Sure. I'm going to give this to you after I'm
24 finished.

25 Q. We'll give this to the court reporter.

1 the report, I took various screenshots of -- or
2 I -- actually I instructed Mr. Esselstyn to
3 create screenshots of what was on his screen and
4 then send me those screenshots, but he did so at
5 my direction.

6 BY MR. FARR:

7 Q. Could you point those out in my report?

8 A. Sure. There's screenshots all over in this
9 section, but they start on page 41 which is
10 labeled as Figure 25, and they go through
11 Figure 29 which is on page 46. I think that's
12 the last one. Let me just check. Yes, that's
13 the last one.

14 So these screenshots came from that set
15 of six Maptitude folders. And again, these were
16 opened up because I instructed Mr. Esselstyn to
17 do so.

18 Q. So these are screenshots that Mr. Esselstyn
19 called up?

20 A. No. No. So a screenshot is something that you
21 take. A folder -- a file is something that you
22 call up.

23 So I instructed Mr. Esselstyn to open
24 up these Maptitude folders, and then after
25 opening them up I then instructed him to take

1 various screenshots of what he and I were seeing
2 on his computer and then send me those
3 screenshots.

4 Q. So let me ask you a question.

5 Do you have any evidence that
6 Dr. Hofeller was viewing the screenshots that
7 you had Mr. Esselstyn -- am I saying that right?

8 A. Esselstyn.

9 Q. Do you have any evidence that Dr. Hofeller
10 was -- viewed these screenshots while he was
11 drawing the districts?

12 A. Yeah. And I'll just give you an example. So
13 when you see in one of these Maptitude folders
14 that there's, say, a formula field or that the
15 district has been sorted in a particular field
16 by, say, racial composition -- these are two
17 things that I talk about in more detail in my
18 report -- these are things that are not
19 automatic settings. Somebody would have had to
20 go in and create these specific formula fields.
21 Somebody would have had to go in and
22 specifically align the districts by African
23 American voting age population. Those things
24 don't happen automatically in Maptitude.

25 So with that information with my

1 knowledge of just generally how GIS software
2 works and knowing that these folders came from
3 Dr. Hofeller's hard drive, it's just a matter of
4 putting two and two together to infer that
5 Dr. Hofeller was creating the formula field that
6 I take a screenshot on in Figure 27, for
7 example, were aligning the districts according
8 to African American voting age population, as I
9 talk about it in length in that section of the
10 report.

11 Q. I've got a question for you.

12 When you -- when you did your simulated
13 maps, did you base your simulated maps on
14 partisan intent when you were drawing them?

15 A. My simulated maps were ignoring partisan data.

16 Q. When you drew them.

17 A. I didn't draw any maps. I programmed the
18 computer.

19 Q. I'm sorry, Dr. Chen. You're too precise for an
20 old lawyer.

21 When the computer was drawing your
22 maps, it was not looking at partisan data?

23 A. The computer did not have partisan data.

24 Q. You looked at partisan data after your maps were
25 drawn by the computer?

1 A. It is on page 41 and 42. And so it's Figure 25
2 and Figure 26. And so I produced a screenshot
3 of the Dataview 1 window, and I can say with
4 certainty that this was the dataview window that
5 Dr. Hofeller had up on the screen when he last
6 was working with this particular Maptitude
7 folder.

8 The only thing that I did or I had
9 Mr. Esselstyn do was to take a screenshot, and
10 prior to taking a screenshot maneuver the
11 windows around, move the windows left to right
12 so that it would be positioned so that the
13 screenshot would capture all the columns or some
14 subset of the columns that I wanted to zoom in
15 on. So I asked Mr. Esselstyn, move the window
16 over here to the left so the screenshot will get
17 as much of the dataview window as we can,
18 something along those lines. So that's how I
19 was able to ask Mr. Esselstyn to get this huge
20 screenshot on Figure 25 that I wanted to have
21 every single column. So obviously I had to ask
22 him to expand that column so that you'd be able
23 to see all of the columns on one screenshot
24 since obviously it's a screenshot so you can't
25 really scroll to the left or to the right.

1 You've got to get everything that you want to
2 show in that one screenshot, so that's what I
3 did.

4 So the point is I'm able to say this
5 Dataview 1 window was the one that was available
6 to Dr. Hofeller when he last worked with this
7 particular draft Maptitude folder.

8 Q. When he last worked with it. What I want to
9 know whenever he first -- the first time he drew
10 it, do you know what was on his screen when he
11 was drawing the map?

12 MR. JACOBSON: Objection.

13 THE WITNESS: That information might
14 possibly be in another backup, but I did not
15 analyze that for this particular draft map.

16 So in general, what a backup does, it's
17 a snapshot and it's whenever that snapshot was
18 created. So I can tell you what was on
19 Dr. Hofeller's Maptitude folder when it was last
20 backed up. I can't tell you about previous
21 backup versions.

22 BY MR. FARR:

23 Q. So you can't testify when he first drew this
24 map, you can't tell what was on his screen?

25 MR. JACOBSON: "This map" is vague.

1 BY MR. FARR:

2 Q. The beginning of this map, the first version of
3 this map that he would have drawn.

4 A. I do think it's vague, and I'm going to explain
5 to you why. These maps are -- go along in a
6 series of something like -- this one here is
7 called House J-25003. There are other maps in
8 this same sort of series that start with J-25,
9 and so there may well be -- may well be earlier
10 versions of this draft map.

11 And I'm not sure exactly what you mean
12 by "this map," if you're referring to the entire
13 series or this one backup. So I'm not totally
14 clear what you mean when you say "this map."

15 Q. Let's say the first version of a House draft map
16 that Dr. Hofeller drew, you can't testify what
17 was on the screen when he did that?

18 A. You said an earlier draft map?

19 Q. The first draft House map he did in 2016 or
20 whenever he started because I don't know when he
21 started.

22 A. Sure. I did not look at every draft map from
23 Dr. Hofeller's hard drive to be able to identify
24 which one was the, quote, first draft map. I
25 looked at some maps. I obviously did not look

1 at every single Maptitude backup.

2 Q. Okay. What is the -- what's Figure 27?

3 A. This is a formula window, and I'll just explain
4 a little bit of background that will help put
5 this in some context.

6 In Maptitude you have obviously one
7 window that shows you the map of North Carolina,
8 and that can be -- can be shown or displayed or,
9 I guess, shaded in at a number of different
10 levels. You could shade in, for example, some
11 characteristic of the VTD but shade in some
12 characteristic of the district, of a house
13 district and so on. You can do any number of
14 things. You could show county level
15 characteristics if you really wanted to.

16 What a formula field does is it allows
17 the Maptitude user, the map drawer, to create
18 labels for the districts, and you can put in
19 these labels whatever information you want as
20 long as that's information that you have
21 imported into Maptitude already. So sometimes a
22 map drawer might just want to label the
23 districts by the district number, so you'll have
24 a label for District 1 and a label for
25 District 2 and so on, but that's not the only

1 is titled -- and it begins on page 48. The
2 section is titled Response to Dr. Brunell,
3 Dr. Hood and Dr. Johnson's Claims Regarding
4 Partisan Intent.

5 In the section I refer to a pretty
6 lengthy number of Microsoft Excel files and I
7 believe one Microsoft Word document. So I'll
8 give you a blanket statement regarding all of
9 these, which is that these files were all
10 delivered to me in the form of two folders that
11 I listed somewhere in my report. If you give me
12 a minute, I'll give you the precise names,
13 something like 2017 NC redistricting, but I'm
14 going to find exactly where I listed this.

15 MR. JACOBSON: I think it's on page 76.

16 THE WITNESS: Yeah. So I'll direct you
17 to the first paragraph on page 76, and I've
18 listed two folders called NC 2017 Redistricting
19 and 2017 Redistricting.

20 These folders which contained several
21 large -- a large number of files were given to
22 me by Stroz Friedberg, and it's my understanding
23 that plaintiffs' counsel asked Stroz Friedberg
24 to give me copies of those two folders and to
25 look at the files inside of them.

1 BY MR. FARR:

2 Q. Okay. Does that complete your explanation of
3 where you got the information for this report?
4 Was there anything else?

5 A. Oh, yeah, let me -- I'll just scan through the
6 rest of my report, but I believe that's about
7 it. I believe the rest of my report does not
8 refer to any more files that came from
9 Dr. Hofeller's hard drive. I'll just scan
10 through just to check.

11 Q. Okay. Did you do any research on the background
12 of Dr. Hofeller's involvement in crafting the
13 2017 House and Senate plans?

14 A. I didn't do any research of my own aside from
15 the information I was given by plaintiffs'
16 counsel and some of the things that we've
17 already talked about earlier today.

18 Q. Do you know who hired him to work on the 2017
19 plans?

20 A. I don't know specifically who.

21 Q. Do you know when Dr. Hofeller was hired to
22 actually draw the 2017 House and Senate plans?

23 A. I have a recollection that I might have written
24 my information about that somewhere in my
25 report. I'm not entirely certain so I'm going

1 that question.

2 (Record Read.)

3 THE WITNESS: I take it that you were
4 referring to the proceedings of August 25th and
5 August 24, 2017.

6 BY MR. FARR:

7 Q. I think those are Exhibits 5 and 6. Yes?

8 A. Okay. And so it wouldn't really make sense for
9 me to have to do a test because obviously a lot
10 of Dr. Hofeller's drafting of the maps occurred
11 before that time. In fact, much of it even
12 occurred before the adopted criteria were passed
13 on August 10th and so that wouldn't really make
14 sense to me to even test that because logically
15 Dr. Hofeller could not have been following the
16 adopted criteria prior to August the 10th.

17 As I explained in my report, much of
18 the House -- the General Assembly's House and
19 Senate districting plans were already in place,
20 were already drafted up by Dr. Hofeller back in
21 June.

22 Q. Okay. That's like a really hyper technical
23 answer, Dr. Chen.

24 What I want to ask you is: Did you
25 test the draft maps that Dr. Hofeller -- that

1 you talked about here today, did you look to see
2 whether or not they complied with the criteria
3 that the committee ultimately adopted on equal
4 population?

5 A. Okay. Same general answer as before as it
6 wouldn't have made sense for me to test them
7 with respect to the adopted criteria generally,
8 but I get that you're asking me a specific
9 question about equal population.

10 So if your question to me is whether or
11 not I looked for whether the draft districts
12 were within 95 to 105 percent, the answer is
13 that I didn't do that.

14 Q. Did you look to see whether the draft maps
15 Dr. Hofeller, you claim, prepared based upon
16 your review of the information you received
17 complied with the county grouping and traversal
18 criteria that was ultimately adopted by the
19 committees?

20 A. I didn't.

21 Q. Okay. Did you determine whether or not the
22 districts on these draft maps that appear to be
23 drawn by Dr. Hofeller were the districts that
24 were changed more compact than the districts in
25 the 2011 plan? Did you check for that?

1 actions were taken, say, on his Maptitude
2 program, and so there were backups taken, and
3 the last modified date for this plan was
4 June 28th.

5 Q. Okay. Did you get a chain of custody for this
6 information that you reviewed?

7 MR. JACOBSON: Objection; vague.

8 THE WITNESS: I don't know what the
9 question means.

10 BY MR. FARR:

11 Q. Well, do you know the people that put their
12 hands on this from the time it was sent by
13 Stephanie Hofeller to when it got to you?

14 A. Well, I think I've given you all the information
15 that I have, and I'm happy to review it again,
16 but I received -- and again, I think -- if
17 you're referring specifically to this Maptitude
18 folder -- any of these other Maptitude folders
19 I'm mentioning, I told you I got it from Stroz
20 Friedberg and I told you what plaintiffs'
21 counsel told me about the providence.

22 Q. But you don't have a chain of custody line
23 showing who touched the stuff by the time it was
24 delivered by Stephanie Hofeller?

25 A. Again, I don't know what that question means.

1 BY MR. FARR:

2 Q. The percentages you calculated of 90.9 percent
3 of the state census blocks, that's a statewide
4 percentage?

5 A. That is a statewide percentage, so it's a
6 percentage of the total number of census blocks
7 in North Carolina which is obviously several
8 hundred thousand.

9 Q. And 88.2 percent is a percentage of the
10 statewide population?

11 A. Correct.

12 Q. Can we turn to your Orange County figures?

13 A. If you'll direct me to the precise page.

14 Q. I believe it's page 9 of your report.

15 A. Okay.

16 Q. At the top you refer to a file that is
17 House J-25.

18 A. Yeah, that's just a short form. I'll point you
19 to where the full name of the file is. It's
20 listed at the top of page 3, and I think I read
21 it out a couple times now. It's NC House
22 J-25003.bak.zip. So J-25 is just kind of
23 shorthand.

24 Q. Was this a bak.zip file?

25 A. I think you're trying to say bak.zip.

1 BY MR. FARR:

2 Q. I'm sorry, Dr. Chen, I think I pulled the
3 wrong -- no, I did.

4 16 is a page from the -- transcribed
5 from the Senate Redistricting Committee hearing,
6 and if you look at the first paragraph there
7 attributed to Senator Hise, the last sentence in
8 that paragraph, is that the one you're referring
9 to in your report?

10 A. Yes.

11 Q. Okay. Do you have any evidence that that's a
12 false statement by Senator Hise as it relates to
13 the state computer upon which the maps offered
14 by Senator Hise and Representative Lewis were
15 offered to the committees?

16 A. Generally, I was not trying to assess the
17 veracity of that statement. I don't know what
18 computers you're talking about so obviously I'm
19 not going to be able to speak to that.

20 Q. Okay. So you're not accusing Senator Hise of
21 lying?

22 A. No, sir. I simply took that statement to help
23 clarify a part of the -- a portion of the
24 adopted criteria as it related to no
25 consideration of racial data.

1 Q. Okay. Looking back to your report on page 39,
2 after you quote Senator Hise you've got a quote
3 from a court filing in Covington v
4 North Carolina. Do you see that?

5 A. Yes, sir.

6 Q. Is that something that you researched or was
7 that quote given to you by someone?

8 A. Plaintiffs' counsel directed me -- or gave me a
9 copy of it or directed me to a URL, I think. As
10 I recall, plaintiffs' counsel either gave me an
11 actual PDF copy or at least a URL. In fact, I
12 think it was just a URL.

13 MR. FARR: Can I take a break because
14 I'm going to try to stop. I'm going to make
15 sure I'm not missing anything else that I need
16 to ask.

17 MR. JACOBSON: That will be great. And
18 I have 30 seconds for redirect max.

19 (Brief Recess: 7:40 to 7:42 p.m.)

20 BY MR. FARR:

21 Q. I want to -- last series of questions, your
22 response to Dr. Lewis.

23 Could you turn to page 77 of your
24 response report.

25 A. Sure.

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A C K N O W L E D G E M E N T O F D E P O N E N T

I, JOWEI CHEN, Ph.D., declare under the penalties of perjury under the State of North Carolina that I have read the foregoing pages, which contain a correct transcription of answers made by me to the questions therein recorded, with the exception(s) and/or addition(s) reflected on the correction sheet attached hereto, if any.

Signed this the day of , 2019.

JOWEI CHEN, Ph.D.

Exhibit 2

EXPERT REPORT OF JOWEI CHEN, Ph.D.

April 8, 2019

I am an Associate Professor in the Department of Political Science at the University of Michigan, Ann Arbor. I am also a Research Associate Professor at the Center for Political Studies of the Institute for Social Research at the University of Michigan and a Research Associate at the Spatial Social Science Laboratory at Stanford University. In 2007, I received a M.S. in Statistics from Stanford University, and in 2009, I received a Ph.D. in Political Science from Stanford University. I have published academic papers on legislative districting and political geography in several political science journals, including *The American Journal of Political Science* and *The American Political Science Review*, and *Election Law Journal*. My academic areas of expertise include legislative elections, spatial statistics, geographic information systems (GIS) data, redistricting, racial politics, legislatures, and political geography. I have expertise in the use of computer simulations of legislative districting and in analyzing political geography, elections, and redistricting.

I have authored expert reports in the following redistricting court cases: *The League of Women Voters of Florida et al. v. Ken Detzner et al.* (Fla. 2d Judicial Cir. Leon Cnty. 2012); *Rene Romo et al. v. Ken Detzner et al.* (Fla. 2d Judicial Cir. Leon Cnty. 2013); *Missouri National Association for the Advancement of Colored People v. Ferguson-Florissant School District and St. Louis County Board of Election Commissioners* (E.D. Mo. 2014); *Raleigh Wake Citizens Association et al. v. Wake County Board of Elections* (E.D.N.C. 2015); *Corrine Brown et al. v. Ken Detzner et al.* (N.D. Fla. 2015); *City of Greensboro et al. v. Guilford County Board of Elections* (M.D.N.C. 2015); *Common Cause et al. v. Robert A. Rucho et al.* (M.D.N.C. 2016); *The League of Women Voters of Pennsylvania et al. v. Commonwealth of Pennsylvania et al.* (No. 261 M.D. 2017); *Georgia State Conference of the NAACP et al. v. The State of Georgia et al.* (N.D. Ga. 2017); *The League of Women Voters of Michigan et al. v. Ruth Johnson et al.* (E.D. Mich. 2017); and *William Whitford et al. v. Beverly Gill et al.* (W.D. Wis. 2018). I have testified either at deposition or at trial in the following cases: *Rene Romo et al. v. Ken Detzner et al.* (Fla. 2d Judicial Cir. Leon Cnty. 2013); *Missouri National Association for the Advancement of Colored People v. Ferguson-Florissant School District and St. Louis County Board of Election Commissioners* (E.D. Mo. 2014); *Raleigh Wake Citizens Association et al. v. Wake County Board of Elections* (E.D.N.C. 2015); *City of Greensboro et al. v. Guilford County Board of*

Elections (M.D.N.C. 2015); Common Cause et al. v. Robert A. Rucho et al. (M.D.N.C. 2016); The League of Women Voters of Pennsylvania et al. v. Commonwealth of Pennsylvania et al. (No. 261 M.D. 2017); Georgia State Conference of the NAACP et al. v. The State of Georgia et al. (N.D. Ga. 2017); The League of Women Voters of Michigan et al. v. Ruth Johnson et al. (E.D. Mich. 2017); and William Whitford et al. v. Beverly Gill et al. (W.D. Wis. 2018). My Curriculum Vitae is attached as an exhibit to this report. I am being compensated \$500 per hour for my work in this case.

Research Question and Summary of Findings

The attorneys for the plaintiffs in this case asked me to analyze the legislative districting plans enacted in 2017 for North Carolina's House of Representatives and Senate districts (the "2017 House Plan" and the "2017 Senate Plan"). Specifically, I was asked to analyze:

- 1) Whether partisan intent was the predominant factor in the drawing of the 2017 House and 2017 Senate Plans, both at a statewide level and with respect to certain county groupings.
- 2) The effect of the enacted plans on the number of Democratic and Republican legislators elected from North Carolina, both at a statewide level and with respect to certain county groupings;
- 3) The extent to which the 2017 House and 2017 Senate Plans conform to the "2017 House and Senate Plans Criteria" adopted by the House and Senate Redistricting Committees (the "2017 Adopted Criteria"), with the exception of the criterion regarding political considerations, and relatedly, the extent to which partisan intent subordinated these Adopted Criteria.
- 4) The effect of the enacted plans on the partisan composition of the individual plaintiffs' House and Senate districts.

In conducting my academic research on legislative districting, partisan and racial gerrymandering, and electoral bias, I have developed various computer simulation programming techniques that allow me to produce a large number of non-partisan districting plans that adhere to traditional districting criteria using US Census geographies as building blocks. This simulation process ignores all partisan and racial considerations when drawing districts. Instead, the

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

This 8th day of April, 2019.

A handwritten signature in black ink, appearing to read "J. Chen", written over a horizontal line.

Jowei Chen

Exhibit 3

STATE OF NORTH CAROLINA
COUNTY OF WAKE

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
Case No. 18 CVS 014001

COMMON CAUSE, *et al.*

Plaintiffs,

v.

DAVID R. LEWIS, *et al.*

Defendants.

Expert Report of Dr. M.V. Hood III.

Pursuant to the North Carolina Rules of Civil Procedure and the Case Management Orders of the Court in the above-captioned matter, I, M.V. (Trey) Hood III, provide the following written report:

I. INTRODUCTION AND BACKGROUND

My name is M.V. (Trey) Hood III, and I am a tenured professor at the University of Georgia with an appointment in the Department of Political Science. I have been a faculty member at the University of Georgia since 1999. I also serve as the Director of the School of Public and International Affairs Survey Research Center. I am an expert in American politics, specifically in the areas of electoral politics, racial politics, election administration, and Southern politics. I teach courses on American politics, Southern politics, and research methods and have taught graduate seminars on the topics of election administration and Southern politics.

I have received research grants from the National Science Foundation and the Pew Charitable Trust. I have also published peer-reviewed journal articles specifically in the areas of redistricting and vote dilution. My academic publications are detailed in a copy of my vita that is attached to the end of this document. Currently, I serve on the editorial boards for *Social Science Quarterly* and *Election Law Journal*. The latter is a peer-reviewed academic journal focused on the area of election administration.

During the preceding four years, I have offered expert testimony (through deposition or at trial) in fourteen cases around the United States: *United States v. North Carolina*, 1:13-cv-861 (M.D. N.C), *Bethune-Hill v. Virginia State Board of Elections*, 3:14-cv-00852 (E.D. Va.), *The Ohio Democratic Party v. Husted*, 2:15-cv-1802 (S.D. Ohio), *The Northeast Ohio Coalition v. Husted*, 2:06-cv-00896 (S.D. Ohio), *One Wisconsin Institute v. Nichol*, 3:15-cv-324 (W.D. Wis.), *Covington v. North Carolina*, 1:15-cv-00399 (M.D.N.C.), *Green Party of Tennessee v. Hargett*, 3:11-cv-00692 (M.D. Tenn.), *Vesilind v. Virginia State Board of Elections*, CL15003886-00 (Richmond Circuit Court), *Common Cause v. Rucho*, 1:16-cv-1026 (M.D.N.C.), *Greater*

Birmingham Ministries v. Merrill, 2:15-cv-02193 (N.D. Ala), *Anne Harding v. County of Dallas, Texas*, 3:15-cv-00131 (N.D. Tex.), *Feldman v. Arizona Secretary of State's Office*, 2:16-cv-16-01065 (Ari.), *League of Women Voters v. Gardner*, 226-2017-cv-00433 (Hillsborough Superior Court), and *Ohio A. Philip Randolph Institute v. Ryan Smith*, 1:18-cv-357 (S.D. Ohio).

In assisting the Legislative Defendants in analyzing the North Carolina's legislative districts, I am receiving \$350 an hour for this work and \$350 an hour for any testimony associated with this work. In reaching my conclusions, I have drawn on my training, experience, and knowledge as a social scientist who has specifically conducted research in the area of redistricting. My compensation in this case is not dependent upon the outcome of the litigation or the substance of my opinions.

II. STATE LEGISLATIVE REDISTRICTING IN NORTH CAROLINA

North Carolina relies on a unique system to draw state legislative districts that is based on multiple rigid criteria. To a large extent, these criteria make drawing state legislative districts in the Tar Heel state a formulaic exercise. The state constitution requires that House and Senate members be elected from districts and that, in the formation of such districts, counties must be kept whole.¹ This mandate has been translated into a system where counties are first grouped together and then districts are drawn within these groups.² In carrying out this mandate, districts should be limited to single counties or the minimum combination of contiguous counties necessary to draw equal-population districts.³ In drawing districts within multi-county groups in 2017, it was only permissible to traverse, or cross, a county boundary line once.⁴ County traversals are only permitted where necessary to comply with district population equalization.⁵ The county group system used by North Carolina acts as constraint on the discretion of line drawers.

Once the county groups have been established, in the case of any group that will contain more than one district, the map drawer is then required to create the requisite number of districts. Each county group comprising more than one district is, at this point, its own self-encapsulated geographic area for the purpose of drawing legislative districts. In other words, districts drawn in one county group are independent of districts in any other county group.

In addition to the county group rules discussed above, in 2017, the General Assembly also imposed other criteria on the drawing of legislative districts. These criteria include population equalization, contiguity, goals for compactness and VTD splits, the consideration of municipal boundaries, and incumbency protection.⁶ Taking into account all the criteria discussed, a map

¹See North Carolina Constitution, Article II, Sections 3 and 5. What is known as the whole county provision has been codified in state court opinions in a number of cases. For example, see *Stephenson v. Bartlett*, 355 N.C. 354 (2002). This provision does not supersede the federal dictate that districts, within a range of +/- 5%, must contain equal population counts.

²In some cases, a county group may be synonymous with a district.

³*Dickson v. Rucho*, 781 N.C. 404 (2015).

⁴2017 House and Senate Plans Criteria (Document Number: LDNC000302).

⁵*Stephenson v. Bartlett*, 355 N.C. 354.

⁶2017 House and Senate Plans Criteria (Document Number: LDNC000302). Partisan data, but not racial data, were considered in the creation of the 2017 House and Senate plans.

drawer creating district boundary lines within a county group is quite constrained as to the amount of discretion they may exercise. This is especially the case in county groups containing only a few districts.

In response to a federal court case, North Carolina was ordered to revise its House and Senate plans prior to the 2018 election-cycle.⁷ The resulting plans are the subject of litigation in the present matter. It should be noted that the plaintiffs in this matter are not challenging the county group mandate nor the current configuration of county groups in the House and Senate plans. In addition, the plaintiffs have only made allegations challenging certain House and Senate districts within the state. In the House, plaintiffs have made allegations challenging a total of 77 districts in eighteen county groups.⁸ In the Senate, they have made allegations challenging a total of 23 districts in seven county groups.

III. TRADITIONAL REDISTRICTING CRITERIA

In this section of my report, I examine the enacted House and Senate plans by analyzing a number of redistricting principles that were highlighted in the 2017 Redistricting Criteria by the General Assembly.

A. VTD Analysis

In this section, I make a number of comparisons concerning VTD splits across districts. According to the redistricting criteria, the 2017 House and Senate plans should make an effort to produce a plan that splits fewer precincts than the 2011 plans.⁹ Table 1 below details the number of VTD splits for the 2017 enacted plans, the 2011 benchmark plans, and Professor Chen's simulated legislative plans.¹⁰

⁷*Covington v. North Carolina*, 267 F. Supp. 3d 664 (M.D.N.C. 2017).

⁸Although House Districts 21, 22, 57, 61, and 62 are located in county groups with other districts about which Plaintiffs have made allegations, Plaintiffs have made no specific allegations challenging these districts,

⁹2017 House and Senate Plans Criteria (Document Number: LDNC000302).

¹⁰North Carolina General Assembly, Redistricting Office and Expert report of Jowei Chen (April 8, 2019), Tables 5 and 6.

Table 1. Comparison of Split Precincts by Plan

Plan	Whole VTDs	Split VTDs	Total VTDs
2017			
House	98.2% [2,644]	1.8% [48]	2,692
Senate	99.8% [2,687]	0.2% [5]	2,692
2011			
House	85.3% [2,297]	14.7% [395]	2,692
Senate	90.5% [2,435]	9.5% [257]	2,692
Chen-Set 1			
House	99.8%-99.3% [2,686-2,674]	0.2%-.07% [6-18]	2,692
Senate	100%-99.9% [2,692-2,689]	0.0%-0.1% [0-3]	2,692
Chen-Set 2			
House	99.7%-99.3% [2,685-2,672]	0.3%-0.7% [7-20]	2,692
Senate	100%-99.9% [2,692-2,689]	0.0%-0.1% [0-3]	2,692

The 2017 enacted House plan split 48 VTDs, or 1.8% of the total number of VTDs. This is a considerable improvement over the benchmark House plan which split 395 VTDs or 14.7% of all VTDs. Looking at the Senate, the 2017 plan split only five VTDs or 0.2% of the total. The previous plan in 2011 split a total of 257 VTDs or 9.5% of all VTDs. Looking at this from another vantage point, more than 98% of VTDs in the House plan and almost 100% of VTDs in the Senate plan were kept wholly intact. Such numbers comply with the stated goal of the redistricting criteria.

Professor Chen's simulations for the House split between six and 20 VTDs. For the Senate, the number of split VTDs ranges from 0 to 3. While these figures represent slight improvements over the 2017 enacted plans, it should be noted that the redistricting criteria do not call for plans designed to minimize VTD splits as inferred by Professor Chen.¹¹ Again, under the 2017 enacted plans, more than 98% of VTDs were not split.

¹¹Expert report of Jowei Chen (April 8, 2019), Table 16.

greater number of Republican incumbents paired in the Senate plan under which the election was held—a total of eight compared to only two Democrats.

To summarize, in both the House and Senate plans, the goal of limiting the number of incumbent pairings of either party was clearly achieved.

Table 5. Incumbent Pairings. 2018

Pairings	House		Senate	
	2017 Enacted	2018 Elections	2017 Enacted	2018 Elections
D, R	0.8% [1]	0.8% [1]	2.0% [1]	4.0% [2]
D, D	0.0% [0]	0.8% [1]	0.0% [0]	0.0% [0]
R, R	0.8% [1]	0.8% [1]	6.0% [3]	6.0% [3]
Open	1.7% [2]	2.5% [3]	8.0% [4]	10.0% [5]
Unpaired	96.7% [116]	95.0% [114]	84.0% [42]	80.0% [40]
Total Seats	120	120	50	50

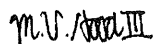
D. Summary

The 2017 House and Senate plans met the goals stated in the adopted redistricting criteria. Compared to the 2011 plans, the 2017 plan saw measurable gains in terms of district compactness and reducing VTD splits as compared to the 2011 plans. The simulations prepared by Professor Chen that were designed to maximize these criteria perform only marginally better on these factors. In addition, the goal of protecting incumbents specified in the criteria was also met as very few House and Senate incumbent members, of either party, were paired in 2017. These factors, combined with the successful implementation of the county grouping system and the condition permitting only a single internal traverse, also meant respect for county boundaries was paramount in the plan's creation. In addition, all House and Senate districts are contiguous and meet the equal population standard as defined by the criteria. These goals, in my opinion, are certainly not partisan in nature. In using a different set of criteria from that adopted by the General Assembly, Professor Chen infers that any deviation from maximization of these factors is an indication of improper partisan motives. In my opinion, imputing motives based on the application of a different set of criteria in no ways proves the General Assembly was engaged in an effort to engage in extreme partisan gerrymander. As indicated in my discussion of the legislative redistricting in North

VI. CERTIFICATION

I certify that the statements and opinions provided in this report are true and accurate to the best of my knowledge, information, and belief.

Executed on April 30, 2019.



M.V. (Trey) Hood III

Department of Political Science
School of Public and International Affairs
180 Baldwin Hall
University of Georgia
Athens, GA 30602

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Exhibit 4

STATE OF NORTH CAROLINA
IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
COUNTY OF WAKE

Common Cause, et al.,)
)
 Plaintiffs,)
)
 v.) Docket No. 18 CVS 014001
)
 Representative David R. Lewis, et al.,)
)
 Defendants.)

AFFIDAVIT OF JANET R. THORNTON, Ph.D.

STATE OF FLORIDA)
) ss.
COUNTY OF LEON)

Dr. Janet R. Thornton, affiant, affirms under oath as follows:

1. I am a Managing Director at Berkeley Research Group (BRG), a consulting firm specializing in the application of economic, econometric, and statistical analysis to litigation, regulatory compliance, and risk assessment matters, among other specialties. BRG experts have analyzed data for matters involving firms in many sectors, government entities, as well as institutions of higher education and research. My fields of special interest include computer analysis of large databases, applied econometrics and statistical analysis.

2. I received doctoral and master's degrees in economics from The Florida State University, and a bachelor's degree from the University of Central Florida in economics and political science.

3. I am a member of the American Economic Association and the National Association of Forensic Economics.

Committees may make reasonable efforts to ensure voters have a reasonable opportunity to elect non-paired incumbents of either party to a district in the 2017 House and Senate plans.

Election Data. Political considerations and election results data may be used in the drawing of legislative districts in the 2017 House and Senate plans.

No Consideration of Racial Data. Data identifying the race of individuals or voters shall not be used in the drawing of legislative districts in the 2017 House and Senate plans.

Dr. Pegden's Deviations from the Actual Criteria:

33. Dr. Pegden deviates from the population and compactness guidelines established for the 2017 enacted map. Rather than requiring a district to meet the $\pm 5\%$ population deviation, Dr. Pegden applies a less clear requirement: "I require comparison districtings to have district populations within the same range as the enacted House or Senate plan, respectively."⁹ In addition, Dr. Pegden does not apply the guide of the minimum Reock ("dispersion") score and Polsby-Popper score ("perimeter") that was used as a minimum threshold for the enacted map. Instead, Dr. Pegden requires the simulated maps to be at least as compact as the enacted map up to an error of 5%.¹⁰ A review of Dr. Pegden's simulation code suggests that in reality, he did not actually apply a compactness criterion. Thus, Dr. Pegden could accept simulated maps that do not meet the minimum thresholds of the enacted map and could have failed to include simulated maps that meet these minimum thresholds.

34. As a consequence of these deviations, Dr. Pegden will accept and reject simulated maps that do not meet the same criteria as the enacted map, resulting in yet another apples and oranges comparison.

⁹ Pegden Report, page 7.

¹⁰ Pegden Report, page 8.

35. Dr. Pegden also does not adjust for incumbency protection in accordance to the enacted plan. Thus, he does not apply a weight for the party of the incumbents, which would change his partisanship outcomes.

36. With respect to the simulations prepared by each of Plaintiffs' experts, none follow the guidelines used to construct the 2017 enacted map. As a consequence, the set of maps resulting from the simulations that are used to compare the Democratic Districts to that of the enacted map are faulty because, in each case, the foundation of the comparison is not the same as the enacted map.

Dr. Chen's Deviations from the Actual Criteria:

37. With respect to compactness the guidelines state, "The Committees shall make reasonable efforts to draw legislative districts in the 2017 House and Senate plans that improve the compactness of the current districts. In doing so, the Committees may use as a guide the minimum Reock ("dispersion") and Polsby-Popper ("perimeter") scores identified by Richard H. Pildes and Richard G. Neimi."¹¹ The minimum dispersion or Reock score is 0.15 and the minimum perimeter or Polsby-Popper score is 0.05 according to this article.¹²

38. Dr. Chen did not apply the compactness guidelines as they were described in the legislative record. Instead, Dr. Chen applies more stringent compactness criteria to accept maps by essentially keeping only those simulated maps with a better score. Thus, it is not surprising that he writes that all of his simulated maps have a higher Reock and Polsby-Popper score than the enacted map.¹³

¹¹ Richard H. Pildes and Richard G. Neimi in *Expressive Harms, "Bizarre Districts," and Voting Rights: Evaluating Election-District Appearances After Shaw v. Reno*, 92 Mich. L. Rev. 483 (1993).

¹² Richard H. Pildes and Richard G. Neimi in *Expressive Harms, "Bizarre Districts," and Voting Rights: Evaluating Election-District Appearances After Shaw v. Reno*, 92 Mich. L. Rev. 483 (1993), Table 3 and cited in Cromartie v. Hunt, 133 F.Supp. 2d 407 (2000), at 415.

¹³ Chen Report, page 16.

39. Dr. Chen's code for acceptance of a map states, "save this plan if it has the lowest t-score."¹⁴ The t-score is only a mathematically convenient criterion introduced by Dr. Chen to generate his maps.

40. In addition to including compactness to construct the t-score, Dr. Chen also included a measure for the splitting of precincts and municipalities as part of the score. The criteria established for the 2017 enacted plan do not state that the goal is to avoid the splitting of precincts and municipalities. Instead, the 2017 enacted plan was constructed to have fewer precinct splits than the prior plan in the districts that were to be redrawn and stated that municipal boundaries could be taken into consideration.

41. A t-score evaluation was not among the actual criteria relied upon for the creation of the 2017 enacted map. To create the t-score that he uses to evaluate a map, Dr. Chen subtracts the Reock and Polsby-Popper scores from 1.75. Dr. Chen does not explain why he decided to use 1.75, but were he to change the 1.75 to another number, he would derive a different t-score by which to evaluate each simulated map. As a consequence, Dr. Chen is able to influence the simulated maps that he accepts and rejects.

42. If Dr. Chen had applied the actual criteria utilized by those who constructed the enacted map, he presumably would have generated a different set of maps. The resulting maps would have been the more relevant simulations to compare to the enacted map to assess partisan bias. Dr. Chen's modification of the actual criteria results in making apples and oranges

¹⁴ See for example code from Dr. Chen's file, NCU_BASE_SET1.JAVA:

```
double t_score = (1+tmcdfrags-ALLmcds.size()+ tvtdfrags-ALLvtds.size()) * (new Double(1.75)-reock-  
polsby); //lower is better  
if(t_score<low_score){ low_score=t_score; Dpcts=makeCopy(districts, t_Dpcts);  
Dpops=(int[])t_Dpops.clone(); } //save this plan if it has the lowest t_score  
System.out.println("tctyfrags: "+tctyfrags+" tmcdfrags: "+tmcdfrags+" tvtdfrags: "+tvtdfrags+" reock:  
"+reock+" polsby: "+polsby+" t_score: "+t_score+" try: "+t);  
System.out.println("====="); break; //System.exit(0);
```

comparisons. It should not be surprising to have maps with “better” scores, although only slightly better based on a review of Tables 5 and 6 of his report, compared to the enacted map. To properly evaluate the enacted map would require using the same, not modified, criteria. Dr. Chen could have accepted maps with the same or fewer splits as the enacted map.

43. Dr. Chen’s Set 2 simulations are an attempt to include incumbency protection among his criteria. He states that he prepared another set of simulations “that intentionally protect exactly as many incumbents as is mathematically possible within each county grouping while otherwise adhering to the same traditional districting criteria.”¹⁵ This approach appears to focus on the first criterion used to prepare the enacted plan, that “Reasonable efforts and political considerations may be used to avoid pairing incumbent members of the House or Senate with another incumbent in legislative districts drawn in the 2017 House and Senate plans.”¹⁶

44. However, Dr. Chen does not take into account the additional criterion used with respect to incumbency protection: “The Committees may make reasonable efforts to ensure voters have a reasonable opportunity to elect non-paired incumbents of either party to a district in the 2017 House and Senate plans.”¹⁷ Dr. Chen ignores this piece of the 2017 enacted map criteria which was to allow for incumbents to win, not to just consider the pairing. He could have modified his criterion to weight the vote share for the political party of the incumbent, but chose not to.

45. A review of the current political party representation in districts that are not frozen and in which non-incumbents were elected reveals a higher proportion of Democratic Party House and Senate members elected to these seats.¹⁸

¹⁵ Chen Report, page 43.

¹⁶ Bates Number LDNC1883.

¹⁷ Bates Number LDNC1883.

¹⁸ Among the frozen House Districts, half of the Districts (or 9 of 18) were Democratic Party candidates. Among the frozen Senate Districts, one-third (or 7 of 21) were Democratic Party candidates. See the North Carolina House of Representatives website, <https://www.ncleg.gov/House>, and the North Carolina Senate website, <https://www.ncleg.gov/Senate>.

84. As shown below, using Dr. Chen’s simulations, there are approximately 5 more Democratic House Districts and 2 more Democratic Senate Districts based on the simulations as compared to the enacted plan. These differences are *not* statistically significant with numbers of standard deviations associated with the differences that are between -0.53 and -0.95.

Table 5—Comparison of the Democratic House and Senate Districts of the Enacted Plan and the Simulated Maps Prepared by Dr. Chen Using the 2010-2016 Composite Statewide Elections

Simulation Set	Number of Districts	Average Democratic District Share Among Simulated Maps	Number of Democratic Districts Based on Enacted Map	Average Number of Democratic Districts from Simulations	Difference between Enacted and Simulated Map Democratic Districts	Number of Standard Deviations Associated with the Difference
<i>Simulated House Districts</i>						
Set 1	120	38.77%	42	46.52	-4.52	-0.85
Set 2	120	39.23%	42	47.08	-5.08	-0.95
<i>Simulated Senate Districts</i>						
Set 1	50	39.70%	18	19.85	-1.85	-0.53
Set 2	50	39.72%	18	19.86	-1.86	-0.54
Set 1 reflects the simulations without incumbency protection and Set 2 reflects the simulations with incumbency protection. The Average Number of Democratic Districts from Simulations is calculated from the distribution of simulation results at Tables 5 and 6 of Dr. Chen’s report.						

Table 6—Comparison of the Democratic House and Senate Districts of the Enacted Plan and the Simulated Maps Prepared by Dr. Mattingly Across the Different Statewide Elections that He Included

Elections	Number of Districts	Average Democratic District Share Among Simulated Maps	Number of Democratic Districts Based on Enacted Map	Average Number of Democratic Districts from Simulations	Difference between Enacted and Simulated Map Democratic Districts	Number of Standard Deviations Associated with the Difference
House	120	44.95%	50.59	53.94	-3.35	-0.62
Senate	50	46.12%	20.82	23.06	-2.24	-0.63

The Average Number of Democratic Districts from Simulations is calculated from the distribution of simulation results at pages 8 and 12 of Dr. Mattingly’s Report.

91. I also prepared tests of two proportions to determine if the proportion of Democratic House and Senate Districts based on the enacted map and the simulated maps are statistically significantly different. I determined that they are not.³⁷

92. I also examined the difference between the median Democratic House districts based on Dr. Mattingly’s simulated maps and the enacted map for the 17 elections he included compared to the 10 elections that were considered when the enacted map was constructed. Across the 17 elections, Dr. Mattingly estimates a shortfall of 3.35 Democratic House districts. This shortfall is reduced to 1.5 when the 10 elections considered by the legislature are included. In addition, Dr. Mattingly’s estimates reveal that there is an excess of Democratic House seats when

³⁷ The following are the results of the tests of two proportions based on Dr. Mattingly’s results:

Elections	Democratic District Share Estimated by Dr. Mattingly from Enacted Map	Democratic District Share Estimated by Dr. Mattingly from Simulations	Percentage Point Difference In Democratic District Share	Number of Standard Deviations
House	42.16%	44.95%	-2.79%	-0.44
Senate	41.65%	46.12%	-4.47%	-0.45

46. Among the 24 House Districts that are not frozen and had individuals elected in 2018 who were *not* incumbents (i.e., individuals with 1 or 1.5 terms), 70.8% (or 17 of 24) were Democratic Party candidates.¹⁹ On the other hand, among the 78 House Districts that are not frozen and had individuals elected in 2018 who *were* incumbents (i.e., individuals with 2 or more terms), 37.2% (or 29 of 78) were Democratic Party candidates. If Dr. Chen had accounted for the party of the incumbents, he would have perhaps generated a different outcome regarding partisanship.

47. The same pattern exists when I examine the Senate Districts. Among the 9 Senate Districts that are not frozen and had individuals elected in 2018 who were *not* incumbents (i.e., 1 term), 66.7% (or 6 of 9) were Democratic Party candidates. On the other hand, among the 20 Senate Districts that are not frozen and had individuals elected in 2018 who *were* incumbents (i.e., 2 or more terms), 40.0% (or 8 of 20) were Democratic Party candidates.

48. These statistics show that if Dr. Chen had controlled for not only the pairing of incumbents but also the party of the incumbents, he would have estimated fewer Democratic seats, because the majority of seats were held by incumbents, of whom a lower proportion were Democratic.

49. Dr. Chen also performs a counterfactual analysis of his simulated maps in which he reviews the simulated maps under 25 different scenarios of the percent Democratic vote share where the vote share is increased and decreased by 6 percentage points. From my review, this counterfactual analysis does not provide useful information because the simulations themselves do not accurately reflect the criteria used to produce the 2017 enacted map. As a consequence,

¹⁹ There were four districts with elected individuals with 1.5 terms all of whom were Democratic Party candidates. If these four are removed from the calculation, then the percentage is 65% (or 13 of 20).

adding or subtracting 6 percentage points from a faulty set of simulations results in a faulty range on which to base the counterfactual analysis.

Dr. Mattingly's Deviations from the Actual Criteria:

50. Dr. Mattingly scores each simulated map from his Markov Chain Monte Carlo simulation²⁰ and applies constraints. However, he does not apply the enacted map's specific criteria overall.

51. Dr. Mattingly's score function includes a weight for a population score, Polsby-Popper score (i.e., compactness), and municipality score. This score impacts which simulated maps are considered.

52. The population score rates how the population from the simulated maps compares to the ideal. This is a deviation from the enacted plan's criteria which is that the "number of persons in each legislative district shall comply with the +/- 5 percent population deviation standard established by *Stephenson v. Bartlett*, 355 N.C. 354, 562 S.E. 2d 377 (2002)."²¹

53. Dr. Mattingly's score function also weights his measure of compactness. Specifically, he ignores the minimum Reock ("dispersion") and Polsby-Popper ("perimeter") scores identified by Richard H. Pildes and Richard G. Neimi for accepting a simulated map. Instead, Dr. Mattingly focuses solely on the Polsby-Popper score²² but does not compare a simulated map's score to the minimum established by Pildes and Neimi. As a consequence, Dr. Mattingly could accept maps that do not conform to the Pildes and Neimi criteria adopted by the 2017 enacted plan.

²⁰ Dr. Mattingly's starting point is the algorithm described by Dr. Chen and Dr. Jonathan Rodden to which he applies his Markov Chain Monte Carlo simulation. (Mattingly Report, page 86; see also: Jowei Chen and Jonathan Rodden. *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, Quarterly Journal of Political Science, (2013) Vol. 8, pages 239–269.)

²¹ Bates Number LDNC1883.

²² Mattingly Report, page 50.

54. Dr. Mattingly's score function also weights for municipality splits. Dr. Mattingly describes his municipality score function as a measure of "how many people in a given municipality have been separated from the district(s) that best represents their municipality."²³ Again, this is not how the 2017 enacted map was constructed, because the criteria were 1) to have fewer precinct splits and 2) that municipal boundaries could be considered when drawing the districts.

55. Dr. Mattingly does not use uniform weights for each component of his score (population, compactness, and municipality) for each county cluster. Further, he does not apply the consistent population threshold of $\pm 5\%$ that was required for the enacted plan. Indeed, he states that he cannot generate plans with all districts between $\pm 5\%$ population deviation.²⁴ For example, the Wake House cluster has a population threshold used in his simulations that is $\pm 12\%$, not $\pm 5\%$.²⁵ By changing the weights and/or changing the threshold, Dr. Mattingly is changing the group of simulated maps that he is selecting. Dr. Mattingly's efforts to create simulated maps do not optimize the criteria used by the legislature, but instead optimize based on his own varied thresholds and score functions.

56. Further, Dr. Mattingly does not consider incumbency protection as defined in the 2017 enacted map criteria. Dr. Mattingly writes that "Our primary ensemble does not preserve incumbents. ... Finally, some of our sampled plans are less compact, split more municipalities, and split more people out of municipalities than the enacted plan."²⁶ Even when he attempts to test more strict redistricting criteria, he does not simultaneously control for *all* of the criteria used to

²³ Mattingly Report, page 50.

²⁴ Mattingly Report, page 54.

²⁵ Mattingly Report, pages 55-56.

²⁶ Mattingly Report, page 81.

data upon which to measure the Democratic two-party vote share used to compare the simulations to the enacted map.

94. Further, it is unknown when the simulation should begin to sample and how often the samples should be collected, because it is almost impossible to prove that each expert's algorithm samples from the entire space of compliant maps.

95. Regardless of the simulation criteria, technique, and the data used to evaluate the maps, none of the three Plaintiffs' experts' findings statistically significantly deviate from the enacted map with respect to the number of Democratic House and Senate districts. It is possible that if each had followed the actual criteria used by the legislature there would be little to no deviation from the enacted map.

I have read the foregoing statement consisting of 95 paragraphs and swear that it is true and accurate to the best of my knowledge and belief.

FURTHER THE AFFIANT SAYETH NOT.

Janet R. Thornton

Janet R. Thornton, Ph.D.

Subscribed and sworn to before me
this 7th day of May, 2019.

Diana R. Bryson

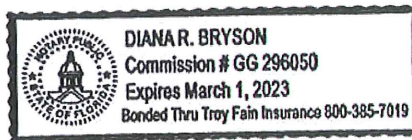


Exhibit 5

Responses to Drs. Barber, Brunell, Hood, Lewis, Johnson, and Owen

Christopher A. Cooper

June 7, 2019

Hood, Johnson, and Brunell on Partisan Intent

Drs. Hood, Johnson, and Brunell characterize the process of mapmaking in North Carolina as a straightforward one with little room for judgment or manipulation. All three also question whether “partisan intent” can be inferred from the current maps. For example, Dr. Hood describes drawing state legislative districts in North Carolina as a “formulaic exercise,” citing the state’s whole county provision along with other criteria that the General Assembly purportedly applied in 2017.¹ According to Dr. Hood, there is insufficient evidence that “the General Assembly was engaged in an effort to engage in extreme partisan gerrymander.”² He goes on to explain that the process of “legislative redistricting in North Carolina...is quite constrained, which greatly limits the ability of map drawers to create districts where partisan motives predominate.”³ Like Dr. Hood, Dr. Johnson claims that “the ‘county groupings’ requirement significantly limits the legislature’s ability to draw lines based exclusively on partisanship.”⁴ And Dr. Brunell similarly asserts that “[d]ivining the intent of the map-maker is extraordinarily difficult because the process of redistricting is complex.”⁵

As set forth in my original report, the partisan effects of the General Assembly in drawing the relevant state House and state Senate districts—within individual counties or county groupings—is clear from analyzing the district lines and historical election data. Indeed, despite claiming that partisan intent is difficult to discern or that there is insufficient evidence of such intent here, Drs. Hood, Johnson, and Brunell do not dispute any of my cluster-by-cluster analyses or my conclusion that the contours of the relevant districts have partisan effects.

There is even more evidence regarding partisan intent with respect to North Carolina’s General Assembly districts. I understand that Plaintiffs’ counsel obtained via subpoena the files of Dr. Thomas Hofeller, who drew the 2011 and 2017 plans. Those files reveal that partisanship was the overwhelming, if not the sole, motivation in drawing the state House and state Senate districts at issue. Below I present my analysis based on a number of Dr. Hofeller’s files that I and geographic information systems specialist Blake Esselstyn (who assisted me in processing and preparing the screenshots for the maps below) received directly from Plaintiffs’ forensic vendor. The maps presented below are taken directly from Dr. Hofeller’s Maptitude files (Maptitude for Redistricting™ is the software that Dr. Hofeller used to draw redistricting plans). These images reflect the exact

¹ April 30, 2019 report of Dr. M.V. Hood III (hereinafter, “Hood Report I”), p. 2.

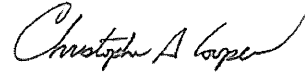
² Hood Report I, p. 9.

³ Hood Report I, pp. 9-10.

⁴ April 30, 2019 report of Dr. Douglas Johnston (hereinafter, “Johnston Report I”), p. 13.

⁵ Report of Thomas Brunell (hereinafter, “Brunell Report”), p. 7.

Submitted June 7, 2019.



Christopher A. Cooper

Exhibit 6

STATE OF NORTH CAROLINA
COUNTY OF WAKE

GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
18 CVS 014001

COMMON CAUSE, ET AL.,)
)
 Plaintiffs,)
)
 vs.)
)
DAVID R. LEWIS, ET AL.,)
)
 Defendants.)

DEPOSITION OF
CHRISTOPHER A. COOPER, PH.D.

9:33 A.M.

THURSDAY, JUNE 13, 2019

OGLETREE, DEAKINS, NASH, SMOAK & STEWART
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P R O C E E D I N G S

CHRISTOPHER A. COOPER, PH.D.,

having been first sworn or affirmed by the court reporter and Notary Public to tell the truth, the whole truth, and nothing but the truth, testified

as follows:

EXAMINATION

BY MR. McKNIGHT:

Q. Good morning, Mr. Cooper. My name is Michael McKnight and I'm one of the attorneys for the legislative defendants in this matter. Could you please state your full name.

A. Sure. Christopher Alan Cooper.

Q. Okay. And have you ever gone by any other names?

A. No.

Q. What is your address?

A. 160 Rose Street, Sylva, North Carolina, 28779.

Q. And have you ever been deposed before?

A. One time.

Q. Okay. And in what -- what context?

A. It was somebody who was denied tenure at a university where I work.

Q. Okay. Not any kind of case involving

1 local politics. I might create a map that
2 would show students states that have some
3 policy or don't have some policy or states
4 that have a lot of female representation
5 versus not a lot of female representation.

6 Q. So different states would have maybe
7 different colors to represent those things or
8 something like that?

9 A. Or something to indicate grading, yeah.

10 Q. Okay. All right. Now, I think you said in
11 your reports that some of the maps that you
12 feature came from the Maptitude computer
13 program; is that right?

14 A. That is correct.

15 Q. Okay. Now, do you use Maptitude in your
16 professional work?

17 A. I do not.

18 Q. Okay. Do you have Maptitude installed on any
19 computer that you use?

20 A. I do not.

21 Q. Okay. And I take it you've never received
22 any training on Maptitude?

23 A. That is correct.

24 Q. Okay. So you have no experience using
25 Maptitude at all?

1 A. I have not received training specifically on
2 Maptitude.

3 Q. So my question's a little different, though.

4 A. Uh-huh.

5 Q. My question is, do you have any experience
6 working with Maptitude software?

7 A. Define experience.

8 Q. I don't know how to define it other than the
9 word experience. Have -- have you ever used
10 Maptitude?

11 A. Have I used Maptitude? No.

12 Q. Okay. All right. Do you know how Maptitude
13 stores and uses its data files?

14 MR. CELLA: Objection to form.

15 A. I'm not sure how to answer that question.

16 Q. So I take it you -- you don't -- you don't
17 know how Maptitude stores its data files?

18 MR. CELLA: Objection to form.

19 A. I'm not agreeing to that.

20 Q. Okay.

21 A. Do --

22 Q. You have -- you don't understand the
23 question?

24 A. I think understanding how something is stored
25 can mean a lot of different things.

1 Q. Okay. Explain to me what -- what you
2 understand, if anything, about how Maptitude
3 works.

4 A. I think Maptitude is a program that takes
5 data at the geographic level and, if
6 manipulated properly, uses -- or creates
7 maps.

8 Q. And is that the entire understanding that you
9 have about how Maptitude works?

10 A. No, that's not the entire understanding.
11 It's like asking me what's my understanding
12 of how Microsoft Word saves files or how
13 Microsoft Word works. I -- I know if I save
14 it, it's on the computer. I don't know --
15 I'm not a computer scientist.

16 Q. Okay. So all I'm trying to get at --

17 A. Yeah.

18 Q. -- is -- is what level understanding that you
19 have about -- of the Maptitude system. Do
20 you know what types of files Maptitude
21 creates?

22 A. It creates mapping files --

23 Q. Okay. Do you know --

24 A. -- from data layers.

25 Q. Okay. Do you know what those files are

1 called?

2 A. No.

3 Q. Okay. All right. Do you know if Maptitude
4 automatically saves files when maps are
5 opened?

6 A. Yes, I do know that. Maptitude -- there's a
7 feature that allows you to check versioning,
8 and I know that when you save it, the last
9 thing you were looking at is what appears on
10 the screen.

11 Q. How do you know that?

12 A. I watched Blake save those files.

13 Q. And so your knowledge of that is -- is
14 watching Mr. Esselstyn --

15 A. Uh-huh.

16 Q. -- save files that were related to the ones
17 that appear in your report; is that right?

18 MR. CELLA: Objection to form.

19 A. Repeat that for me.

20 Q. Sure. So your understanding of how Maptitude
21 saves files when they're opened is based upon
22 your observations of Mr. Esselstyn when he
23 was saving maps related to your report; is
24 that right?

25 A. Yes.

1 Q. In fact, you never talked to anybody who did
2 make any of these maps, right?

3 A. In consult with this, no.

4 Q. I'm talking about any time. You never spoke
5 at any time with anyone who made any of the
6 maps that are at issue in this lawsuit,
7 right?

8 A. Not that I recall.

9 Q. Okay. So you can't comment into what they
10 intended to do or did not intend to do,
11 right?

12 A. I can tell you what the effect is. I can
13 tell you what knowledge they had when they
14 created them.

15 Q. Now, how do you know what knowledge someone
16 has when they create a map? How do you know
17 that?

18 A. I think in the rebuttal report the Hofeller
19 files pretty clearly indicate that he had
20 partisan knowledge when he created the maps.

21 Q. Well, now, what your rebuttal report shows is
22 that -- at least according to your report --

23 A. Uh-huh.

24 Q. -- that certain things were on a computer
25 screen when a file was last saved. Is

1 that -- is that what they show?

2 A. With Dr. Hofeller's initials in the
3 properties.

4 Q. Okay. And how do you know that?

5 A. Because I saw the initials in the properties.

6 Q. Did you look at it yourself?

7 A. Yes.

8 Q. Okay. What -- what did Mr. Esselstyn do in
9 terms of pulling up those files?

10 A. He stood there in front of me and pulled up
11 those files.

12 Q. Okay. Did you look at all of Dr. Hofeller's
13 files?

14 A. No.

15 Q. Which files did you look at first?

16 A. The ones that are in the report and --

17 Q. Okay.

18 A. -- maybe ten more.

19 Q. Okay. For the ones that weren't in the
20 report that --

21 A. Uh-huh.

22 Q. -- you looked at --

23 A. Sure.

24 Q. -- why didn't you include those in your
25 report?

1 A. He collected data on partisanship, generated
2 a partisan index, both rounds of
3 redistricting, had that partisan layer active
4 when he saved -- well, when somebody with his
5 initials saved his files.

6 Q. But you don't know what was on the screen
7 when Dr. Hofeller was moving district lines
8 around, for example?

9 MR. CELLA: Objection to form.

10 A. I know what was on his screen when he saved
11 the file.

12 Q. Okay. When he last saved the file?

13 A. When he last -- the -- the one that I put in
14 the report --

15 Q. Okay.

16 A. -- is -- he -- the last thing he had saved
17 right before then was what appears in the
18 report.

19 Q. So you don't know what was on his screen when
20 he was deciding which VTDs to include in
21 which districts?

22 A. I was not in the room with him.

23 Q. Okay. And do you know if the maps that you
24 viewed were ultimately the maps that were
25 enacted?

1 A. Some were; some were not.

2 Q. Okay. How do you know that?

3 A. You can just look at them.

4 Q. Okay. But you -- you didn't do any
5 comparison in your report about whether any
6 of the maps were the same or -- or different,
7 right?

8 MR. CELLA: Objection to form.

9 A. Some were the same; some were different.

10 Q. Okay. All right. Now, how long -- well, let
11 me ask -- let me ask the question this way:
12 When did you obtain the maps that you have
13 featured in this report?

14 A. I don't know the date. I'm going to say
15 about three weeks before I submitted this --

16 Q. That's when you first --

17 A. -- my best recollection.

18 Q. -- obtained those maps?

19 A. Yes.

20 Q. Okay.

21 A. That's my best recollection, about -- about
22 three weeks before this date.

23 Q. Did you know about them before then?

24 A. I did not.

25 Q. Okay. What did you understand about where

1 the maps came from?

2 A. Not much. I understood they came from
3 Dr. Hofeller's hard drive.

4 Q. Okay. Did you get any information about how
5 they were obtained?

6 A. I believe by subpoena.

7 Q. Do you know who they were obtained from?

8 A. I believe it was his daughter. And that
9 information I'm getting mostly from the
10 Raleigh News & Observer so...

11 Q. Now, with respect to these maps --

12 A. Uh-huh.

13 Q. -- you used Blake Esselstyn, right?

14 A. Uh-huh.

15 Q. What did Mr. Esselstyn do with respect to
16 these maps?

17 A. They were Maptitude files, Maptitude for
18 Redistricting, and so he opened them --
19 unencrypted them, opened them, and then
20 grabbed screen shots of them.

21 Q. Did you watch him go through that process?

22 A. I did.

23 Q. Okay. The entire time?

24 A. From encryption.

25 Q. Okay. So walk me through then what you saw

1 him do.

2 A. I saw him download the files from Stroz
3 Friedberg, who's the, I guess, forensic
4 vendor, unencrypt them, unzip them, open them
5 up in Maptitude for Redistricting.

6 Q. How long did that process take?

7 A. To get the first file open, maybe 20 minutes.

8 Q. Okay. And then how long did it take to open
9 subsequent files?

10 A. It doesn't work quite that way. So you open
11 one -- imagine a map of the state of North
12 Carolina and you open that file which has
13 file paths underneath it, and then you -- you
14 can see and then you can grab screen shots of
15 specific parts of the state. So then imagine
16 doing that in 27 -- for the 2017 maps and
17 then for each of the two versions of the 2011
18 maps that are featured here.

19 Q. So is it fair to say that you and Mr. --
20 Mr. Esselstyn -- for example, looking at
21 Figure 2 on Page 7, you all decided what this
22 screen shot would look like, right?

23 MR. CELLA: Objection to form.

24 A. I wouldn't say that.

25 Q. Well, so what you -- what you started out

1 looking at was a map of the entire state,
2 right?

3 A. Yes.

4 Q. Okay. And then you decided to go to -- look
5 at Guilford County, right?

6 A. In this case.

7 Q. Okay. So -- so for Figure 2 what you did is
8 you zoomed in toward the area of the state
9 that included Guilford, Randolph, and
10 Alamance Counties, right?

11 A. Yes.

12 Q. Okay. And so this Figure 2 was not something
13 that was saved on Dr. Hofeller's hard drive
14 as it appears here, right? In other words,
15 he didn't have a file that looks like Figure
16 2 and -- and this is all it showed?

17 MR. CELLA: Objection to form.

18 A. He had a file that showed exactly that. It
19 just showed other pieces of geography around
20 it and it included exactly this with exactly
21 these color schemes.

22 Q. Well, let me ask it this way: I -- I take
23 it, again --

24 A. Uh-huh.

25 Q. -- what -- he had one file that had the

1 entire state of North Carolina on it, right?

2 A. Yeah.

3 Q. And this is a screen shot of a particular
4 section of the state of North Carolina that
5 you all selected, right?

6 A. This is a screen shot of a particular part of
7 North Carolina that was visible in the
8 state -- in the state of North Carolina.

9 Q. Okay.

10 A. Yeah.

11 Q. I assume the whole state was visible,
12 correct?

13 A. Yes.

14 Q. Okay. So you all zoomed in on this
15 particular area that's around the -- we'll
16 call it the Triad area; is that fair?

17 A. Sure.

18 Q. So you all zoomed in on this area and then
19 you took a screen shot of it, right?

20 A. That's correct.

21 Q. Okay. And you put it in this report?

22 A. That is correct.

23 Q. And that's what you did for all the other
24 figures that appear here; is that right?

25 A. That is correct.

1 Q. Okay. Now, you say the 2017 Senate maps here
2 are all from a file entitled -- and I'm --
3 I'm look- -- I'm sorry. I'm looking at Page
4 5 at the bottom.

5 A. Okay.

6 Q. You've got a footnote, Footnote 6, and it
7 says, the 2017 Senate maps depicted here are
8 all from NC Senate J-24 plan that was saved
9 on July 5th, 2017.

10 Do you see that?

11 A. I do.

12 Q. Okay. So how did you determine what date the
13 plan was saved on?

14 A. There's a properties file. So you -- every
15 time he saved, it would -- basically, he
16 would do a hard drive backup and so you could
17 see the date in those properties.

18 Q. Now, was this particular plan that you looked
19 at here saved before July 5th, 2017?

20 A. I think it was a backup from -- initially
21 from June 24th because these were his J-24
22 plans.

23 Q. What does that stand for, do you know?

24 A. I believe it stands for June 24th.

25 Q. What is your understanding about -- when you

- 1 said you go in -- you went into properties to
2 determine the date the plan was saved on --
- 3 A. Uh-huh.
- 4 Q. -- what is your understanding of the
5 significance of the July 5th date? Is that
6 the date that the plan was saved on the hard
7 drive that you looked at or was it the date
8 that the plan was saved in the Maptitude
9 system?
- 10 A. Well, if it's saved on the hard drive, I
11 think it's saved in the Maptitude system. So
12 I think it'd be the last date that that file
13 was saved and then he might create another
14 file.
- 15 Q. Okay. Now, when you -- when you looked at
16 his map of the entire state --
- 17 A. Uh-huh.
- 18 Q. -- of which this is a -- this is a part --
- 19 A. Okay.
- 20 Q. -- was -- was this -- was the color key on
21 the left-hand side --
- 22 A. Where are we on?
- 23 Q. -- of the screen?
- 24 A. Are we on -- back on 8 or --
- 25 Q. Well, look at --

1 right?

2 A. Yes.

3 Q. Exactly as it appears here?

4 A. Yes.

5 Q. Okay. Now, looking at Page 5, you've got
6 Figure 1?

7 A. Uh-huh.

8 Q. Tell me how you created Figure 1.

9 A. So if you can -- which section of -- go into
10 a menu essentially and you can call up a
11 formula field and then it has the formula
12 field listed. So if you added -- you know,
13 just like in Excel, if you add Column A plus
14 Column B and those columns happen to have
15 names and there's a formula field, very
16 similar.

17 Q. Okay. So -- so you -- is that what you
18 clicked on here? Is that why this is
19 highlighted in blue? It says theme,
20 formula --

21 A. Yes.

22 Q. -- field? So you -- or Mr. Esselstyn was
23 doing this?

24 A. He was clicking as I was standing.

25 Q. Okay. So he -- I'll try to get that right as

1 Q. Okay. So going back to what you and
2 Mr. Esselstyn were doing, you went and took
3 screen shots of different areas of the Senate
4 map here that's identified as the NC Senate
5 J-24 map, right?

6 A. That's correct.

7 Q. Okay. And how did you decide what areas of
8 the state to take the screen shots of?

9 A. For the 20- -- basically try to get one of
10 each of the clusters that was in the case,
11 and if they had been changed in 2017, we used
12 the newer version, and if they had not, then
13 we went with the 2011 version.

14 Q. All right. So let's look at Page 13 of your
15 rebuttal report --

16 A. Sure.

17 Q. -- because in this section of the report you
18 discuss maps that are from the file entitled,
19 NC House J-25 Plan, right?

20 A. Yes.

21 Q. What did you understand the J-25 to stand
22 for?

23 A. I believe they were June 25th.

24 Q. Now, what -- what makes you say that?

25 A. It stands to reason that J would be June and,

1 if I recall correctly, the properties spelled
2 that out as well.

3 Q. And remind me again what --

4 A. Sure.

5 Q. -- you're saying the properties said with
6 respect to what -- what happened on June
7 25th.

8 A. That it was -- that it was active on that
9 day.

10 Q. Okay. But not before then?

11 A. I don't know if it was active before then or
12 not.

13 Q. Okay. But the properties didn't tell you
14 either way?

15 A. I believe that's correct.

16 Q. Okay. And the same thing for the Senate plan
17 we just talked about --

18 A. That's correct.

19 Q. -- you -- you don't know whether there was
20 any activity before June 24th, right?

21 A. We know activity when he saved essentially,
22 when he backed up.

23 Q. Okay. All right. And as far as you could
24 tell, no activity with the map before June
25 24th or June 25th?

1 A. I -- I don't know.

2 Q. You didn't look at that?

3 A. I don't -- I don't know.

4 Q. Okay. And with respect to the June 24th or
5 June 25th, do you know what year that's
6 referring to?

7 A. Those are from 2017.

8 Q. Okay. Well, how do you know that?

9 A. Again, that was in the properties of when
10 he --

11 Q. Okay.

12 A. -- created them and saved them.

13 Q. All right. But in terms of the House -- 2017
14 House maps --

15 A. Sure.

16 Q. -- you looked at, you say here that plan was
17 saved on August 7th of 2017; is that right?

18 A. That's what I wrote. I think -- I assume
19 that's right.

20 Q. That's Footnote 13?

21 A. Yeah. Oh, I gotcha.

22 Q. That -- you -- you saw that on the properties
23 of the file?

24 A. Yes.

25 Q. Now -- now, you say in your report here that

1 an enacted district was safer for Republicans
2 than one of the draft districts, did you
3 provide any quantification of how much safer
4 the enacted district is from one of the
5 districts that was found on the hard drive
6 here?

7 A. I do not have a single number that I've
8 reduced that to, no.

9 Q. Okay. And in your review of Dr. Hofeller's
10 hard drive, you weren't able to glean any
11 reasons as to why these districts were
12 drafted, were you?

13 MR. CELLA: Objection to form.

14 A. Yeah, I don't know how you could get reasons
15 from a hard drive.

16 Q. Well, there was -- there was nothing in
17 the -- in any of the properties or metadata
18 or anything about any of these files that you
19 reviewed from Dr. Hofeller's hard drive that
20 would give you an indication as to why he had
21 prepared these maps, would it?

22 MR. CELLA: Objection to form.

23 A. I looked at the map files. That's --

24 Q. Okay.

25 A. So there was no -- there'd be no place to

1 have that. There was no --

2 Q. Okay.

3 A. -- "Dear Diary" section.

4 Q. Okay. All right. Nothing in the names of
5 the files, nothing in the properties that
6 would indicate to you why that was done?

7 MR. CELLA: Objection, form.

8 A. The names of the files say, North Carolina
9 Senate plan, North Carolina House plan.

10 Q. Okay. Well, they don't say plan, do they?
11 They -- they might say, NC House J-25, right?
12 Is the word -- is the word plan in any of
13 these? Whatever --

14 A. N- --

15 Q. Whatever --

16 A. NC Senate master.

17 Q. Okay.

18 A. In a -- saved in a root folder NC plans, NC
19 Senate master. So, yeah, they do.

20 Q. Okay. Now, looking at Page 23 --

21 A. Uh-huh.

22 Q. -- the districts that are featured in this
23 section, you're saying these are the
24 districts that did not change from 2011 to
25 2017; is that right?

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A C K N O W L E D G E M E N T O F D E P O N E N T

I, CHRISTOPHER A. COOPER, PH.D., declare under the penalties of perjury under the State of North Carolina that I have read the foregoing 284 pages, which contain a correct transcription of answers made by me to the question therein recorded, with the exception(s) and/or addition(s) reflected on the correction sheet attached hereto, if any.

Signed this, the _____ day of _____, 2019.

CHRISTOPHER COOPER, PH.D.

State of: _____

County of: _____

Subscribed and sworn to before me this _____ day of _____, 2019.

Notary Public

My commission expires: _____

Exhibit 7

3. I maintain membership in the Information Systems Security Association (ISSA) and I hold certifications as a Certified Information Security Systems Professional (ISC²) as well as an EnCase Certified Examiner (Guidance Software). Previously, I was a Special Agent in the United States Air Force Office of Special Investigations where I investigated computer related crime and cyber counterintelligence for the Department of Defense. I have excelled in over 500 hours of classroom instruction on computer crime investigative techniques and I was a DoD certified Computer Crime Investigator and Computer Forensic Examiner from the Defense Cyber Investigations Training Academy. I was responsible for computer investigations covering the Western Coast of the United States as well as the entire US Air Force interest in the Asia/Pacific region. I also utilized my computer investigative expertise during the Global War on Terror in Iraq to identify and neutralize terrorist threats to United States in a Joint Special Operations Task Force. Attached hereto as Exhibit A is my Curriculum Vitae.

4. Setec has participated in and led countless computer forensic investigations and electronic discovery efforts to facilitate the discovery of electronic evidence in support of criminal and civil lawsuits. Setec is regularly designated as an expert and our team of computer forensic and electronic discovery specialists frequently provides expert witness testimony.

5. Due to my experience and education, I am familiar with basic forensic information captured in metadata on electronically stored files. I have the experience and training to examine metadata captured in files and discern what that metadata does and does not indicate as to the use or alteration of electronically stored files.

6. My firm has been employed by the law firm Ogletree Deakins, Nash, Smoak & Stewart, P.C. ("Ogletree Deakins") to assist in data processing for the above-captioned litigation.

I have personally worked on this project. This project is similar to the work my firm and I have performed on numerous occasions for law firms and cases nationwide.

7. In the ordinary course of work for Ogletree, Deakins my firm was provided forensic images of numerous data sources containing data that we understand pertain to a redistricting expert named Dr. Thomas Hofeller. We received these forensic images on or about May 6, 2019 in a Federal Express package, tracking number 775134673880 from Stroz Friedberg at the direction of Ogletree Deakins and Arnold & Porter. No Chain of Custody form was included in the package. This was an enormous volume of material totaling numerous terabytes.

8. The forensic images were mounted using EnCase software, an industry standard computer forensic software. Once mounted, Setec assembled full file and folder inventories of the forensic images including available timestamp metadata visible using EnCase. The inventories also included file names, folder names, path information, and details including whether or not the files were deleted, but still visible using EnCase.

9. In reviewing that metadata, I noticed some information recorded in that metadata that I, based on my experience and knowledge, find unusual.

10. I understand from counsel at Ogletree Deakins, and a review of publicly available information, that Dr. Hofeller passed away on August 16, 2016. However, there are many files with metadata indicating that they were accessed, created, and/or modified after that date.

11. Some files have a "Last Written" timestamp in the days immediately after Dr. Hofeller's passing in August, including 150 files with a "Last Written" timestamp on August 25, 2018. The "Last Written" timestamp is the time when the substance or contents of the file were

last changed and saved. These files were primarily identified on the forensic image labeled as ES0007C.

12. I understand from counsel at Ogletree Deakins that the above-captioned case is in North Carolina and that Ogletree Deakins represents the North Carolina legislature in that case. Based on that representation and my review of metadata, it appears that numerous files connected with the case and/or client were modified and/or transferred on August 25, 2018. Several files with some reference to North Carolina, such as with the words “Carolina,” or “NC”, have a “Last Written” date of August 25, 2018.

13. Numerous forensic images contained files and folders with “Entry Modified” timestamps on various dates between August 25, 2018, and December 24, 2018, including 10/13/18, 10/14/18, 10/20/18, 10/31/18, 11/24/18, and 12/20/18. File and Folder names include “Trusts-Wills-Powers” and “Dales Papers”. The existence of these dates in the metadata timestamps on these evidence items indicates they were at least powered on and interacted with on these dates.

14. This information indicates that someone, presumably not Dr. Hofeller (who, I understand, was not then alive), was accessing and saving these files on these dates.

15. Another piece of information I find unusual concerns the “recycle bin” on the drives. On August 25, 2018, the same date on which many files have an “Entry Modified” date, and/or “Last Written” date, the files and/or folders in the “recycle bin” also had “Entry Modified” timestamps on August 25, 2018. This is consistent with files being sent to the recycle bin on that date. The “recycle bin” is also known as a hard drive’s trash folder. It is the destination for files and folders when a user deletes them through Windows Explorer. These

files placed in the "recycle bin" on August 25, 2018, were not recovered, and the contents are unknown.

16. Counsel at Ogletree Deakins informed me that the adverse law firm or firms refused to provide a chain of custody accounting for the possession of the digital media from August 16, 2018, through March 20, 2019 (the latest creation date of the forensic images). It is my understanding that for the bulk of this time, the documents were not in the possession of Plaintiffs' counsel or Stroz Friedberg. I am therefore unable to assess who accessed, modified, and/or copied files in that period. Nor am I able to assess whether the files were stored according to industry standards.

17. In my experience serving as a computer forensic examiner, it is highly unusual for a firm to decline to provide chain of custody documentation. It is industry standard for this information to be provided. In 15 years of experience, I have never heard of a firm turning down a request for chain of custody documentation.

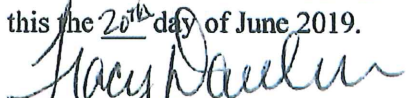
18. Given the enormous volume of data, our investigation continues, and we hereby reserve the right to amend this affidavit.

This the 20th day of June, 2019.



Michael Kunkel

Sworn and subscribed before me
this the 20th day of June, 2019.



Notary Public

My commission expires: 12-28-2019

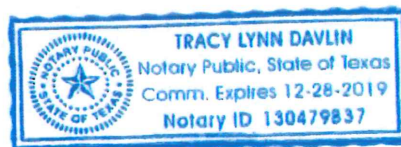


Exhibit A



Curriculum Vitae

Michael Kunkel

Director of Investigative Services

(800) 748-5440

mkunkel@SetecInvestigations.com

www.SetecInvestigations.com

Mr. Michael Kunkel is Setec Investigations' Director of Investigative Services. Mr. Kunkel possesses an extensive technical background, which is combined with a thorough education, time served in the United States Air Force, and numerous certifications, including an EnCase Certified Examiner (EnCE) by Guidance Software and as a Certified Information Security Systems Professional by ISC². Mr. Kunkel's expertise in computer forensics and investigative techniques allows him to successfully provide corporations, law firms, and law enforcement agencies with electronic evidence critical to the resolution of civil and criminal litigations and lead these investigations in a professional manner.

Mr. Kunkel continuously supports public and private corporations, along with government entities through litigation support and expert witness services, leveraging his technical expertise, understanding of the legal system, and real-world experience to produce cost-effective strategies for the discovery, collection, and investigation of electronic evidence. In addition, Mr. Kunkel participates in Setec Investigations' Computer Incident Response Team (CIRT) and applies his real-world experience by performing corporate computer fraud and cybercrime investigations.

Mr. Kunkel has acted as a computer forensic investigator for private attorneys, law enforcement agencies, corporations, insurance companies, and private individuals. Mr. Kunkel's involvement in diverse investigations and litigations has spanned numerous areas, including:

- Fraud
- Theft of Intellectual Property
- Trade Secret Misappropriation
- Email & Internet Abuse
- Employee Disputes
- Patent Infringement
- Copyright Infringement
- Divorce & Family Law
- Asset Recovery
- Defamation
- Industrial Espionage
- Disputed Dismissals
- Software Code Review
- Breach of Contract

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8391 Beverly Blvd. #167, Los Angeles, CA 90048

Tel 323.939.5598 Toll-Free 800.748.5440 Fax 323.939.5481

www.SetecInvestigations.com

PROFESSIONAL EXPERIENCE:

Director of Investigative Services, Setec Security Technologies, Inc. (September 2011 to Present)

- Leads and participates on computer forensic investigations and electronic discovery activities as a skilled high-tech investigator and project manager, regularly focusing on corporate computer fraud and cybercrime investigations.
- Provides litigation support advisory assistance to attorneys to advance computer forensic and electronic discovery efforts, satisfy discovery requests, and compel inspections.
- Acts as a computer forensic investigator for private attorneys, law enforcement agencies, corporations, insurance companies, and private individuals involved in diverse investigations and litigations spanning numerous areas, including, but not limited to: fraud, theft of intellectual property, trade secret misappropriation, email and internet abuse, employee disputes, sexual harassment, and breach of contract.

Digital Forensic Examiner, Stroz Friedberg L.L.C., San Francisco (August 2009 to September 2011)

- Conducted digital forensic acquisitions and analyses of laptops, desktops, and servers in civil litigations, criminal matters, and internal investigations.
- Developed and programmed customized utilities for use in the processing of electronic data, increasing the efficiency of electronic discovery processes.
- Performed large-scale electronic discovery involving the preservation, processing, and production of electronic data from a variety of digital sources.

United States Air Force, Chief of Cyber Investigations & Operations, Office of Special Investigations (AFOSI), Yokota Air Base, Japan (August 2006 to August 2009)

- Supervised, planned, coordinated, and implemented all cyber counterintelligence operations and network intrusion investigations conducted by the Air Force, from the Horn of Africa to the International Date Line.
- Led a team of Special Agents providing cyber investigative and computer forensic support to a multitude of criminal and counterintelligence cases covering 8 locations and providing consultations to over one hundred field agents.
- Provided specialized briefings to other government agencies and Air Force leadership concerning the threats to the U.S. network infrastructure from foreign intelligence services.
- Conducted extensive liaison with high-level Japanese, Korean, and U.S. military and law enforcement counterparts regarding threats to their networks.

United States Air Force, Global War on Terrorism, Operation Iraqi Freedom, Iraq, (September 2008 to March 2009)

- Deployed to Iraq as part of a Joint Special Operations Task Force working alongside members of each service and civilians to counter the Iraqi insurgency and establish stability in the region.

United States Air Force, Computer Crime Investigator, Travis Air Force Base, California (December 2005 to August 2006)

- Planned, coordinated, and implemented cyber counterintelligence operations in the western United States.
- Served as the primary investigator on network intrusion investigations involving US Air Force assets.
- Provided cyber investigative consultation and computer forensic analysis to 17 other Air Force field investigative units.
- Testified in multiple court martial proceedings.

United States Air Force, Criminal Investigator, Travis Air Force Base, California, (June 2004 to December 2005)

- Acted as primary investigator for felony-level crimes including: murder, rape, child molestation, drugs, blackmail, and fraud.
- Assisted in the apprehension and subsequent incarceration of multiple Air Force criminals.
- Wrote reports and provided testimony in multiple court-martial proceedings.

PROFESSIONAL CERTIFICATIONS

- EnCase Certified Examiner, 2010.
- Certified Information Security Systems Professional, 2009.
- DoD-Certified Computer Crime Investigator, 2006.
- DoD-Certified Computer Forensic Examiner, 2005.

SELECTION OF PROFESSIONAL TRAINING

- STROZ FRIEDBERG, Internal Training Program - Attended weekly in-house training presentations on digital forensics, cybercrime response, computer security, desktop and network forensics tools, and relevant legal topics.
- DEFENSE CYBER INVESTIGATIONS TRAINING ACADEMY - Excelled in 500 hours of formal cyber investigative training in Networks and Computer Hardware, Incident Response, Windows Forensic Examinations, Forensics and Intrusions in Windows and Linux Environments, Network Monitoring, Online Undercover Techniques, and Malicious Code Analysis.

- UNITED STATES AIR FORCE SPECIAL INVESTIGATIONS ACADEMY - Credentialed as a Special Agent of the United States Government.
- FEDERAL LAW ENFORCEMENT TRAINING CENTER - Criminal Investigator's Training Program.

EDUCATION

- 2008, UNIVERSITY OF TEXAS AT DALLAS, M.B.A., Business
- 2004, UNITED STATES NAVAL ACADEMY, B.S., Systems Engineering

SELECTION OF TESTIMONY EXPERIENCE

1. United States v Mirabal, Case No: Unknown, United States Air Force Court Martial, Nellis Air Force Base, Nevada, April 2006.
2. United States v Turner, Case No: Unknown, United States Air Force Court Martial, Travis Air Force Base, California, January 2007.
3. United States v Chapman, Case No: Unknown, United States Air Force Court Martial, Travis Air Force Base, California, January 2007.
4. United States v Cann, Case No: Unknown, United States Air Force Court Martial, Elmendorf Air Force Base, Alaska, January 2007.
5. United States v Ruddy, Case No: Unknown, United States Air Force Court Martial, Travis Air Force Base, California, June 2007.
6. Denise Winters v County of Solano, Case No: FCS035144, Superior Court of California, Solano County, California, October 2011.
7. Bruce W. Ballai v Kiewitt, Case No: 10CV09827, District Court of Johnson County Kansas, Johnson County, Kansas, February 2012.
8. Hummer Construction, Inc. v Aidlin General Trust, et al., Case No: BC449181, Superior Court of California, Los Angeles County, California, May 2012.
9. Bergstein, et al. v. Tregub, et al., Case No: BC434558, Superior Court of California, Los Angeles County, California, September 2012.
10. SMH Capital Advisors, Inc. v. Jimmy Day, FINRA Case No: 12-03291, FINRA Arbitration, Dallas, Texas, October 2012
11. *Id.*, March 2013.
12. Videotech Services, Inc. v. Edward Abdalla, David Santos, Timothy Rodriguez, Timothy Woolsey, H.F. Woolsey Corporation d/b/a The Crew Source, Case No. SC105947, Superior Court of California, Los Angeles County, California, January 2013
13. *Id.*, July 2014.

14. RPMx Construction, LLC, v. Brian Colin and Earth Basics Contracting Corporation, Case No. 417-02459-2013, District Court, 417 Judicial District, Collin County, Texas, July 2013.
15. Pavez Insurance Agency, Inc. DBA CPI Financial & Insurance Services vs. Sandra M. Best and Does 1 to 10, Inclusive, Case No. CIVSS 818321, Superior Court of California, San Bernardino County, California, September 2013
16. *Id.*, October 2013.
17. Slaymaker v Armstrong Financial Group, Case No. 37-2012-00054141-CU-OE-NC, Superior Court of California, San Diego County, California, April 2014.
18. Dupree, Sulatycky, O'Brien, Giron, and Morales v Sajahtera, Inc., Case No. BC463162, Superior Court of California, Los Angeles County, California, July 2014.
19. Rebecca Lewis v Alexandria Gramercy, LLC; Urban Brokerage, Inc., Case No. BC497235, Superior Court of California, Los Angeles County, California, August 2014.
20. Compak Securities, Inc., v Olandj, McDonald, and Orama, JAMS Reference No. 1200047466, JAMS Arbitration, Los Angeles, California, August 2014.
21. Stephen Welsh v Ryder Truck Rental, INC., and Navistar International Corporation; Case No. 37-2012-00085385-CU-PO-CTL, Superior Court of California, San Diego County, California, September 2014.
22. Archie Roundtree v Los Angeles Unified School District, Gerardo Loera, Ari Bennett, Adriana Maldonado-Gomez and Does 1-30, Case No. BC 499893, Superior Court of California, Los Angeles County, California, November 2014.
23. InfoSpan, Inc. v Emirates NBD Bank PJSC, Case No. 8:11-CV01062 JVS (ANx), United States District Court, Central District of California, Southern Division, January 2015.
24. Luminant Generation Company, LLC., vs Jennifer Morrison, T. Jeff Stone, and T. Jeff Stone & Associates, LLC., Cause No. 416-03151-2013, District Court of Collin County, Texas, 416th Judicial District, February 2015.
25. Procaps S.A. v Patheon Inc., Case No. 1:12-cv-24356-JG, United States District Court, Southern District of Florida, Miami Division, June 2015.
26. Central Medical Diagnostic Laboratory, Inc., v Brian Patchett, Michael Lumkin, California Laboratory Sciences LLC, Case No. 30-2013-00628124, Superior Court of California, County of Orange – Central Justice Center, California, February 2015
27. *Id.*, September 2015.
28. Cat 3, LLC, SXH, LLC, and Suchman, LLC, v Black Lineage, Inc., and Vahe Estepanian a/k/a Fletch Estepanian, Case N. 14-cv-5511 (AT), United States District Court, Southern District of New York, California, October 2015
29. *Id.*, New York, December 2015.

30. Charles M. Natcher, Jr., v JPH Consulting, INC., Case No. 56-2013-0446158-CU-WT-VTA, Superior Court of the State of California, Ventura County – Hall of Justice, Arbitration, California, January 2016.
31. American Lighting Inc, Neo-Neon Led USA Holdings Ltd and Tivoli LLC, v Targetti Sankey, S p A, et al., Case No. 14-01285-DOC, United States District Court for the Central District of California, Southern Division, California, February 2016.
32. Bombardier Inc. v Fabio Rebello, Case No. 2014-CA-001878-O, Circuit Court of the Ninth Judicial Circuit In And For Orange County, Florida, Texas, February 2016.
33. CoreLogic, Inc. v First American Financial Corporation, Case No. A213700, Judicate West Arbitration, California, April 2016.
34. Integrated Instrument Services, Inc. v Aziz Rahim and Pippets Pro, LLC, Cause No. 201613511, 165th Judicial District, District Court of Harris County, Texas, May 2016.
35. Chaowen Zhong v Eaton Escrow, Inc, Case No. 37-2015-00006141-CU-PN-CTL, Superior Court of the State of California, San Diego County, California, May 2016.
36. Building Materials Corporation of America dba GAF Materials Corporation v Paramount Petroleum Corporation, Case No. BC 481673, Superior Court of the State of California, Los Angeles County, California, July 2016.
37. The Regents of the University of California v Paul S. Aisen, et. al., Case No. 3:15-cv-01766-BEN-JLB, United States District Court, Southern District of California, California, December 2016.
38. Alessandro Camara v C.G. Motor Sports, Inc., Case No. CIVDS1517958, Superior Court of the State of California, County of San Bernardino, California, January 2017.
39. Fiber Systems International, Inc. v. Michael Dabrowski, Case No. 417-05506-2016, District Court of Collin County, Texas, 417th District Court, McKinney, Texas, February 2017.
40. FaxLogic, LLC v Matthew Thornton, Cause No. DC-15-07964, District Court of Dallas, Texas, 193rd Judicial District, Dallas, Texas, October 2016
41. *Id.*, May 2017.
42. Aerovironment, Inc. v. Torres, McAllister, McBride, Micasense Inc., Case No. 56-2015-00465460-CU-BC-VTA, Superior Court of the State of California, Ventura County, California, June 2017.
43. CP Kelco U.S., Inc. v. Chienkuo Yuan, Case No. 37-2015-00022453-CU-BT-CTL, Superior Court of the State of California, County of San Diego, California, March 2017
44. *Id.*, August 2017.
45. Tracey Downey-Racen v. Healthy Gourmet, LLC, Case No. 30-2012-00619381-CU-BC-CJC, Superior Court of the State of California, County of Orange, California, October 2017.

46. The New Home Company v. Jay Bartell and Ginger Marin, Case No. BC607130, Superior Court of the State of California, County of Los Angeles, California, October 2017.
47. Jeffer Mangels Butler & Mitchell LLP v Gregory J. Lorber, Case No. 14-65050GAG, ADR Services, Inc., California, June 2018
48. *Id.*, July 2018.
49. Professional Reprographics Services, Inc. v. Hudson Shuffleboards, Inc., Case No. 30-2018-00992602-CU-UD-CJC, Superior Court of the State of California, County of Orange, Texas via VTC, July 2018.
50. Oren Cohen v. Avraham Hassid, Case No. BC618549, Superior Court of the State of California, County of Los Angeles, California, September 2018.
51. Savills Studley, Inc. v. Ashley Elkin, Case No. 1:18-cv-02887-CMA-NRN, U.S.District Court, District of Colorado, Colorado, November 2018.
52. Taryn Dudley v. Allan M. Acton, D.D.S., P.A a/k/a Cary Family Dental, LLC, Case No. 5:18-cv-00146-D, U.S.District Court, Eastern District of North Carolina, Western Division, Texas via VTC, April 2019.
53. Absolute Pediatric Services, Inc. v. LaDonna Humphrey, Case No. 04CV-18-961, Circuit Court of Benton County, Arkansas, May 2019.

Exhibit 8

[CORRECTED] RESPONSE REPORT OF JOWEI CHEN, Ph.D.

June 7, 2019

Response to Dr. Hood's and Dr. Thornton's claims that the General Assembly Followed the 2017 House and Senate Plans Criteria:

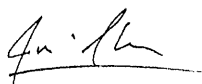
In their rebuttal reports, Dr. Hood and Dr. Thornton claim that in drawing the 2017 House Plan and the 2017 Senate Plan, the General Assembly followed the 2017 House and Senate Plans Criteria adopted by the House and Senate Redistricting Committees on August 10, 2017 (hereinafter: "The Adopted Criteria"). Specifically, Dr. Hood argues that "Taking into account all the criteria discussed [in the Adopted Criteria], a map drawer creating district boundary lines within a county group is quite constrained as to the amount of discretion they may exercise" (p. 2-3, Hood report of April 30, 2019). Dr. Hood further conducts an analysis to purportedly demonstrate that the 2017 Plans comply with the Adopted Criteria, and he concludes that "[t]he 2017 House and Senate plans met the goals stated in the adopted redistricting criteria." (p. 9 of Hood report of April 30, 2019). Similar to Dr. Hood, Dr. Thornton asserts that the Adopted Criteria reflect "the actual criteria utilized by those who constructed the enacted [2017] map, " and Dr. Thornton bases much of the analysis in her report upon this assumption (Para. 32, 33-56, 80-86, Thornton report of May 7, 2019).

I have two responses to this claim by Dr. Hood and Dr. Thornton. My first response is that Dr. Hofeller logically could not have been following the 2017 Adopted Criteria in June 2017, which is when he drafted much of the General Assembly's eventually enacted House and Senate districts. My second response to Dr. Hood's and Dr. Thornton's argument is that at all times in drawing the 2017 Plans, including after the 2017 Adopted Criteria were passed on August 10, 2017, Dr. Hofeller appeared to violate the Adopted Criteria's prohibition against any "consideration of racial data" (2017 House and Senate Plans Criteria, August 10, 2017). I explain both of these findings in detail below.

Dr. Hofeller Could Not Have Followed the Adopted Criteria When He Drafted the House and Senate Districts During June 2017: As detailed above, Dr. Hood and Dr. Thornton argue that the General Assembly followed the 2017 Adopted Criteria in producing the 2017

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

This 7th day of June, 2019.

A handwritten signature in black ink, appearing to read "Jowei Chen", written over a horizontal line.

Jowei Chen

Exhibit 9

STATE OF NORTH CAROLINA
COUNTY OF WAKE

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
Case No. 18 CVS 014001

COMMON CAUSE, *et al.*

Plaintiffs,

v.

DAVID R. LEWIS, *et al.*

Defendants.

Expert Rebuttal Report of Douglas Johnson, Ph.D.

Pursuant to the North Carolina Rules of Civil Procedure and the Case Management Orders of the Court in the above-captioned matter, I, Douglas Johnson, provide the following written report:

1. I am over 18 years of age and I have personal knowledge of the facts stated herein. My qualifications are stated in my original report, to which I add the following paragraph:

Expertise with Maptitude Software

2. Since I started working at NDC in 2011, I have drawn thousands of districting and redistricting plans using Maptitude for Redistricting software. I provided expert testimony on the software and its functionality in *Leach v. Arizona Independent Redistricting Commission*, in Maricopa County Superior Court, Case No. CV2012-007344. I have built hundreds of statewide and local demographic databases using this software. And I have used Maptitude for Redistricting to perform demographic analysis and to plot public opinion survey results for numerous projects. On average, I have probably spent two to three hours using the software each workday for the last eighteen years. Given the intensity of my daily use of the software; my nearly two decades of experience using the software; and the number of districting projects my firm has handled due to the impact of the California Voting Rights Act, the odds are high that I have drawn more districting and redistricting maps using Maptitude for Redistricting than anyone else in the country. The number of maps that I have drawn, analyzed, and presented using the software is certainly well over one thousand. I frequently talk with the Caliper customer support team and the programmers on the company's staff about the software's functionality, bugs, bug fixes, and new features for new releases of the software. I have spoken at a more than a dozen local, state and national government conferences on redistricting, and many of those discussions included discussion of the Maptitude software and its functions and advantages. I have trained newly hired students at the Rose Institute of State and Local Government at Claremont McKenna College on the use of Maptitude for Redistricting software almost every year for the last 17 years. I have led numerous community engagement sessions where, on behalf of our local government clients, we trained local residents on the use of the very similar "Maptitude Online Redistricting" program. And I have demonstrated the use of GIS software in general, and usually Maptitude for Redistricting in particular, on CNN, Fox News, Good Morning

America, and various Public Television News programs in southern California.

Task Description

3. For this supplemental report, I was asked to review and comment on Dr. Chen's June 7th rebuttal report. I have done so in as much detail as possible in the limited time available. I may continue to analyze that report and may further refine, revise or expand my analysis.

Summary of Opinions

4. Dr. Chen's percentages of population matches between the 2017 Adopted map and the maps allegedly from Dr. Hofeller's computer files are inflated and ignore the fact that any mapmaker has no discretion over how to draw districts covering most of the state's territory and much of its population.
5. The true measures of how many people are moved between the two House maps and between the two Senate maps prove that the differences in the Adopted maps are significant and widespread. The scale of population that differs between the Hofeller and the Adopted maps is similar to the scale of differences between the Hofeller and Covington maps, and between the Hofeller and Common Cause maps. In the House, Dr. Chen's method of measuring the differences concludes the Hofeller map is a closer match with the Common Cause map than with the Adopted map.
6. The Maptitude backup files allegedly from Dr. Hofeller's computer files reflect what was in each Redistricting Plan at the time it was last closed – they do not tell us what was on the screen as the plans were being drawn.
7. The way Maptitude encourages creating new maps by copying old maps and then erasing the specific district lines of the old map means the data, formulas, and color ranges all could have been carried into these maps from plans drawn weeks, months or even years earlier.

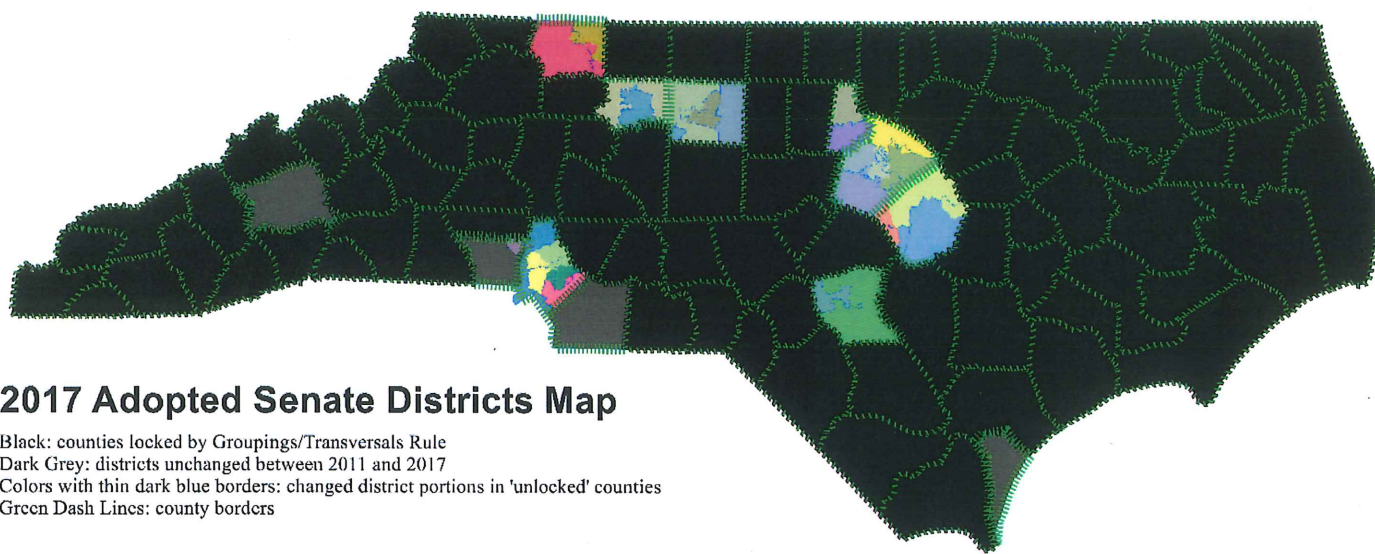
Chen's 'district match' percentages are inflated

8. The district by district percentages listed by Dr. Chen on page 2 of his rebuttal report incorrectly claim that Dr. Hofeller made 90 percent or more of the decisions about population assignments on his computer. Dr. Chen incorrectly indicates Dr. Hofeller simply transferred those assignments to the state computer and made minor final adjustments. The

reality is that the County Groupings and Traversal rules of the North Carolina Constitution, not Dr. Hofeller, made 54.5% of the population assignments in the 2017 Adopted Senate map, and 22.1% in the 2017 Adopted House map. No mapmaker, of any party, has any discretion over where those residents are assigned. Another 800,000 residents (8.8% of the state's population), reside in counties that are not locked in by the County Groupings and Traversal rules but live in Senate districts that were unchanged from the 2011 map to the 2017 adopted map. And 2.3 million residents (24.4% of the state's population) reside in House districts that in the 2017 Adopted House map are unchanged from their 2011 versions even though they are not locked by the County Groupings and Traversal rules.

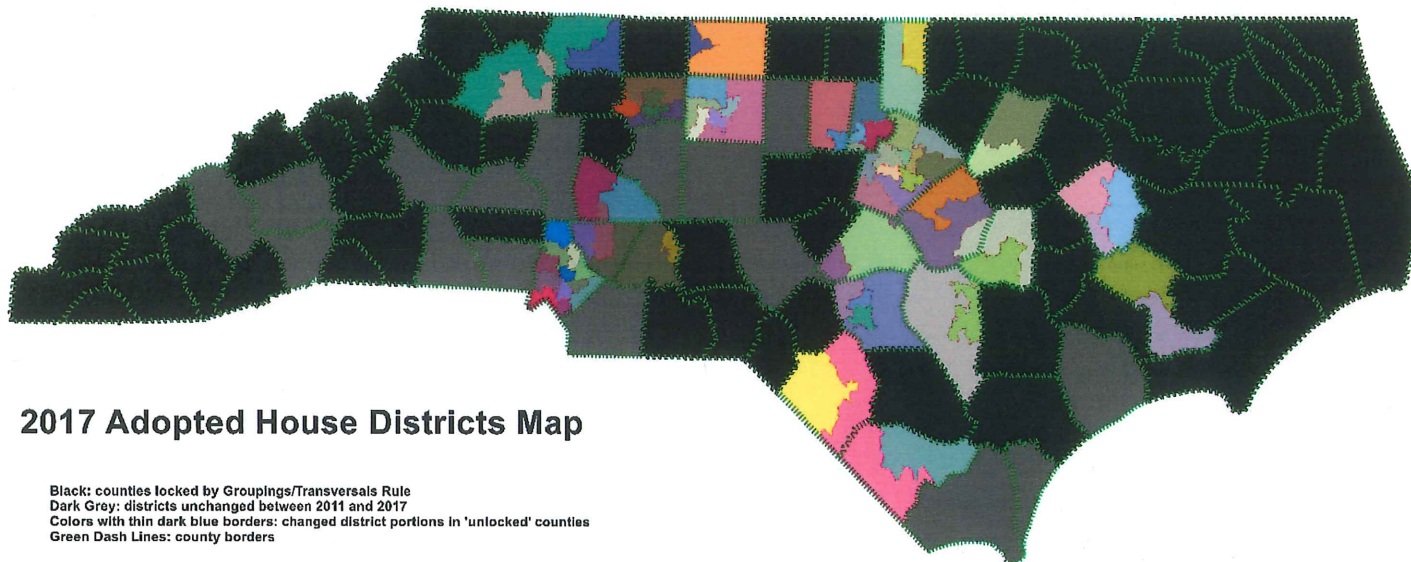
9. Thus, the total share of state population locked into Senate districts and outside of any mapmaker's discretion is 63.3%. The mapmaker's only discretion over where the lines go is for the remaining 36.7% of the state's population, shown by the colored (not black or grey) districts below. The green dashed lines are county borders; the black areas are counties that fall under the Groupings and Traversal rule; the dark grey areas are the 2017 districts where the entire district was kept identical to its 2011 version; and the other colors are the parts of Senate Districts that are in divided counties and that change from their 2011 shapes:

Rebuttal Map 1



10. For the House, even with the smaller districts that mean fewer whole-county locked districts, mapmakers have discretion over only half (53.5%) of the state's population for the same reasons:

Rebuttal Map 2



2017 Adopted House Districts Map

Black: counties locked by Groupings/Transversals Rule
Dark Grey: districts unchanged between 2011 and 2017
Colors with thin dark blue borders: changed district portions in 'unlocked' counties
Green Dash Lines: county borders

11. Just under half (46.5%) of the state's population is locked into 2017 districts either because of the Grouping and Traversal rules or because they are in districts unchanged from 2011.

Senate Similarity Index Results

12. Where the district numbers change among competing map proposals, analyzing the similarities between a district in one map and a district in a later map requires some way to deal with those changing district numbers. In 2002, Professors Gary Cox and Johnathan Katz came up with the "similarity index" to do just that. The similarity index tells us that 19% of the population that Dr. Hofeller had the option to move (excluding those locked in by the County Groupings and Traversal rules, and by the unchanged 2011 – 2017 districts), were moved between the Senate map allegedly on Dr. Hofeller's home computer and the 2017 Adopted Map. In other words, one in five residents who could be in another district are in another district when we compare these two maps. Eighty-one percent of the population

that legally could be moved stayed in the same district (not the 95.6% figure cited by Dr. Chen on page 2 of his report).

13. For comparison, 59% of the discretionary population stays in the same district between the Hofeller map and the Common Cause Plaintiffs' Senate map, as do 56% between the Hofeller map and the Covington Plaintiffs' map. This means over half of the population subject to map-maker discretion was assigned to the same districts in the Hofeller Senate map and the Covington and Common Cause Senate maps. Yet no one is alleging Dr. Hofeller secretly drew the Covington or Common Cause maps. I disagree that the difference between 81% (one in five residents moved) and 59% (two in five residents moved) proves that one map was predetermined while the other map is independent.
14. I realize that is a lot of numbers. This may be a useful alternative way to look at it: when compared to the Senate map allegedly from Dr. Hofeller's computer, the adopted map changed the district assignments of one in five residents whose district assignments were open to change. The Covington map changed the district assignment of two in five, and Common Cause changed the assignments of slightly more than two in five. Dr. Chen's allegation appears to be that changing two in five does not indicate a secret and improper relationship between the maps, but one in five does. That appears to be an arbitrary dividing line. It is incorrect to say that a map where the average district changes the district assignment of one in five residents (of those who can be reassigned) is substantively identical to the alternative map, especially if one claims the remedy is an alternative map that changes the district assignment of only two in five residents (of those eligible to move).

Dr. Chen's 'Population Moved' Totals Appear Incorrect, Inflated and Overly Simplified

15. Instead of using an established methodology for measuring similarity ratios across plans, Dr. Chen's artificially inflated percentages simply calculate a percentage of the statewide population found in the same district in the Hofeller map and the 2017 map. Dr. Chen's 95.6% figure is artificially inflated because it ignores the fact that mapmakers have no discretion in the district assignments of much of the state's population. Dr. Chen writes that "in a June 24, 2017 draft Senate map, Dr. Hofeller had already finished assigning 95.6% of

North Carolina's census blocks (containing 97.6% of the state's population) into their final districts. First, his math is slightly off, and the actual figure is 95.7% of the state's population, not 97.6%. More importantly, that 95.7% is actually the sum of three categories of population, over two of which the mapmaker has no control:

16. Population Locked into Districts by the Groupings and Traversal rules:

a. 5,197,864 people, or 54.5% of the state's population;

17. Population Unchanged from 2011 Districts:

a. 839,312 people, or 8.8% (for a cumulative total of 63.3%);

18. Population in the same district in the Hofeller map and the 2017 map:

a. 3,085,195, or 32.4% of the state's population (for a cumulative total of 95.7% of the state's population).

19. While Dr. Chen claims "the final Senate Bill 691 map affected only . . . 2.4% of the state's population", the fact is that, when compared to the Hofeller map, the districts in the 2017 Adopted Senate map moved an average of 19% of the residents who were eligible to be moved. Dr. Chen's counts as mapmaker-driven-decisions those residents who in fact were locked in by the Grouping and Traversal requirements and those residents in unchanged 2011 districts. The result of this mistake is to artificially inflate the percentages reported. Districts in substantively identical maps would move only a percentage or two of population, and even that only for population balancing – moving an average 19% of those residents who can be moved in each district represents a large and significant map revision.

20. For comparison, using Dr. Chen's approach: the 2017 map actually keeps 95.7% of the state's population in the same district as in the Hofeller map; the Covington plaintiffs' map keeps 88.0% in the same district as in the Hofeller map; and Common Cause keeps 89.2%. Dr. Chen's assertion that the 95.7% similarity proves an excessive and thus illegal dependency on the earlier map seems dubious when the corresponding similarity percentages for the alternative maps proposed by various plaintiffs in related cases are only slightly lower at 88.0% and 89.2%.

House Similarity Index Results

21. I found similar results when looking at the various House plans:
- a. Similarity Index for Hofeller versus 2017 Adopted House Map: 64%
 - b. Similarity Index for Hofeller versus Covington House Map: 40%
 - c. Similarity Index for Hofeller versus Common Cause House Map: 53%
22. Dr. Chen also artificially inflates the “unchanged” percentage in his report when he writes “Subsequent changes made after Dr. Hofeller’s June 28 draft map and prior to the final House Bill 927 map affected only . . . 11.8% of the state’s population”. Again he is attributing to the mapmaker decisions that were dictated by law and by the decision to keep numerous districts unchanged from the 2011 map. Using, simply for comparison, Dr. Chen’s (flawed) analytic approach, the actual percentage of population in one district in the Hofeller map and in another in the 2017 Adopted House map is 25.5%. Following this methodology, one gets the following “unchanged population” percentages when comparing the Hofeller map with the following maps:
- a. Unchanged Population for Hofeller versus 2017 Adopted House Map: 74.5%
 - b. Unchanged Population for Hofeller versus Covington: 67.4%
 - c. Unchanged Population Percentage for Hofeller versus Common Cause: 82.1%
23. You read that correctly: a larger percentage of the state’s population in the Common Cause map match their assignments in the Hofeller map than match their assignments in the 2017 Adopted House map.

Similarity Conclusions

24. Dr. Chen’s groupings charts (starting on page 4) also artificially inflate the population similarities between the Hofeller districts and the 2017 Adopted maps. The numbers are again artificially inflated by counting residents whose assignment is dictated by the Traversal Rule or locked-in by the unchanged 2011 to 2017 districts.
25. For example, to cite a district found on page 32 of Dr. Chen’s report, the Traversal Rule dictates that all of the territory of Davie County must be united in a single district. So Dr. Hofeller and the Legislature had no discretion to assign it to any other district, despite the implications in Dr. Chen’s report. Dr. Chen never mentions the Traversal Rule, so I am

unaware of whether he ignored it in his report by choice, or whether he did not know about that part of the state constitution's requirements for redistricting.

26. An even clearer analytical mistake is Dr. Chen's analysis of the Duplin/Onslow County Group on pages 12 and 13. Dr. Chen highlights that 100% of all three districts in this grouping match in the Hofeller and Adopted House maps – but fails to mention that the mapmaker had zero discretion in any district in this grouping. The County Traversal rule dictated that Duplin County be kept whole in one district, while districts 14 and 15 are locked in as unchanged from the 2011 map, leaving the mapmaker no options and dictating that district 4 cover the portion of Onslow County shown in the adopted map.

Dr. Chen's cluster by cluster analysis ignore the Traversal Rule

27. The math on pages 4 through 38 of Dr. Chen's report is similarly inflated like the figures on page 2 of his report. Also, the titles on the grouping by grouping maps are misleading – the “.shp” files and the resulting images labeled as “Hofeller” were created by Blake Esselstyn, not Dr. Hofeller, as Dr. Chen acknowledges in a completely separate footnote on page 2.
28. The screenshots attributed to Dr. Hofeller and Maptitude were not made in Maptitude (by Dr. Hofeller nor by anyone else).
29. Each time a redistricting plan is closed in Maptitude, the program creates a backup file and includes in it a “.bmp” (“bit-map”) file that captures the image currently in the map window. But that .bmp file captures only the specific window with the map in it – not the top or side menus, dataviews, or any other screen elements. Maptitude does not have a “screenshot” function in it. (I did a word search on the Maptitude for Redistricting help system to confirm this, and a search for “screenshot” or “screen shot” did not find those words anywhere in the system. And I have not yet found any “.jpg” or “.png” screen shots in Dr. Hofeller's files (those are the two file formats screen shots are most typically stored in when they are created and saved). We know from the “Licensed to FrontWater geo” wording at the top of the screenshots that they were created by Blake Esselstyn, not Dr. Hofeller.

Maptitude Backup File Dates indicate the last time they were closed, not when they were modified

30. Dr. Chen repeatedly references the “Modified” dates on the Maptitude files allegedly from Dr. Hofeller’s computer and cites those dates as indicating when those maps were drawn. This is an incorrect inference. Every time a Maptitude Plan file is opened and closed, Maptitude creates a backup file with a “Modified” date matching the time it is created. This occurs even when no changes were made in the plan. So a plan with a backup file “last modified” date could very well have been last worked on months or even years earlier, if a user then accidentally or intentionally opened it simply to look at it rather than to modify it.

Maptitude Carries Dataviews and Formula Fields forward from one plan to another

31. Maptitude can have literally hundreds of system and data settings for a given map. Rather than set those map by map, users either create a plan template or simply copy an old map when starting work on a new map. If a new map is made by copying and then modifying an old map (which is the way I create two-thirds or more of the maps I make for NDC), the formula fields and dataview sort settings are also carried over. So it is entirely possible that the formula fields and sort-by-field settings cited by Dr. Chen in pages 39 through 51 were set up weeks or months prior to the June and August “last modified” dates cited by Dr. Chen, and their presence simply shows that at some time those fields and views were set up – not that they were set up or used after the state’s adoption of criteria for the 2017 redistricting. There are a myriad of reasons why these fields and views may have been set up at various earlier dates in the process, and the information cited by Dr. Chen gives us no indication of when or why Dr. Hofeller might have actually reviewed and/or used that data.

Maptitude Backup Files Show What Was On Screen When a Map is Closed – Not What Was On Screen When the Map was Drawn

32. The map, dataview, layers and other settings in a Maptitude Redistricting Plan backup file are stored at the time a Redistricting Plan is closed, not while an operator is working on the Plan. There is no “backup now” or other mid-project function that creates a backup file while an operator is in the software. That functionality only creates the “.zip” backup file of a Plan when the Plan is closed.

33. In short, all of the screen shots labeled or cited as “Hofeller” were in fact made by Blake

Esselstyn. The backup files used by Mr. Esselstyn to make the pictures in Dr. Chen's report use data and maps that were (according to the plaintiffs) in Dr. Hofeller's personal computers or backup drives when he closed each Redistricting Plan file. To emphasize that key point: these backup files tell us what was in the system at the time the Plan was closed, not at the time the Plan was originally drawn or modified. We have no indications that Dr. Hofeller used those color-coded maps at the time he was drawing the plans allegedly on his laptop, or whether those were just settings and data carried over from older plans drawn weeks, months or even years earlier.

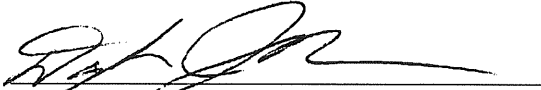
34. And even if all of those facts about the data in the backup files are ignored, Dr. Chen artificially inflated how closely the maps allegedly on Dr. Hofeller's personal files matched the 2017 Adopted House and Senate maps. In reality, the difference is one of degrees, rather than major jumps, between how closely the maps in those personal files match the Adopted maps compared to how closely the Covington and Common Cause plaintiff maps match those Adopted maps. As I have previously noted, North Carolina's County Groupings and Traversal rules are a significant limitation on the discretion of mapmakers. Those rules, along with avoiding changing 2011 districts that do not need to be changed, dictated the district assignment of just slightly under half of the state's population in House maps and nearly two-thirds of the state's population in Senate maps.

A final caveat

35. In the time available, I was able to calculate the population "locked in" to their district assignments because they are in districts that did not change from 2011 to 2017 and/or because they are in counties that cannot be split due to the Groupings and Traversal rule. But House District 4 in Onslow County illustrates another group of people "locked in" who are not captured by my math. These residents are "locked in" not because the district and county where they live is directly covered by any of these rules, but because every other district in the county is "locked" – indirectly "locking" these residents in as well. If my calculations included these additional "locked in" residents, the resulting reductions in the total statewide "population eligible to move" would increase the evidence in support of my opinions.

CERTIFICATION

I certify that the statements and opinions provided in this report are true and accurate to the best of my knowledge, information, and belief.



Douglas Mark Johnson, Ph.D.

6-21-2019

Date

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