Partisan Fairness* in Dave's Redistricting App

March 28, 2024 | Redistricting Data Hub (RDH)

** and other partisan outcomes*

Agenda

1. Defining our terms
2. What is required?
3. How to measure it?
4. How to analyze it in DRA?
5. Questions

Defining Our Terms

- **Partisan Gerrymandering** is the act of drawing districts with the intent to gain a partisan advantage

- Can lead to:
    a. One party winning more districts that they *should* (a lack of **partisan fairness**)

Defining Our Terms

- One party winning more districts that they *should* could mean:
    a. **Disproportionality**: one party receives disproportionately more seats than would be expected based on the statewide vote

Defining Our Terms

- One party winning more districts that they *should* could mean:
    a. **Disproportionality**: one party receives disproportionately more seats than would be expected based on the statewide vote
    b. **Bias**: one party receives more representation than the other, if roles were reversed; a lack of "partisan symmetry"

Defining Our Terms

- Partisan Gerrymandering is the act of drawing districts with the intent to gain a partisan advantage

- Can lead to:
    a. One party winning more districts that they *should* (a lack of partisan fairness)
    b. Fewer **competitive** districts

What Is Required?

- At the federal level, the US Supreme Court has ruled political gerrymandering to be "incompatible with democratic principles," but also a political question not justiciable in federal court (*Rucho v. Common Cause* 2019)

- Absent Congress passing a law, it is up to the states, by way of ballot initiative, legislation, and/or court interpretation, to determine whether partisan fairness is required in redistricting

What Is Required?

- Some states have requirements around partisan fairness, through:
    a. Legislative prohibitions on “unduly” favoring (or disfavoring) parties (ex: CA, FL, MI)
    b. Legislative requirements to uphold “partisan fairness” (ex: MO, OH)
    c. State court interpretations of state constitutions (ex: AK, PA, ~~NC~~)

What Is Required?

- In all cases, requirements often differ for congressional and state legislative maps

- It's important to understand what the rules are - if any - in your state!

How to Measure? (an example)

Districts [in Missouri] shall be drawn in a manner that achieves partisan fairness ... To this end, the average electoral performance of the two political parties receiving the most votes in the three preceding general elections for governor, for United States Senate, and for President of the United States shall be calculated.

This index shall be defined as the total votes received by each party in the three preceding general elections for governor, for United States Senate, and for President of the United States, divided by the total votes cast for both parties in these elections.

Using this index, the total number of wasted votes for each party, summing across all of the districts in the plan shall be calculated. "Wasted votes" are votes cast for a losing candidate or for a winning candidate in excess of the threshold needed for victory. In any redistricting plan and map of the proposed districts, the difference between the two parties' total wasted votes, divided by the total votes cast for the two parties, shall not exceed fifteen percent.

How to Measure? (an example)

No [Florida] apportionment plan or district shall be drawn with the intent to favor or disfavor a political party or an incumbent...

How to Measure?

- A simple way to conceptualize whether a map exhibits partisan fairness is to look at the number of seats expected to be won by one party, relative to their share of the statewide vote

- For example, if a party receives 55% of the votes statewide, they should receive 55% of the seats

- This is the essence of **(dis)proportionality**

How to Measure? (an example)

- In Massachusetts in 2020, Biden won 65% of the vote, Trump won 35%
- If we assume presidential votes perfectly predict congressional votes, we might expect 3 (~35%) of Massachusetts' 9 congressional seats to be held by Republicans … but none currently are
- If Republicans comprised 35% of each district, Democrats would likely win all 9 seats

How to Measure?

- “Such claims invariably sound in a desire for proportional representation, but the Constitution does not require proportional representation, and federal courts are neither equipped nor authorized to apportion political power as a matter of fairness.” (*Rucho v Common Cause* 2019)

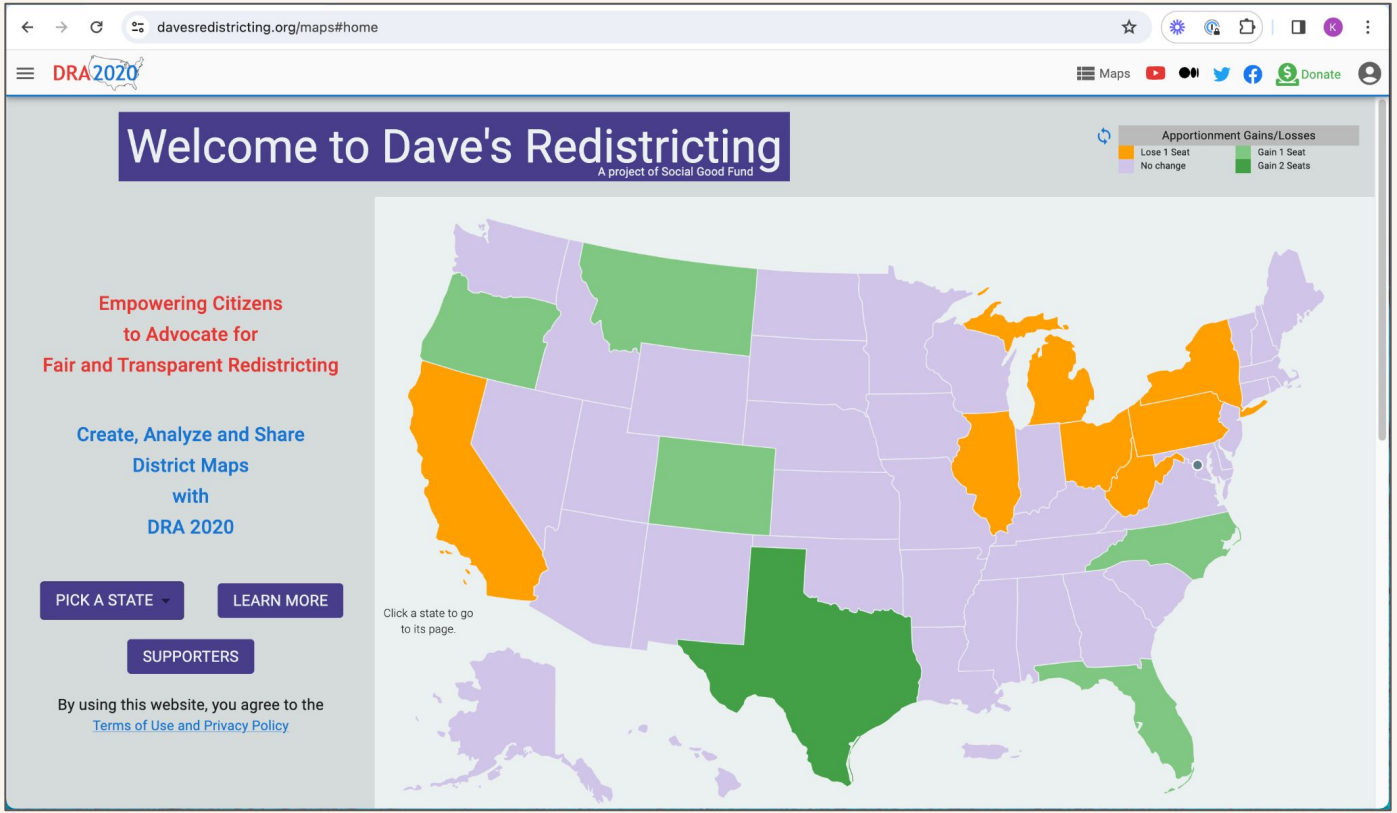
How to Measure?

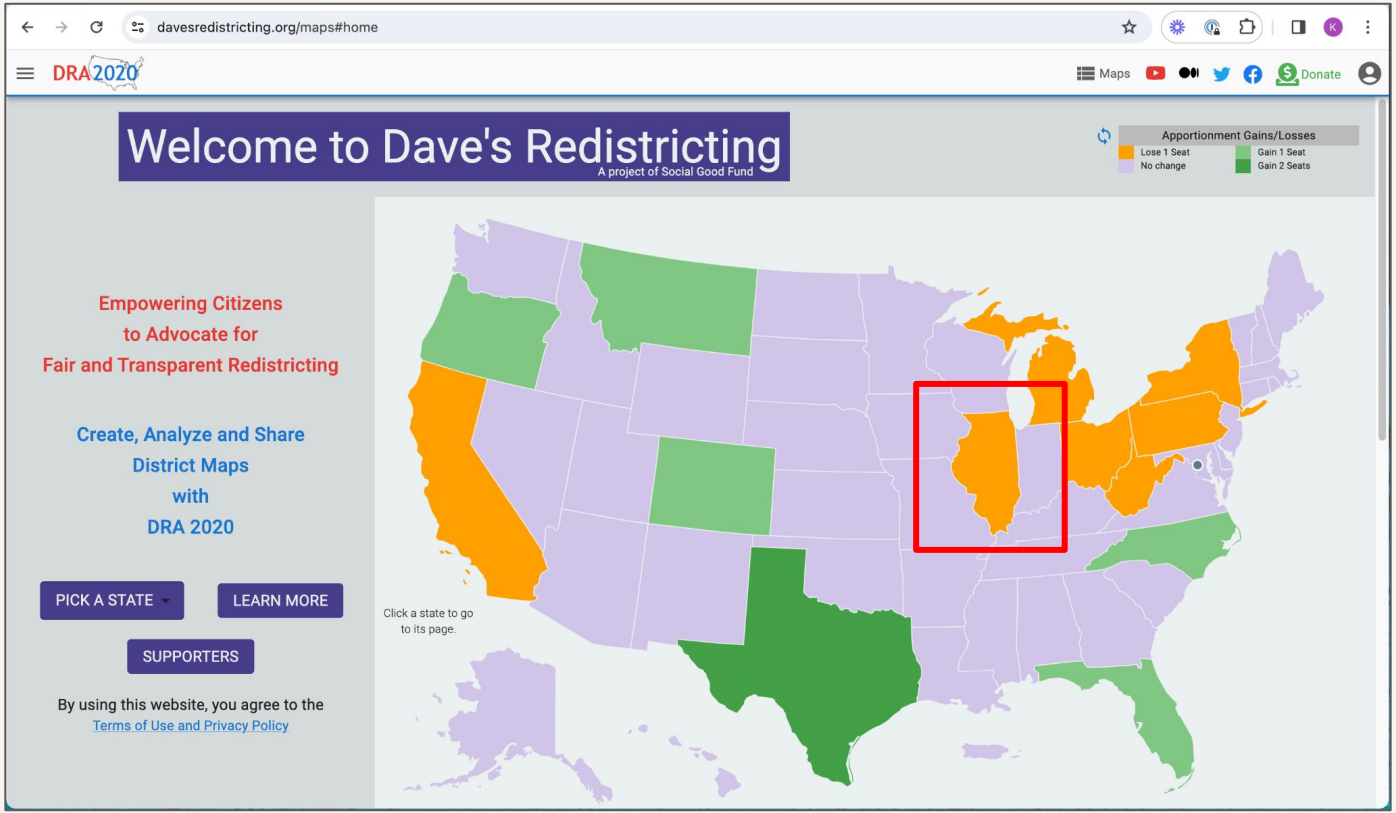
- Most states' requirements around partisan fairness are broadly worded, if they exist at all
- There are many measures of partisan fairness
- There is not yet consensus on how best to measure partisan fairness, and we do not endorse any particular metric over another

How to Analyze in DRA?

- Measure of Proportionality
- Much, much more in Advanced

Go to www.davesredistricting.org

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Apportionment Gains/Losses
Lose 1 Seat
No change
Gain 1 Seat
Gain 2 Seats
Empowering Citizens
to Advocate for
Fair and Transparent Redistricting
Create, Analyze and Share
District Maps
with
DRA 2020
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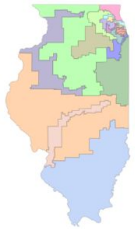
Maps Donate

Illinois

The Prairie State

Current Maps | Redistricting Resources | Notable Maps | Precinct Updates

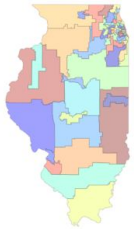
Current Maps



2022 Congressional Map
Ratings: 44, 19, 89, 10, 0

17 districts

EXPLORE THIS MAP



2022 State Senate Map
Ratings: 72, 23, 77, 31, 12

59 districts (nesting required)

EXPLORE THIS MAP

2022 State House Map
Ratings: 87, 21, 83, 36, 25

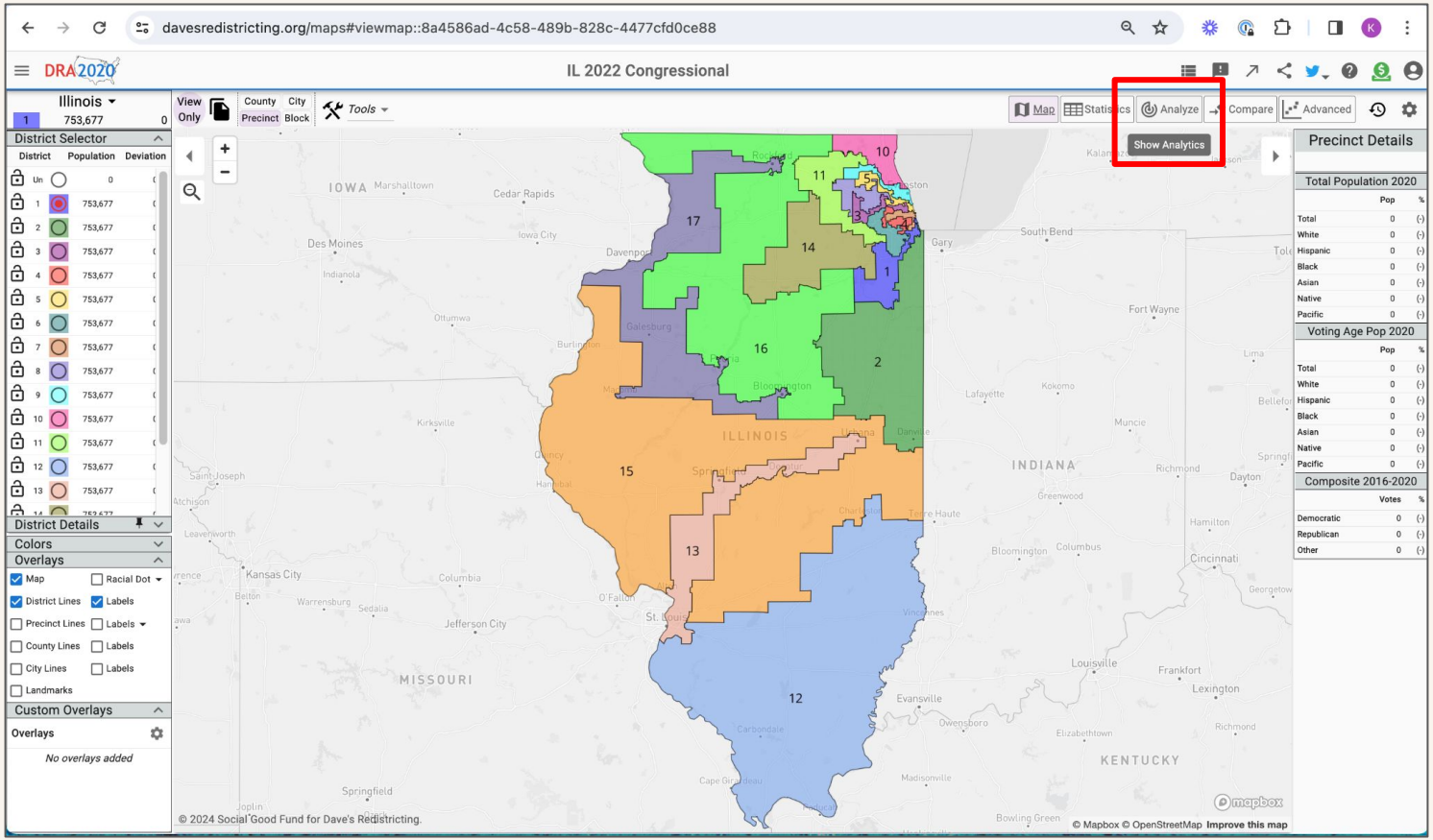
118 districts (nesting required)

EXPLORE THIS MAP

Illinois has enacted all 2022 district plans

Redistricting Resources

- Official Illinois Plans in DRA 2020
- Official Redistricting Site: Senate Redistricting Committee
- Submit Testimony: MyDistricting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DRA2020
IL 2022 Congressional
Illinois
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District Selector
District
Population
Deviation
Un
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District Details
Colors
Overlays
Map
Racial Dot
District Lines
Labels
Precinct Lines
Labels
County Lines
Labels
City Lines
Labels
Landmarks
Custom Overlays
Overlays
No overlays added
View Only
County
City
Precinct
Block
Tools
Map
Statistics
Analyze
Compare
Advanced
Show Analytics
Precinct Details
Total Population 2020
Pop
%
Total 0 (-)
White 0 (-)
Hispanic 0 (-)
Black 0 (-)
Asian 0 (-)
Native 0 (-)
Pacific 0 (-)
Voting Age Pop 2020
Pop
%
Total 0 (-)
White 0 (-)
Hispanic 0 (-)
Black 0 (-)
Asian 0 (-)
Native 0 (-)
Pacific 0 (-)
Composite 2016-2020
Votes
%
Democratic 0 (-)
Republican 0 (-)
Other 0 (-)
IOWA
ILLINOIS
INDIANA
MISSOURI
KENTUCKY
Des Moines
Cedar Rapids
Davenport
Rockford
South Bend
Fort Wayne
Peoria
Bloomington
Springfield
Kansas City
St. Louis
Louisville
Evansville
Indianapolis
Cincinnati
Columbus
Dayton
Lexington
Frankfort
Jefferson City
Carbondale
Cape Girardeau
Bowling Green
17
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DRA2020 IL 2022 Congressional

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Bigger is better, for the ratings above.

Show Values

We check four general requirements & help you evaluate your map by rating five criteria. Some may not apply, or a state or jurisdiction may require different metrics. It's up to you to decide which criteria to consider and to address any map-specific requirements. Also, some factors such as communities of interest are hard to quantify.

This analysis is based on:

- Precinct Shapes: Census 2020
- Total Population: Census 2020
- Voting Age Population: Census 2020
- Election Result: Composite of 2016 Pres, 2020 Pres, 2016 Sen, 2020 Sen, 2018 Gov, 2018 AG

Requirements

How to Analyze in DRA?

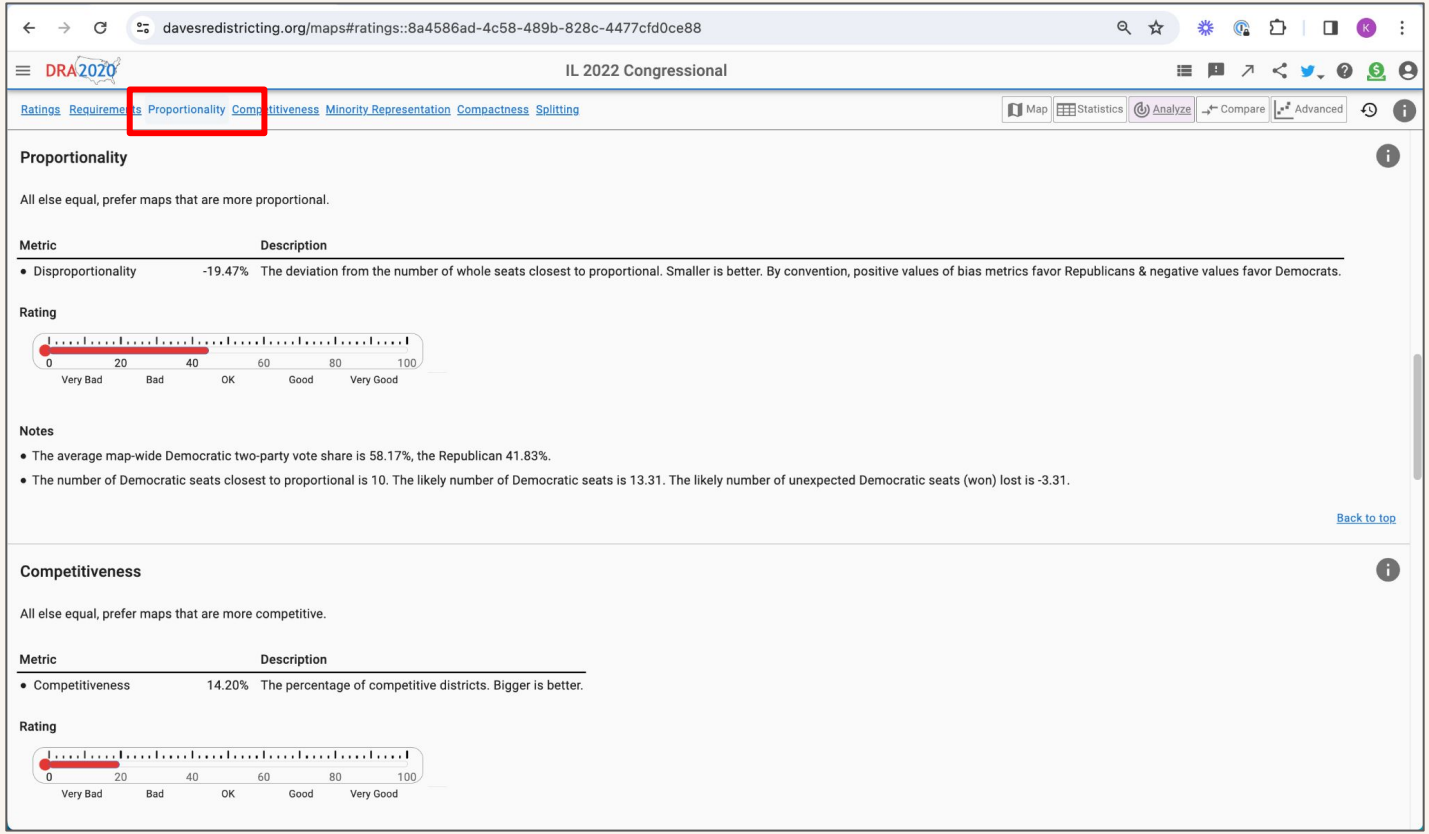
- The measure of **Proportionality** provides:
  a. The **percentage deviation** in number of seats expected in this map compared to what is expected under proportional representation
  b. A **rating** that normalizes the percentage deviation using a "winner's bonus"
  c. Notes, including the:
     - **statewide Democratic vote share**, based on an election composite of the two-party vote
     - **seat split**, or the whole number of seats closest to proportional

How to Analyze in DRA?

- The **percentage deviation** in number of seats expected in this map compared to what is expected under proportional representation
    a. Imagine a state with 100 state House seats, with 55% of the electorate voting Republican and 45% voting Democratic
    b. Proportional representation would predict ~55 seats for Republicans
    c. If your current map predicts 50 seats for Republicans, then:

        55-50/100 = -5% deviation

- Positive values indicate more seats for Republicans, negative values indicate more seats for Democrats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DRA 2020
IL 2022 Congressional
Ratings
Requirements
Proportionality
Competitiveness
Minority Representation
Compactness
Splitting
Map
Statistics
Analyze
Compare
Advanced
Proportionality
All else equal, prefer maps that are more proportional.
Metric
Description
Disproportionality
-19.47%
The deviation from the number of whole seats closest to proportional. Smaller is better. By convention, positive values of bias metrics favor Republicans & negative values favor Democrats.
Rating
0
20
40
60
80
100
Very Bad
Bad
OK
Good
Very Good
Notes
The average map-wide Democratic two-party vote share is 58.17%, the Republican 41.83%.
The number of Democratic seats closest to proportional is 10. The likely number of Democratic seats is 13.31. The likely number of unexpected Democratic seats (won) lost is -3.31.
Back to top
Competitiveness
All else equal, prefer maps that are more competitive.
Metric
Description
Competitiveness
14.20%
The percentage of competitive districts. Bigger is better.
Rating
0
20
40
60
80
100
Very Bad
Bad
OK
Good
Very Good

Proportionality

All else equal, prefer maps that are more proportional.

Metric		Description
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Rating

Notes

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How to Analyze in DRA?

- A **rating** that normalizes the percentage deviation using a "winner's bonus"
    a. DRA caps the range of proportionality from 0% (no disproportionality) to 20% (historically observed maximum)
    b. Values are rescaled to range from 0 to 100 and inverted so that higher values indicate more proportional
    c. The winner's bonus refers to the observation that often, the greater the statewide vote share, the more disproportionate the seats won will be

Proportionality

All else equal, prefer maps that are more proportional.

Metric		Description
• Disproportionality	-19.47%	The deviation from the number of whole seats closest to proportional. Smaller is better. By convention, positive values of bias metrics favor Republicans & negative values favor Democrats.

Rating

Notes

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How to Analyze in DRA?

- You are also provided with some Notes, including:
  a. statewide Democratic vote share, based on an election composite
  b. “seat split” - whole number of seats closest to proportional for Democrats
  c. likely number of Democratic seats - sum of the predicted probabilities for each party winning each district, and thus often fractional
  d. “unexpected Democratic seats (won) lost” - the difference between proportional (b.) and likely seats (c.)

Proportionality

All else equal, prefer maps that are more proportional.

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Rating

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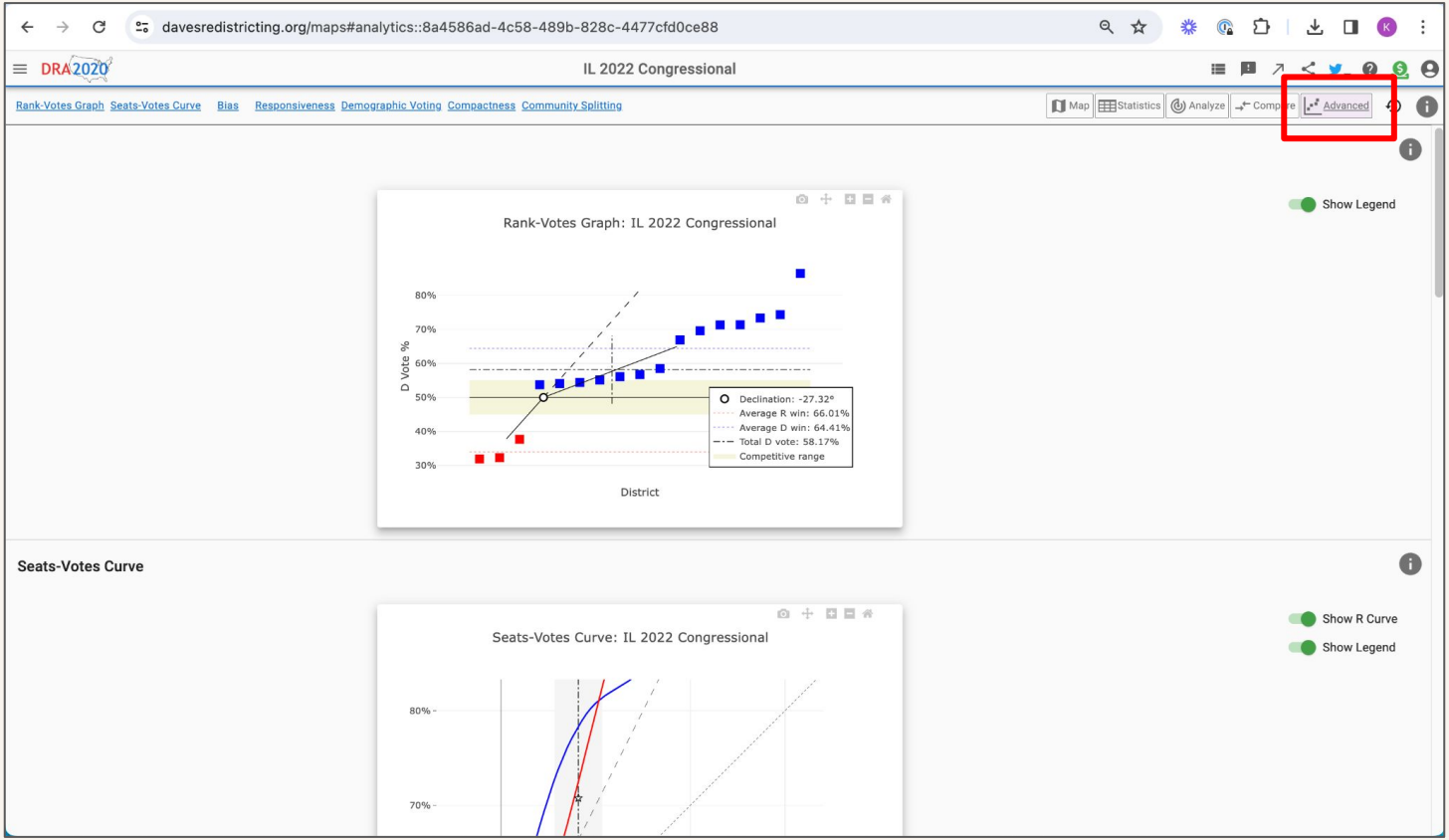
How to Analyze in DRA?

- Many more measures of partisan fairness in Advanced, including metrics that were cited in:
  a. Pennsylvania (efficiency gap; mean-median)
  b. North Carolina (efficiency gap; mean-median; close votes, close seats analysis; partisan symmetry)
  c. Maryland (efficiency gap)

- Caution: no guardrails in the Advanced tab!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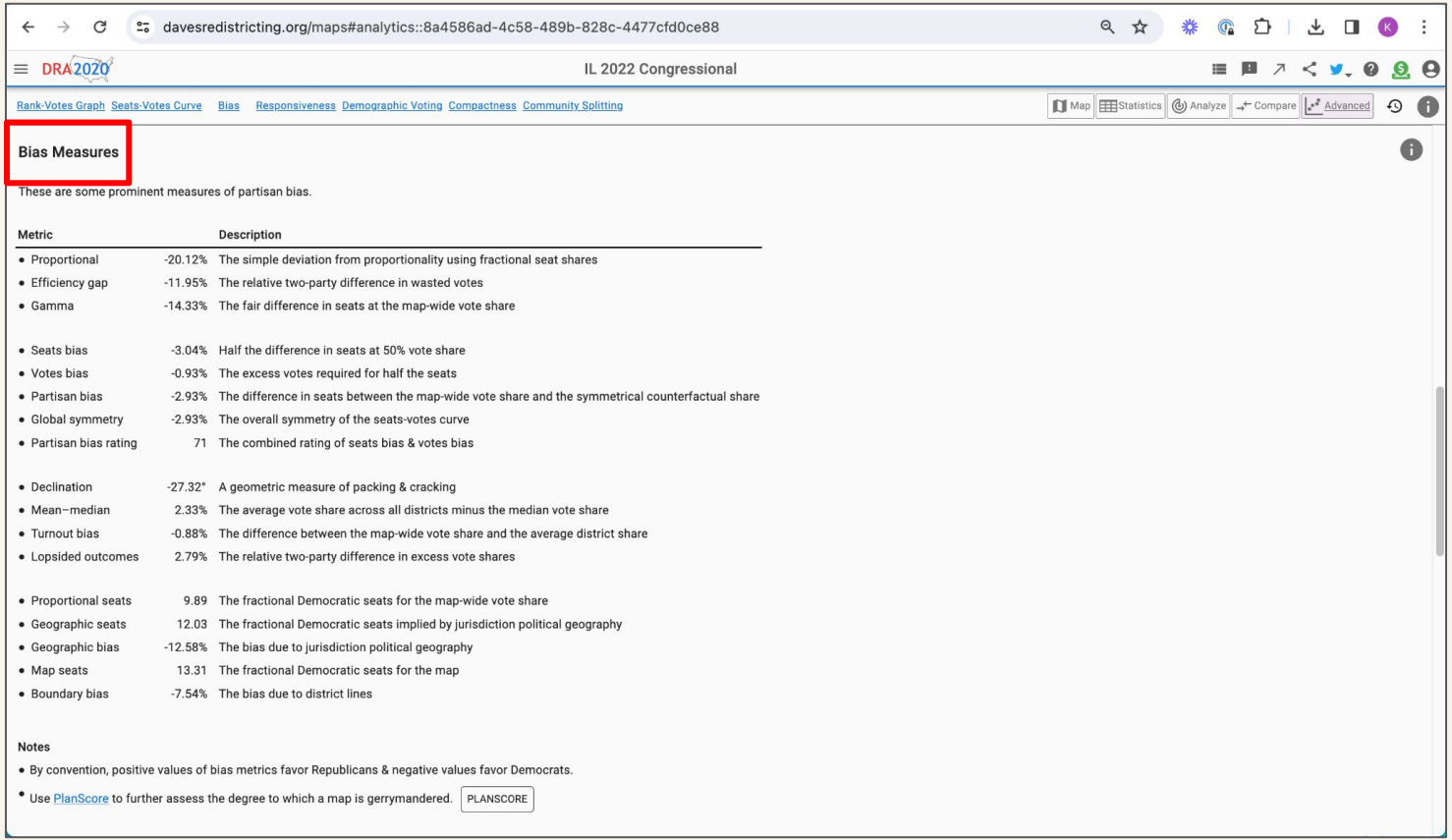
DRA2020
IL 2022 Congressional
Rank-Votes Graph
Seats-Votes Curve
Bias
Responsiveness
Demographic Voting
Compactness
Community Splitting
Map
Statistics
Analyze
Compare
Advanced
Show Legend
Rank-Votes Graph: IL 2022 Congressional
D Vote %
80%
70%
60%
50%
40%
30%
District
Declination: -27.32°
Average R win: 66.01%
Average D win: 64.41%
Total D vote: 58.17%
Competitive range
Seats-Votes Curve
Show R Curve
Show Legend
Seats-Votes Curve: IL 2022 Congressional
80%
70%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DRA2020
IL 2022 Congressional
Rank-Votes Graph Seats-Votes Curve Bias Responsiveness Demographic Voting Compactness Community Splitting
Map Statistics Analyze Compare Advanced
Bias Measures
These are some prominent measures of partisan bias.
Metric Description
• Proportional -20.12% The simple deviation from proportionality using fractional seat shares
• Efficiency gap -11.95% The relative two-party difference in wasted votes
• Gamma -14.33% The fair difference in seats at the map-wide vote share
• Seats bias -3.04% Half the difference in seats at 50% vote share
• Votes bias -0.93% The excess votes required for half the seats
• Partisan bias -2.93% The difference in seats between the map-wide vote share and the symmetrical counterfactual share
• Global symmetry -2.93% The overall symmetry of the seats-votes curve
• Partisan bias rating 71 The combined rating of seats bias & votes bias
• Declination -27.32° A geometric measure of packing & cracking
• Mean–median 2.33% The average vote share across all districts minus the median vote share
• Turnout bias -0.88% The difference between the map-wide vote share and the average district share
• Lopsided outcomes 2.79% The relative two-party difference in excess vote shares
• Proportional seats 9.89 The fractional Democratic seats for the map-wide vote share
• Geographic seats 12.03 The fractional Democratic seats implied by jurisdiction political geography
• Geographic bias -12.58% The bias due to jurisdiction political geography
• Map seats 13.31 The fractional Democratic seats for the map
• Boundary bias -7.54% The bias due to district lines
Notes
• By convention, positive values of bias metrics favor Republicans & negative values favor Democrats.
• Use PlanScore to further assess the degree to which a map is gerrymandered. PLANSCORE

How to Analyze in DRA?

- Other partisan fairness concepts, metrics, and approaches have been cited in litigation in:
  a. Florida (partisan intent)
  b. Pennsylvania and Maryland (ensemble analysis)
  c. Wisconsin (majoritarianism)

- Learn more about what states have weighed in on the question of partisan fairness from the Brennan Center

Defining Our Terms

- **Competitiveness** is a redistricting criterion that encourages drawing districts that can be won by either party

- Related to the notion of **responsiveness**: how much a *change* in the seat share results from a change in the vote share

What Is Required?

- A few states have requirements to:
  a. uphold competitiveness (AZ, CO, MO, WA)
  b. prohibit “discouraging” competition (NY)

How to Analyze in DRA?

- The measure of **competitiveness**:
  a. generates a prediction for each district based on your Primary Election Dataset, where 50% vote share for each party is perfectly competitive, and anything beyond 40 or 60% of the vote share is not at all competitive
  b. sums these predictions up and divides by the total number of seats
  c. Normalizes this to range to a value ranging from 0 to 100, with larger values indicating greater competitiveness

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DRA2020 IL 2022 Congressional

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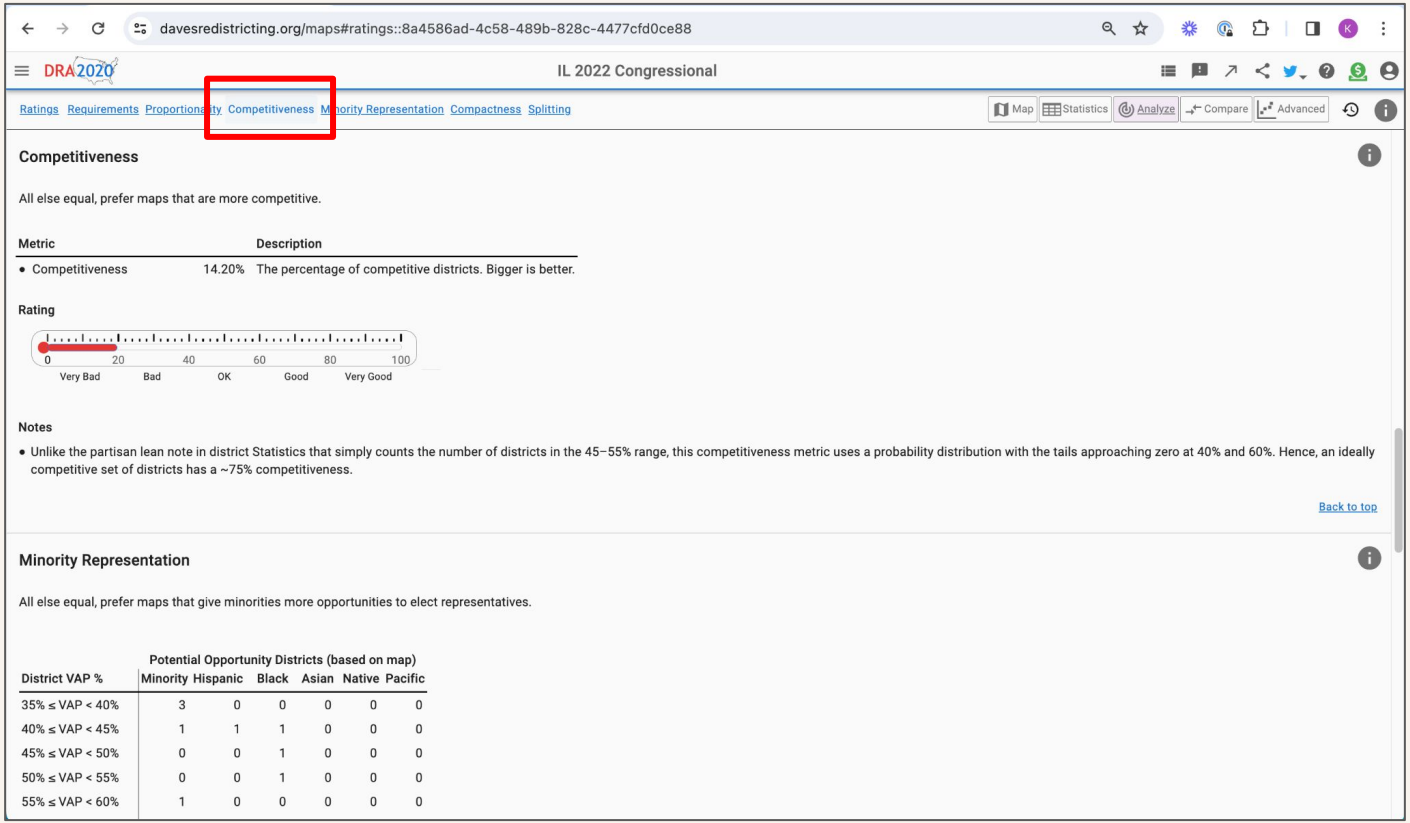
Requirements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Competitiveness
All else equal, prefer maps that are more competitive.
Metric Description
• Competitiveness 14.20% The percentage of competitive districts. Bigger is better.
Rating
0 20 40 60 80 100
Very Bad Bad OK Good Very Good
Notes
• Unlike the partisan lean note in district Statistics that simply counts the number of districts in the 45–55% range, this competitiveness metric uses a probability distribution with the tails approaching zero at 40% and 60%. Hence, an ideally competitive set of districts has a ~75% competitiveness.
Back to top
Minority Representation
All else equal, prefer maps that give minorities more opportunities to elect representatives.
Potential Opportunity Districts (based on map)
District VAP % Minority Hispanic Black Asian Native Pacific
35% ≤ VAP < 40% 3 0 0 0 0 0
40% ≤ VAP < 45% 1 1 1 0 0 0
45% ≤ VAP < 50% 0 0 1 0 0 0
50% ≤ VAP < 55% 0 0 1 0 0 0
55% ≤ VAP < 60% 1 0 0 0 0 0

Competitiveness

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Metric		Description
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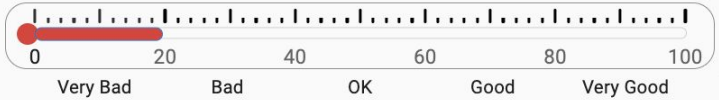
Rating



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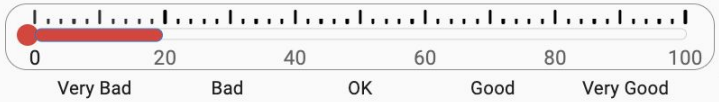

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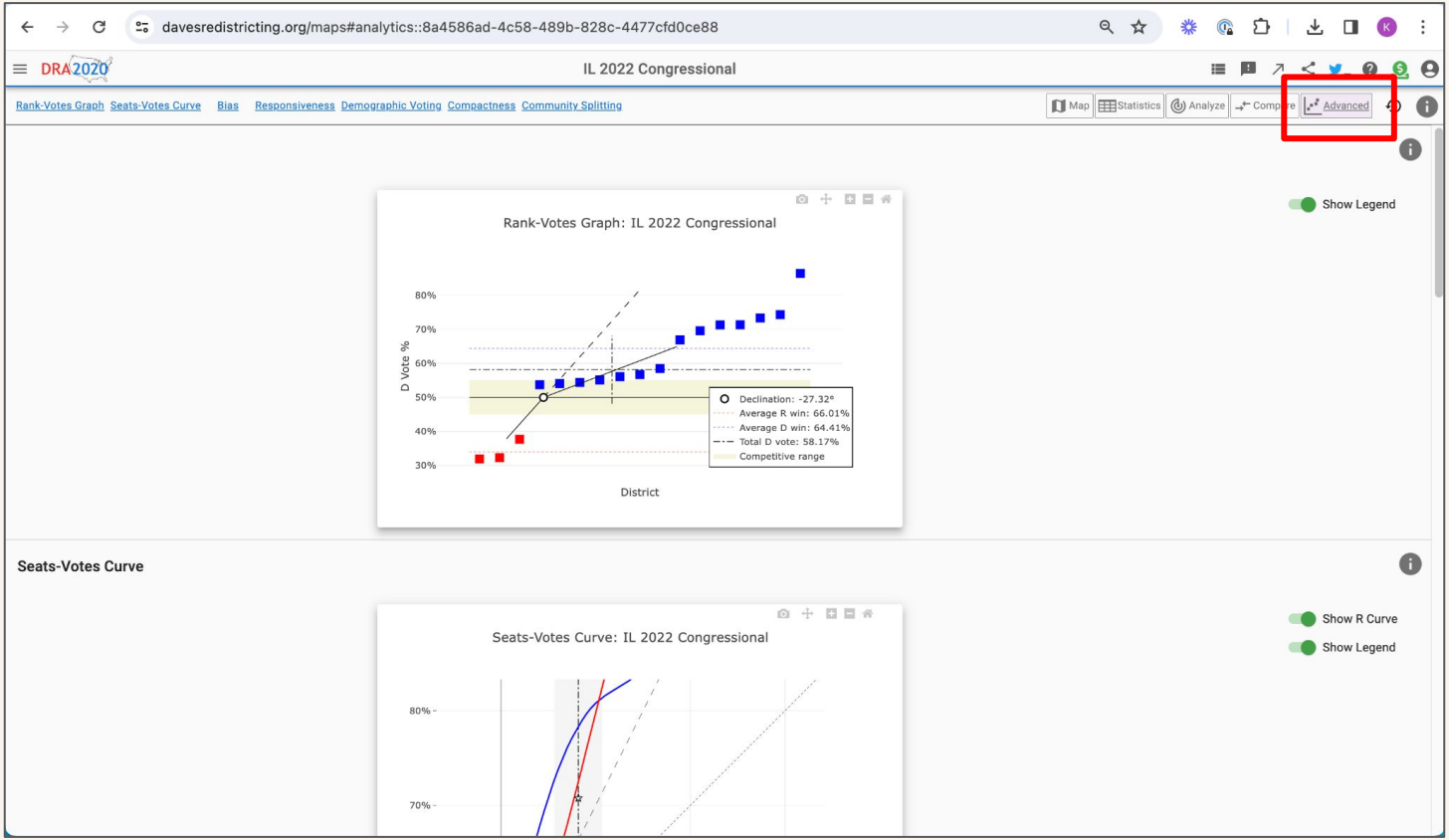
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Show Legend
Rank-Votes Graph: IL 2022 Congressional
D Vote %
80%
70%
60%
50%
40%
30%
District
Declination: -27.32°
Average R win: 66.01%
Average D win: 64.41%
Total D vote: 58.17%
Competitive range
Seats-Votes Curve
Show R Curve
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Seats-Votes Curve: IL 2022 Congressional
80%
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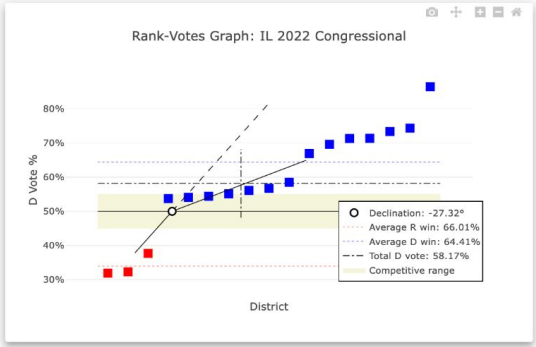
davesredistricting.org/maps#analytics::8a4586ad-4c58-489b-828c-4477cfd0ce88

DRA2020 IL 2022 Congressional

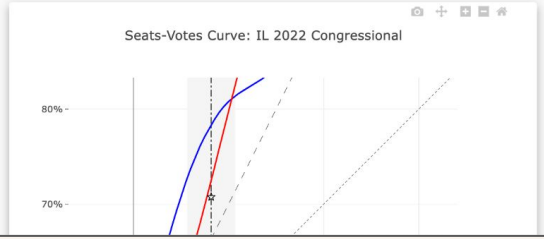
Rank-Votes Graph | Seats-Votes Curve | Bias | Responsiveness | Demographic Voting | Compactness | Community Splitting

Map | Statistics | Analyze | Compare | Advanced



Show Legend

Seats-Votes Curve



Show R Curve

Show Legend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DRA2020
IL 2022 Congressional
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Map Statistics Analyze Compare Advanced
Responsiveness Measures
These are some prominent measures of responsiveness.
Metric Description
• Responsiveness 1.71 The slope of the seats-votes curve at the map-wide vote share
• Responsive districts 2.41 The likely number of responsive districts
• Overall responsiveness 3.46 The overall responsiveness (or winner's bonus)
Back to top
Demographic Voting
This is a preliminary analysis of the partisan voting patterns of demographic groups.
For district compare voting to voting ANALYZE

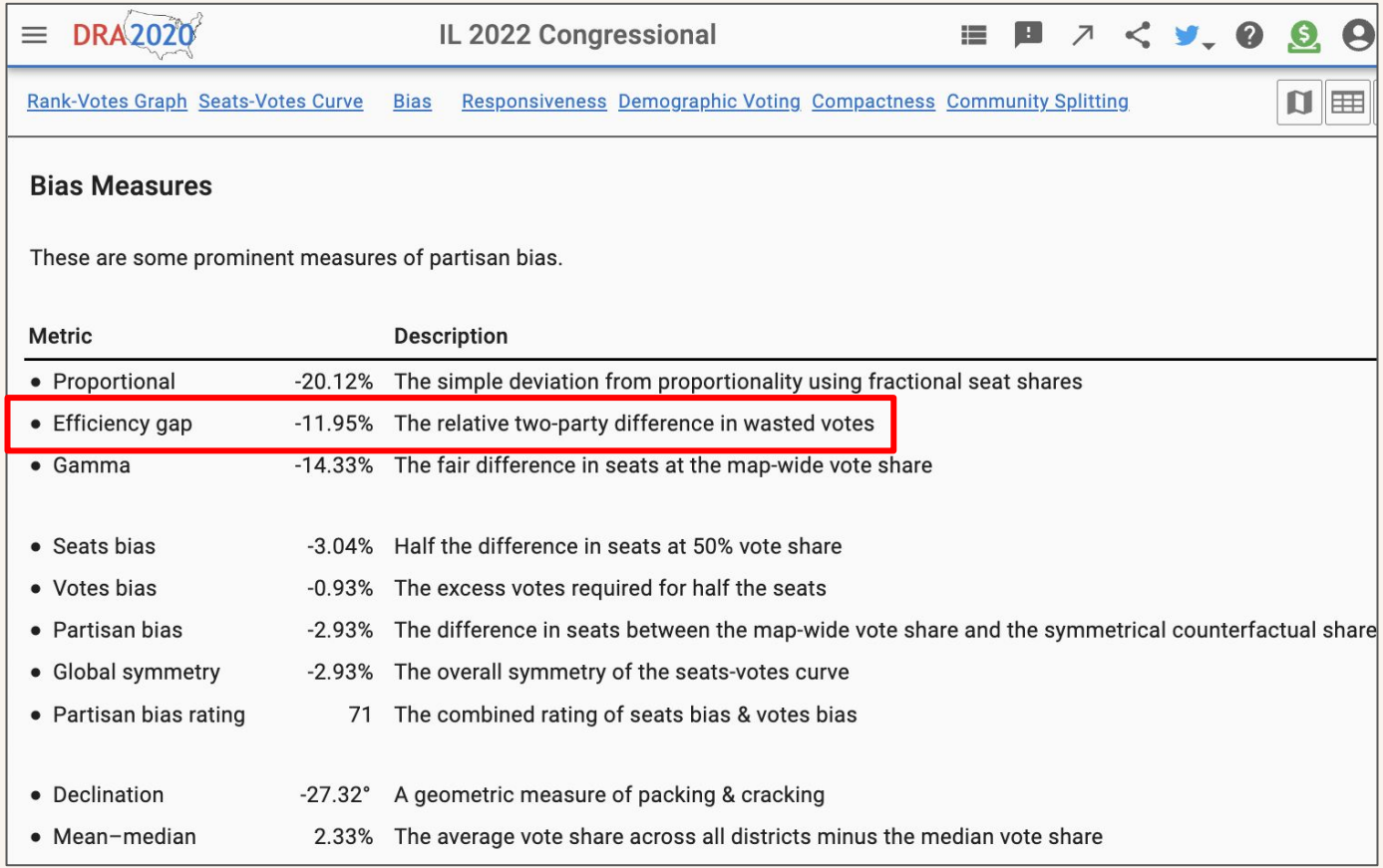
Take Homes

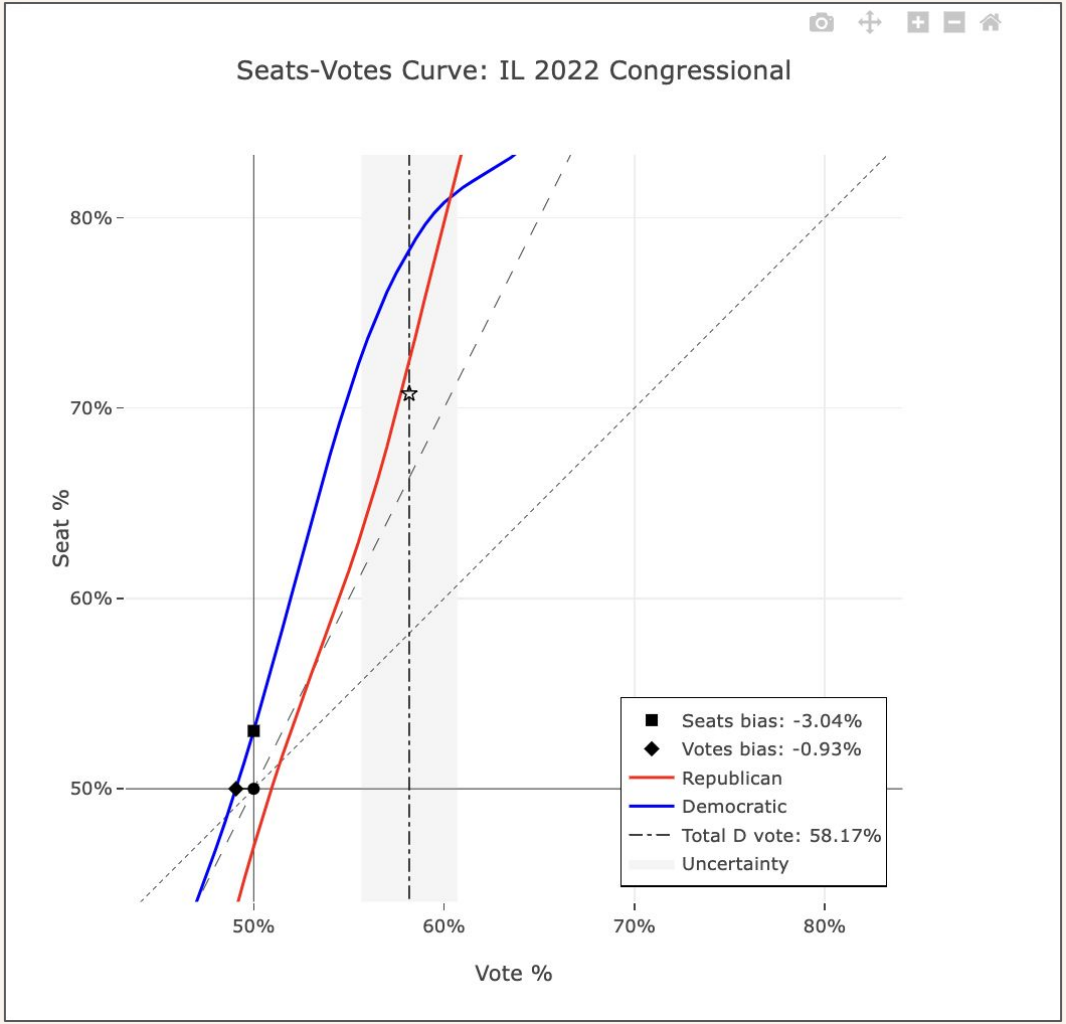
- There is no consensus regarding how best to identify partisan fairness (or competitiveness/responsiveness)
- There are many metrics available, each with their own (dis)advantages
- Most of it is in DRA!

Take Homes

- You can learn more about these metrics from Alec Ramsay's Medium articles:
  a. Proportionality
  b. Two Definitions of Fair
  c. Seats-Votes Curve
  d. Competitiveness and Evaluating Competitiveness
  e. Advanced Measures of Bias and Responsiveness

Questions?


DRA 2020
IL 2022 Congressional
Rank-Votes Graph
Seats-Votes Curve
Bias
Responsiveness
Demographic Voting
Compactness
Community Splitting
Bias Measures
These are some prominent measures of partisan bias.
Metric
Description
• Proportional -20.12% The simple deviation from proportionality using fractional seat shares
• Efficiency gap -11.95% The relative two-party difference in wasted votes
• Gamma -14.33% The fair difference in seats at the map-wide vote share
• Seats bias -3.04% Half the difference in seats at 50% vote share
• Votes bias -0.93% The excess votes required for half the seats
• Partisan bias -2.93% The difference in seats between the map-wide vote share and the symmetrical counterfactual share
• Global symmetry -2.93% The overall symmetry of the seats-votes curve
• Partisan bias rating 71 The combined rating of seats bias & votes bias
• Declination -27.32° A geometric measure of packing & cracking
• Mean–median 2.33% The average vote share across all districts minus the median vote share


Seats-Votes Curve: IL 2022 Congressional
80%
70%
60%
50%
Seat %
50%
60%
70%
80%
Vote %
Seats bias: -3.04%
Votes bias: -0.93%
Republican
Democratic
Total D vote: 58.17%
Uncertainty