

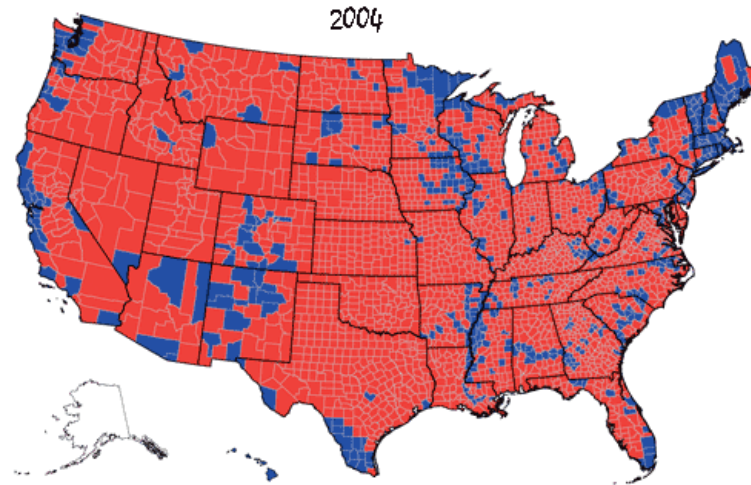
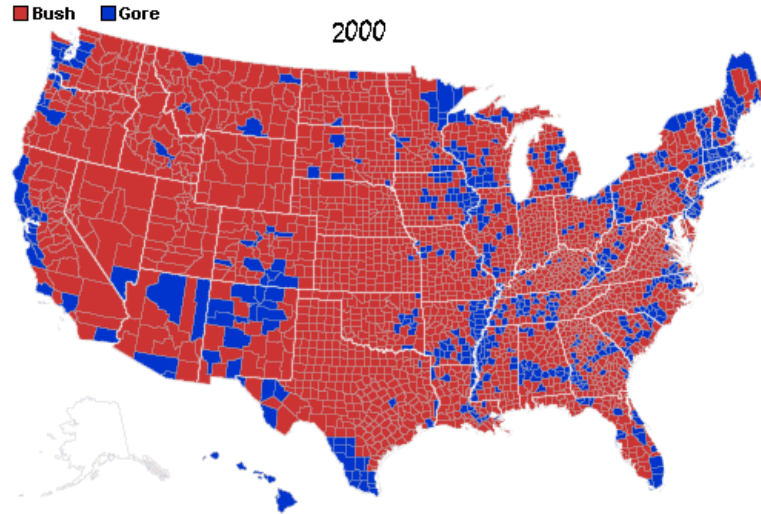
# Purple America: Using Color and Other Visual Cues to Convey Information

Robert J. Vanderbei

December 7, 2007

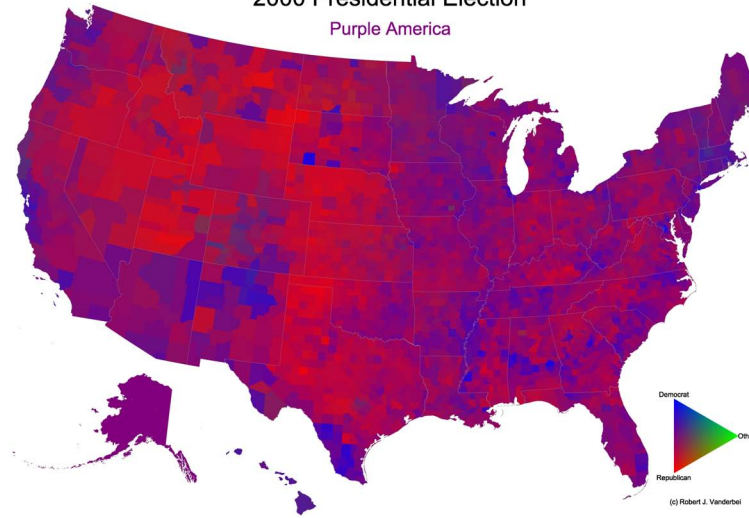
Politics Department Lunchtime Seminar  
Princeton University

USA Today  
Election  
Maps



# Purple America

2000 Presidential Election  
Purple America



2004 Presidential Election  
Purple America



June 12, 2007

## Final Jeopardy! Round

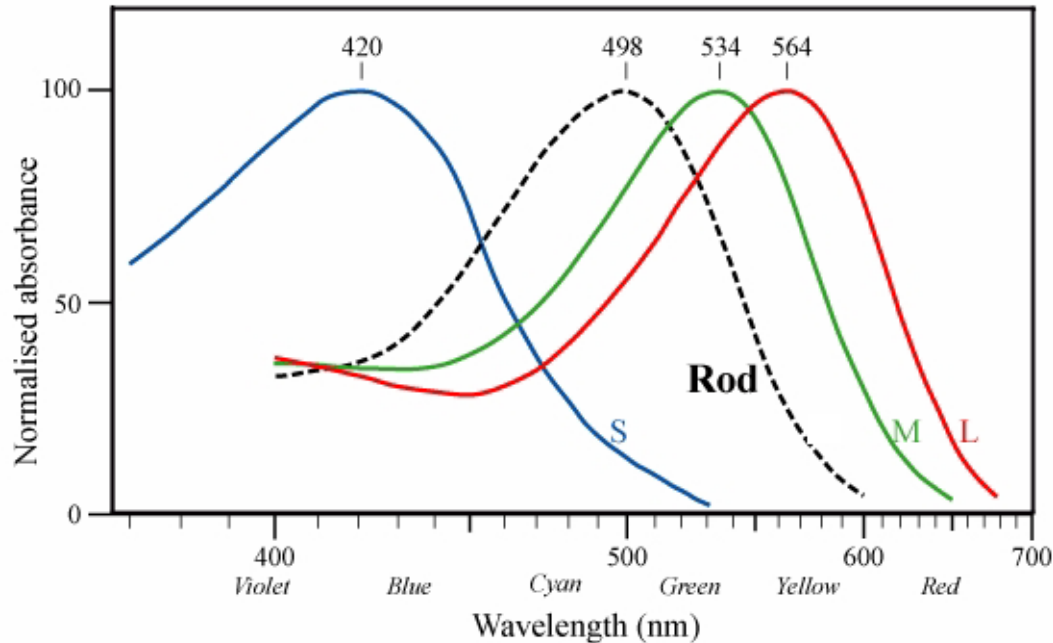
**COLORS**

Political battleground  
states are usually called  
this secondary color

# Color Perception

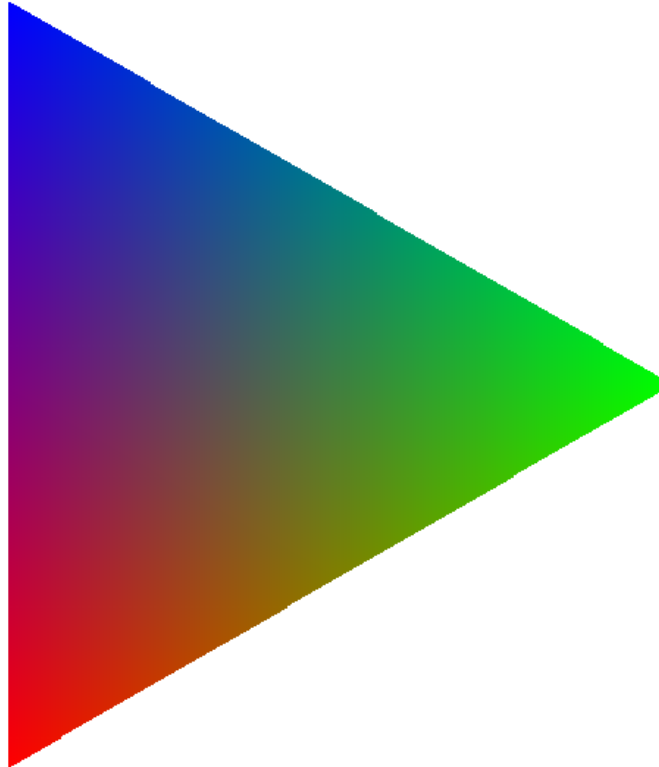
Physically, color is infinite dimensional—it can be described by a function  $I(\lambda)$ .

But, the human eye has only three types of color receptors. They are located in the cones. Hence, human color perception is 3 dimensional.



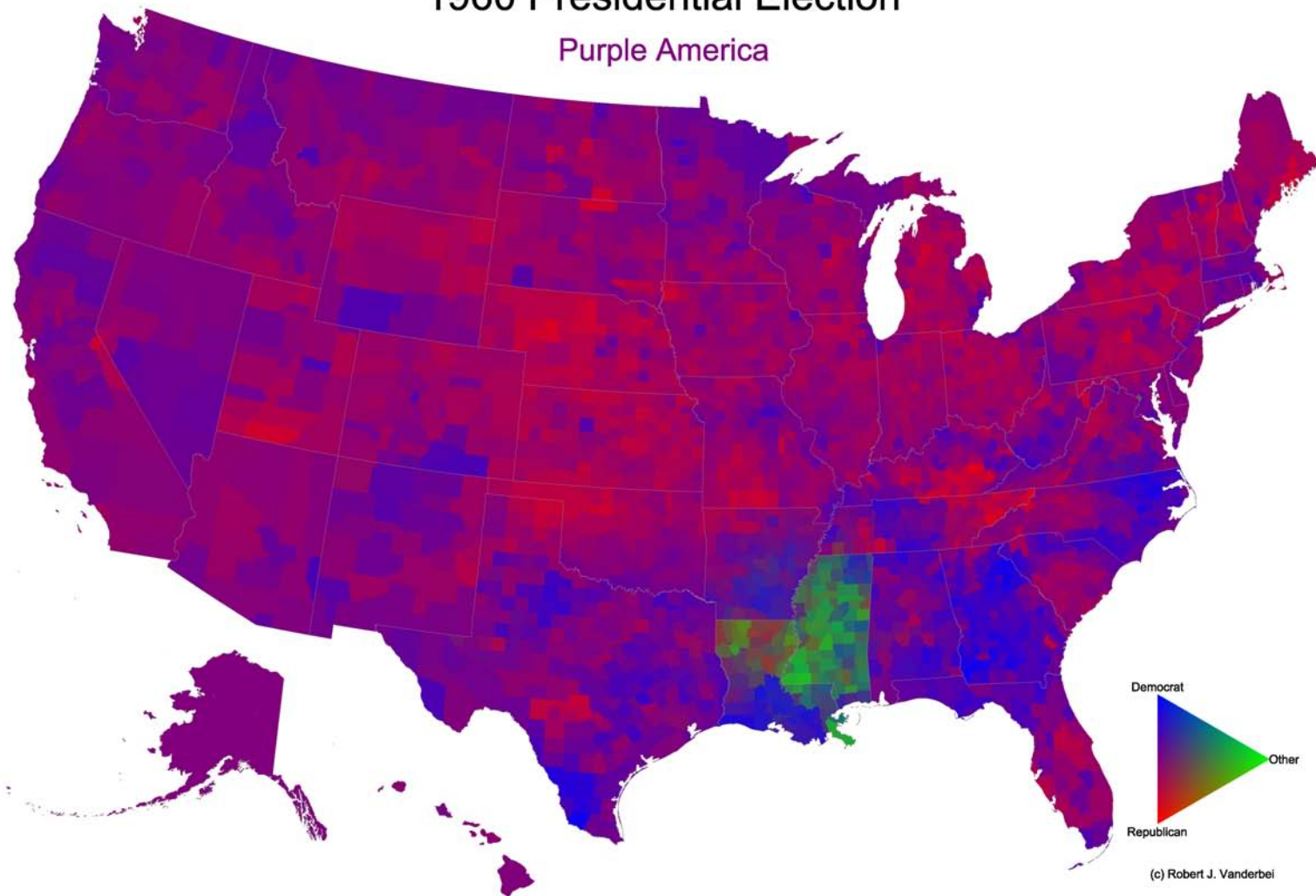
# Primary Colors

Computer monitors use Red, Green, and Blue as primary colors:



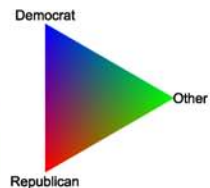
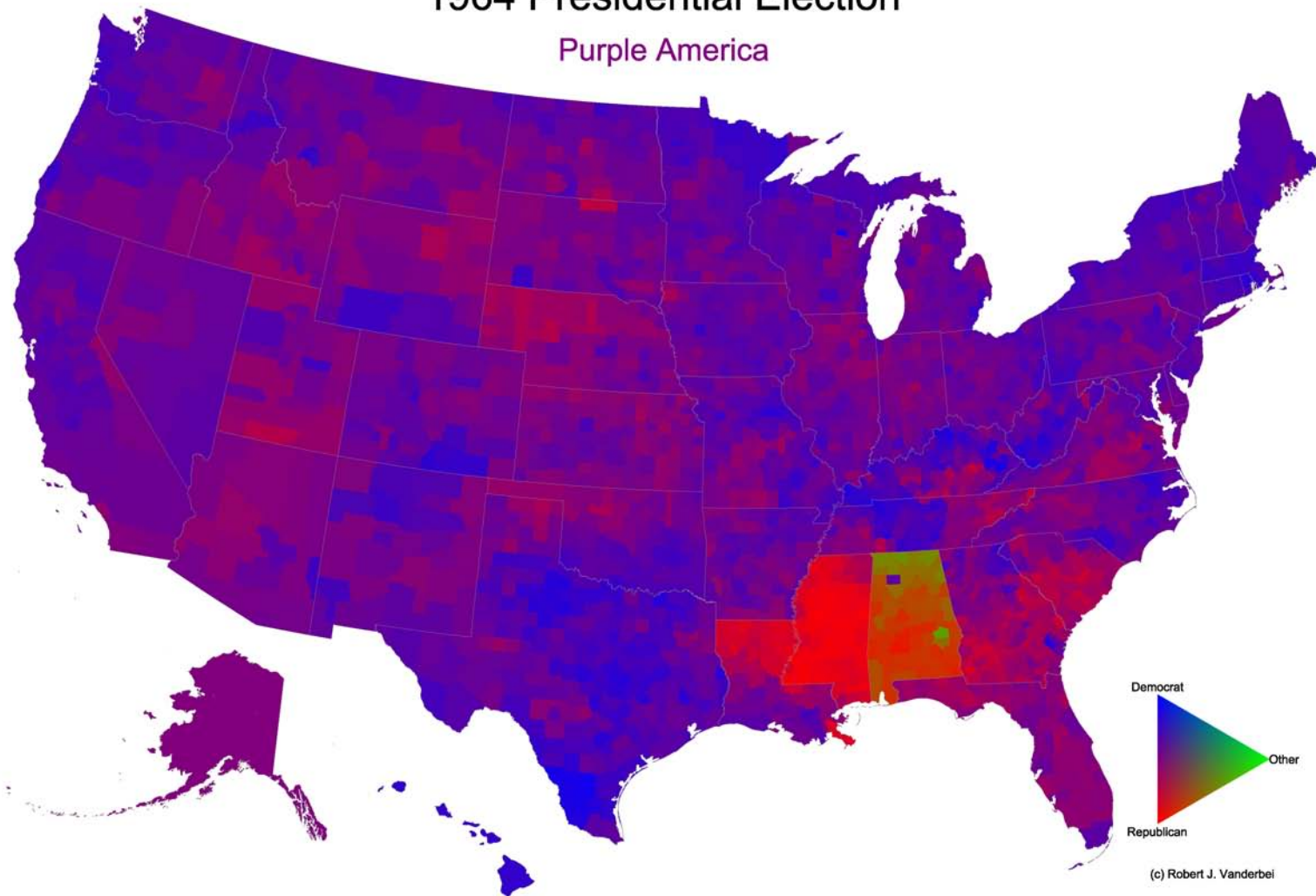
# 1960 Presidential Election

Purple America



# 1964 Presidential Election

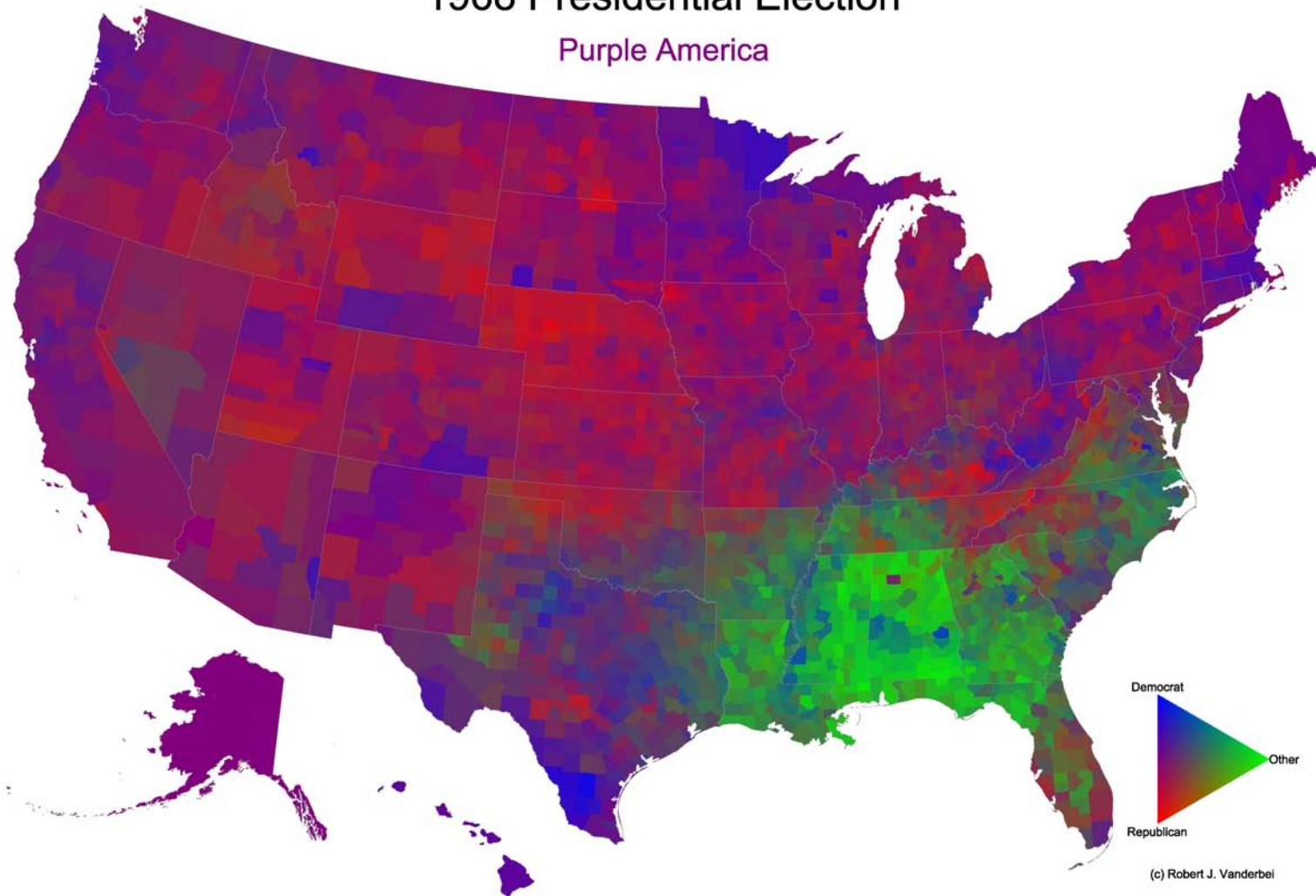
Purple America



(c) Robert J. Vanderbei

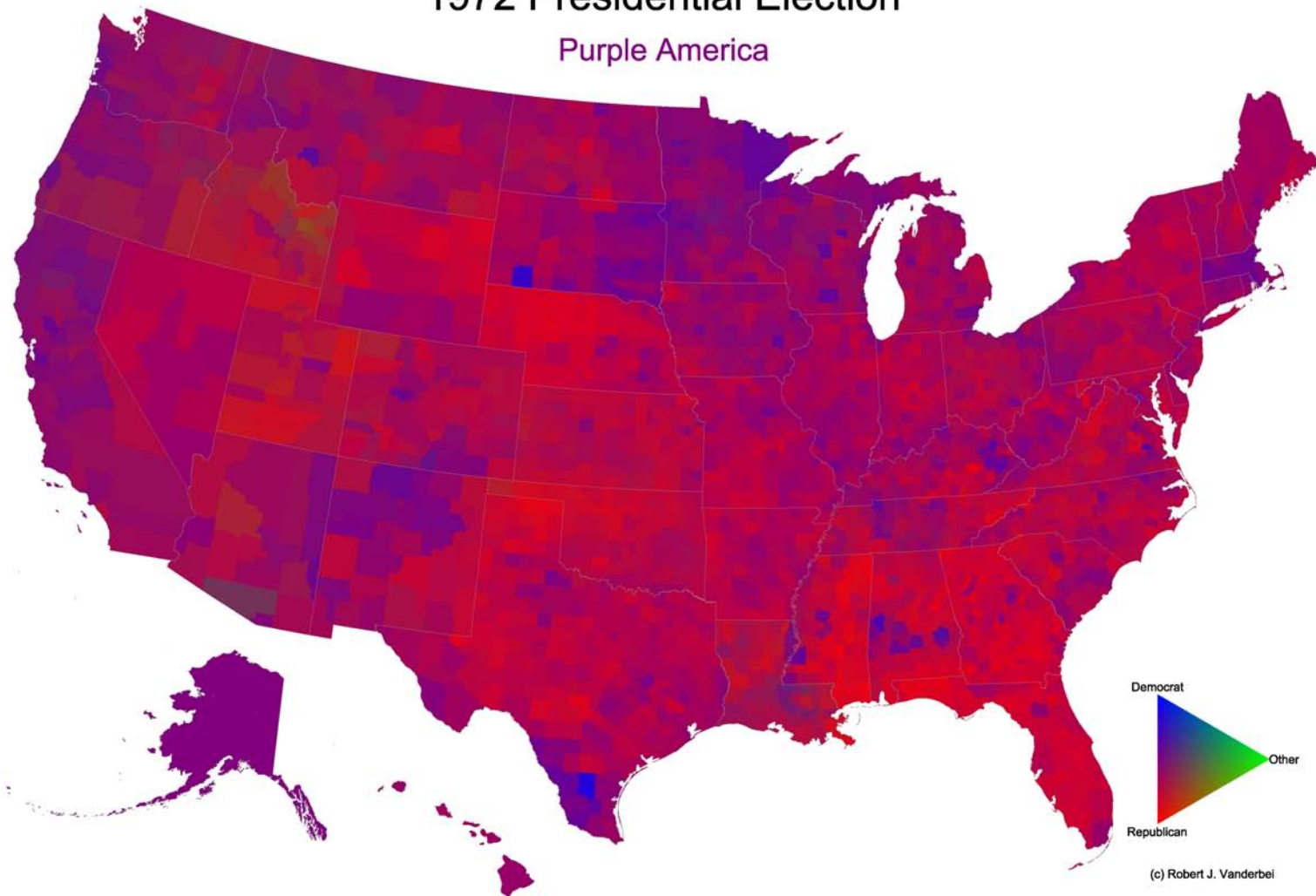
# 1968 Presidential Election

Purple America



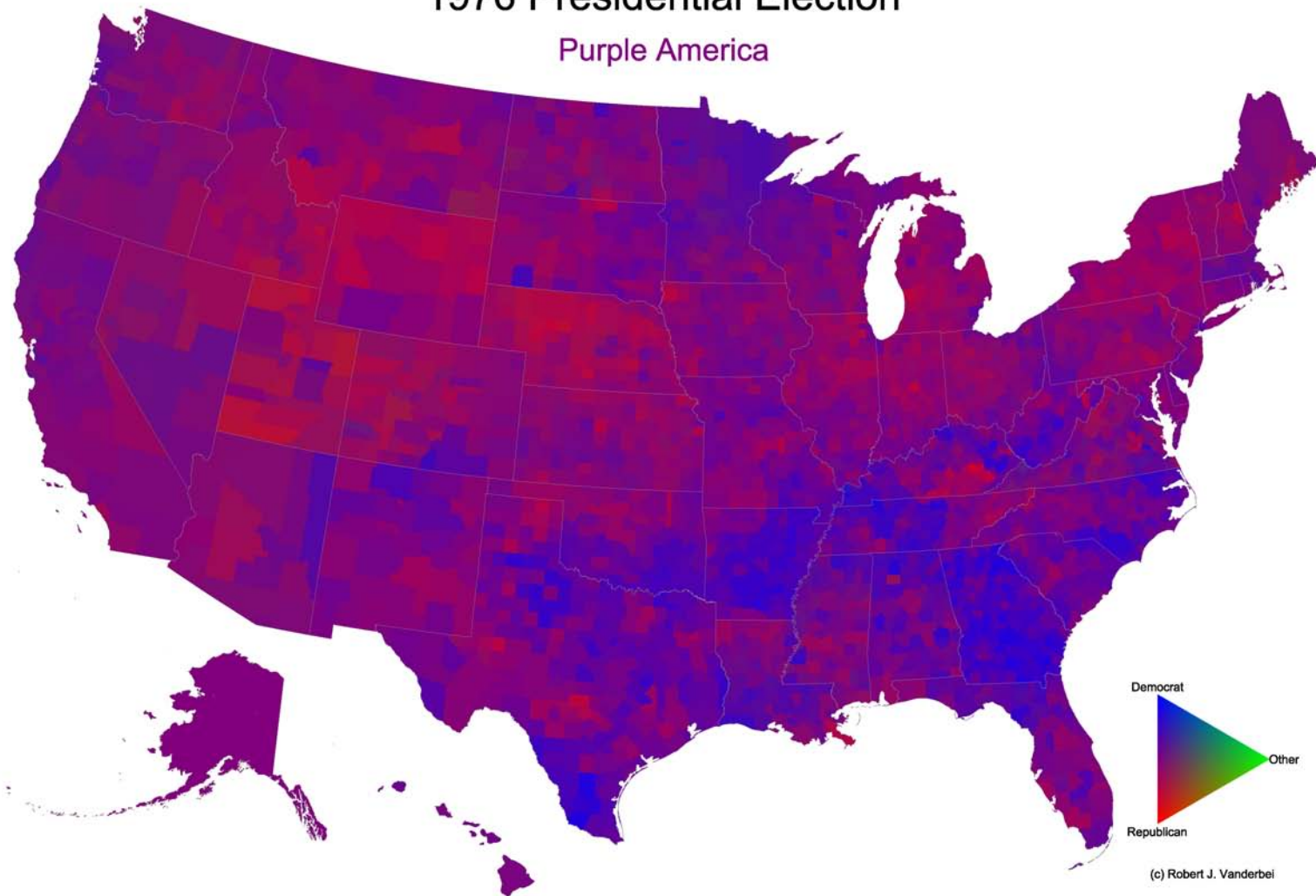
# 1972 Presidential Election

Purple America



# 1976 Presidential Election

Purple America

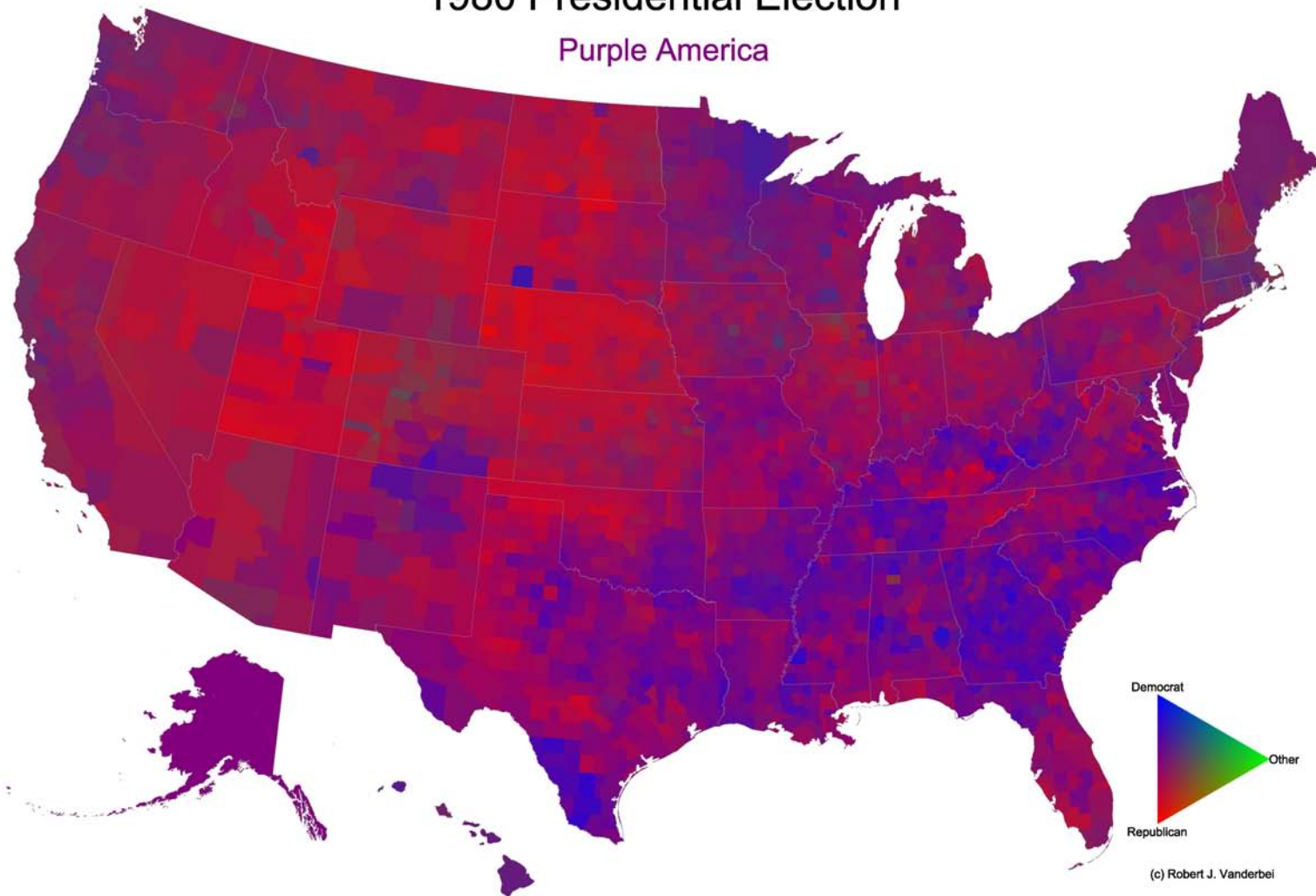


Democrat  
Republican  
Other

(c) Robert J. Vanderbei

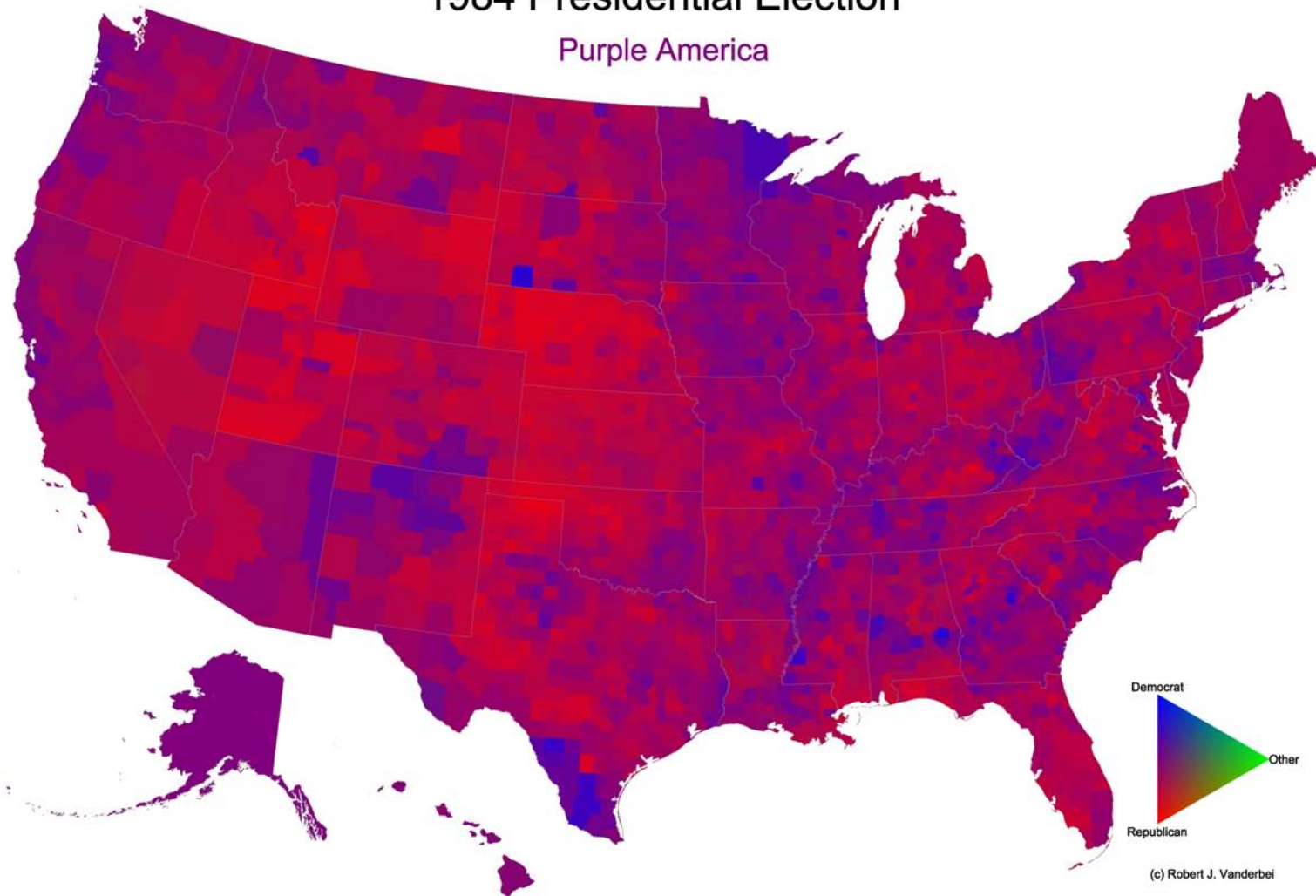
# 1980 Presidential Election

Purple America



# 1984 Presidential Election

Purple America



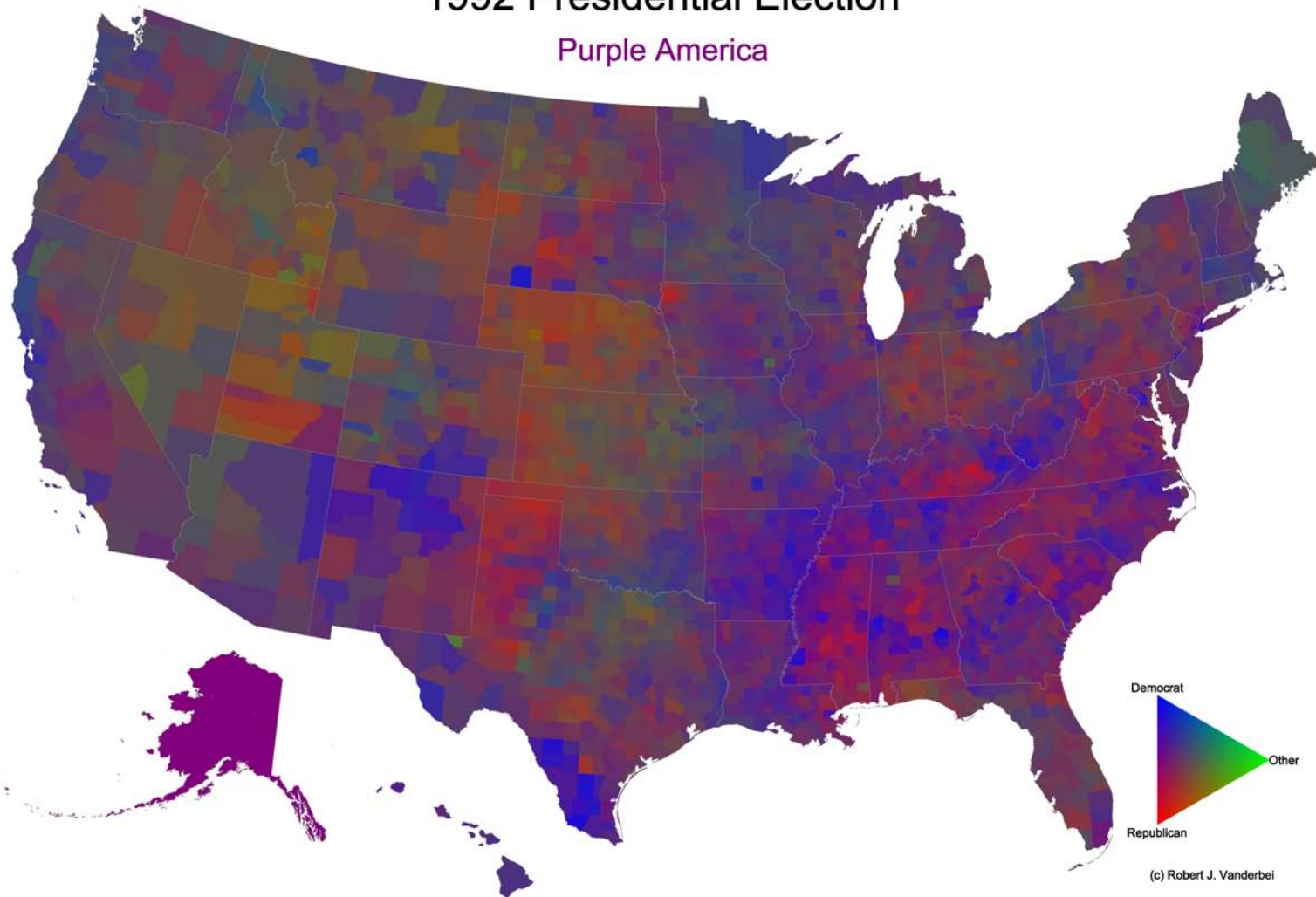
# 1988 Presidential Election

Purple America



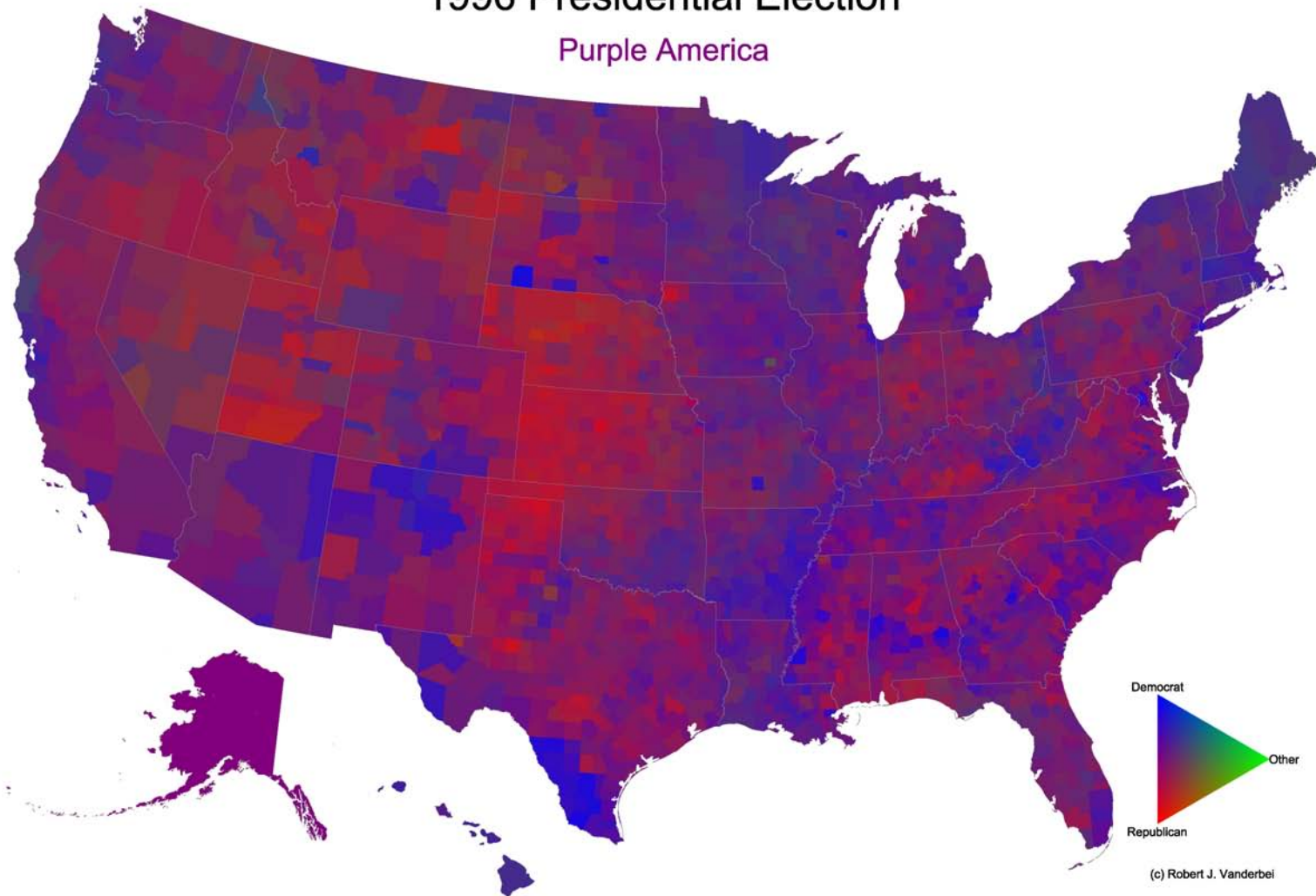
# 1992 Presidential Election

Purple America



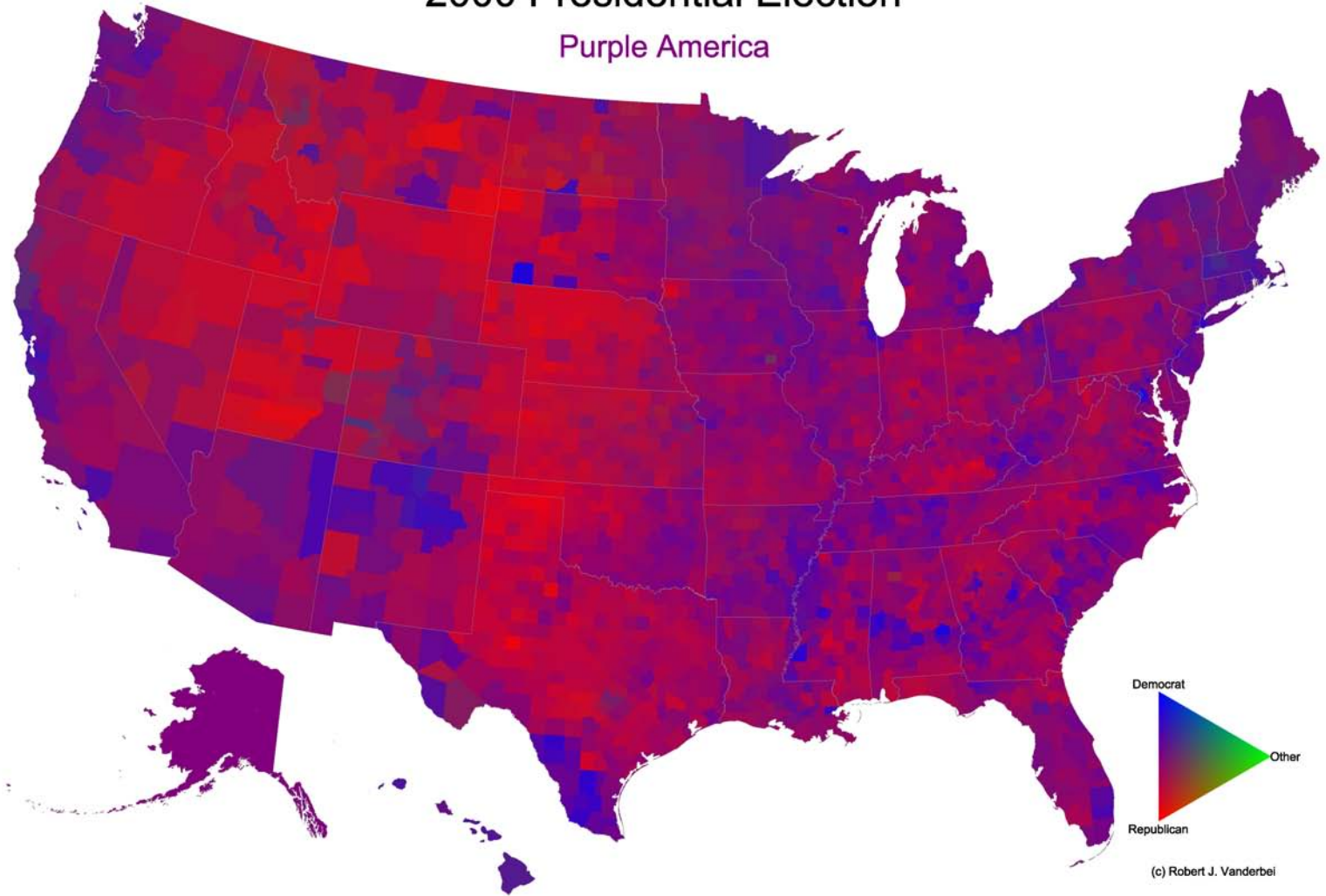
# 1996 Presidential Election

Purple America



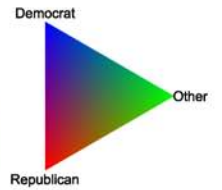
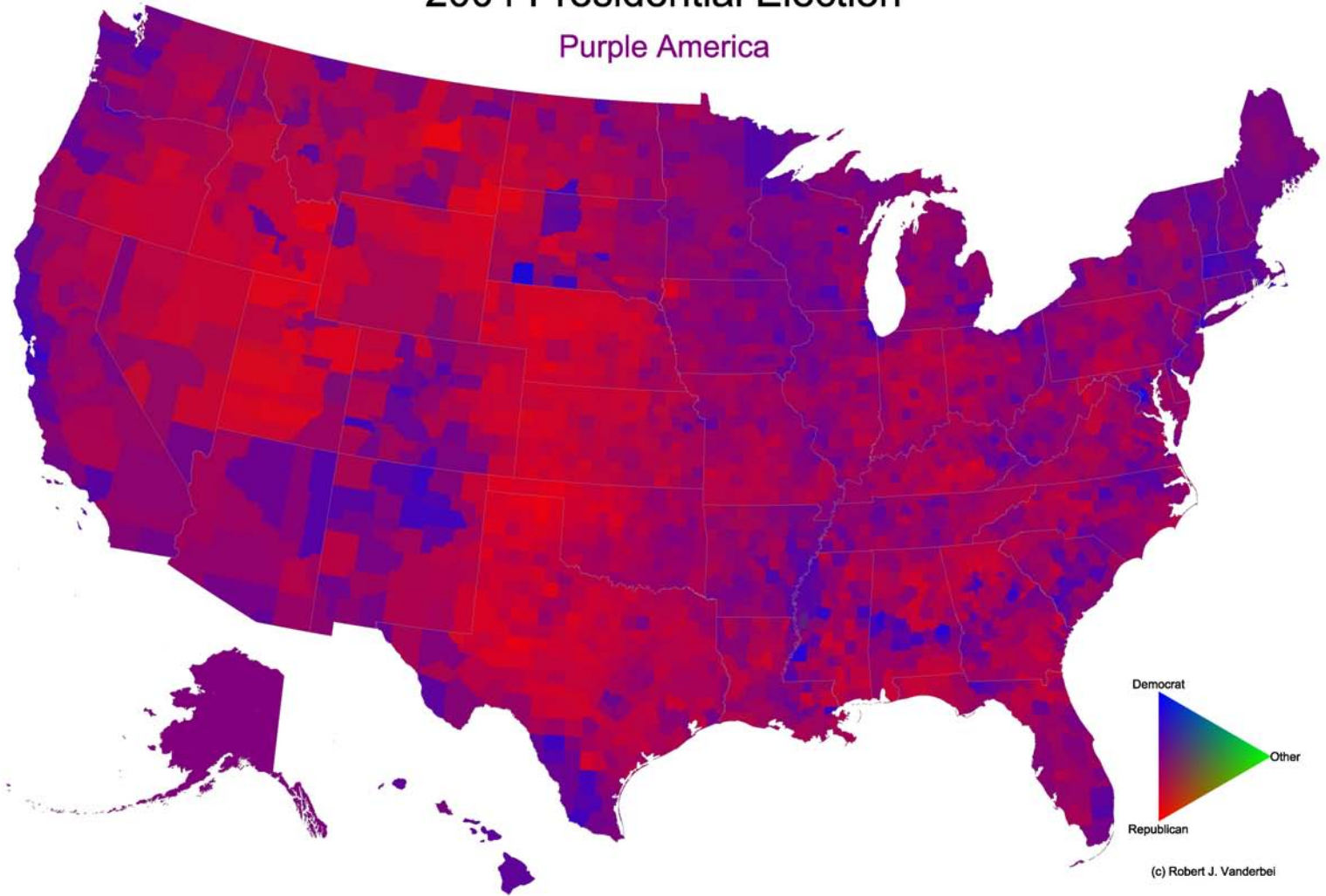
# 2000 Presidential Election

Purple America



# 2004 Presidential Election

Purple America



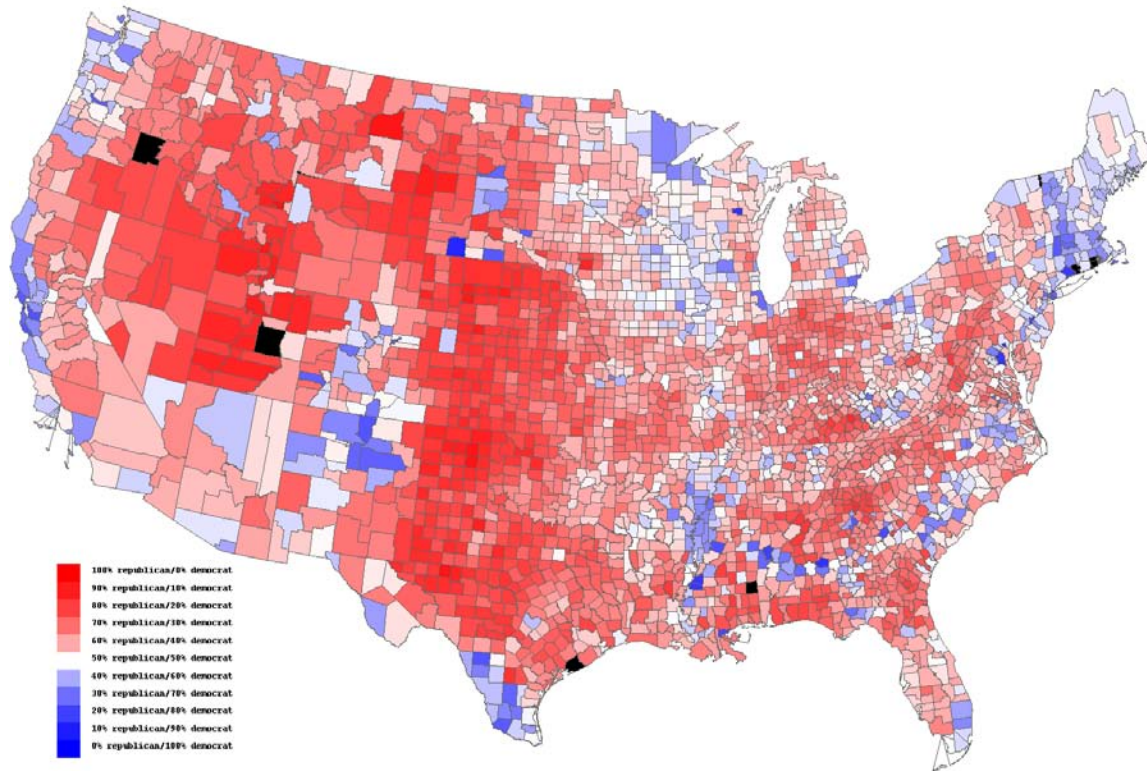
(c) Robert J. Vanderbei

# Purple America, The Movie

[Click Here](#)

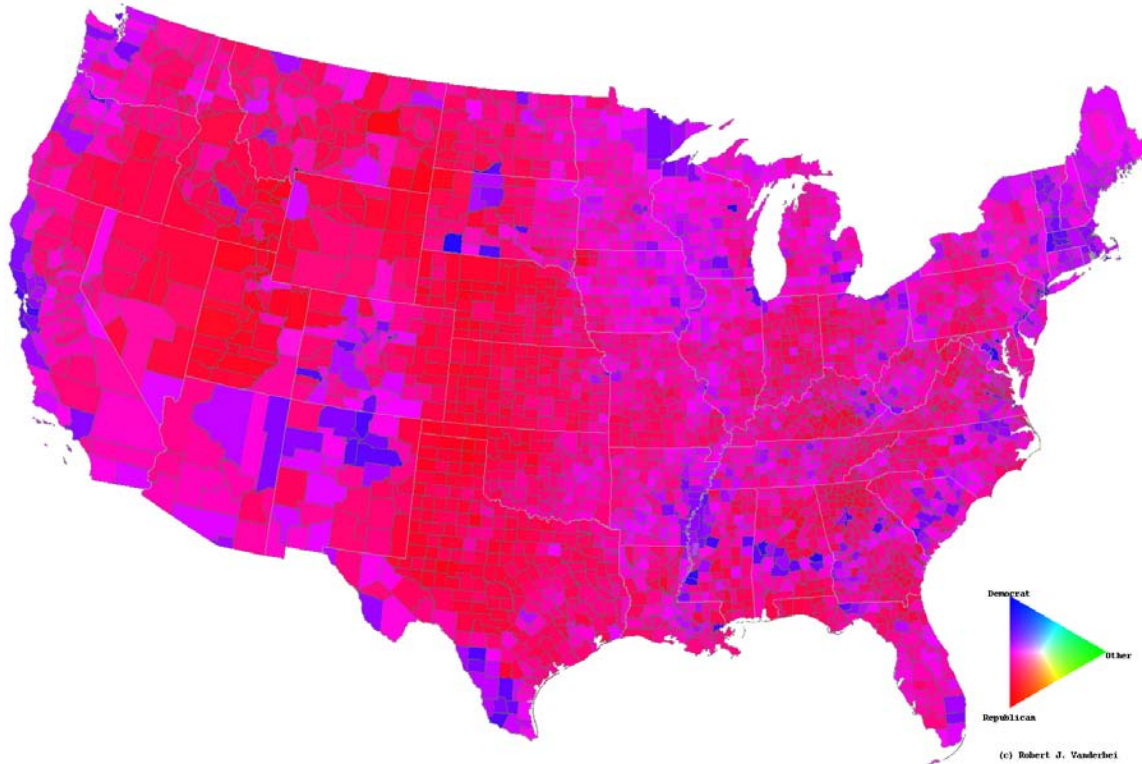
# Red, White, and Blue America

## Margin of Victory

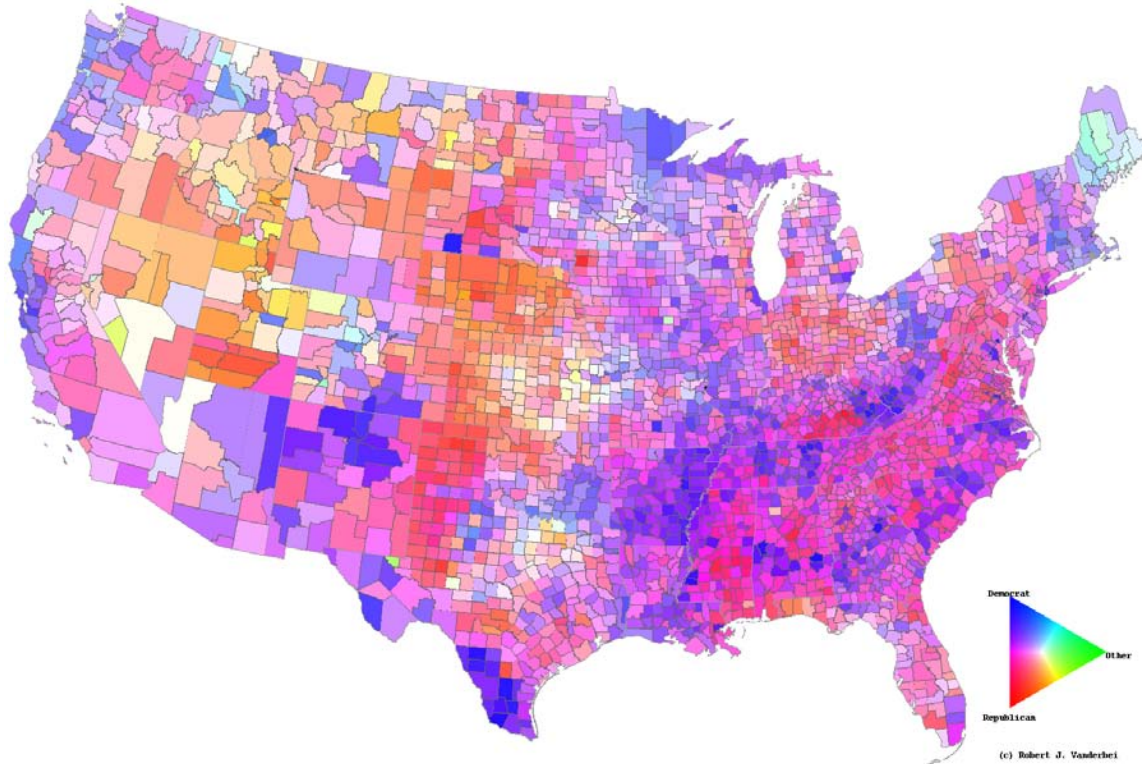


Very patriotic!

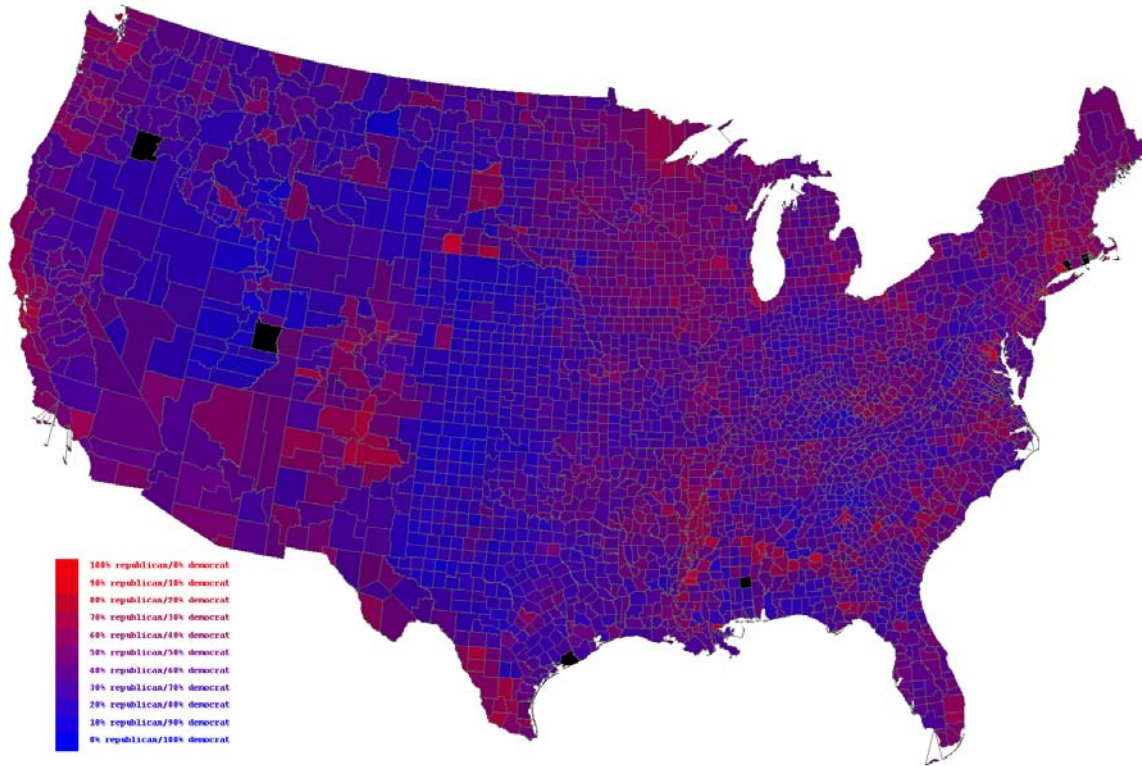
# Brighter America 2004



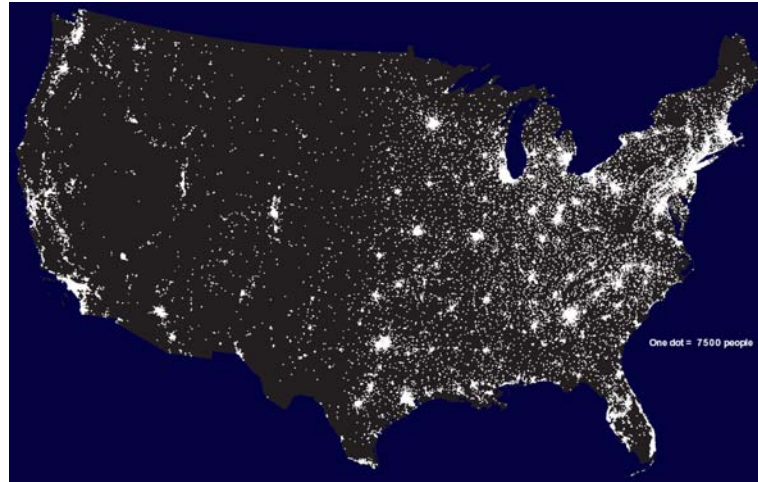
# Brighter America 1992



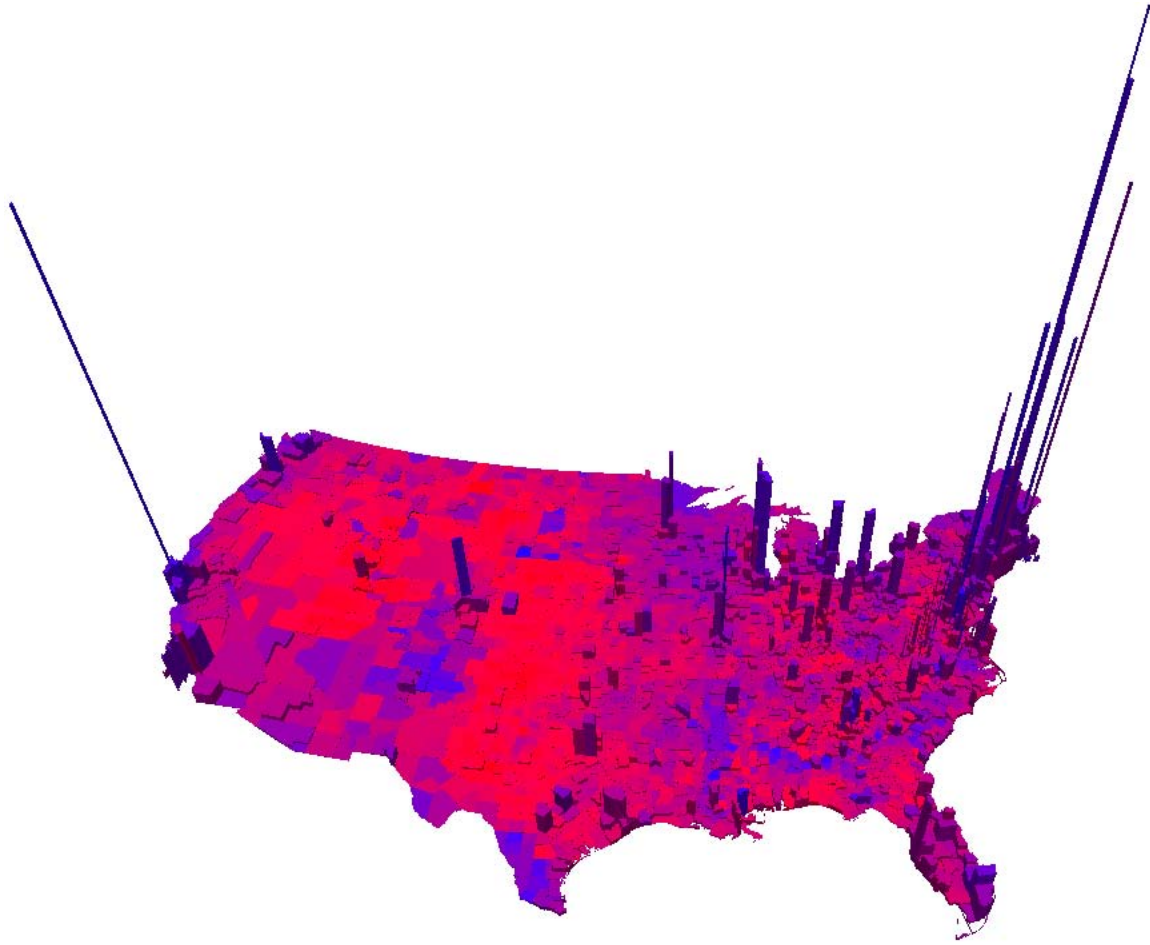
# Colors Reversed

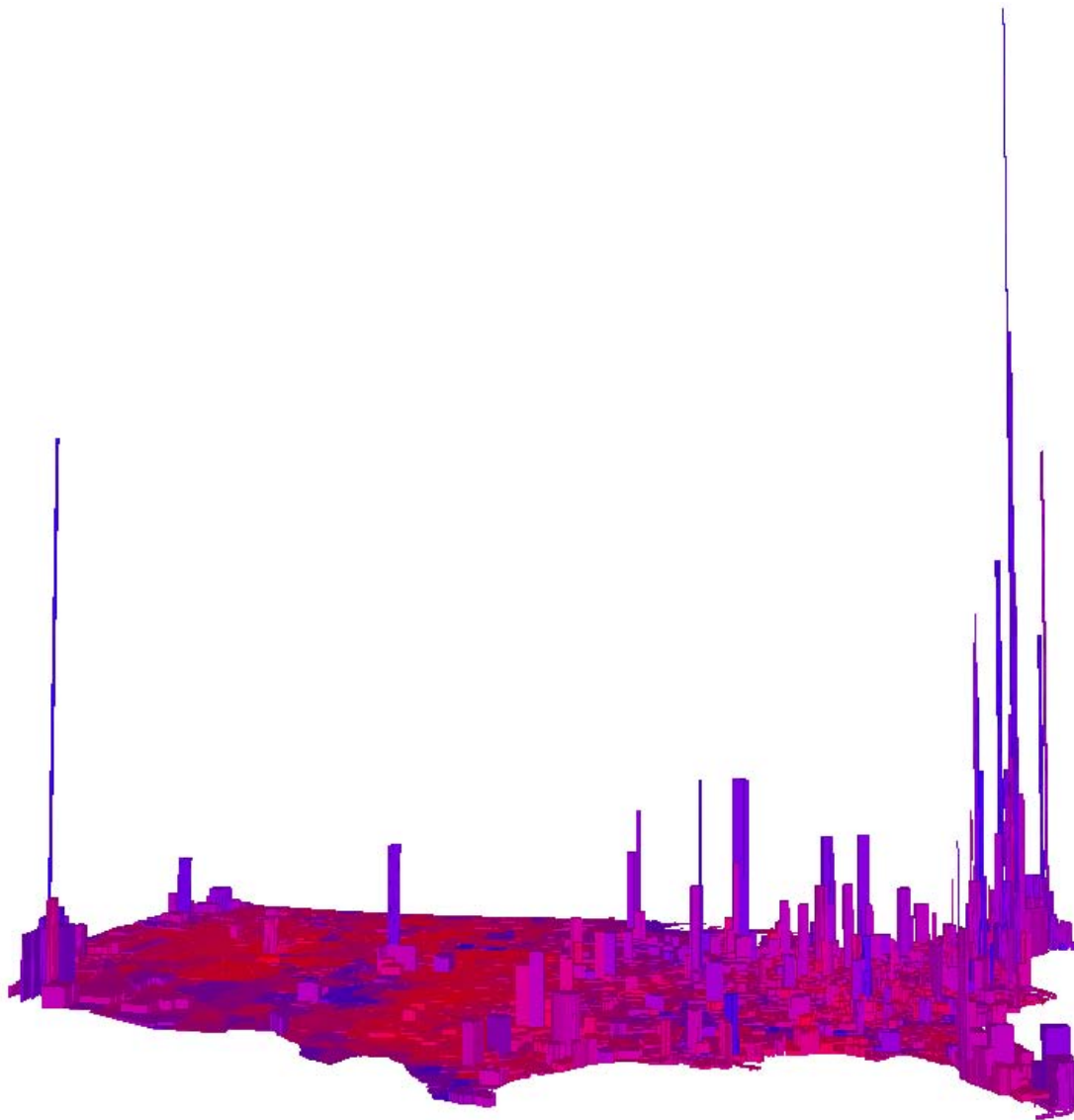


# Where People Live

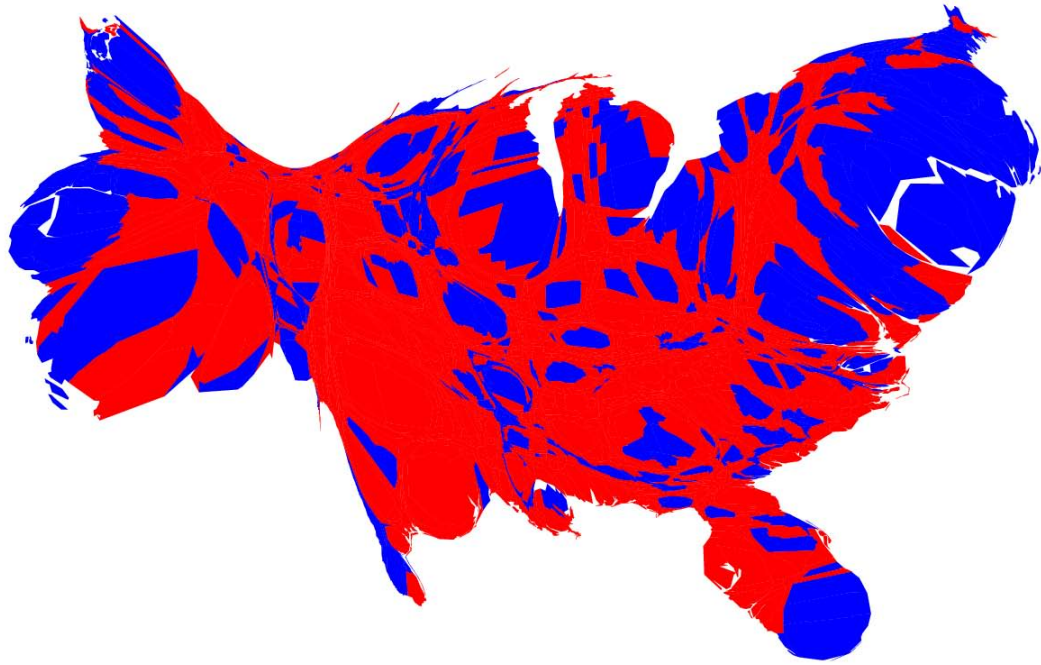


# Purple Mountains Majesty

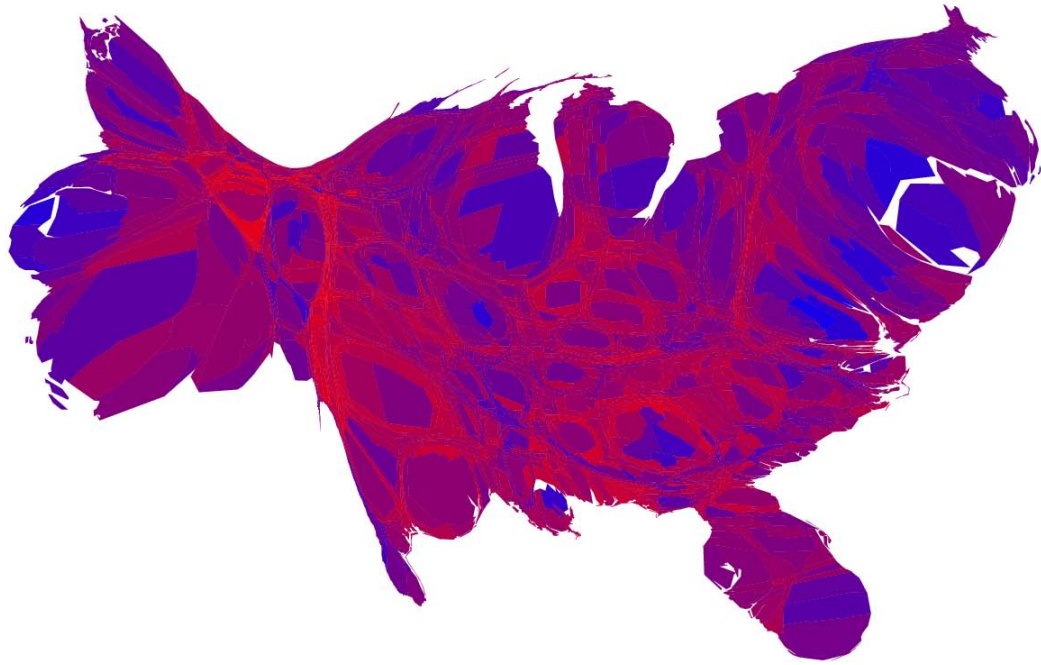




# Red-Blue Cartogram

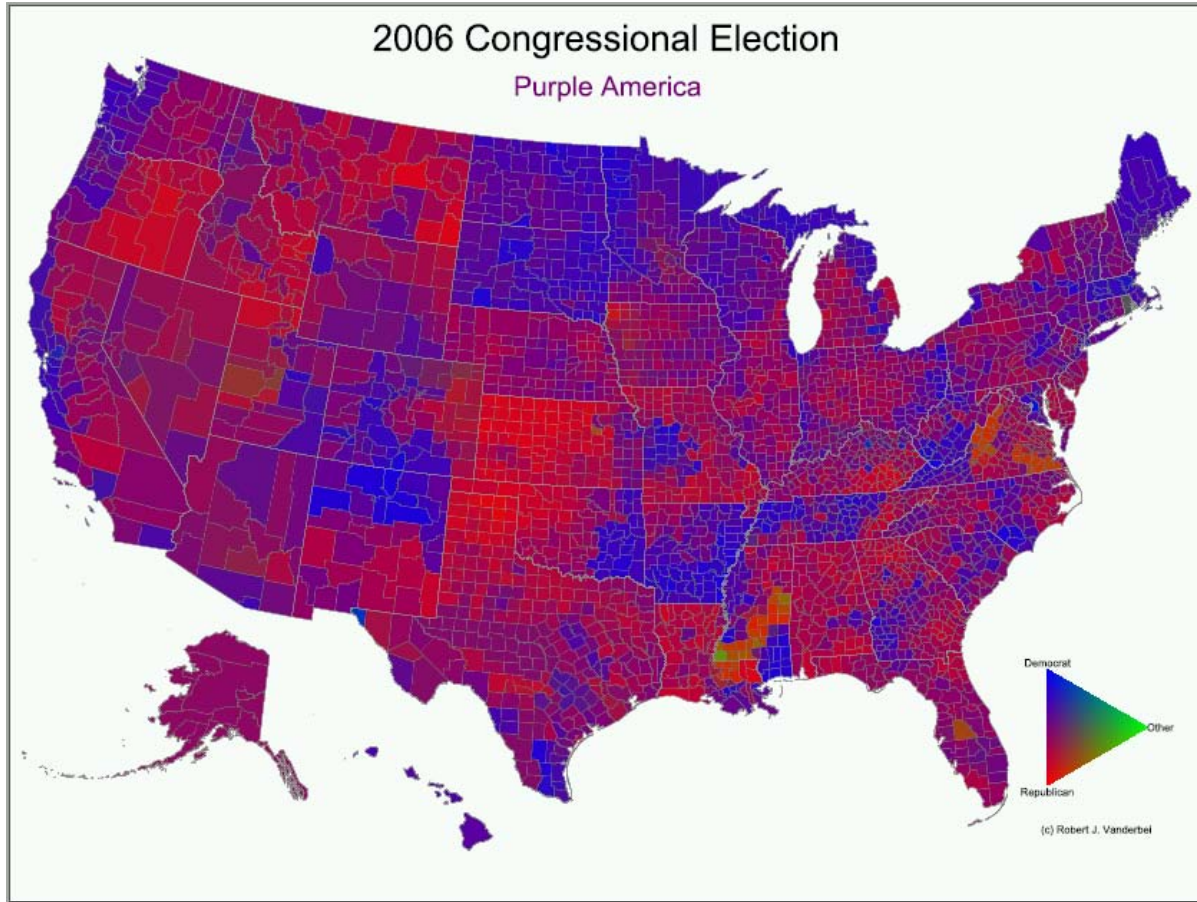


# Purple Cartogram



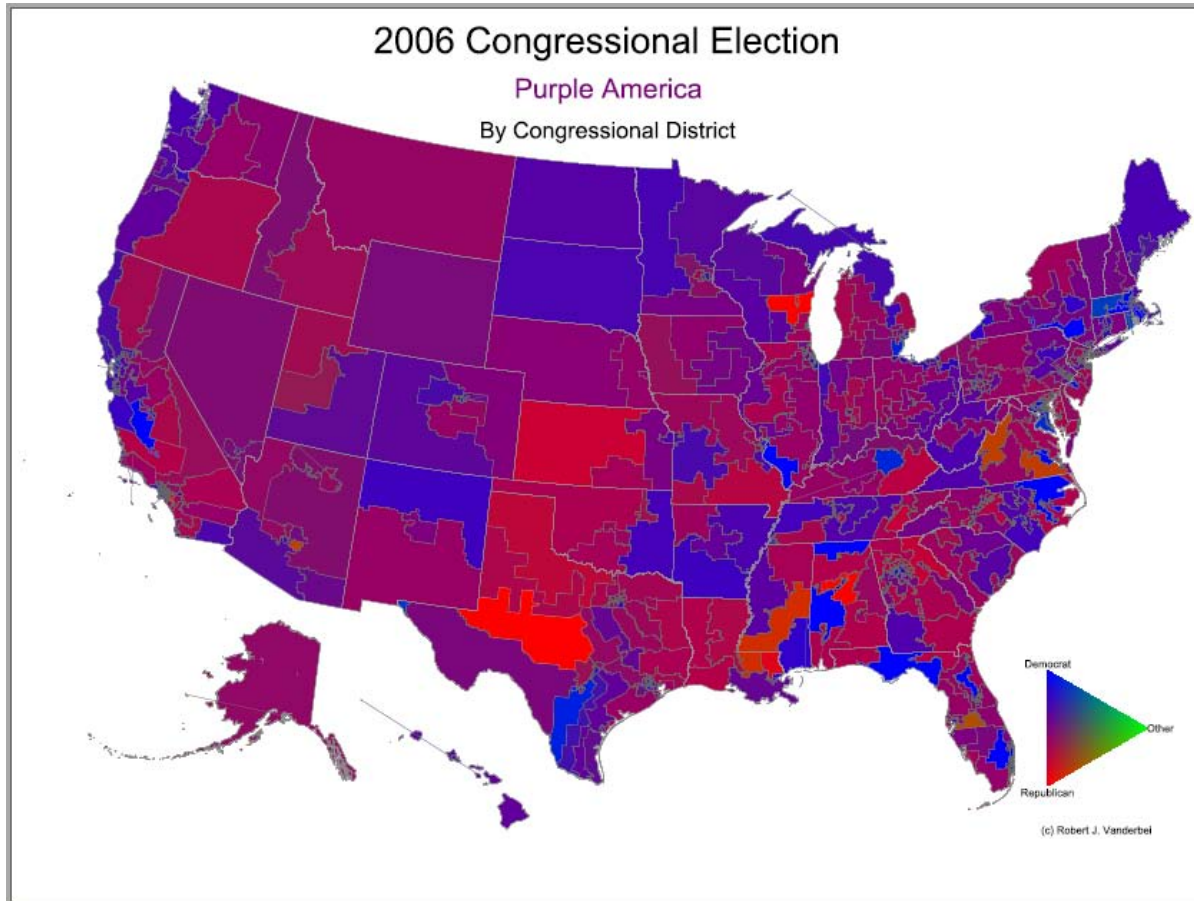
# 2006 Congressional Election

## County-by-County



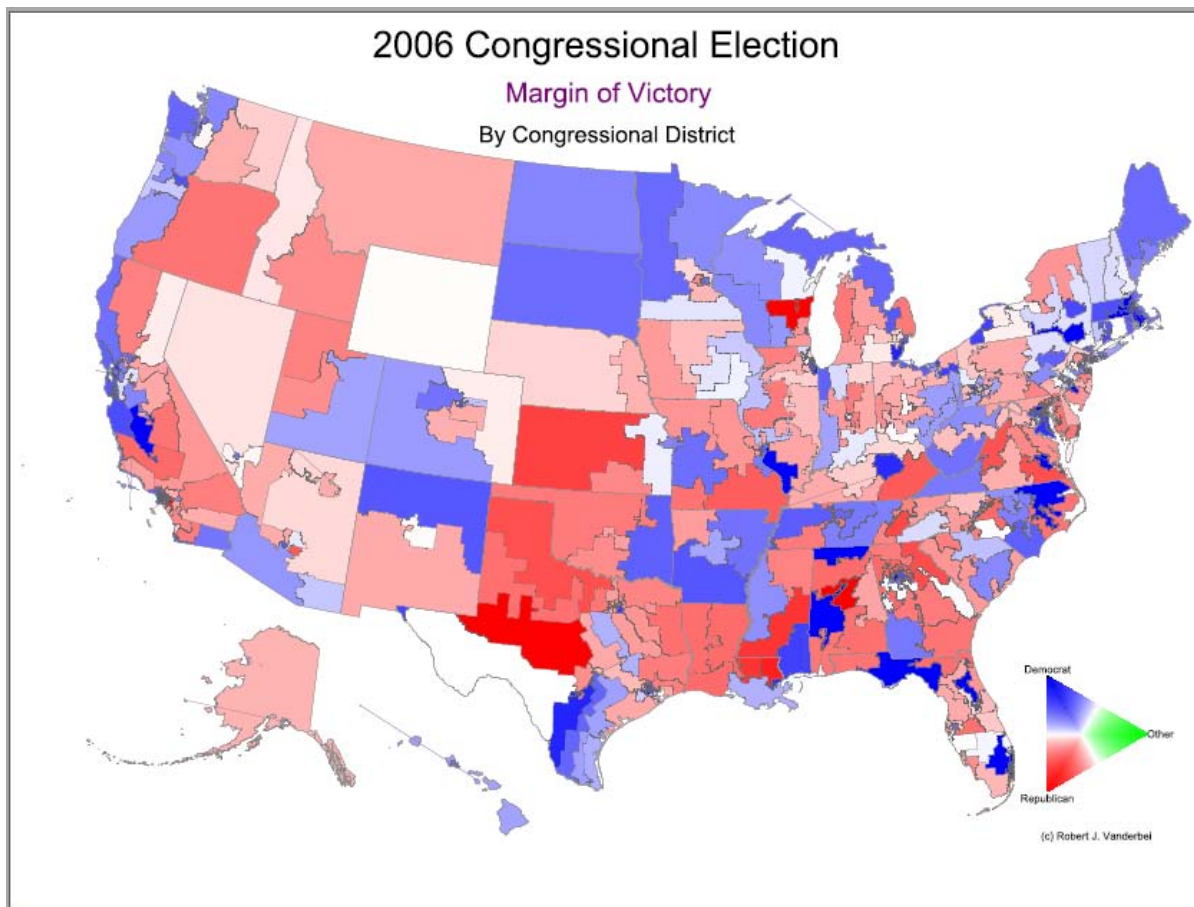
# 2006 Congressional Election

## District-by-District



# 2006 Congressional Election: Margin-Of-Victory

## District-by-District



# Statistical Analysis of Polling Data

**Electoral Scoreboard** (Oct 3 - Nov 2 8:17 AM): **Kerry 248**, **Bush 290**, Toss-Up 0

In the table below are given for each state, the median margin of victory as a percentage by either candidate (Kerry in blue, Bush in red); also given are the win-loss record and the number of electors from each state. All data were gathered from

[www.electoral-vote.com](http://www.electoral-vote.com)

[Explanation of method](#) ... [All Polls Since Jul 7](#) ... [Blank Map for Election Night](#)

|                 | Med.<br>MOV<br>(%) | W-L-T    | E.V. |  | Med.<br>MOV<br>(%) | W-L-T | E.V.    |    |
|-----------------|--------------------|----------|------|--|--------------------|-------|---------|----|
| AL              | 18.0               | 5-0-0    | 9    |  | MT                 | 21.0  | 2-0-0   | 3  |
| AK*             | 27.0               | 1-0-0    | 3    |  | NE <sup>2</sup>    | 29.0  | 1-0-0   | 5  |
| AZ              | 6.0                | 10-0-0   | 10   |  | NV                 | 4.0   | 16-1-1  | 5  |
| AR              | 5.5                | 8-0-2    | 6    |  | NH                 | 2.5   | 10-2-4  | 4  |
| CA              | 9.0                | 9-0-0    | 55   |  | NJ                 | 5.0   | 18-1-2  | 15 |
| CO <sup>1</sup> | 1.5                | 14-6-2   | 9    |  | NM                 | 3.0   | 12-6-1  | 5  |
| CT              | 10.0               | 1-0-0    | 7    |  | NY                 | 17.0  | 7-0-0   | 31 |
| DC*             | 67.0               | 1-0-0    | 3    |  | NC                 | 7.5   | 10-0-0  | 15 |
| DE*             | 7.0                | 1-0-0    | 3    |  | ND                 | 20.0  | 1-0-0   | 3  |
| FL              | 1.5                | 40-16-12 | 27   |  | OH                 | 2.0   | 39-14-3 | 20 |
| GA              | 17.0               | 11-0-0   | 15   |  | OK                 | 30.0  | 8-0-0   | 7  |
| HI              | 0.5                | 1-0-1    | 4    |  | OR                 | 6.0   | 14-1-0  | 7  |
| ID*             | 29.0               | 1-0-0    | 4    |  | PA                 | 3.0   | 52-3-5  | 21 |
| IL              | 12.0               | 8-0-0    | 21   |  | RI                 | 16.5  | 2-0-0   | 4  |
| IN              | 19.0               | 6-0-0    | 11   |  | SC                 | 13.0  | 6-0-0   | 8  |
| IA              | 0.5                | 17-11-6  | 7    |  | SD                 | 19.0  | 3-0-0   | 3  |
| KS              | 23.0               | 3-0-0    | 6    |  | TN                 | 14.5  | 8-0-0   | 11 |
| KY              | 20.0               | 4-0-0    | 8    |  | TX                 | 23.0  | 3-0-0   | 34 |
| LA              | 15.0               | 6-0-0    | 9    |  | UT                 | 45.0  | 2-0-0   | 5  |
| ME <sup>2</sup> | 7.0                | 4-0-0    | 4    |  | VT                 | 13.0  | 1-0-0   | 3  |
| MD              | 10.0               | 7-0-0    | 10   |  | VA                 | 5.0   | 8-0-0   | 13 |
| MA              | 14.0               | 1-0-0    | 12   |  | WA                 | 6.0   | 10-0-1  | 11 |
| MI              | 3.0                | 42-5-5   | 17   |  | WV                 | 5.0   | 5-0-0   | 5  |
| MN              | 2.0                | 30-16-6  | 10   |  | WI                 | 1.0   | 16-13-2 | 10 |
| MS*             | 9.0                | 1-0-0    | 6    |  | WY*                | 36.0  | 1-0-0   | 3  |
| MO              | 5.0                | 12-0-0   | 11   |  |                    |       |         |    |

Map layout by J. Richard Gott, III. The area of each state is directly proportional to its number of electoral votes. Note also that the topology of the states is correct in that all states that touch in reality touch on the map, and states that do not touch in reality do not touch on the map.

\*Asterisked states have no poll available in the time window; the most recent has been used.  
 1-Colorado referendum to split electors proportionally to its popular vote is behind in polls. [\[explanations\]](#)  
 2-Maine and Nebraska award two electoral votes to the popular vote winner, then assign the other electors by congressional district. [\[explanations\]](#)

[Wesley N. Colley... Rankings Home](#)