

HOW WOULD YOU DRAW THE NORTH CAROLINA ELECTORAL MAP?

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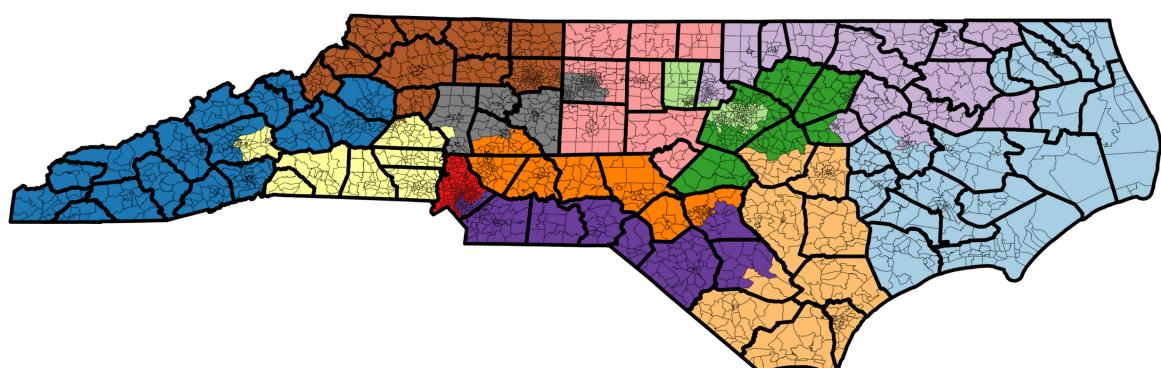
INTRODUCTION

Over the past decade in North Carolina, several maps have been presented to the State Legislature for approval. Depending on how the map is drawn, the outcome of the elections may change dramatically!

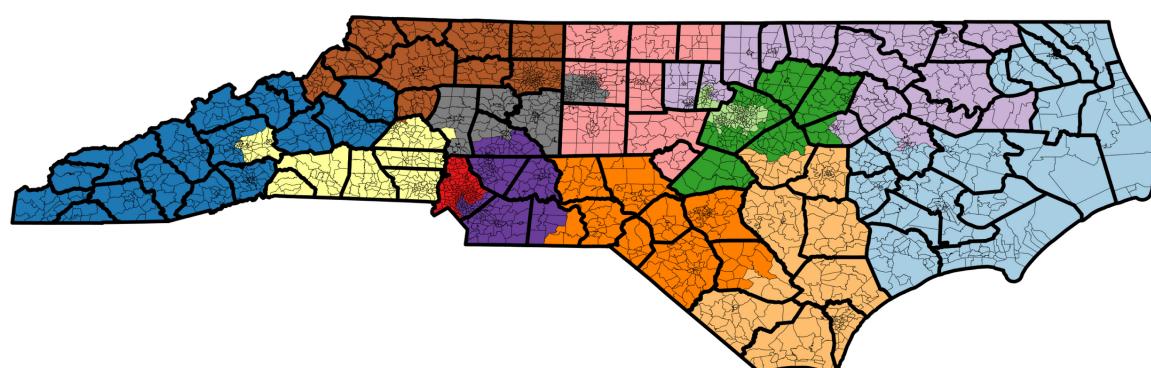
SO HOW CAN WE DRAW A FAIR MAP?

1. The state legislature chooses a few nonpartisan map-drawing rules, called constraints, like equal population distribution or compactness.
2. Mathematics researchers at Duke plug these rules into an algorithm (a computer program) to create thousands of map samples. Four samples are shown here.
3. These maps might look very different from each other and might even produce slightly different election results!
4. On average, though, the electoral outcomes of these maps would be considered “fair” according to the constraints. We can then compare the average results to the maps submitted by legislators, and see if they are following their own rules!

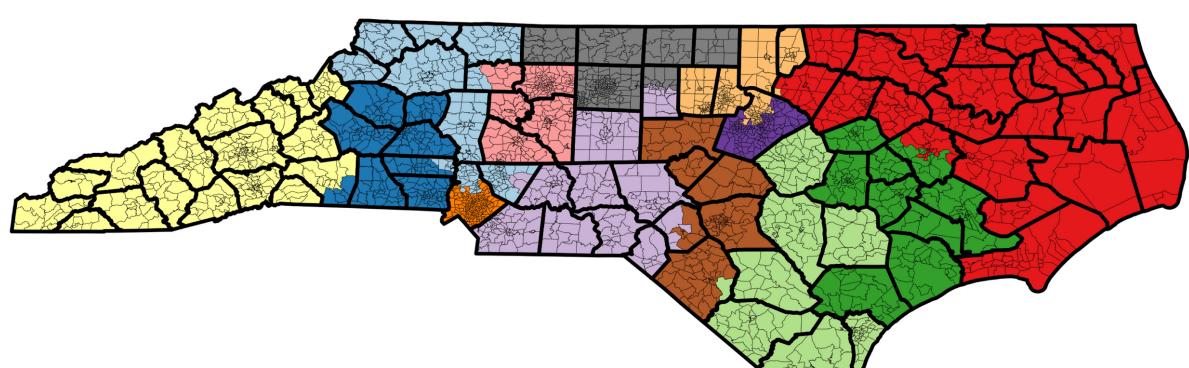
RESULTS



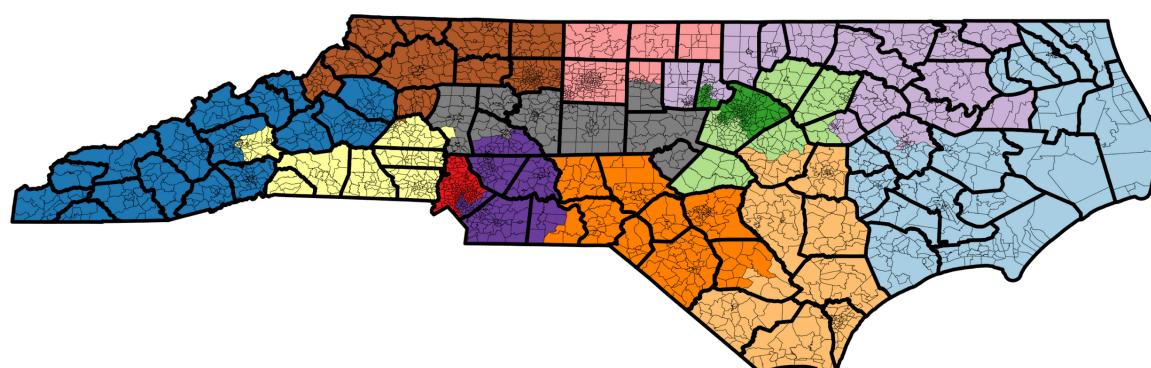
Sample Map 1



Sample Map 2



Sample Map 3



Sample Map 4

STATISTICS AND MATH CONCEPTS AT PLAY

- Average
- Sample
- Algorithm
- Constraints

DISCUSSION

Using simple statistical ideas and techniques, we are able to test what is considered “fair” under a given set of rules. Research like this uncovers biases in our decision making which can have a huge impact on our lives. This research focuses on political applications, but these ideas are used in research in every discipline!

