

Regulating Elections: Districts

17.251/252

Fall 2008

Major ways that congressional elections are regulated

- The Constitution
 - Basic stuff (age, apportionment, states given lots of autonomy)
 - Federalism key
- Districting
- Campaign finance

An aside about the states: Run-off vs. plurality rule

- The South
- Interest in “instant runoff”

An Aside about Direct Elections

- 17th Amendment: 1914
- Indirect election didn't make senators tools of the state legislatures... quite the opposite
- Direct election effects? Who knows

Districting

- Apportionment
 - Method of equal proportions
- Required in House races since 1820s
- Effects
 - Possible “malapportionment”
 - Responsiveness

Apportionment methods

- 1790 to 1830--The "Jefferson method" of greatest divisors
 - Fixed “ratio of representation” with rejected fractional remainders
 - Size of House can vary
- 1840--The "Webster method" of major fractions
 - Fixed “ratio of representation” with retained major fractional remainders
 - Size of House can vary
- 1850-1900--The "Vinton" or "Hamilton" method
 - Predetermined # of reps
 - Seats for state = $\text{Population of State} / (\text{Population of US} / N \text{ of Seats})$
 - Remaining seats assigned one at a time according to “largest remainder”
 - “Alabama paradox”
- 1940-2000--The method of equal proportions

Diversion to the Alabama Paradox

- Called the “Alabama paradox” because of the 1880 census (increasing the House from 299 to 300 reduces Alabama’s seats)
- Rule: Compute “fair share” of seats, then allocate an additional seat according to largest remainder
- Example, 3 states w/ 10 & 11 seats

		10 Seats		11 Seats	
State	Pop.	Fair share	Seats	Fair share	Seats
A	6	4.286	4	4.714	5
B	6	4.286	4	4.714	5
C	2	1.429	2	1.571	1
Total	14				
Divisor	1.4 = 14/10			1.3 = 14/11	

Balinsky and Young (1982)

Fair Representation

- Any method of apportionment will yield paradoxes
- No apportionment method...
 - Follows the quota rule
 - Avoids the Alabama paradox
 - Avoids the population paradox
 - Pop paradox: when you have two states, and the one that grows faster loses seats to the one that grows slower

Method of equal proportions

- “Results in a listing of the states according to a priority value--calculated by dividing the population of each state by the geometric mean of its current and next seats—that assigns seats 51 through 435.”
- Practically: This method assigns seats in the House of Representatives according to a ‘priority’ value. The priority value is determined by multiplying the population of a state by a ‘multiplier.’ For example, following the 1990 census, each of the 50 states was given one seat out of the current total of 435. The next, or 51st seat, went to the state with the highest priority value and thus became that state's second seat.

Priority values after 2000

Seat #	State	State seat	Priority #
51	CA	2	23992697
52	TX	2	14781356
53	CA	3	13852190
54	NY	2	13438545
55	FL	2	11334137
...			
431	IA	5	655598
432	FL	25	654377
433	OH	18	650239
434	CA	53	646330
435	NC	13	645931
436	UT	4	645684
437	NY	30	644329
438	TX	33	643276
439	MI	16	642646
440	IN	10	642025

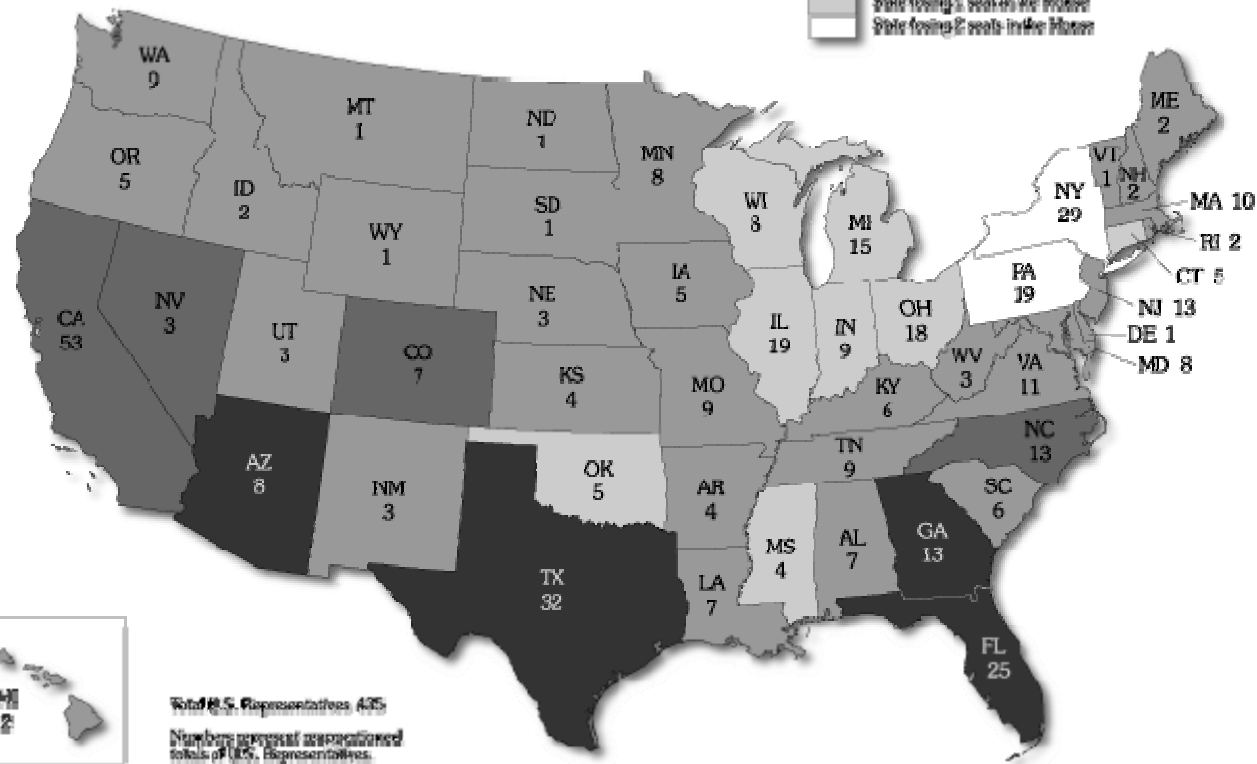
Reapportionment Change in 2000



Figure 3. Apportionment of the U.S. House of Representatives for the 106th Congress

Change from 1990 to 2000

- State gaining 2 seats in the House
- State gaining 1 seat in the House
- No change
- State losing 1 seat in the House
- State losing 2 seats in the House



Total U.S. Representatives: 435
 Numbers represent reapportioned totals of U.S. Representatives.

Reapportionment 2010

-2	-1	+1	+2	+3
NY	AL	AZ	FL	TX
OH	IL	CA		
	IA	GA		
	MA	NV		
	MO	UT		
	PA			

Note: Based on 2008 Census Bureau projections of 2010 pop.

2010 Priority Numbers

State	# State Seats	Priority number	Overall seat #
Michigan	15	719647.5	430
Pennsylvania	18	719407.3	431
Texas	35	714535.6	432
Louisiana	7	711751.8	433
California	54	711566.3	434
Georgia	14	710789.9	435
Alabama	7	709229.1	436
New York	28	707159.5	437
Ohio	17	701909.1	438
Massachusetts	10	700912.6	439
Florida	28	700177.3	440

Reapportionment Court Challenges

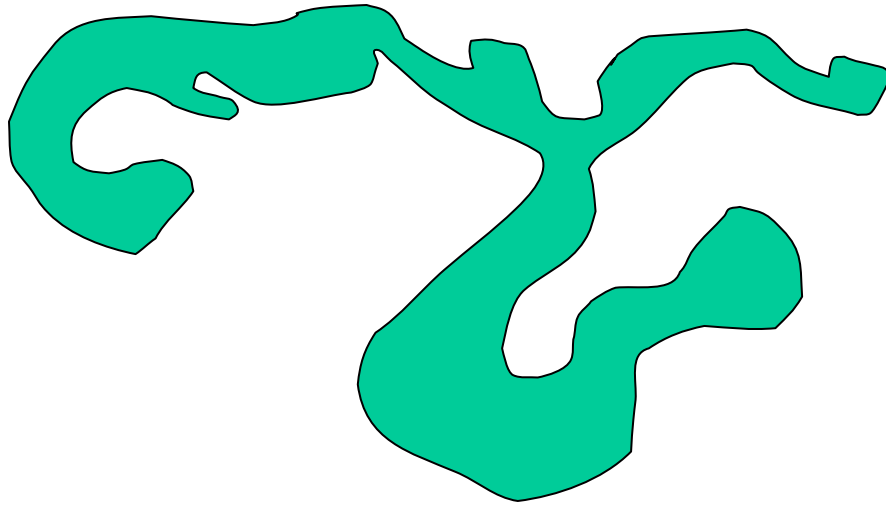
- *Department of Commerce v. United States House of Representatives*, 525 U.S. 316 (1999)
 - The Census Bureau can't sample
- *Utah v. Evans*
 - “Hot deck” imputation challenged
 - Mormon missionaries miscounted

Districting principles

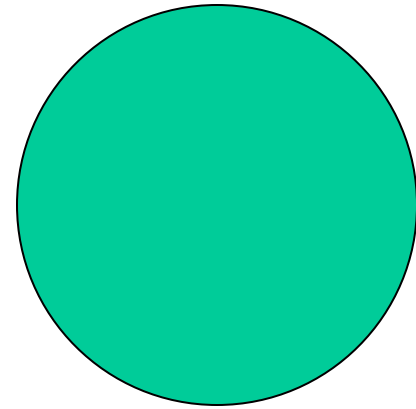
- Compactness and contiguity
- Equal population
- Respect existing political communities
- Partisan (or other) fairness

Compactness

- General idea: $\min(\text{border}/\text{area})$

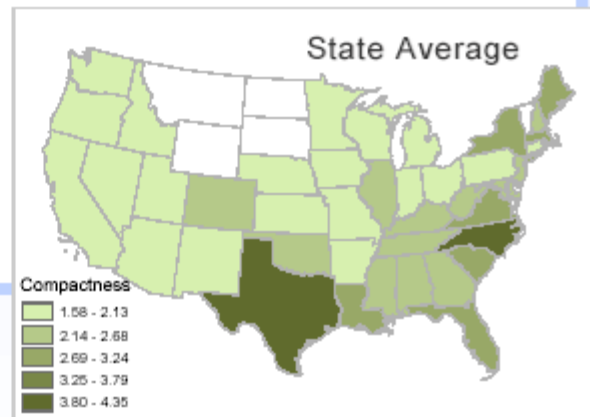
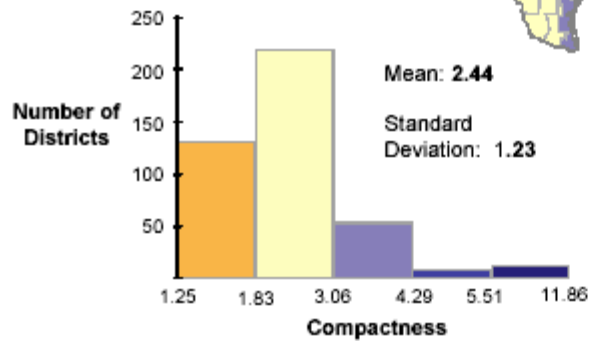
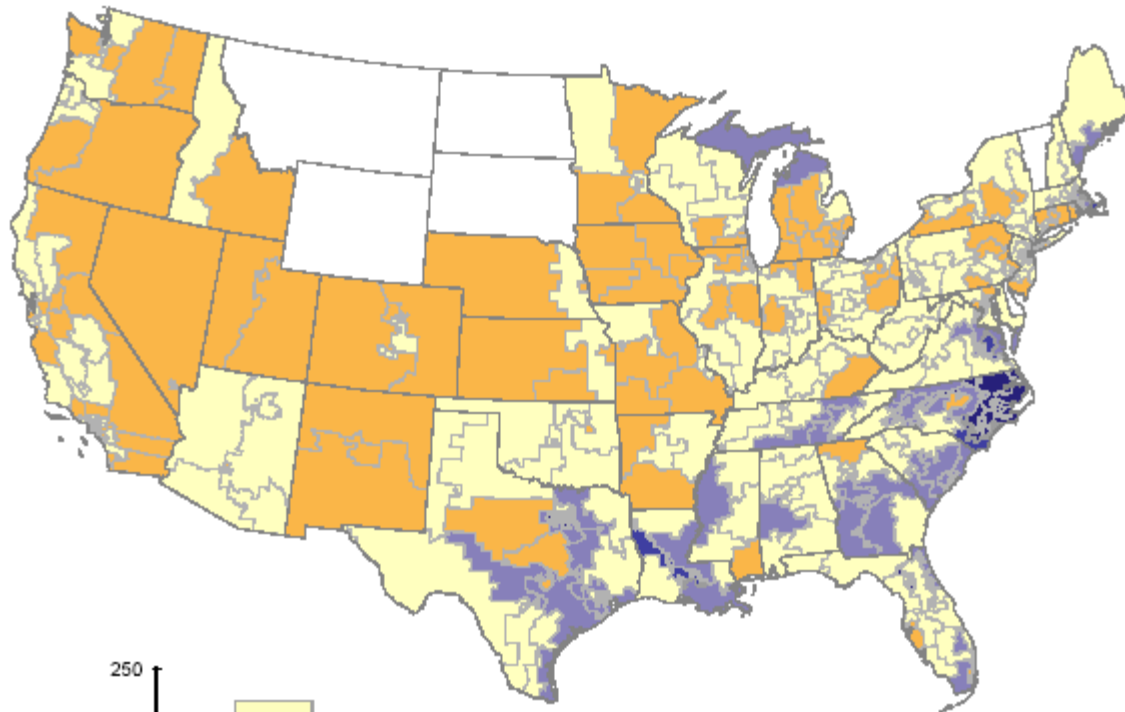


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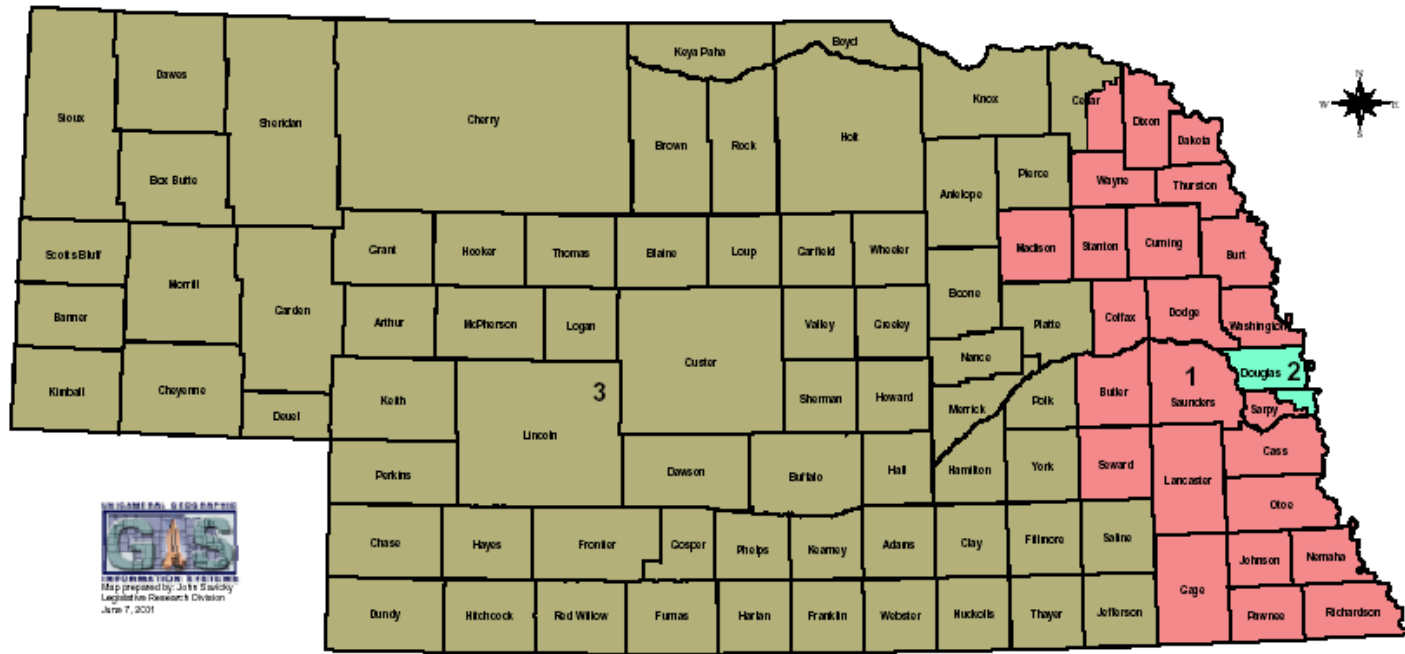
Good

104th Congressional Districts January 1995 to January 1997



Compactness in the real world: Nebraska 2000

U.S. House of Representatives - LB 851 (2001)
(Districts take effect September 1, 2001)



Source: U.S. Bureau of the Census, 2000 TIGER/Line Files
12-06-1983

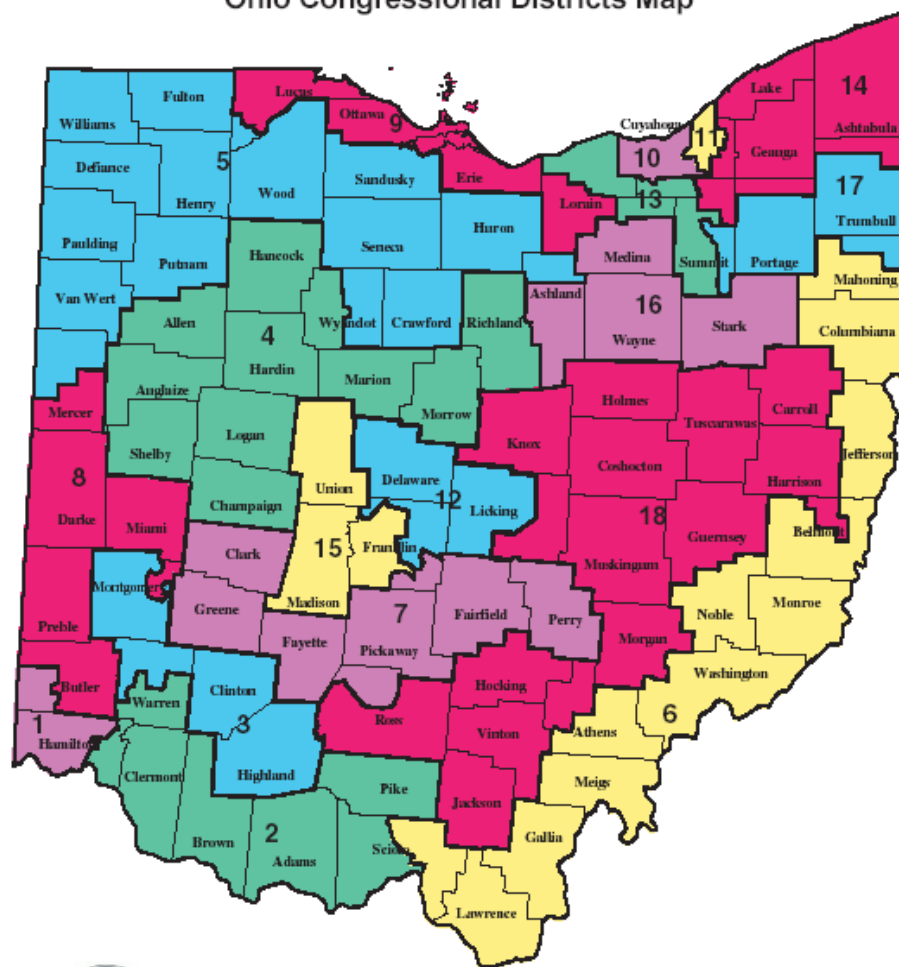
The TIGER/Line files have been updated to reflect the passage of PL 107-153, which changed the boundary between Colorado and Nebraska.

Compactness in the real world

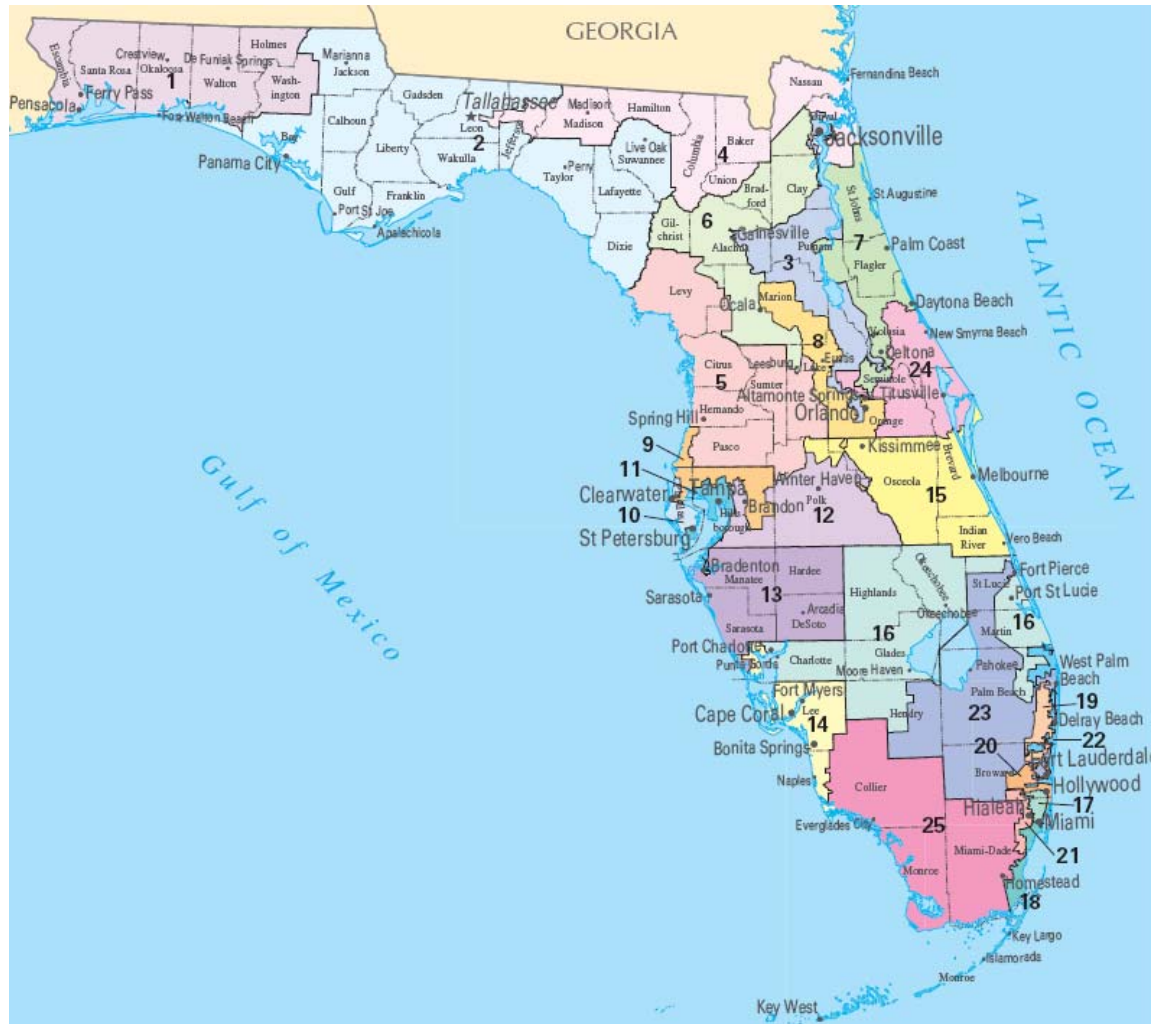
Ohio 2000

2002 - 2012

Ohio Congressional Districts Map



Compactness in the real world: Florida

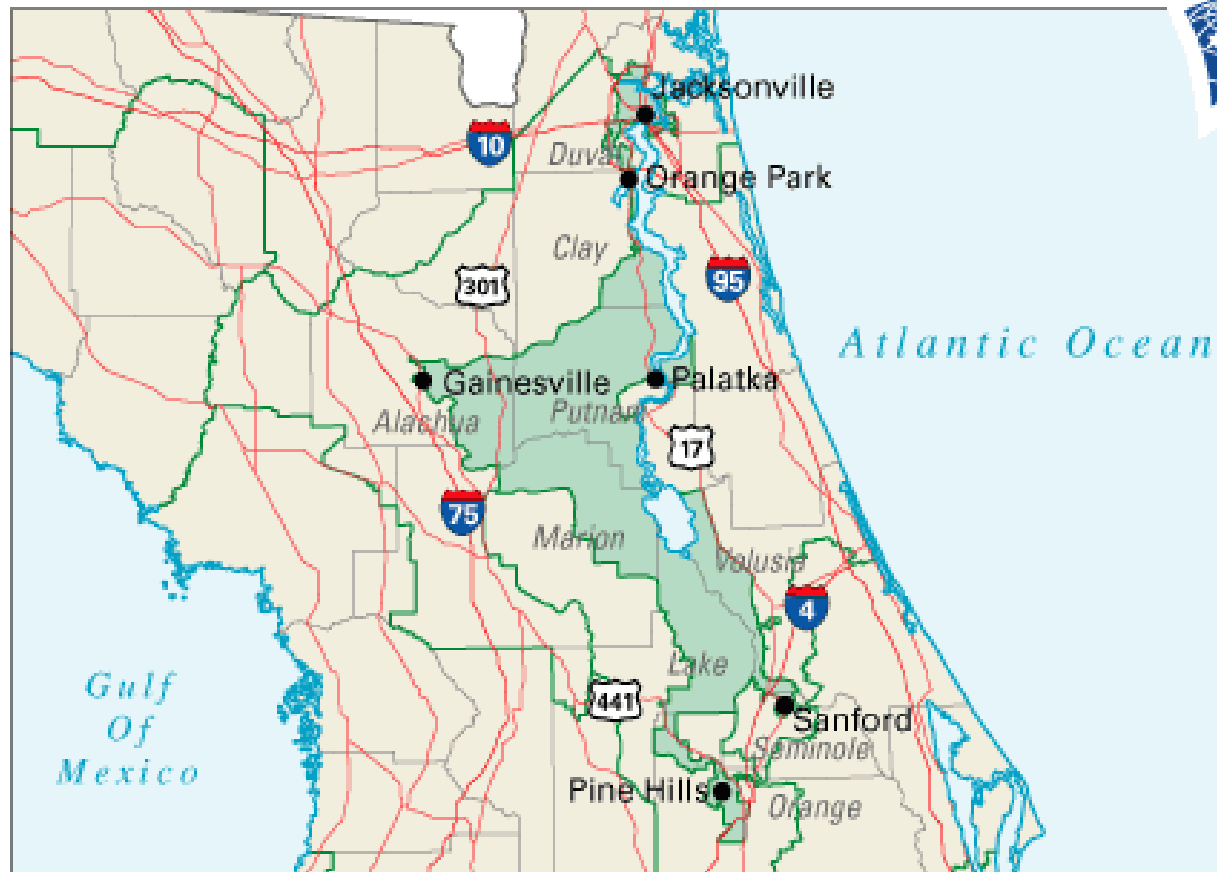


Florida 3rd district

Congressional District 3

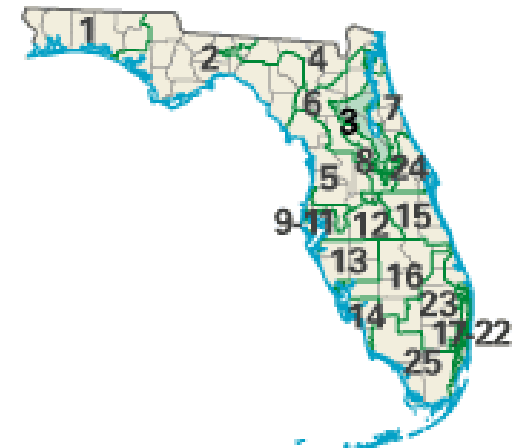


nationalatlas.gov™



3 Congressional District

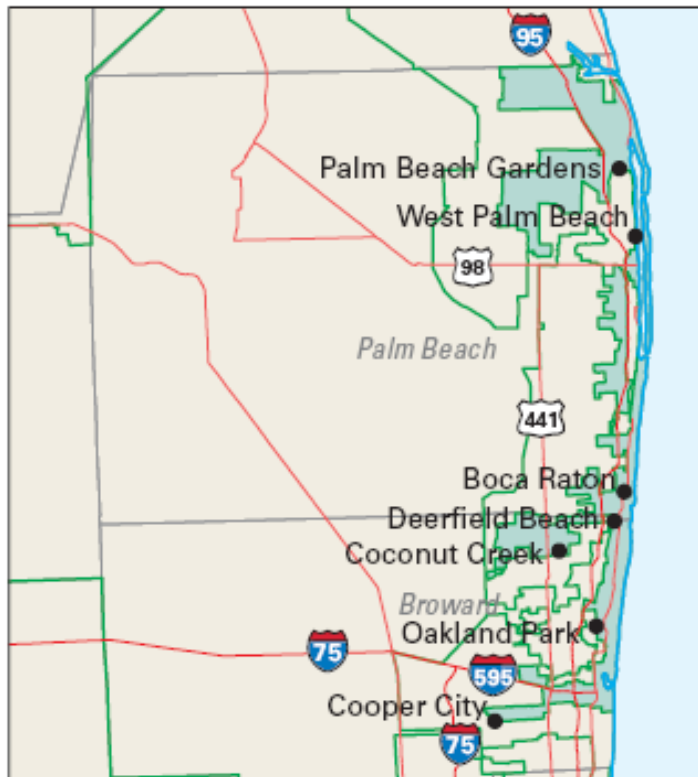
Marion County



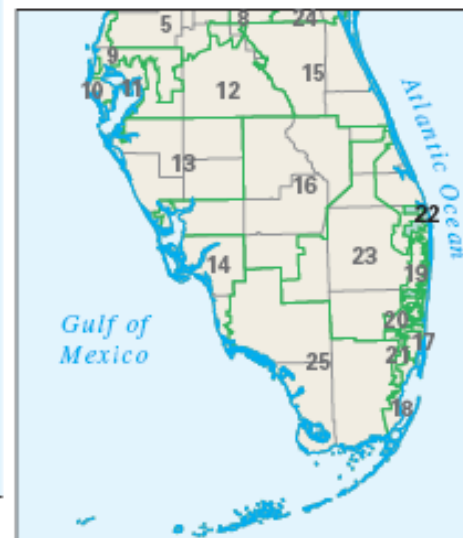
Florida (25 Districts)

Florida 22nd District

Congressional District 22



22 Congressional District
Palm Beach County

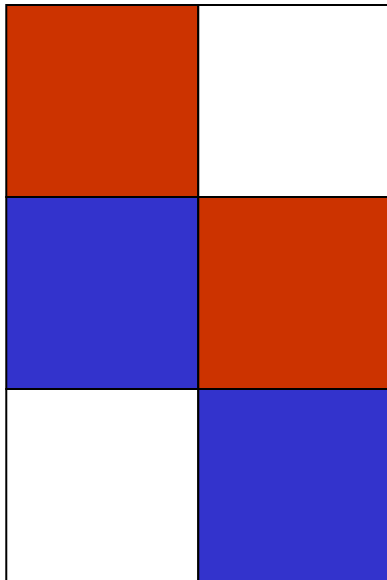


Florida (25 Districts)

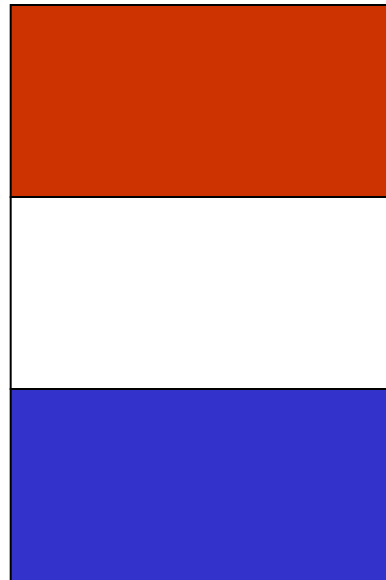
Contiguity

- General idea: keep the district together

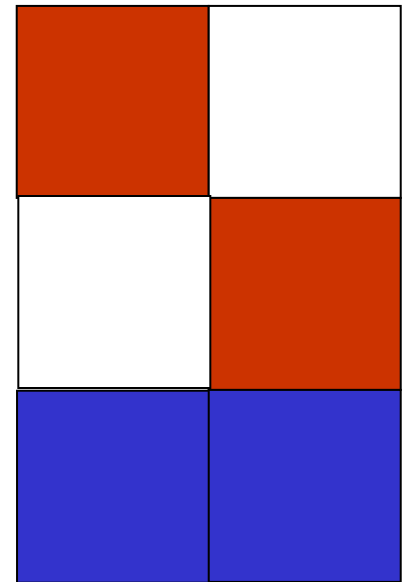
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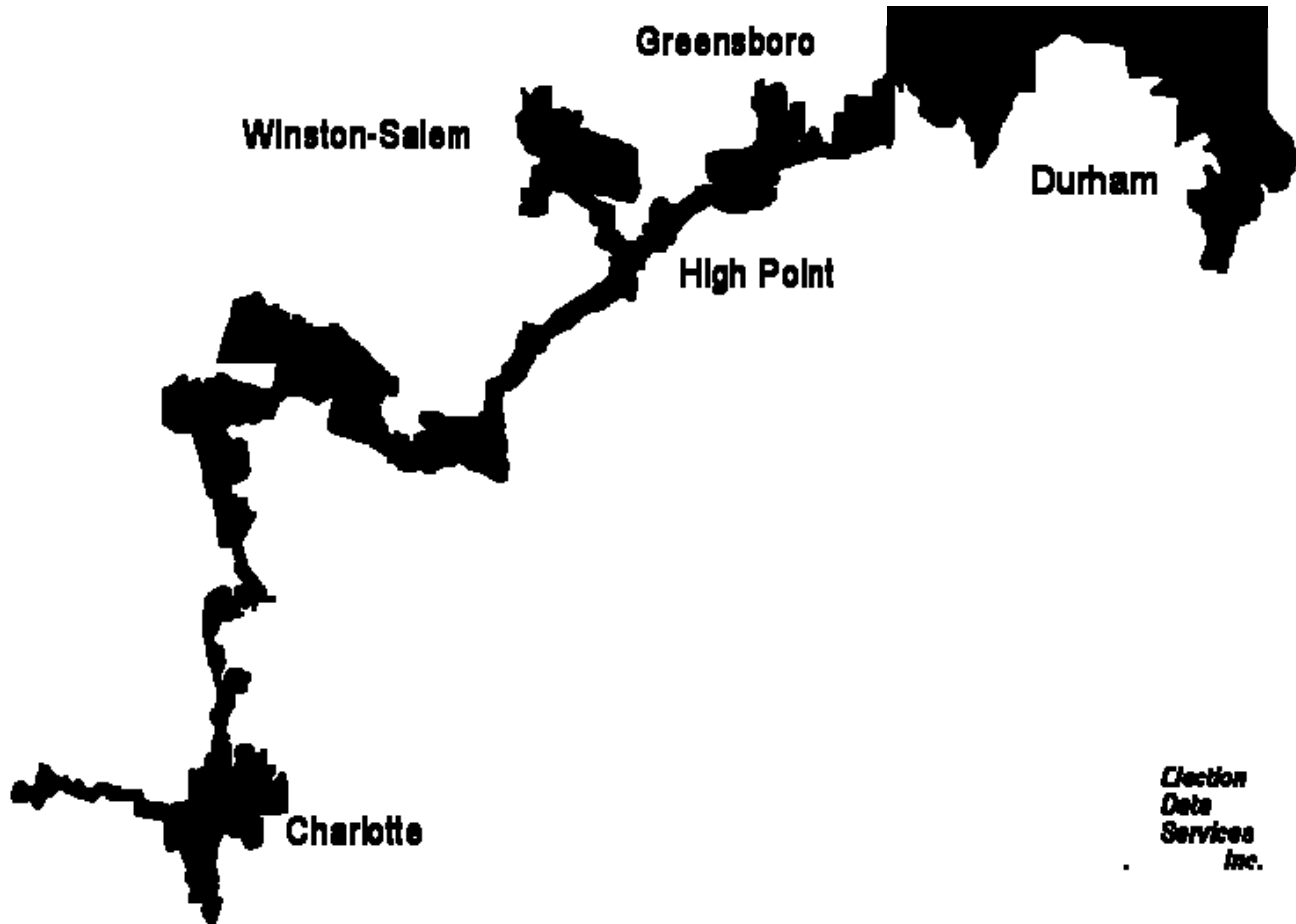
Good



?



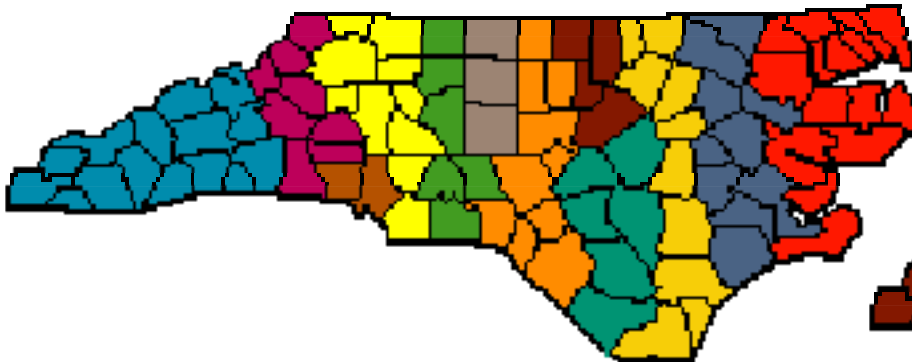
12th District Close-up



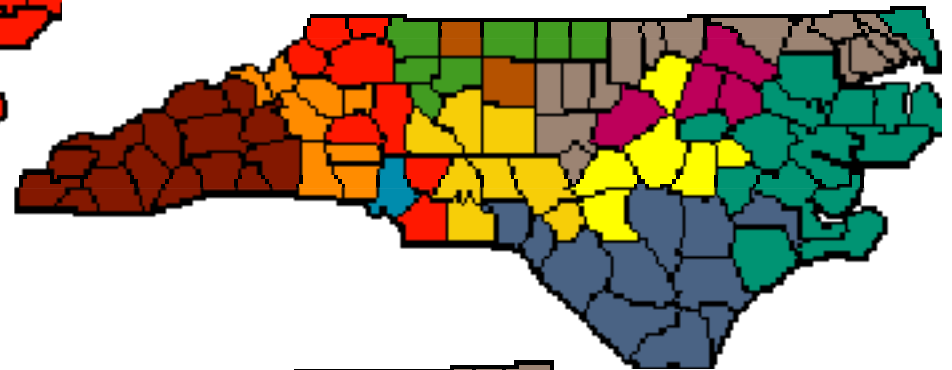
*Election
Data
Services
Inc.*

An aside: “Machine politics” in *The American Scientist*

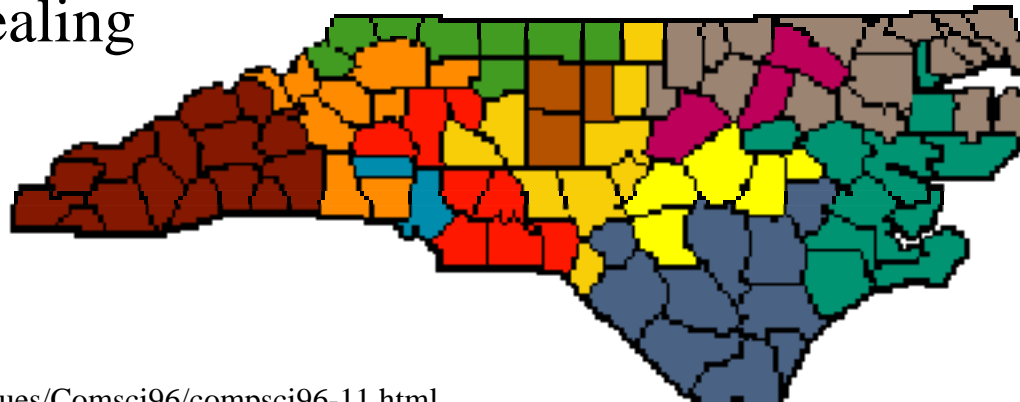
Cake-cutting algorithm



Greedy algorithm



Simulated annealing

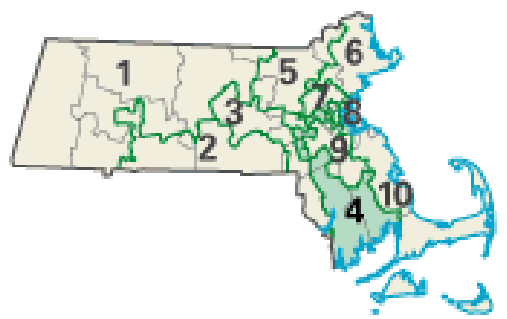


Contiguity in Mass. 4th CD, 2000

Congressional District 4



- 4** Congressional District
- Bristol* County



Massachusetts (10 Districts)

Equal population

- Implied by having districts
- Bad: Many states before 1960s
 - Illinois in 1940s (112k-914k)
 - Georgia in 1960s (272k-824k)
- Good: equality?

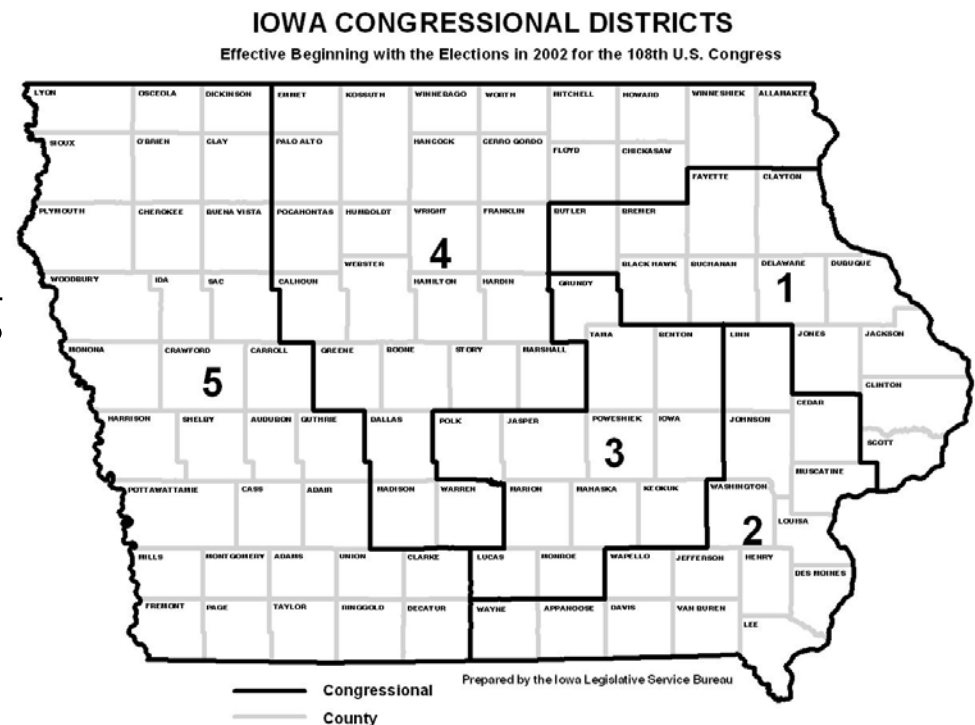
Equality in 2000

	Ideal District Size	Percent Overall Range	Overall Range (# of people)		Ideal District Size	Percent Overall Range	Overall Range (# of people)
Alabama	636,300	0.00%	-	Montana	N/A	N/A	N/A
Alaska	N/A	N/A	N/A	Nebraska	570,421	0.00%	0
Arizona	641,329	0.00%	0	Nevada	666,086	0.00%	6
Arkansas	668,350	0.04%	303	New Hampshire	617,893	0.10%	636
California	639,088	0.00%	1	New Jersey	647,257	0.00%	1
Colorado	614,465	0.00%	2	New Mexico	606,349	0.03%	166
Connecticut	681,113	0.00%	0	New York	654,360	0.00%	1
Delaware	N/A	N/A	N/A	North Carolina	619,178	0.00%	1
Florida	639,295	0.00%	1	North Dakota	N/A	N/A	N/A
Georgia	629,727	0.01%	72	Ohio	630,730	-	-
Hawaii	582,234	-	-	Oklahoma	690,131	-	-
Idaho	646,977	0.60%	3,595	Oregon	684,280	0.00%	1
Illinois	653,647	0.00%	11	Pennsylvania	646,371	0.00%	19
Indiana	675,609	0.02%	102	Rhode Island	524,160	0.00%	6
Iowa	585,265	0.02%	134	South Carolina	668,669	0.00%	2
Kansas	672,105	0.00%	33	South Dakota	N/A	N/A	N/A
Kentucky	673,628	0.00%	2	Tennessee	632,143	0.00%	5
Louisiana	638,425	0.04%	240	Texas	651,619	0.00%	1
Maine	637,462	-	-	Utah	744,390	0.00%	1
Maryland	662,061	0.00%	2	Vermont	N/A	N/A	N/A
Massachusetts	634,910	0.39%	-	Virginia	643,501	0.00%	38
Michigan	662,563	0.00%	1	Washington	654,902	0.00%	7
Minnesota	614,935	0.00%	1	West Virginia	602,781	-	-
Mississippi	711,165	0.00%	10	Wisconsin	670,459	0.00%	5
Missouri	621,690	0.00%	1	Wyoming	N/A	N/A	N/A

Source: National Conf. of State Leg.

Respect for existing political communities

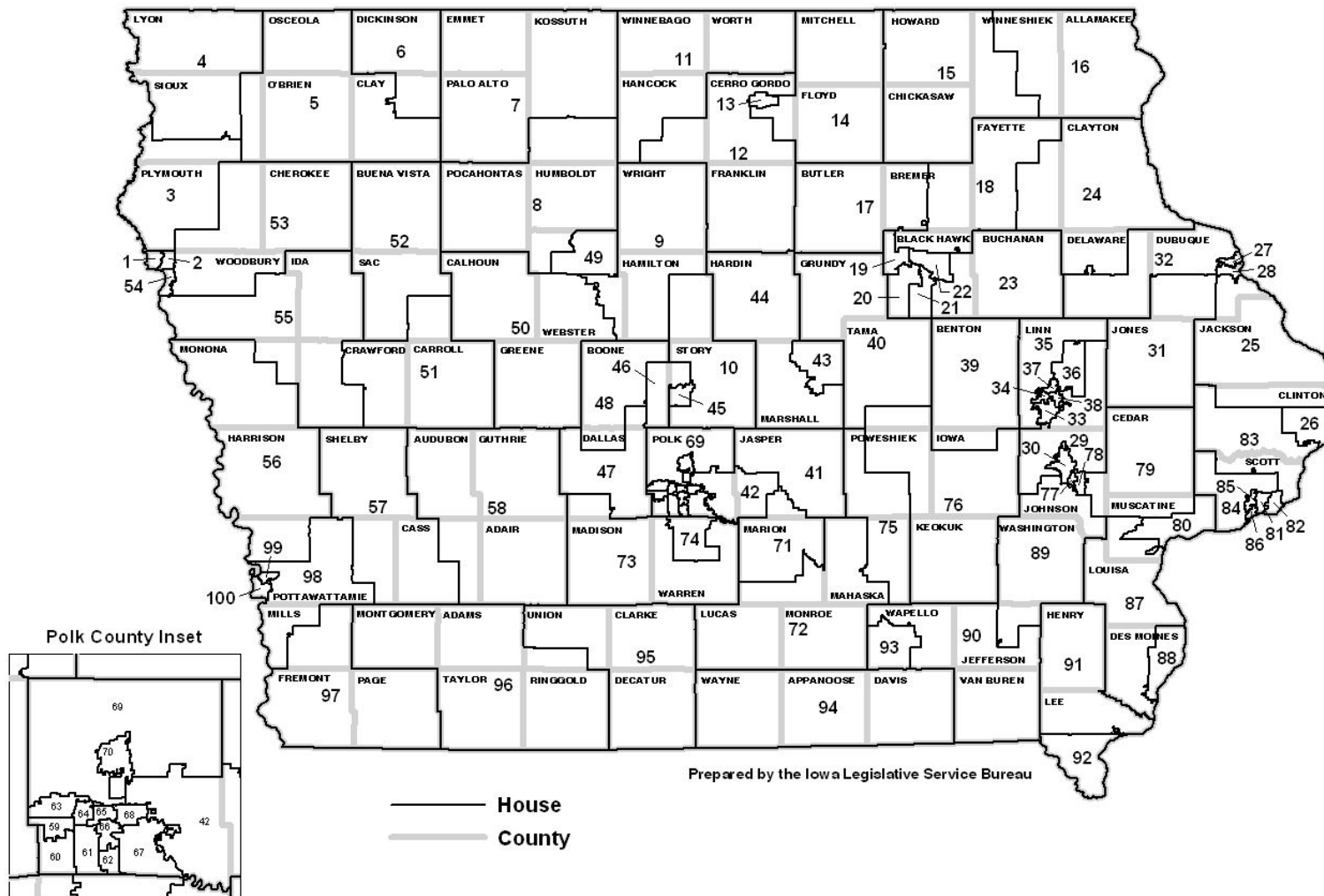
- Iowa
- Politicians like it
- May be better for citizens
- Getting more difficult with computer drafting of districts and (nearly) equal populations



But, the Assembly's another matter

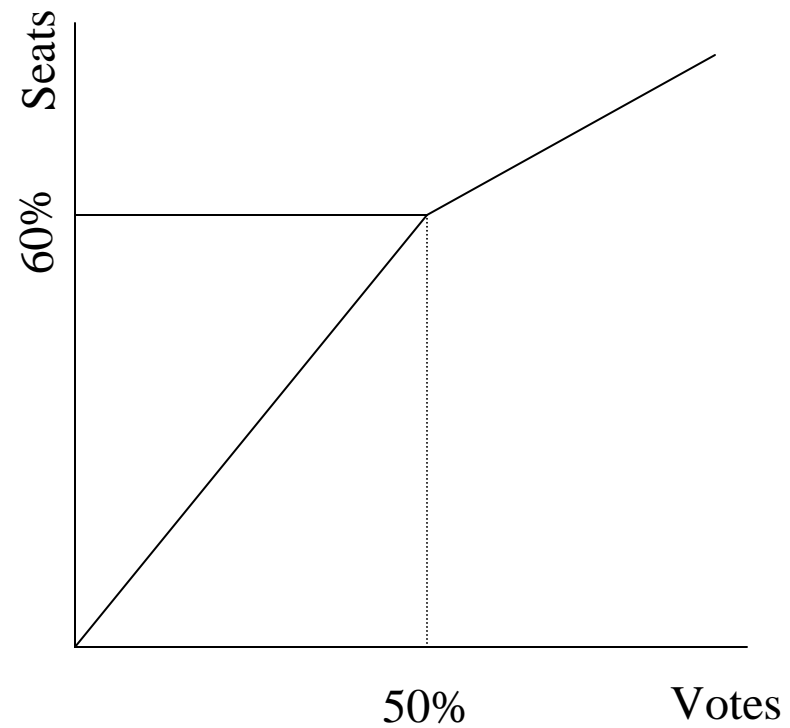
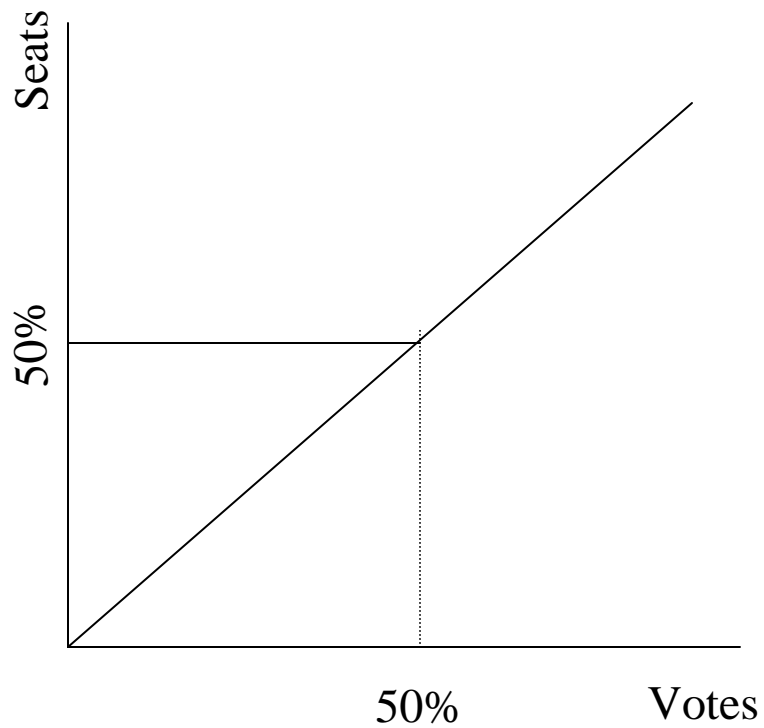
IOWA HOUSE DISTRICTS

Effective Beginning with the Elections in 2002 for the 80th Iowa General Assembly



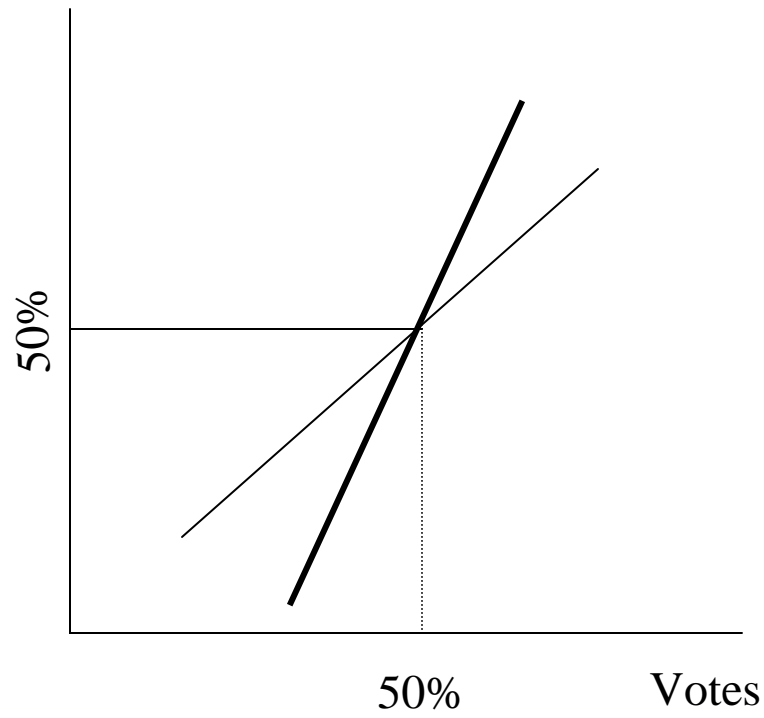
Partisan Fairness

- Results should be symmetrical
- Results should be unbiased



Partisan Fairness

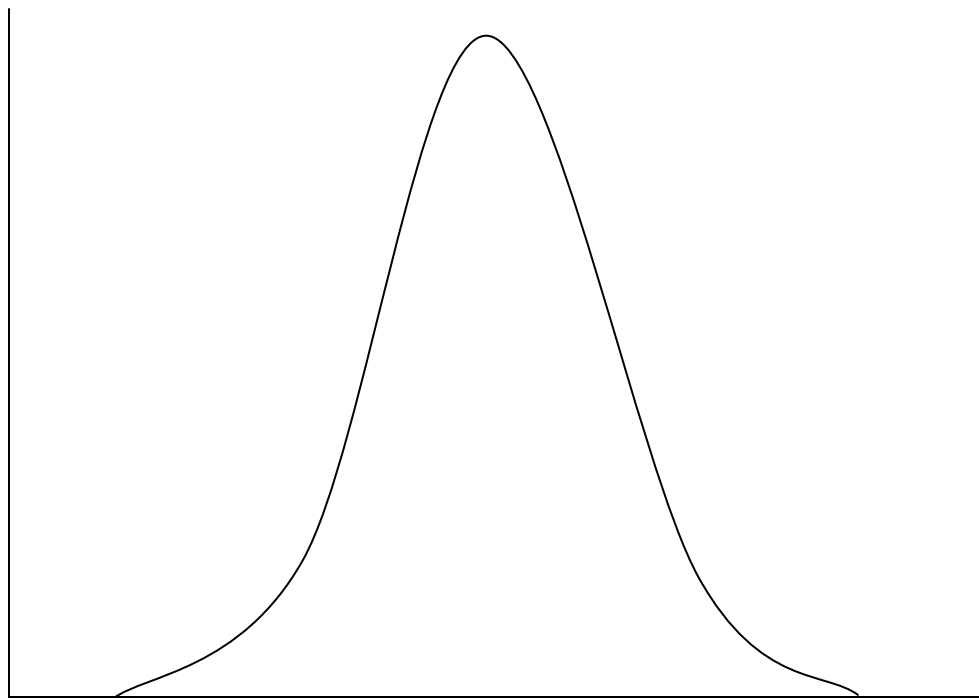
- What is the right responsiveness?



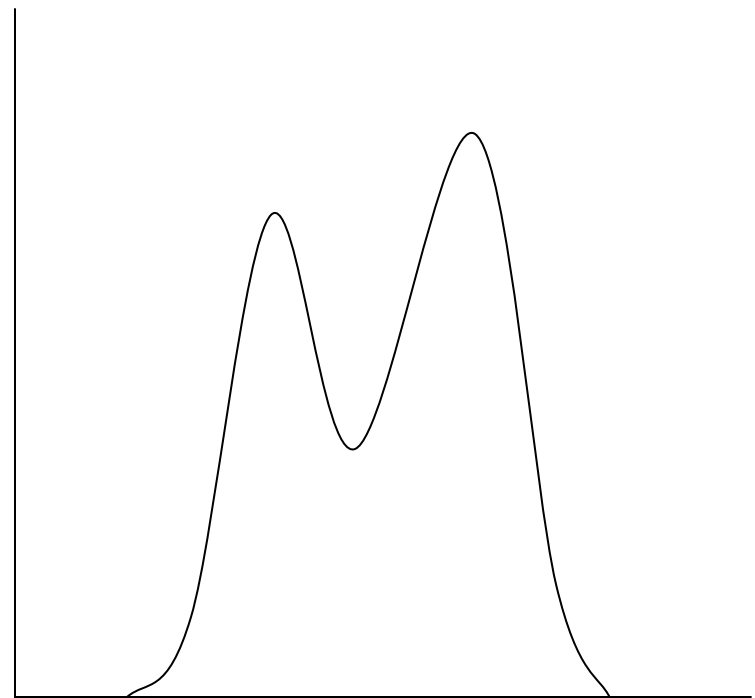
Swing ratio

- Measure of responsiveness
- Concept:
 - Swing ratio = $\Delta\text{Seats}_p / \Delta\text{Votes}_p$
- Various ways to measure

Why the swing ratio is rarely 1

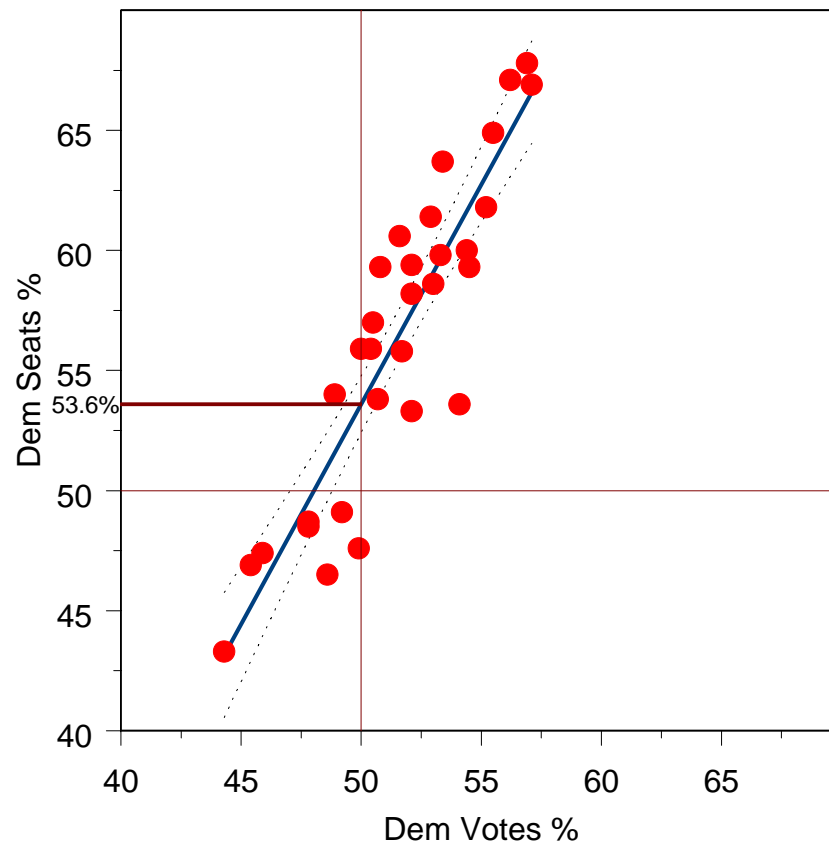


% Dem vote



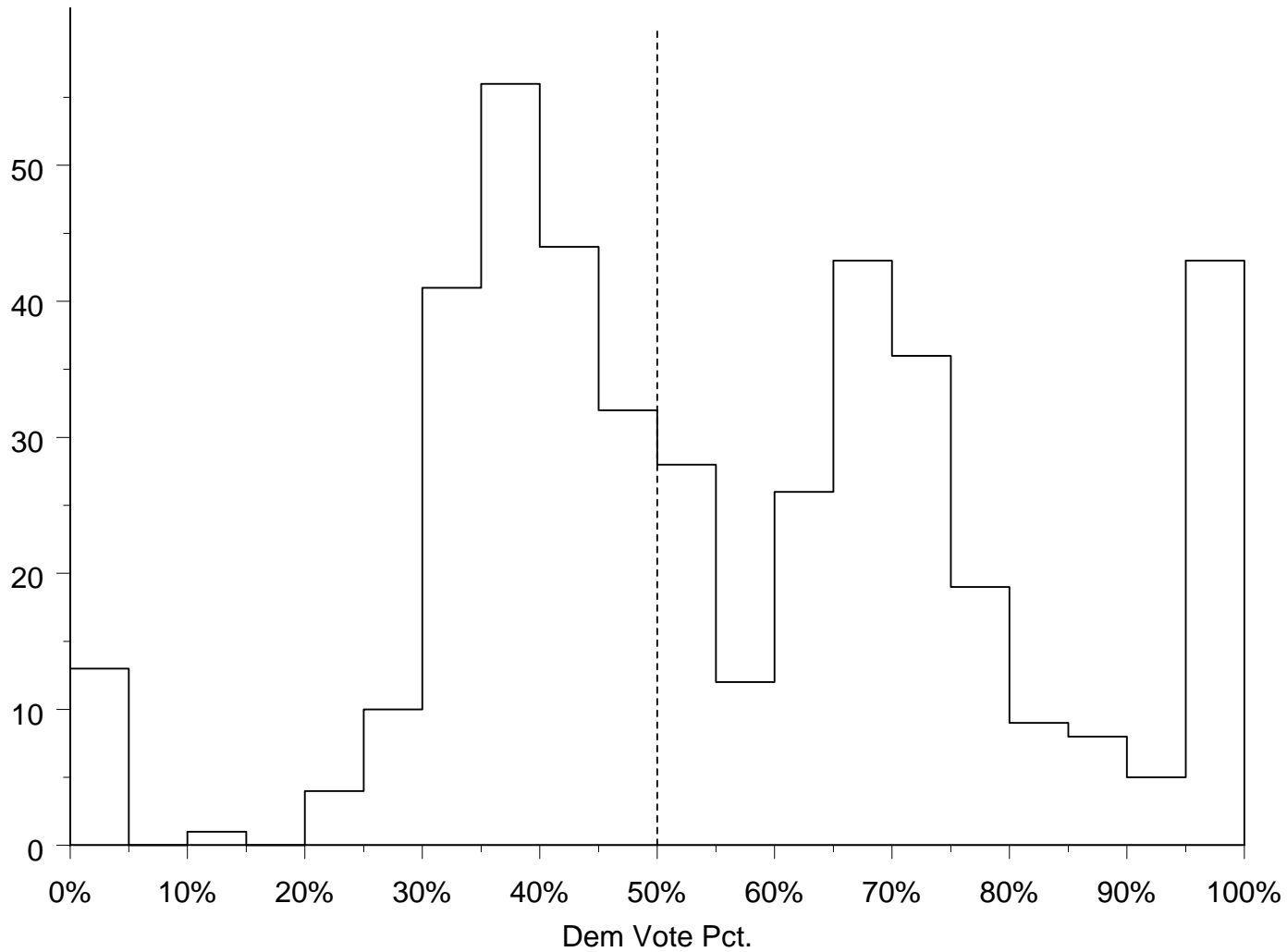
% Dem vote

Empirical swing ratio (with data from 1946-2006)

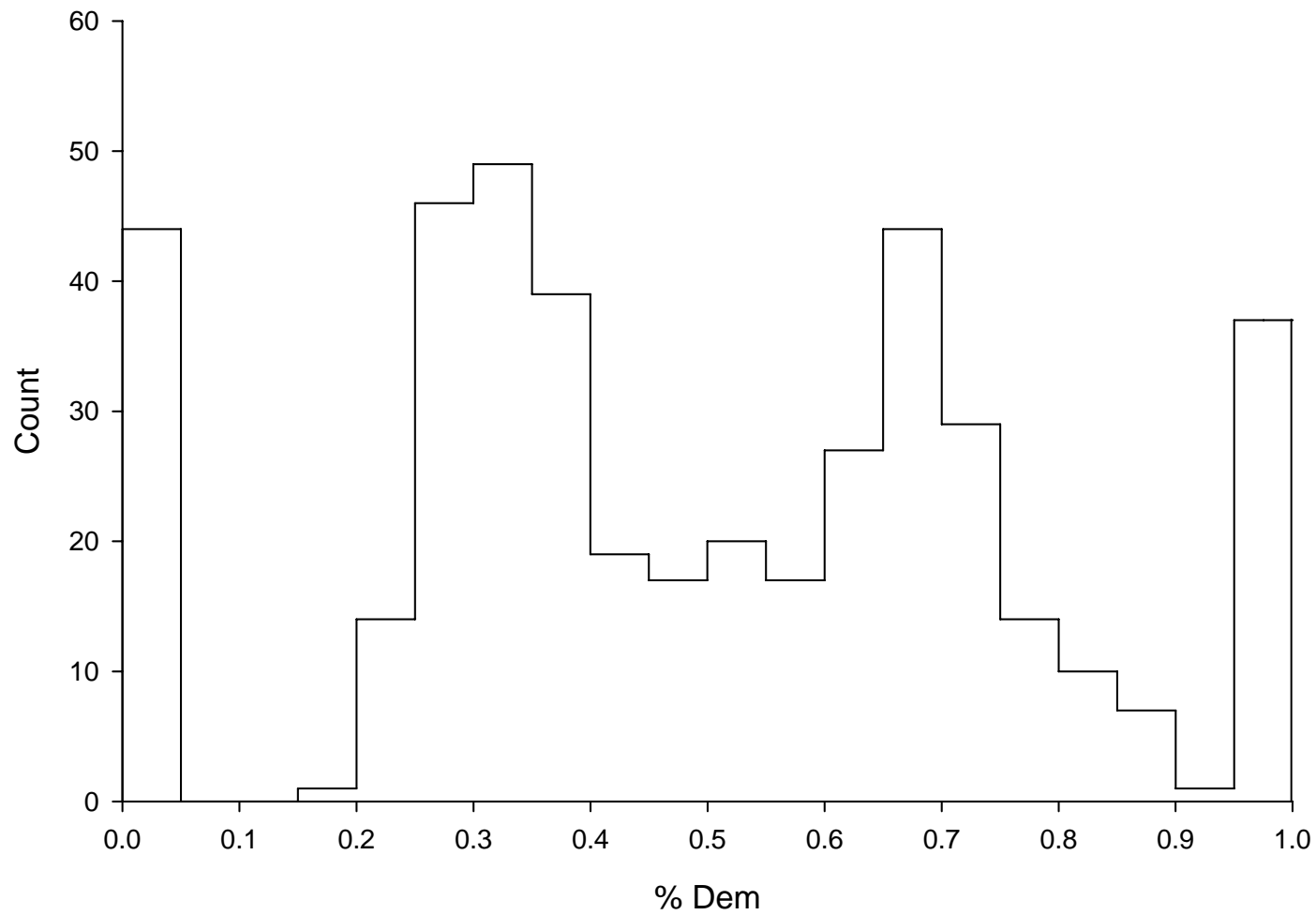


Swing ratio =
1.83:1

Mayhew Diagram 2006



Mayhew Diagram, 2002



Racial fairness

- From 15th amendment
 - “The right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of race, color, or previous condition of servitude.”
- Voting Rights Act of 1965
 - Prevented dilution
 - 1980: *Mobile v. Bolden*
 - S.C. says you have to show intent
 - 1982: VRA extension allows *effect*
 - 1990: Justice dept. moved to requiring *maximizing* minority representation through pre-clearance

Some Court Cases

- Equal population
 - Colgrave v. Green (1946): “political question”
 - Baker v. Carr (1962): Tennessee state districts
 - Gray v. Sanders (1963): Ga. unit rule
 - Wesberry v. Sanders (1964): “one person, one vote” doctrine
 - Veith v. Pennsylvania (2002): no deviation allowed

VRA Cases

- 1965: Dilution outlawed
- 1982: Extension + Republican DOJ = Racial gerrymanders
- 1993: Shaw v. Reno
 - Race must be narrowly tailored to serve a compelling gov't interest, or....
 - Sandra is the law
 - Non-retrogression doctrine
 - Districting overturned in GA, NC, VA, FL, TX, LA, NY (but not IL)
- Page v. Bartels (2001): incumbency protection OK, even if it's only minority incumbents

A Word about Massachusetts

