A light gray silhouette of the state of Minnesota is centered in the background. The background is split vertically: the left side features a blue geometric pattern of various triangles, and the right side is a solid red color.

Minnesota

Mid term election predictions

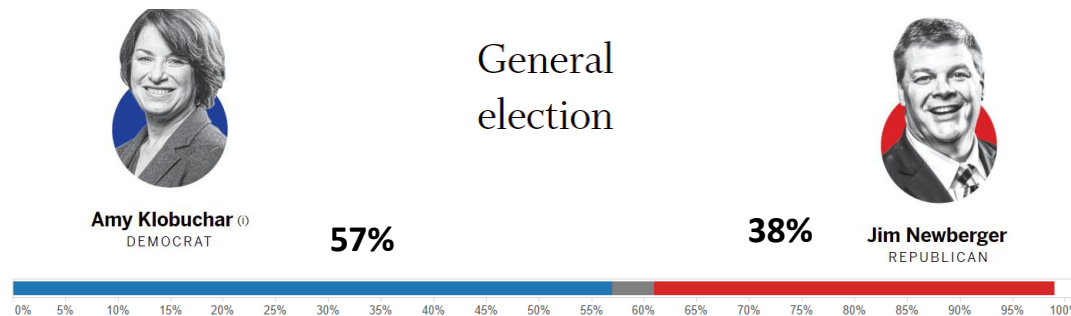
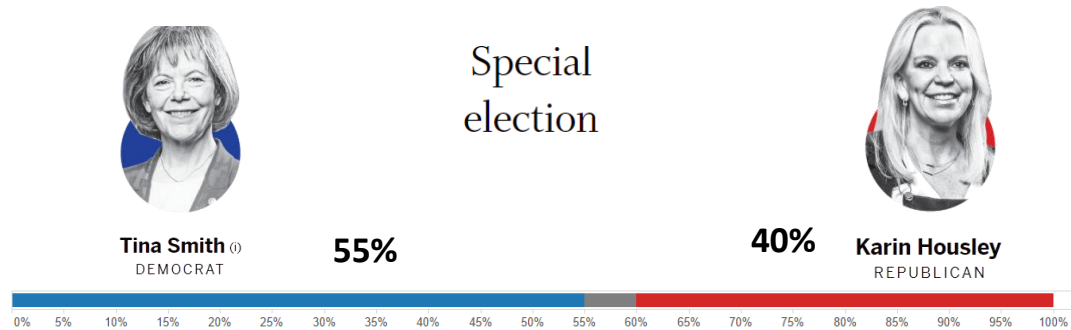
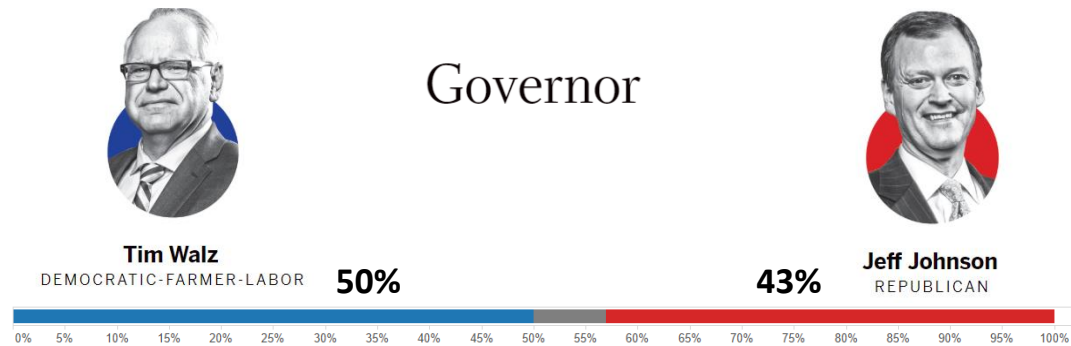
**Minnesota is now ground zero in the 2018
midterm elections**

STORY HIGHLIGHTS

Minnesota's move toward swing state status is part of the remaking of the US political map

Minnesota joins California as one of the most important states in the 2018 elections

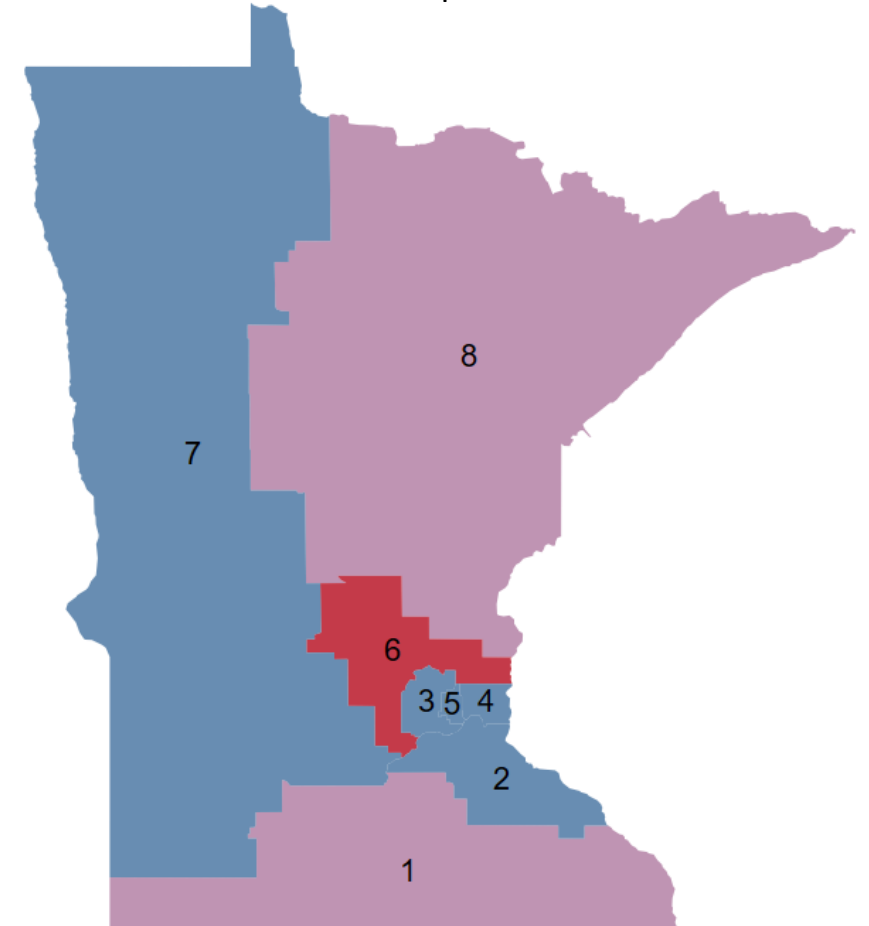
Minnesota to favor Democrats, with 65% turnout



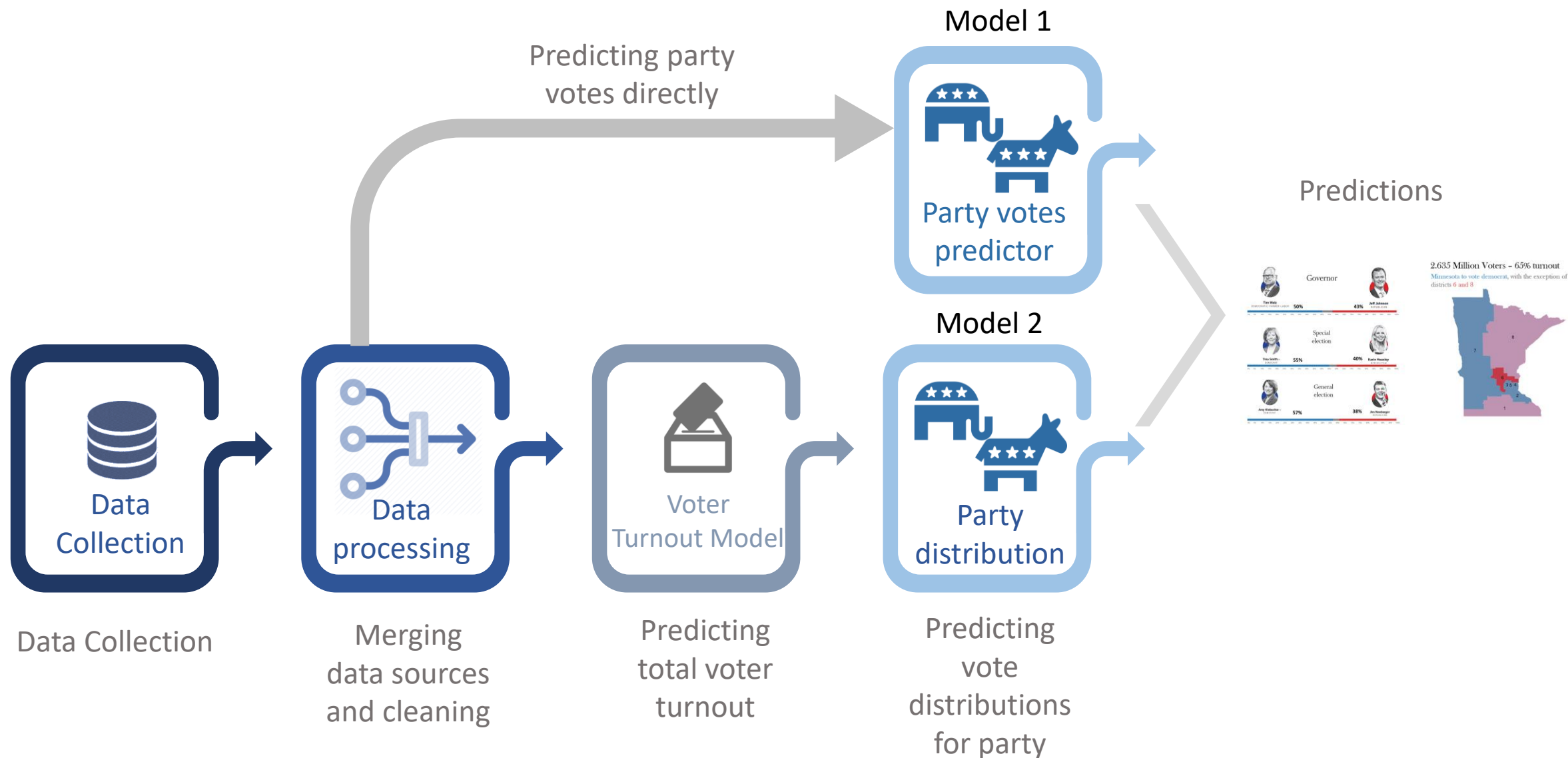
2.635 Million Voters to turn up – 65%

Minnesota to favor democrats

● Democrats ● Republicans ● Toss - ups



A two-model approach to predict voter turnout



A Data stack was created by combining diverse sources



Twitter
mentions of
candidates



Pre polling and
surveys



Census/
American community survey
(Demographics)



Fundraising by
parties



Historical
voting data



The datasets were merged after creating time-lagged and derived variables



American
community survey
(Census.gov)

- Education
- Health insurance
- Poverty
- Nativity
- Race
- Income level
- Veteran status



Twitter mentions of
candidates using Twint
and Vader

- Analyzed total negative and positive sentiment on the twitter mentions of candidates to create sentiment scores



Data from over 300
pollsters

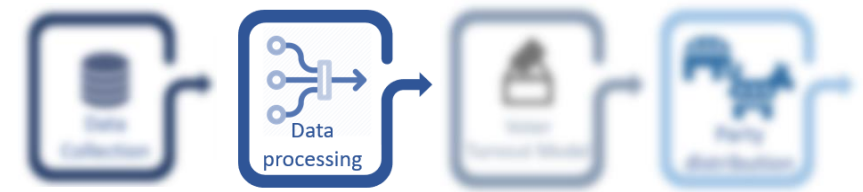
- Aggregated data from over 300 pollsters



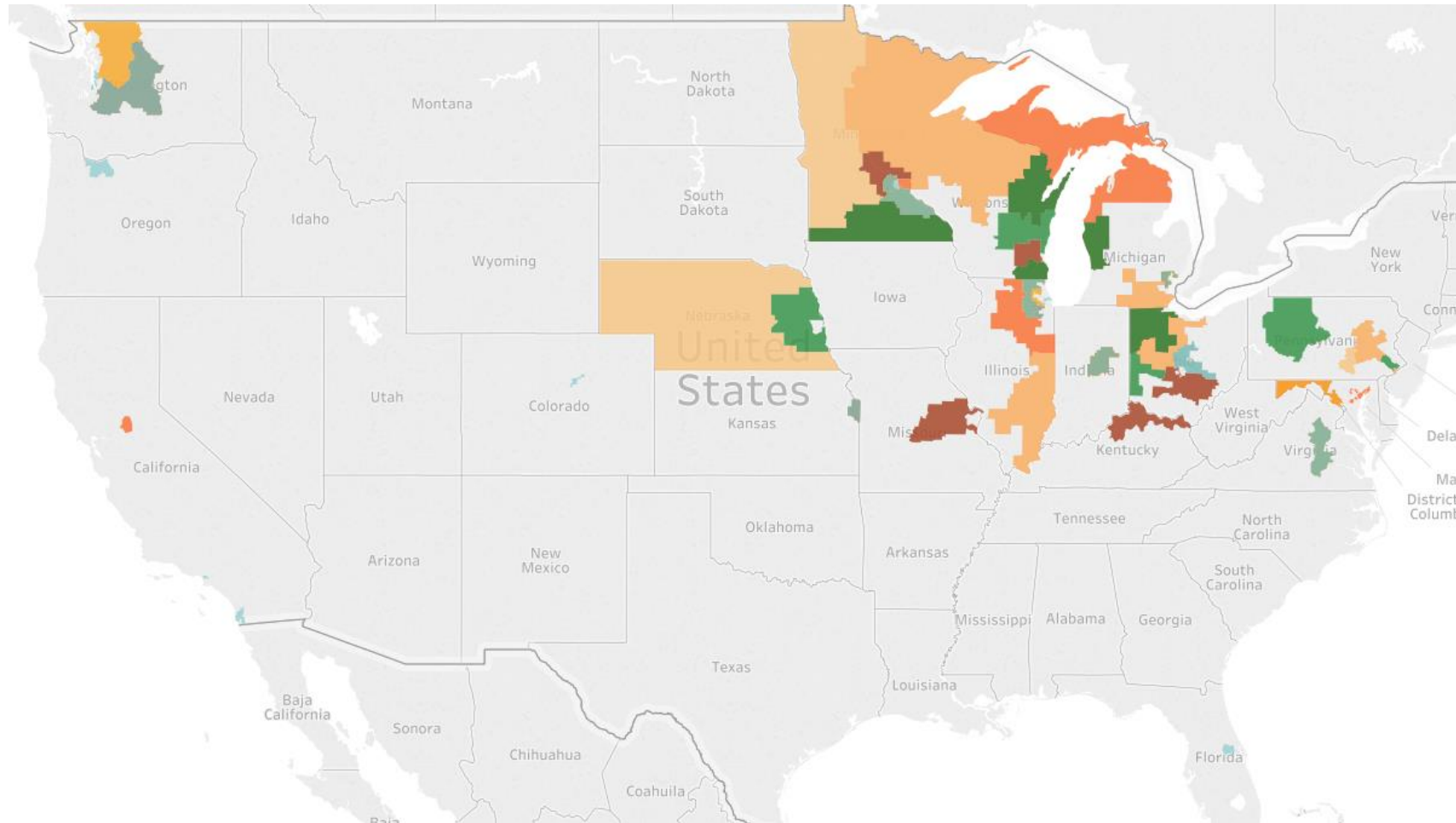
Derived and time-lagged
variables

- President/senate/governor/incumbent flag
- Last year margins
- Last year voting
- Change in voter registration
- Prior candidacy

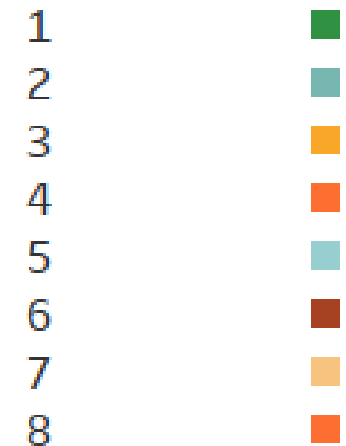
We found districts similar to Minnesota districts to increase data volume



Combination of demographics and political features were used to find districts similar to Minnesota districts



Minnesota districts

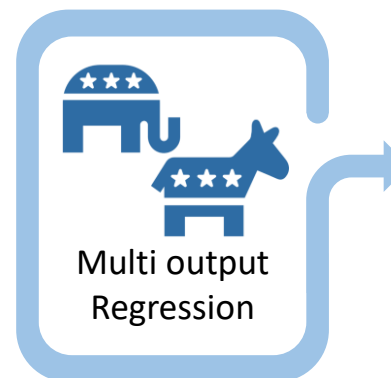


A two-model approach to predict voter turnout



Final
Analytical
Dataset

Multi-output regression

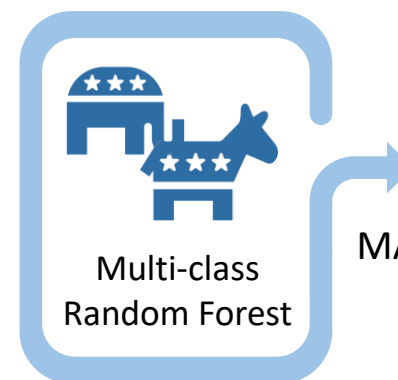


Party votes predictor
MAE : ~ 10,000

Regression + Classification

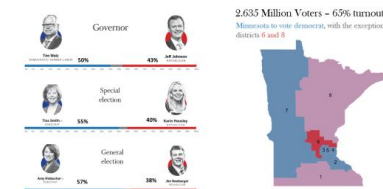


Voter Turnout Model
MAE : ~ 11,500



Party distribution
Accuracy 91%

MAE : ~ 9,000



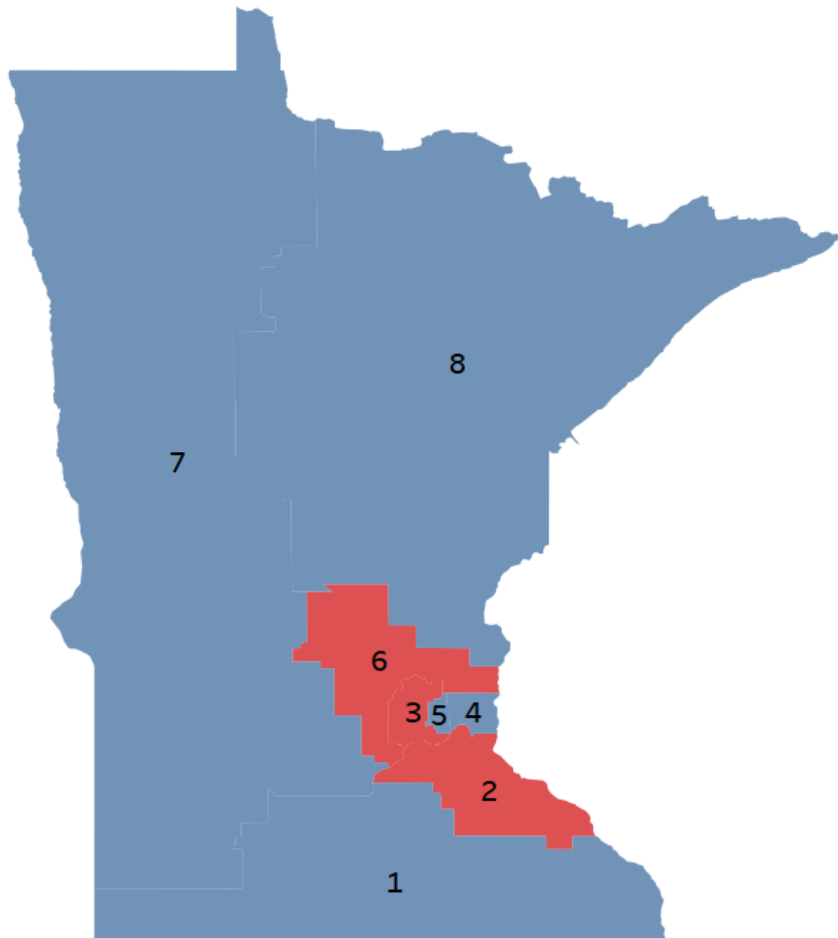
We predict flips in 2 districts and toss-ups in 2 districts

● Democrats

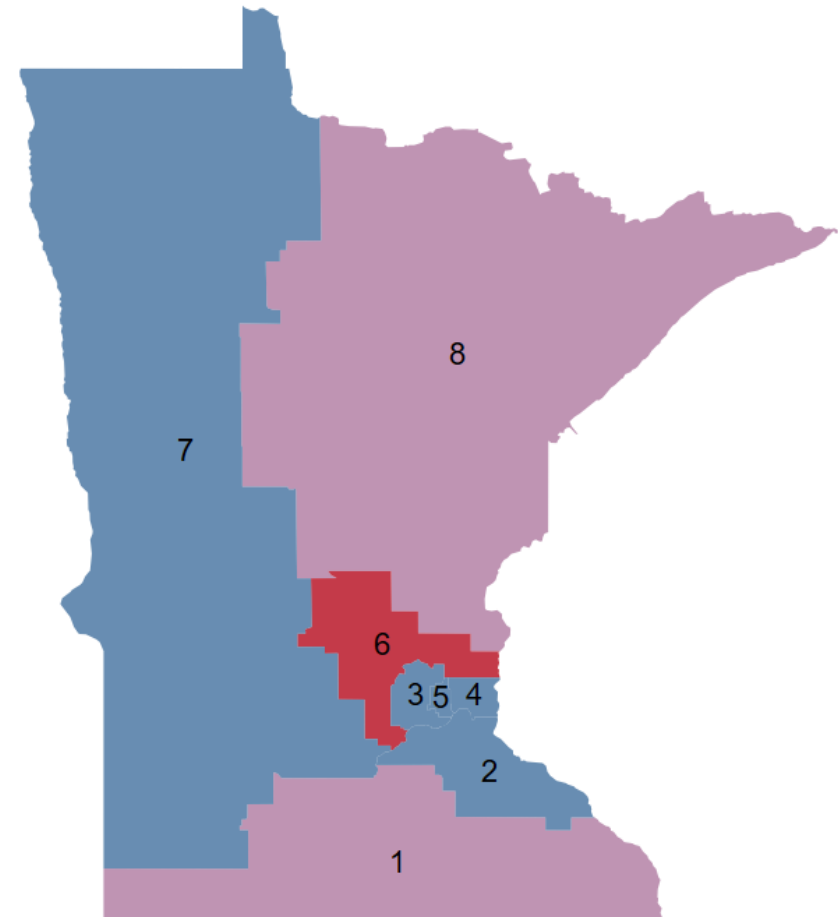
● Republicans

● Toss - ups

Present - 2016

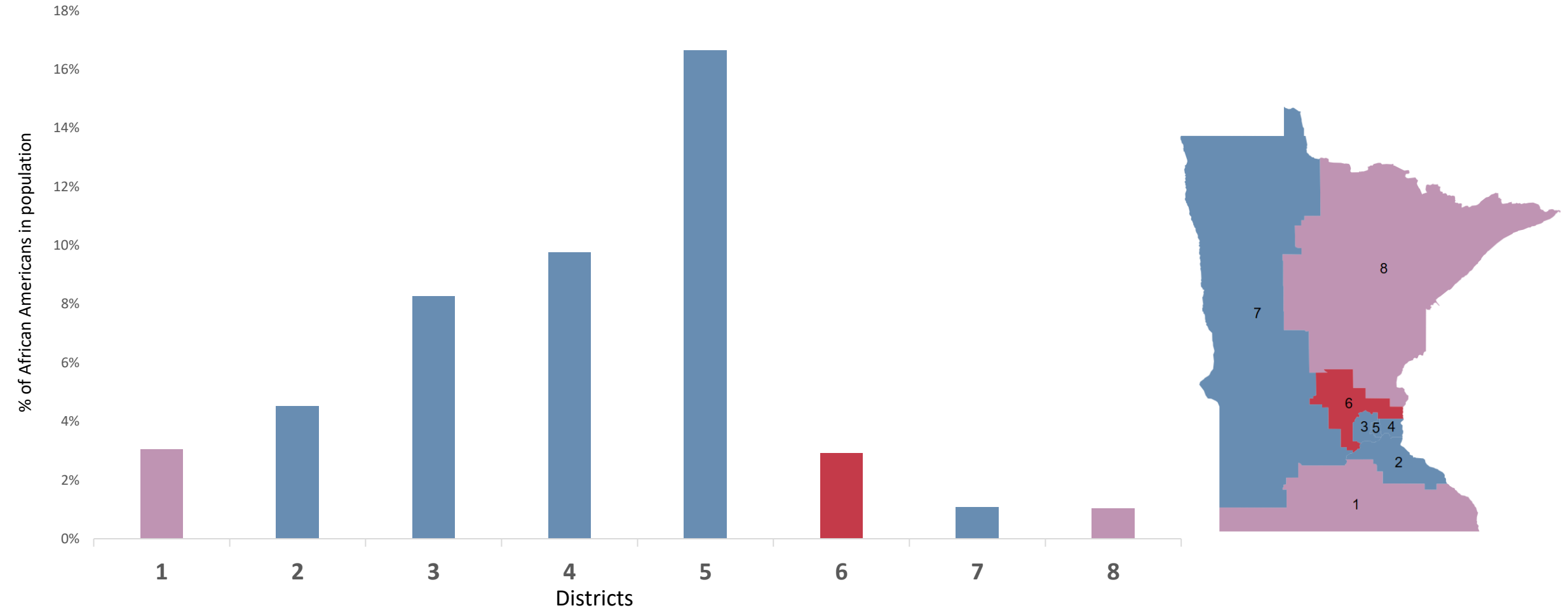


Mid-term 2018



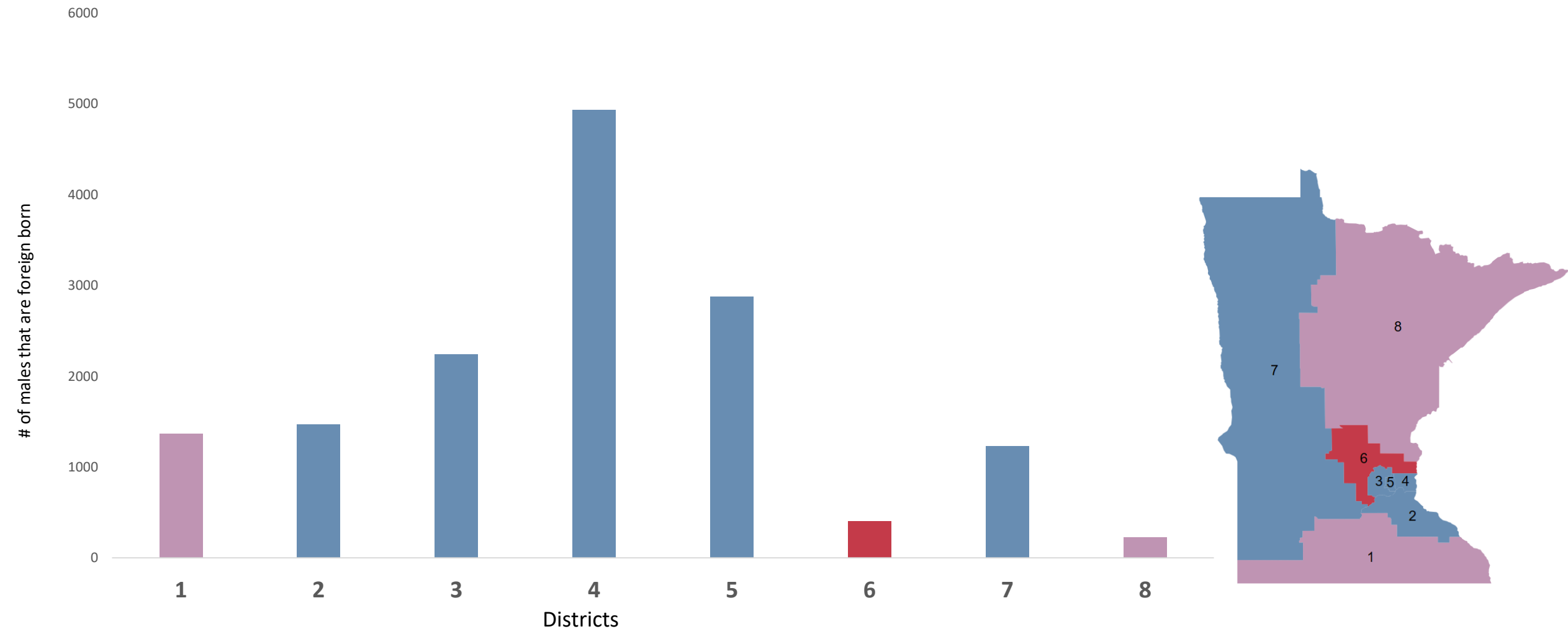
Race is predictive of votes distribution for parties

High African American populated districts tend to vote democrat



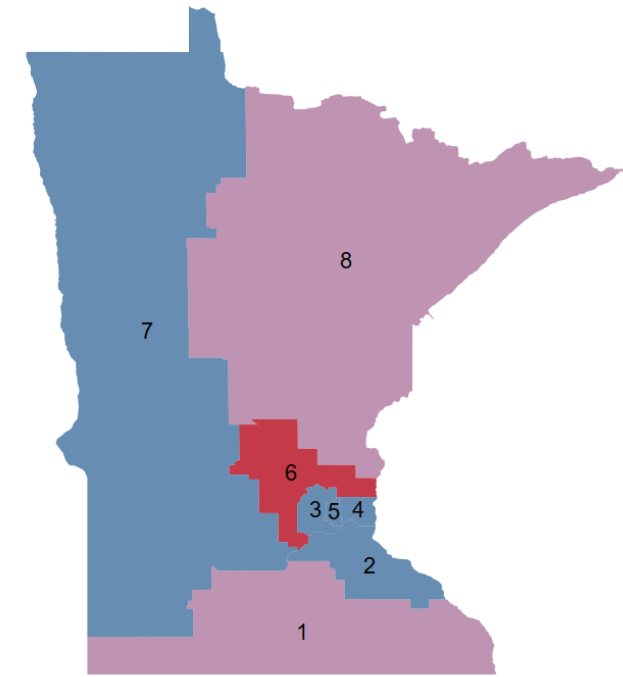
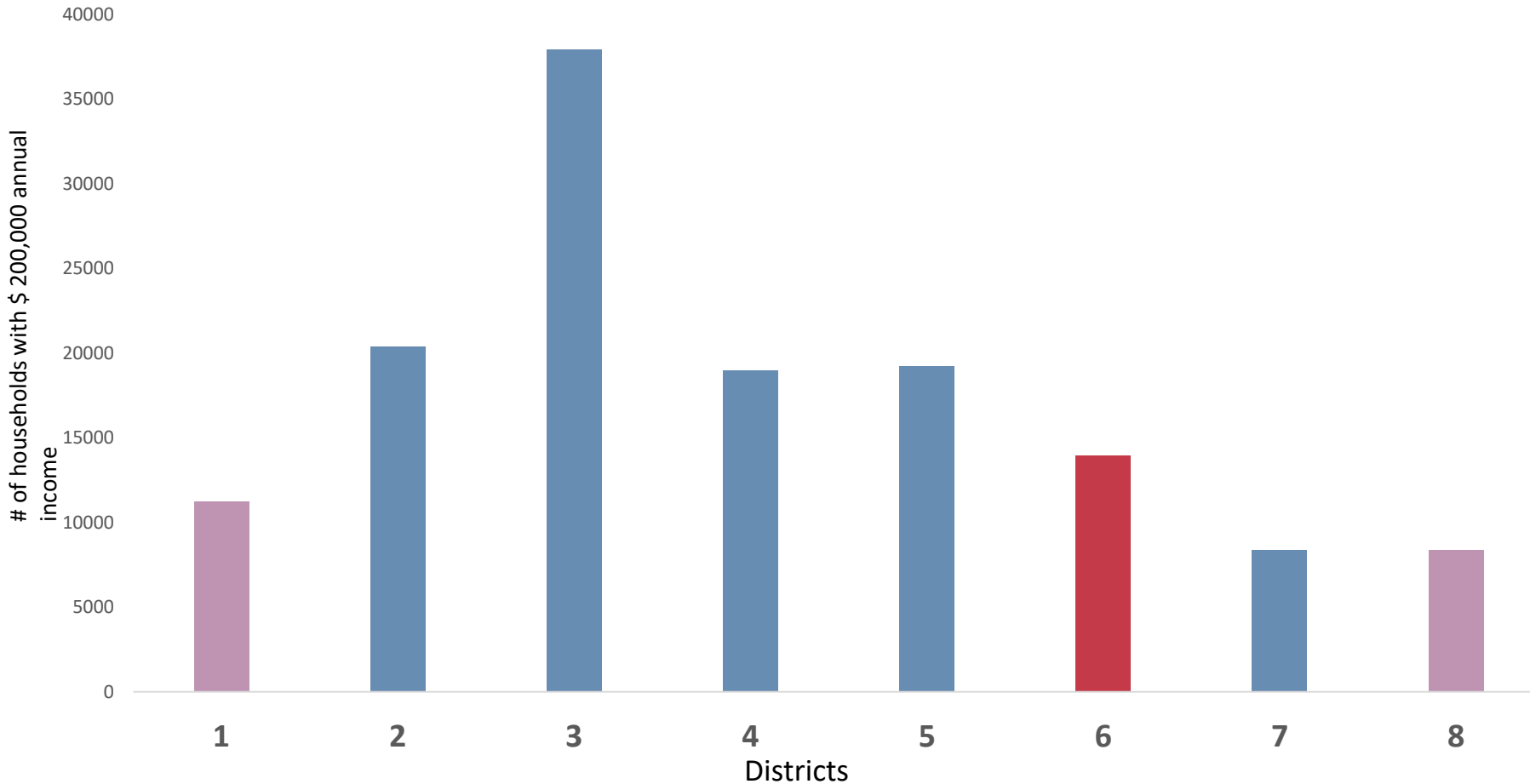
Foreign born citizens are predictive of votes distribution for parties

High non-native populated districts tend to vote democrat



Household income is predictive of votes distribution for parties

Districts with higher household income seem to vote democrat



Key Takeaways



Interpretable Model

Explainable results




Sentiment

Allowed to capture
public opinion



Clustering

Enabled to expand data



Questions

Appendix

Data Sources - I

- Factfinder - <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- American Community Survey - <https://factfinder.census.gov/faces/nav/jsf/pages/programs.xhtml?program=acs>
- IPUMS - <https://usa.ipums.org/usa/>
- Census - <https://www.census.gov/ces/dataproducts/demographicdata.html>
- Financial Data, Federal Election Commission - <https://www.fec.gov/data/advanced/?tab=bulk-data>
- Secretary of State website for each state - <https://www.sos.state.mn.us/elections-voting/election-results>

Data Sources – II

- Cook Political Report Partisan Voter Index - <https://www.cookpolitical.com/introducing-2017-cook-political-report-partisan-voter-index>
- Google search API: <https://pypi.org/project/google-search/>
- Polling - https://www.realclearpolitics.com/epolls/latest_polls/ , <http://useventing.com/survey>, <https://github.com/fivethirtyeight/data>
- Twitter Python Package - <https://github.com/twintproject/twint>

American Community Survey

The ACS collects and produces population and housing information every year instead of every ten years. Collecting data every year provides more up-to-date information throughout the decade about the U.S. population at the local community level. About 3.5 million housing unit addresses are selected annually, across every county in the nation.

<https://factfinder.census.gov/faces/nav/jsf/pages/programs.xhtml?program=acs>

Twitter Data Collection Using Twint

Its an advanced Twitter scraping & OSINT tool written in Python that doesn't use Twitter's API, enabling scraping of user's followers, following, Tweets and more while evading most API limitations.

Twint utilizes Twitter's search operators to scrape Tweets from specific users, scrape Tweets relating to certain topics, hashtags & trends.

Source: <https://github.com/twintproject/twint>

Cook Political Report Partisan Voter Index

First introduced in 1997, the Cook PVI measures how each district performs at the presidential level compared to the nation as a whole.

This 2017 release incorporates the results of the November 2016 presidential election. A Partisan Voting Index score of D+2, for example, means that in the 2012 and 2016 presidential elections, that district performed an average of two points more Democratic than the nation did as a whole, while an R+4 means the district performed four points more Republican than the national average.

Source: <https://www.docdroid.net/4vS5iWM/arranged-by-state-district-1.pdf>

<https://www.cookpolitical.com/introducing-2017-cook-political-report-partisan-voter-index>

Redistricting in Minnesota

Following the 2010 United States Census, Minnesota neither gained nor lost congressional seats. At the time of redistricting, Republicans controlled both chambers of the state legislature but a Democrat, Mark Dayton, was governor. On May 19, 2011, Dayton vetoed the legislature's plan. The Minnesota Supreme Court appointed a judicial panel to draw the lines. The panel issued its map on February 21, 2012.

[https://ballotpedia.org/Redistricting in Minnesota](https://ballotpedia.org/Redistricting_in_Minnesota)

Early Voting

- <http://www.fox9.com/news/minnesota-early-voting-turnout-on-pace-with-presidential-election>

Minnesota Primary Election Results

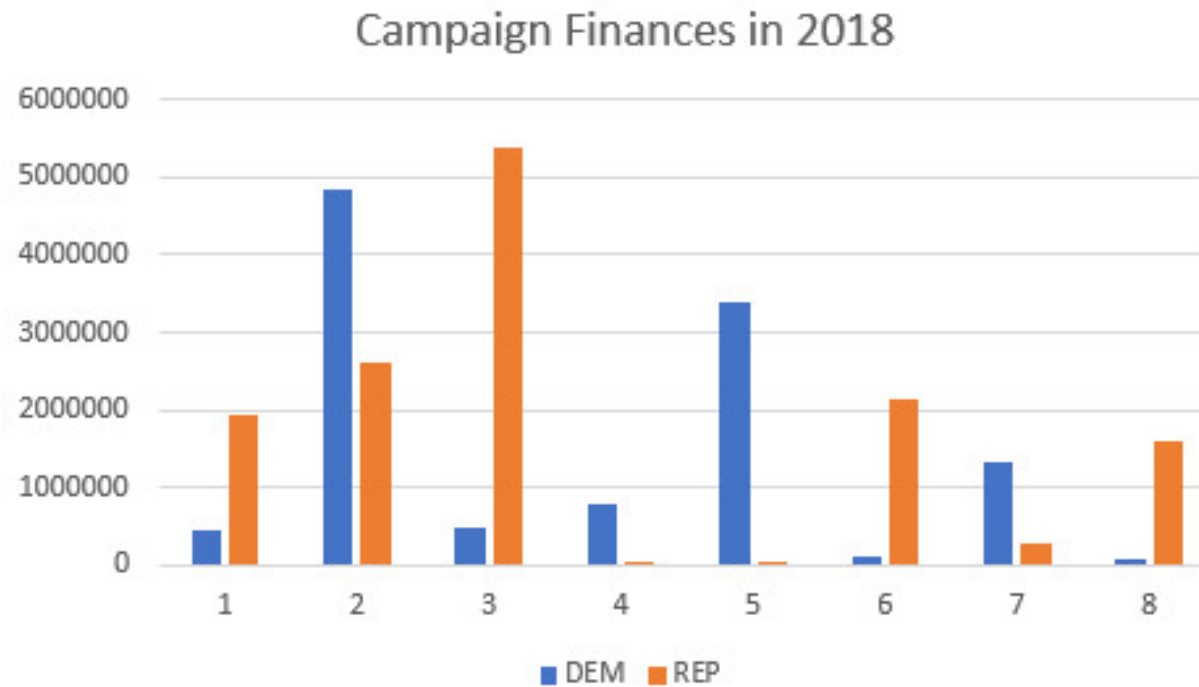
State Primary Election - August 14, 2018

Votes for U.S. Senator : 872,307

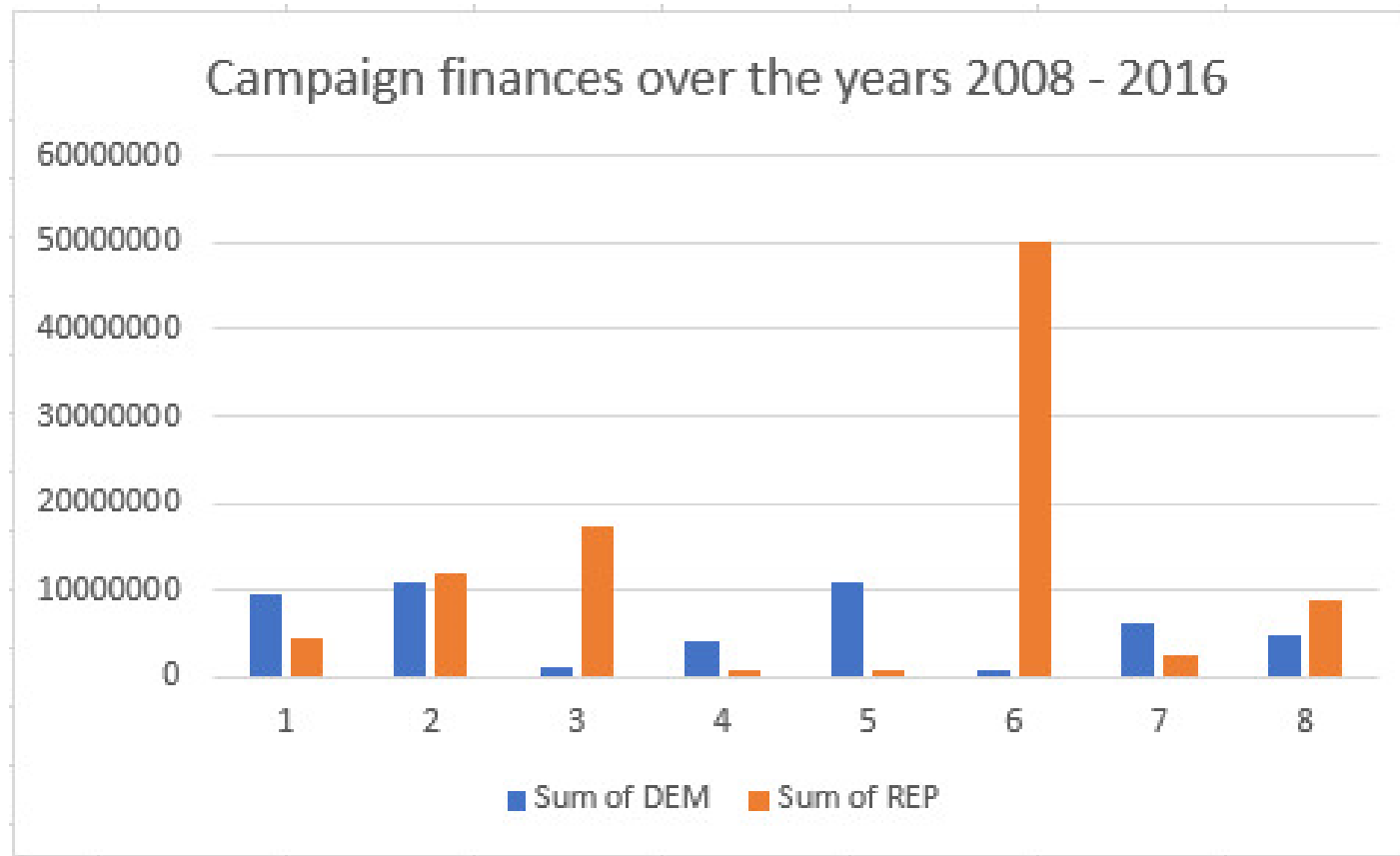
Votes for Governor and Lieutenant Governor : 904,649

- <https://www.sos.state.mn.us/elections-voting/2018-primary-election-results/>
- <https://electionresults.sos.state.mn.us/20180814>
- <https://www.sos.state.mn.us/elections-voting/election-results>

Finance Data



Finance Data



Multi-output Regression

- <http://cig.fi.upm.es/articles/2015/Borchani-2015-WDMKD.pdf>