Since 2010, every state election held for the North Carolina state legislature used redistricting plans that were later deemed unconstitutionally gerrymandered by the United States Supreme Court. Through our research, we aim to quantify the extent of gerrymandering within North Carolina's House and Senate legislatures.

**How Do We Quantify?**
- Randomly generate ensemble of 1,000 compliant district plans with a Markov Chain Monte Carlo algorithm
- Factor in population, compactness, and limiting split counties
- Map previous election voting data onto each plan
- Simulate election outcomes in the ensemble for four elections:
  - 2012 President (PRE12)
  - 2014 Senate (SEN14)
  - 2016 Commissioner of Insurance (COI16)
  - 2016 Governor (GOV16)
- Compare % of seats won by Democrats in ensemble plans to % of seats won by Democrats in enacted plan for each district

**Do Borders Matter?**
 Were redistricting borders intentionally chosen to “pack” large numbers of Democrats into few districts and “crack” remaining few in the majority of districts?

- We created a new metric focusing on just precincts at the border – the gradient
- **Gradient** – Difference in vote fraction across precincts separated by a district border

**Election Results**
- We simulated four elections for Guilford county
- Districts ordered from lowest Dem vote % to greatest
- **Purple**: distribution of Dem vote % for our 1,000 ensemble plans
- **Orange**: Dem vote % for enacted plan

**Implications**

**Election Outcomes:**
- 40% of House counties and 50% of Senate counties across North Carolina indicate some skew in election outcomes towards Republicans
- Competitive districts skew towards the Republicans
- Typically safe Democratic districts became competitive

**Gradient Outcomes:**
- Enacted plans had extremely steeper gradients than the ensemble averages
- Analyses at finer scales revealed larger differences in gradients
- Cracking and Packing was highly likely used to dilute the Democratic vote