

## Scores (Metrics)

These are the metrics ("scores") calculated for the plans in an ensemble, when you run the `score_ensemble.py` script. They are grouped below in the order that they appear in the scores CSV.

### General

- **map** – The plan (map) name.
- **D** – The number of districts.
- **C** – The number of counties.
- **population\_deviation** – The population deviation of the plan.
- **estimated\_vote\_pct** – The Democratic two-party vote share.

### Partisan Bias

The measures of partisan bias (in this section) and responsiveness (in the next section) are described in some detail in [Advanced Measures of Bias & Responsiveness](#). Many use [fractional seat probabilities](#).

- **pr\_deviation** – The deviation from `pr_seats`. Smaller is better, and zero is perfect.
- **pr\_seats** – The integral number of seats closest to proportional representation.
- **pr\_pct** – `pr_seats` as a percentage of the number of districts.
- **estimated\_seats** – The estimated number of fractional Democratic seats.
- **estimated\_seat\_pct** – `estimated_seats` as a percentage of the number of districts.
- **fptp\_seats** – The estimated number of Democratic seats using "first past the post" (FPTP), all-or-nothing accounting.
- **disproportionality** – `estimated_vote_pct` minus `estimated_seat_pct`.
- **efficiency\_gap** – The efficiency gap. Smaller absolute value is better. Positive values favor Republicans; negative values favor Democrats.
- **gamma** – A new measure of bias that combines seats and responsiveness.

- **seats\_bias** ( $\alpha_s$ ) – The seats bias at 50% Democratic vote share.
- **votes\_bias** ( $\alpha_v$ ) – The votes bias at 50% Democratic vote share.
- **geometric\_seats\_bias** ( $\beta$ ) – The seats bias at the statewide Democratic vote share, not 50% (aka "partisan bias").
- **global\_symmetry** (GS) – A combination of seats and votes bias.
- **declination** ( $\delta$ ) – The declination angle (in degrees), calculated using fractional seats and votes. Smaller is better.
- **mean\_median\_statewide** – The statewide Democratic two-party vote share minus the median Democratic two-party district vote share.
- **mean\_median\_average\_district** – The mean Democratic two-party district vote share minus the median Democratic two-party district vote share.
- **turnout\_bias** (TO) – The difference between the statewide Democratic vote share and the average their average district vote share.
- **lopsided\_outcomes** (LO) – The difference between the average two-party vote shares for the Democratic and Republican wins.

## Competitiveness & Responsiveness

- **competitive\_districts** – The estimated number of competitive districts, using fractional seat probabilities. Bigger is better.
- **competitive\_district\_pct** – competitive\_districts as a percentage of the number of districts (D).
- **average\_margin** – The average margin of victory. Smaller is better.
- **responsiveness** ( $\rho$ ) – The slope of the seats-votes curve at the statewide Democratic vote share.
- **responsive\_districts** – The likely number of responsive districts, using fractional seat probabilities.
- **responsive\_district\_pct** – responsive\_districts as a percentage of the number of districts (D).
- **overall\_responsiveness** (R) – An overall measure of responsiveness which you can think of as a winner's bonus.
- **avg\_dem\_win\_pct** – The average Democratic two-party vote share in districts won by Democrats.
- **avg\_rep\_win\_pct** – The average Republican two-party vote share in districts won by Republicans.

## Opportunity for Minority Representation

- **opportunity\_districts** – The estimated number of single race or ethnicity minority opportunity districts, using fractional seat probabilities (and DRA's method).
- **proportional\_opportunities** – The proportional number of single race or ethnicity minority opportunity districts, based on statewide VAP.
- **coalition\_districts** – The estimated number of all-minorities-together coalition districts, using fractional seat probabilities (and DRA's method).
- **proportional\_coalitions** – The proportional number of all-minorities-together coalition districts, based on statewide VAP.
- **alt\_opportunity\_districts** – The estimated number of single race or ethnicity minority opportunity districts, using fractional seat probabilities. Unlike opportunity\_districts, this "alt" metric means does not clip below the 37% threshold (like DRA does). The results are more continuous.
- **alt\_coalition\_districts** – The estimated number of all-minorities-together coalition districts, using fractional seat probabilities. Unlike coalition\_districts, this "alt" metric does not clip below the 37% threshold (like DRA does). The results are more continuous.

## Compactness

- **reock** – The average Reock measure of compactness for the districts. Bigger is better.
- **polsby\_popper** – The average Polsby-Popper measure of compactness for the districts. Bigger is better.
- **cut\_score** – The number of edges between nodes (precincts) in the contiguity graph that are cut (cross district boundaries). A measure of compactness using discrete geometry. Smaller is better.
- **spanning\_tree\_score** – The spanning tree score. Another measure of compactness using discrete geometry. Bigger is better.
- **population\_compactness** – The population compactness of the map. Lower is more *energy* compact. Smaller is better.

## County-District Splitting

The county and district splitting measures are described in [Measuring County & District Splitting](#).

- **county\_splitting** – A measure of the degree of county splitting. Smaller is better, and 1.0 (no splitting) is the best.
- **district\_splitting** – A measure of the degree of district splitting. Smaller is better, and 1.0 (no splitting) is the best.
- **counties\_split** – The number of counties split across districts. Smaller is better.
- **county\_splits** – The number of *times* counties are split, e.g, a county may be split more than once. Smaller is better.

## Dave's Redistricting Ratings

- **proportionality** – DRA's proportionality rating. Integers [0-100], where bigger is better.
- **competitiveness** – DRA's competitiveness rating. Integers [0-100], where bigger is better.
- **minority** – DRA's minority opportunity rating. Integers [0-100], where bigger is better.
- **compactness** – DRA's compactness rating. Integers [0-100], where bigger is better.
- **splitting** – DRA's county-district splitting rating. Integers [0-100], where bigger is better.
- **minority\_alt** – A modified version of DRA's minority opportunity rating that uses `alt_opportunity_districts` and `alt_coalition_districts` (i.e., does not clip below the 37% threshold) making the results more continuous.

## Additional Custom Metrics

- **mod\_districts** – The sum of minority opportunity districts (MOD) for Blacks alone, Hispanics alone, and Blacks & Hispanics together, where a district is defined as a minority opportunity when the minority preferred candidate wins

the district and there are more minority votes for the winner than white votes for the winner.

- **mod\_reock** – The average `reock` for MOD districts.
- **mod\_polsby\_popper** – The average `polsby_popper` for MOD districts.
- **mod\_spanning\_tree\_score** – The average `spanning_tree_score` for MOD districts.
- **mod\_district\_splitting** – The average `district_splitting` for MOD districts.