

# COMPACTNESS IN THE REDISTRICTING PROCESS

Where are the Dangers?

What is the Law?

What are its Measures?

How Useful are Its Measures?

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Republican National Committee

Some Maps Courtesy of:  
Kimball Brace  
Election Data Services

# WARNING !!!

The following does not constitute legal advice. It is presented for discussion purposes only.  
See your attorney and you MIGHT get the correct legal advice.

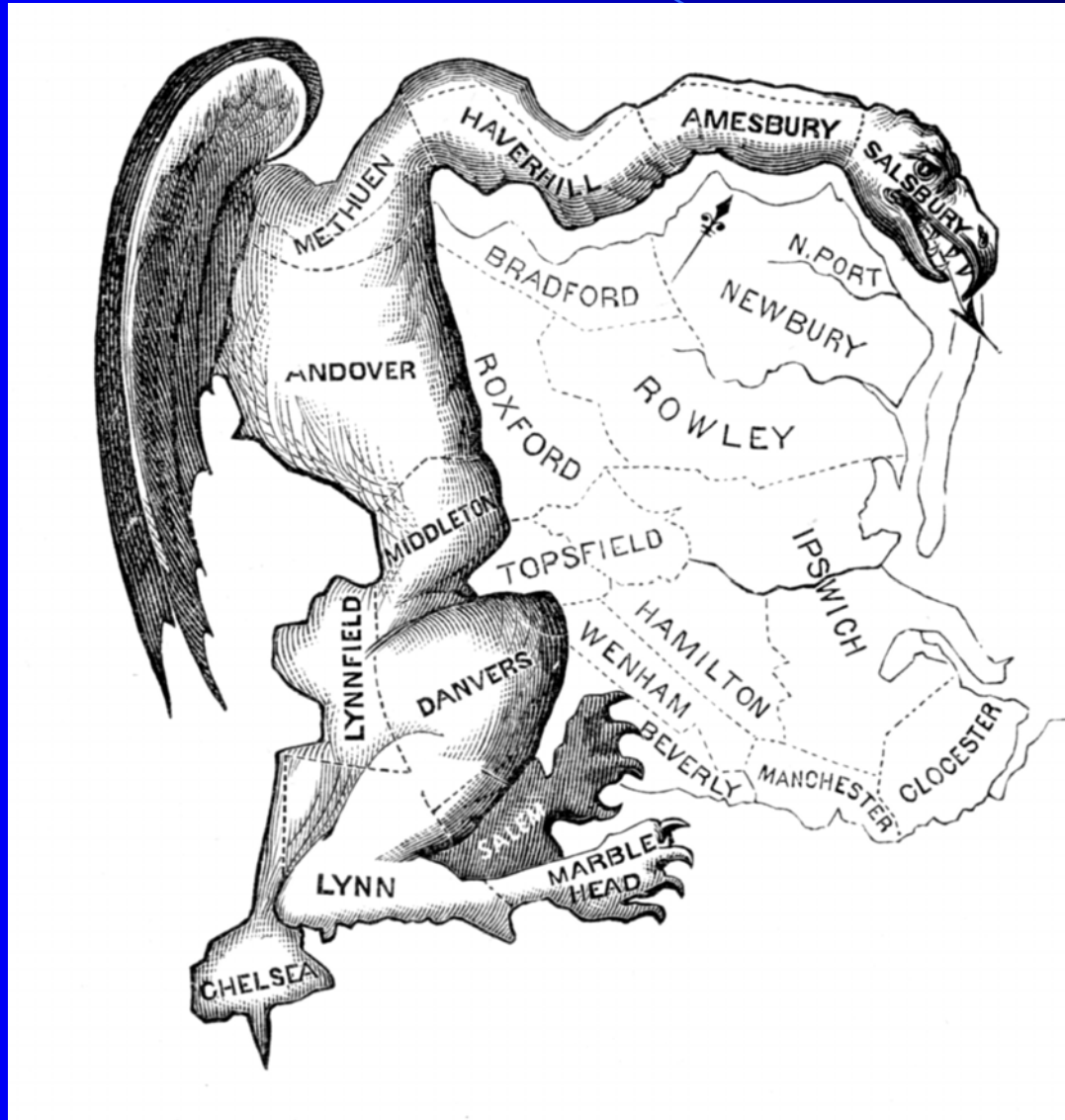
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IN THE REDISTRICTING PROCESS:

**NEVER TRAVEL WITHOUT COUNSEL**

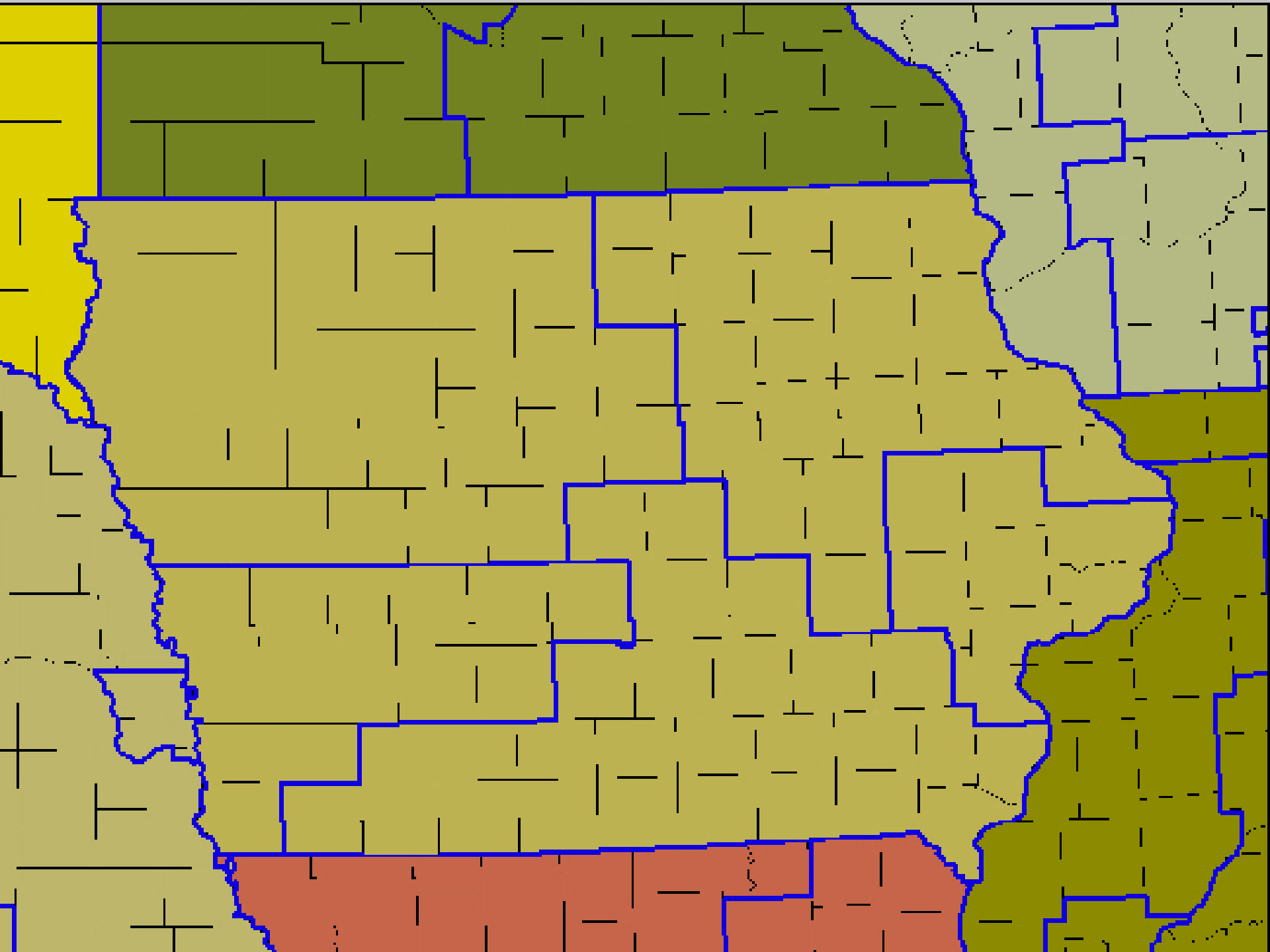
Michael Hess  
Former RNC Chief Counsel

# The First Gerrymander



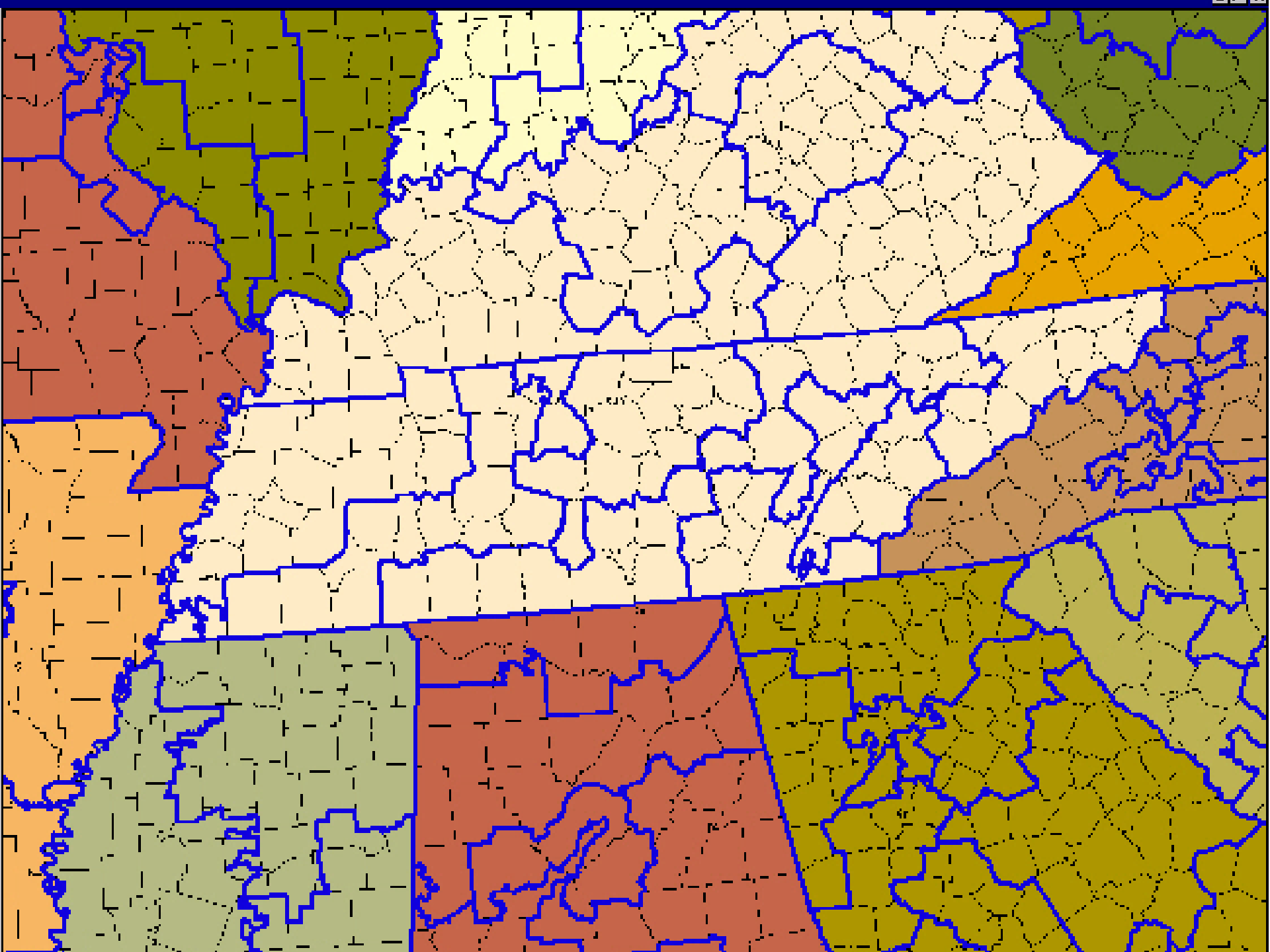
# HISTORY OF COMPACTNESS

- Discussion embedded in US History
- **Before “One Person, One Vote”**
  - Counties or legislative districts were building blocks
  - Many states had regularly shaped districts

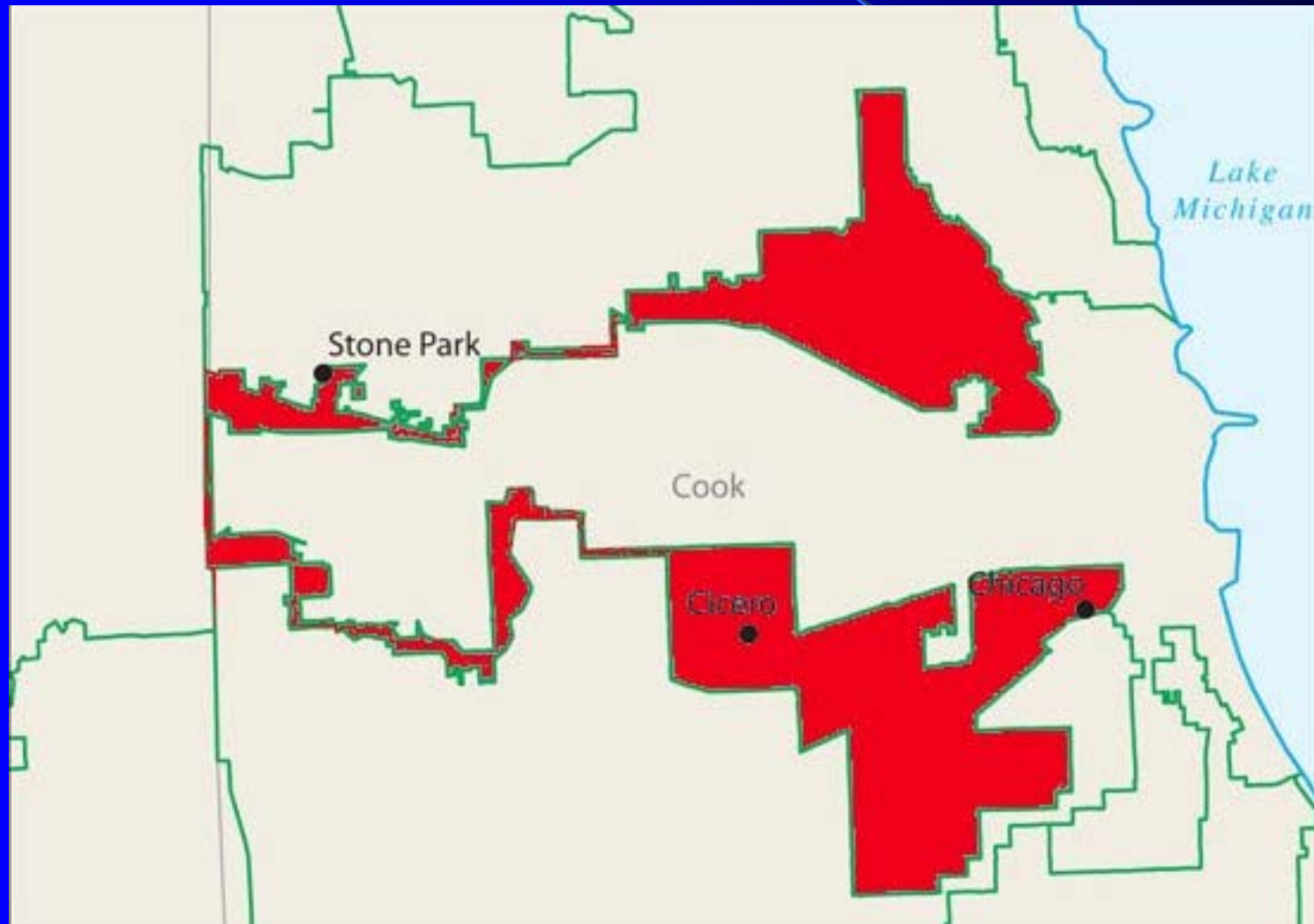


# HISTORY OF COMPACTNESS


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- Before “One Person, One Vote”
  - Counties or legislative districts were building blocks
  - Many states had regularly shaped districts
- **Baker v. Carr, et al lead to splitting of geography as population deviations were driven lower**
  - Shapes became less important



## What the Democrats Have Done Before Illinois Congressional District – 2001



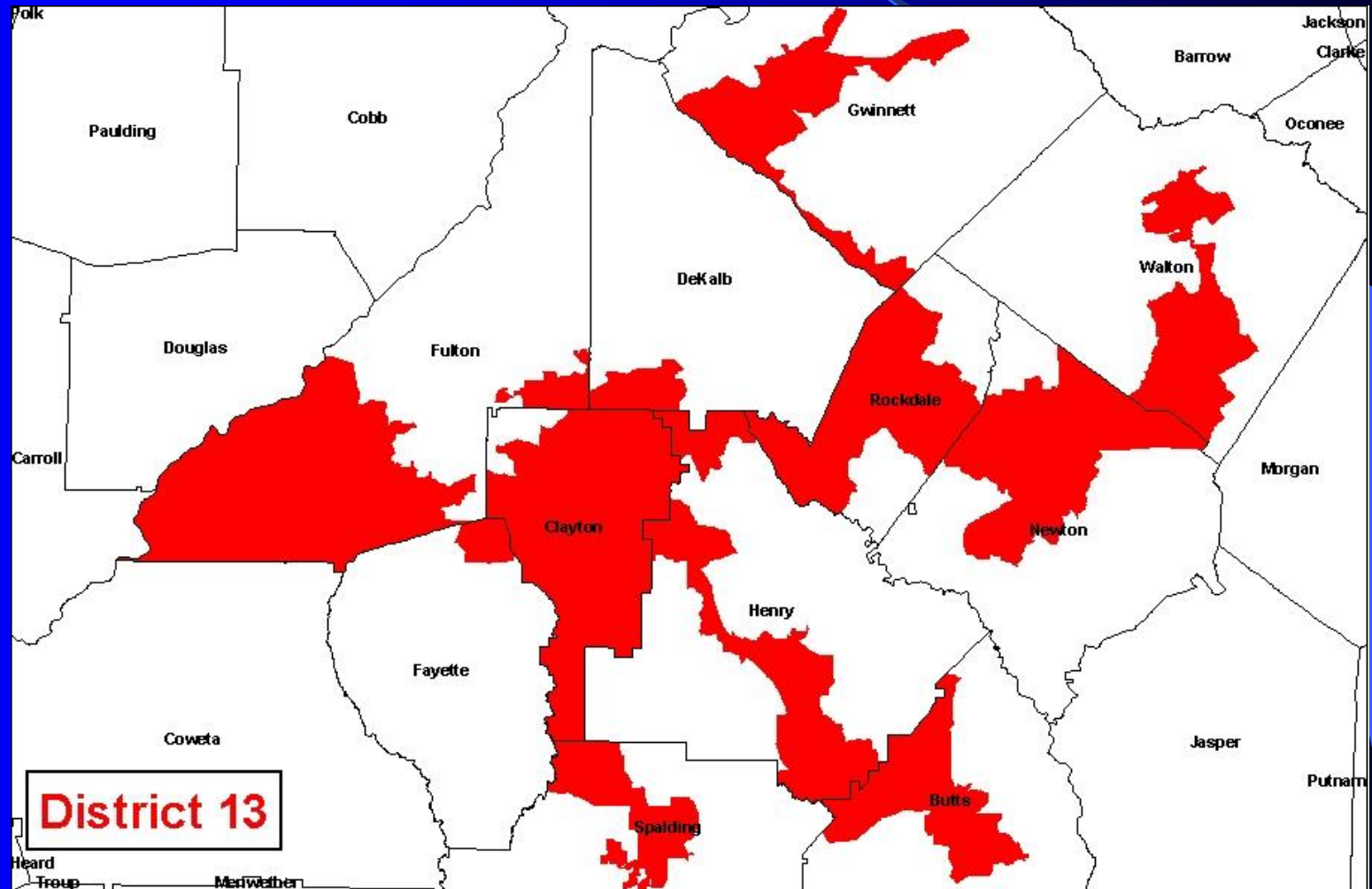


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Here are some other  
great examples !

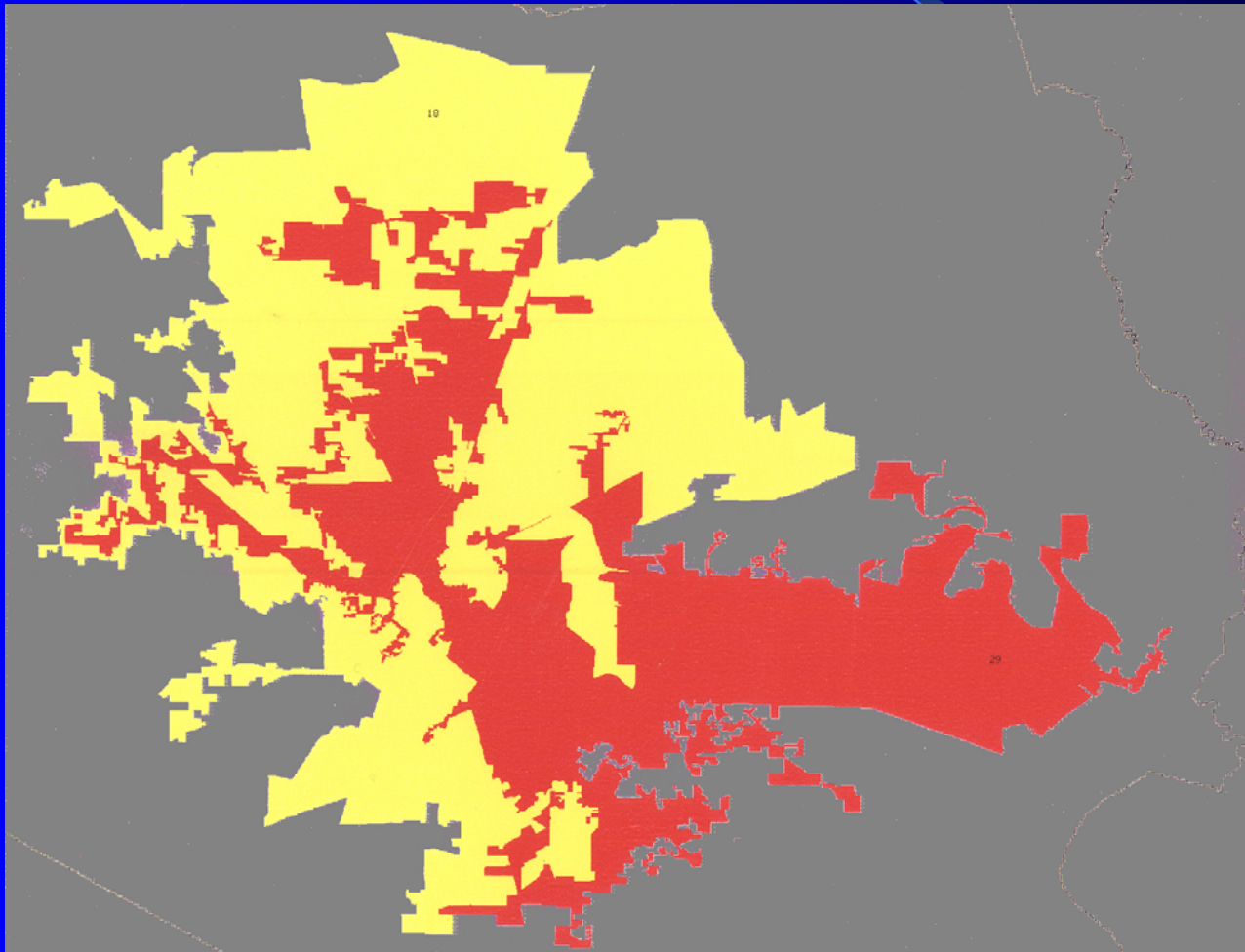
# What the Democrats Have Done Before

## Georgia Congressional District – 2001

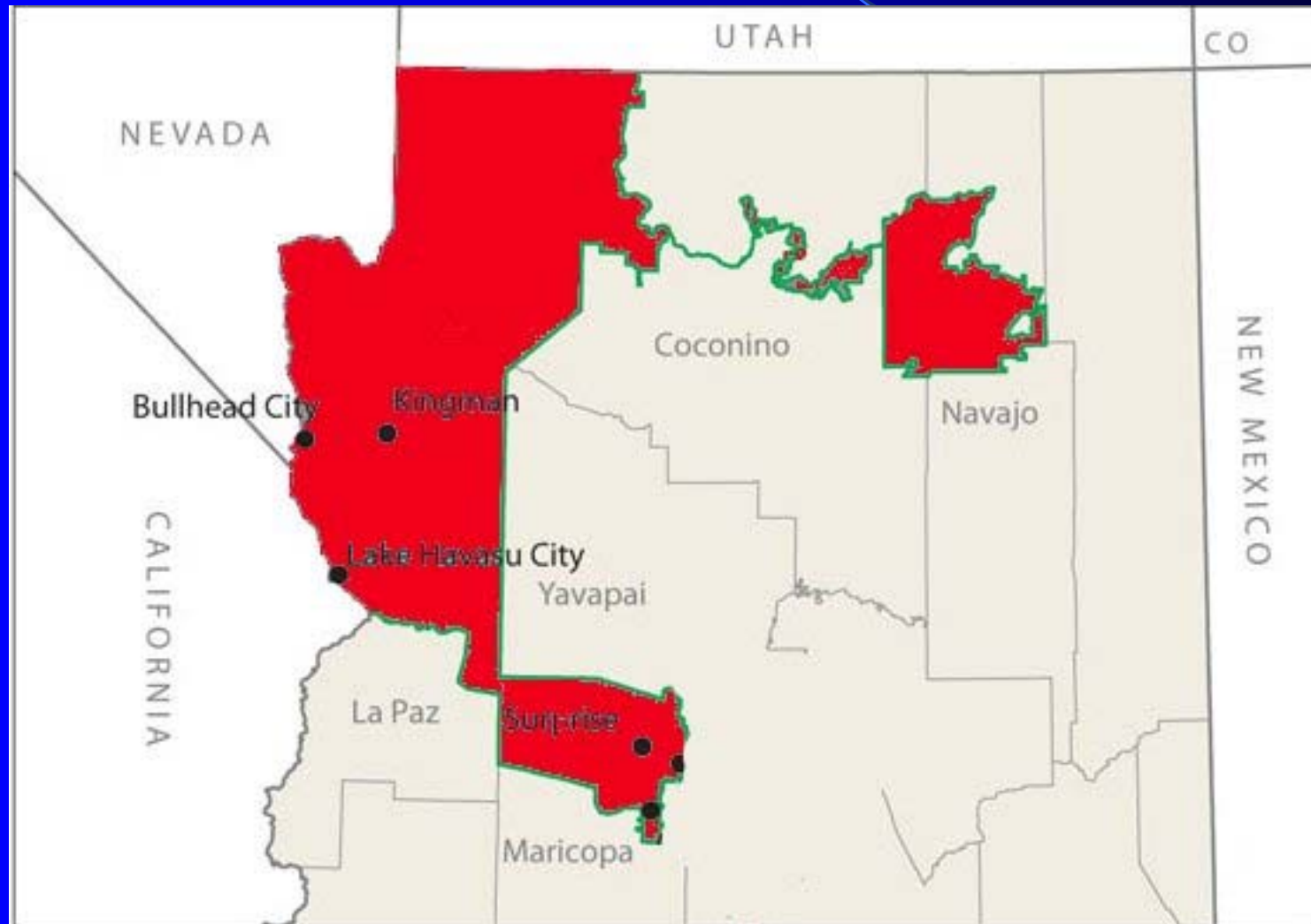


# What the Democrats Have Done Before

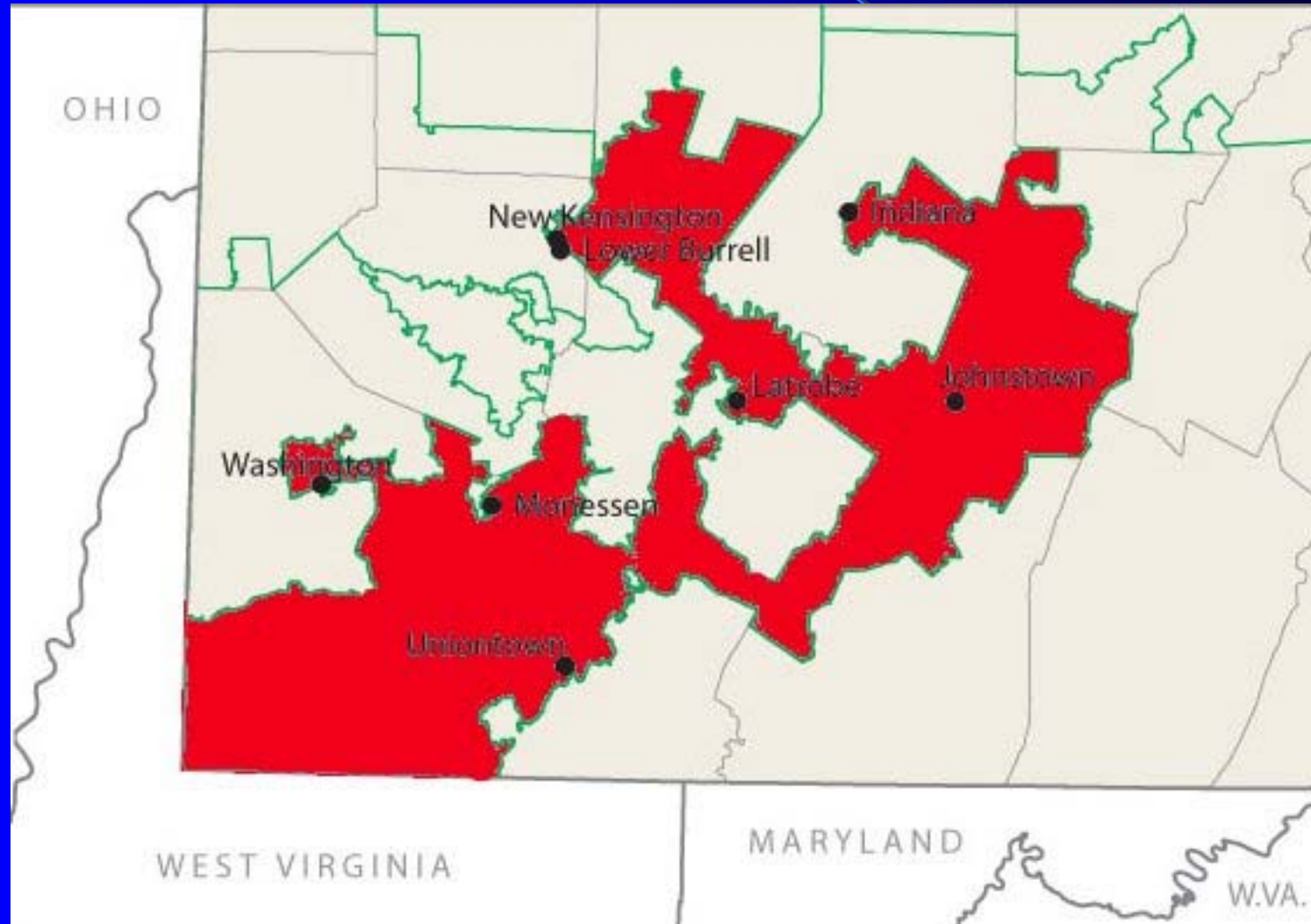
## Texas Congressional Districts – 1991



## What the Democrats Have Done Before Arizona Congressional District – 2001

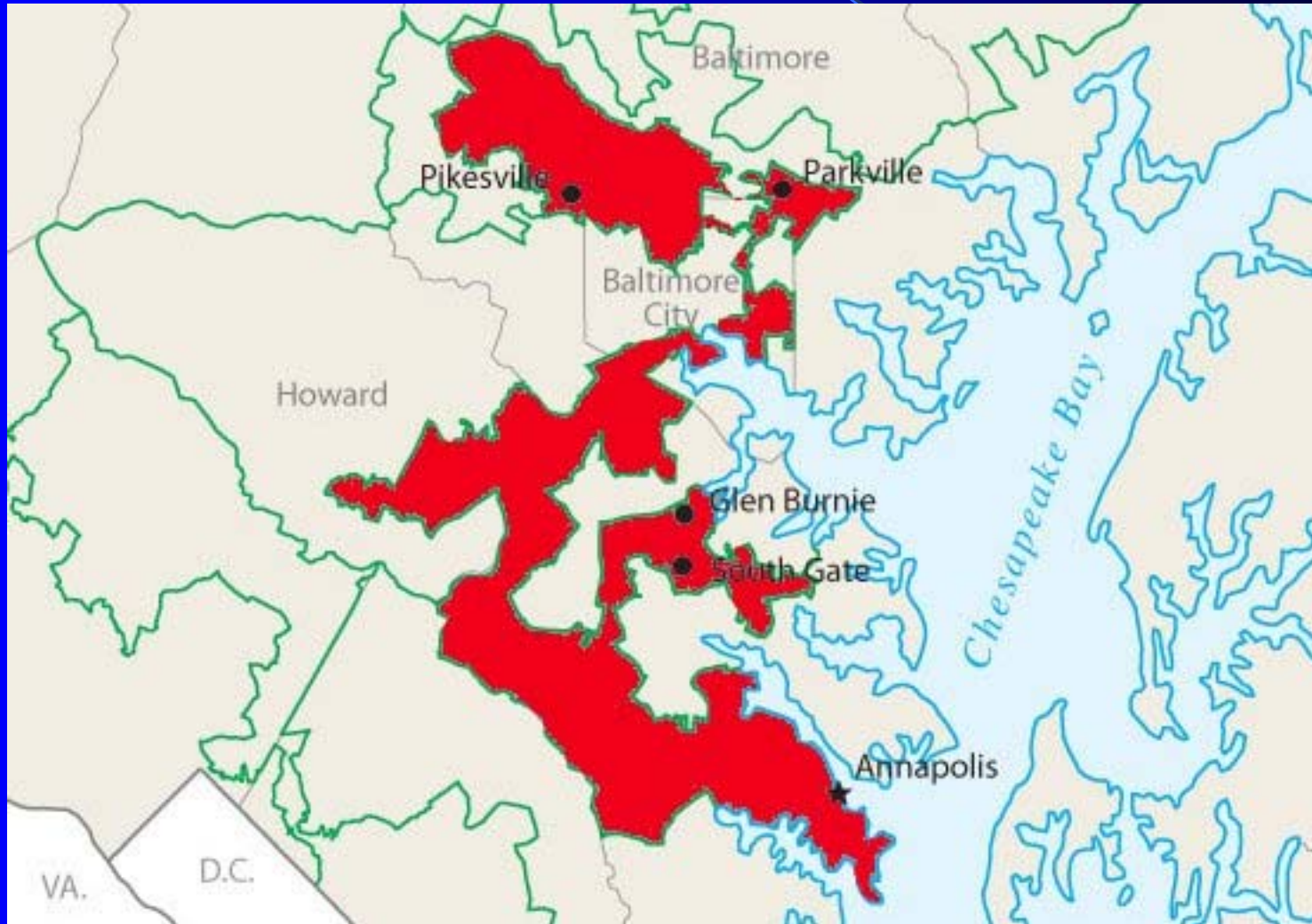


## What the Democrats Have Done Before Pennsylvania Congressional District – 2001



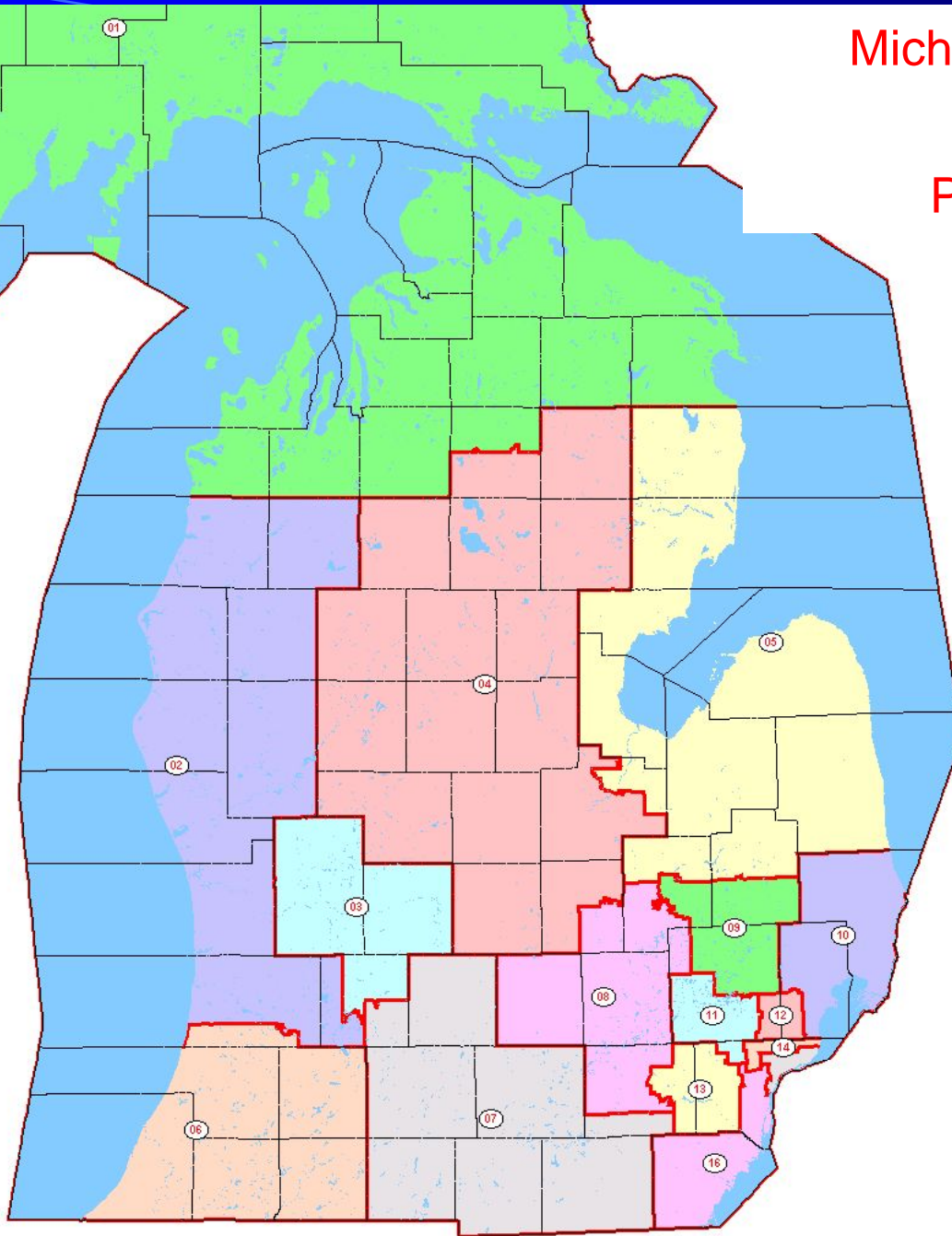


## What the Democrats Have Done Before Maryland Congressional District – 2001



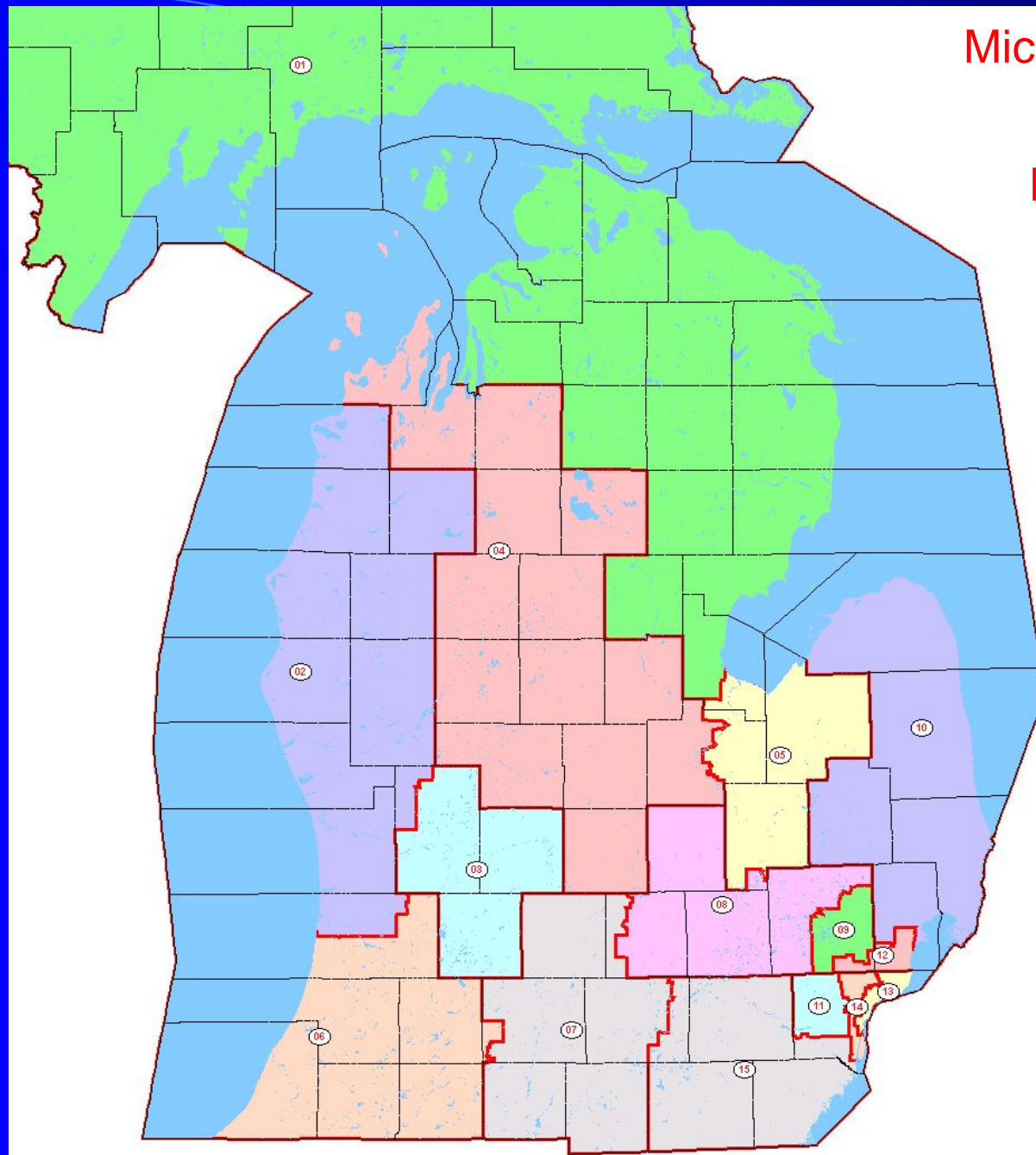
# Michigan Congressional Districts

Pre-Redistricting



# Michigan Congressional Districts

Post-Redistricting





# HISTORY OF COMPACTNESS

- **The 1971 and 1981 Reapportionments used limited computer mapping for the first time**
  - Pretty much limited to census tracts & “precincts”
- **1991 added significant geographic technology**
  - Census Tiger Files
  - Geographic Information Systems (GIS)
  - Personal Computers (PC’s)

# HISTORY OF COMPACTNESS

- **The “new” technology of the 90’s allowed:**
  - **“On screen” mapping in color**
  - **Display of data to block level**
  - **More detailed data files**
  - **Ability to run compactness tests**
  - **Pinpoint political & demographic gerrymandering**

# COMPACTNESS & THE LAW

Let's Look at Compactness  
as it's used in the Law  
and how Courts view it.

# COMPACTNESS & THE LAW

- Most states have generic language for compactness requirements
  - “districts shall be compact in form...”
  - “districts shall consist of compact territory...”
  - Some states, such as Iowa have specific tests

# REDISTRICTING COMPACTNESS

- Development of Compactness in Federal Law
  - No standards for CD's until 1842
  - Reapportionment Act of 1842 added requirement for single-member districts.
  - Population equality added in 1872
  - Compactness & contiguity added in 1901
  - All but standard were dropped in 1929
  - Single-member comes back in 1967
  - Compactness comes back (racial/ethnic fairness) starting in the '60's

# Compactness & the Law

- General compactness ignored by most courts even though many state constitutions contained compactness requirements
- Compactness added indirectly in *Gomillion v. Lightfoot* (1960) City of Tuskegee, AL
- *Thornburg v. Gingles* (1986) (N.C.) used a compactness test to test violations of Voting Rights Act – § 2.

## Section 2 – *Gingles* Test

- A test to determine the need to create a majority-minority (equal opportunity) district
- [the minority population must be] “sufficiently large and geographically compact to constitute a MAJORITY in a single-member district”
- Politically cohesive
- Racial block voting must be present
- Additional tests (totality of circumstances)

# *Shaw v. Reno* (North Carolina)

- 1993 Racial Malcompactness Case
- Justice O'Connor's description of the 12<sup>th</sup> Congressional District as “bizarre”
- Also “we believe that **reapportionment** is one area in which appearances do matter”



# *Shaw v. Reno* (North Carolina)

- “One need not use Justice Stewart’s classic definition of obscenity – ‘I know it when I see it’ – as an ultimate standard for judging the constitutionality of a gerrymander to recognize that dramatically irregular shapes may have sufficient probative force to call for an explanation”

# Other Admonitions

- *Miller v. Johnson* (1995) (Georgia)
  - Presence of malcompactness NOT necessary to find racial gerrymandering (Kennedy, J.)
- *Bush v. Vera* (1996) (Texas)
  - “Constitution does not mandate regularity of district shape” [see *Shaw* I]

# Where does this leave us?

- It is extremely unlikely that a Court will ever judicially adopt its own mathematical measure of compactness
- However, a mathematical compactness measure can have TWO possible court uses

# Where does this leave us?

- TWO POSSIBLE COURT USES:
  - Evidence that validates that a specific district is far less compact than other districts in the jurisdiction
  - As a specific legislatively adopted test in a jurisdiction

# Where does this leave us?

- So . . . . We're back to the famous Grofman “interocular test”
- AND
- Be careful of the compactness standards you adopt. They may come back to bite you on the rear in court.

# Where does Compactness Fit?

- List of possible criteria:
  - Single versus Multi-member districts
  - Population Equality
  - Voting Rights Act Compliance
  - Compactness and Contiguity
  - Preservation of Political Boundaries
  - Communities of Interest
  - Partisan and Incumbent Interests
- Obviously, these Criteria may conflict with one another

# LOOKING AT COMPACTNESS

- One can consider two types of compactness
- Geographic compactness – What is the SHAPE of the district(s) in question?
- Racial Compactness – The nature of the degree of racial/ethnic compactness within a district.
- There might be one without the other.

# LOOKING AT COMPACTNESS

- As usual scholars take different viewpoints and argue the topic in endless papers
- Some believe Compactness is outdated and irrelevant.
- Some believe that it's biased against certain political parties and minorities.
- Some believe Compactness is the prime defense against gerrymandering



# LOOKING AT COMPACTNESS

- Is it the distribution of VOTERS or LAND that is the most important consideration?
  - Is gerrymandering totally defined by geographic shape?
  - Can one gerrymander with compact districts?

# TYPES OF COMPACTNESS

- Dispersion Measures
  - How tightly packed or spread out is a district?
- Perimeter Measures
  - Comparing boundary length to other districts or other plans
- Population Measures
  - Where are the people located within districts?

# DISPERSION MEASURES

- Width vs. Length

- Compares length of longest axis to maximum width of district perpendicular to the axis.
- Advantage is Simplicity
- Too dependent on extreme points
- Gives high scores to unnatural figures such as a tightly coiled snake

# DISPERSION MEASURES

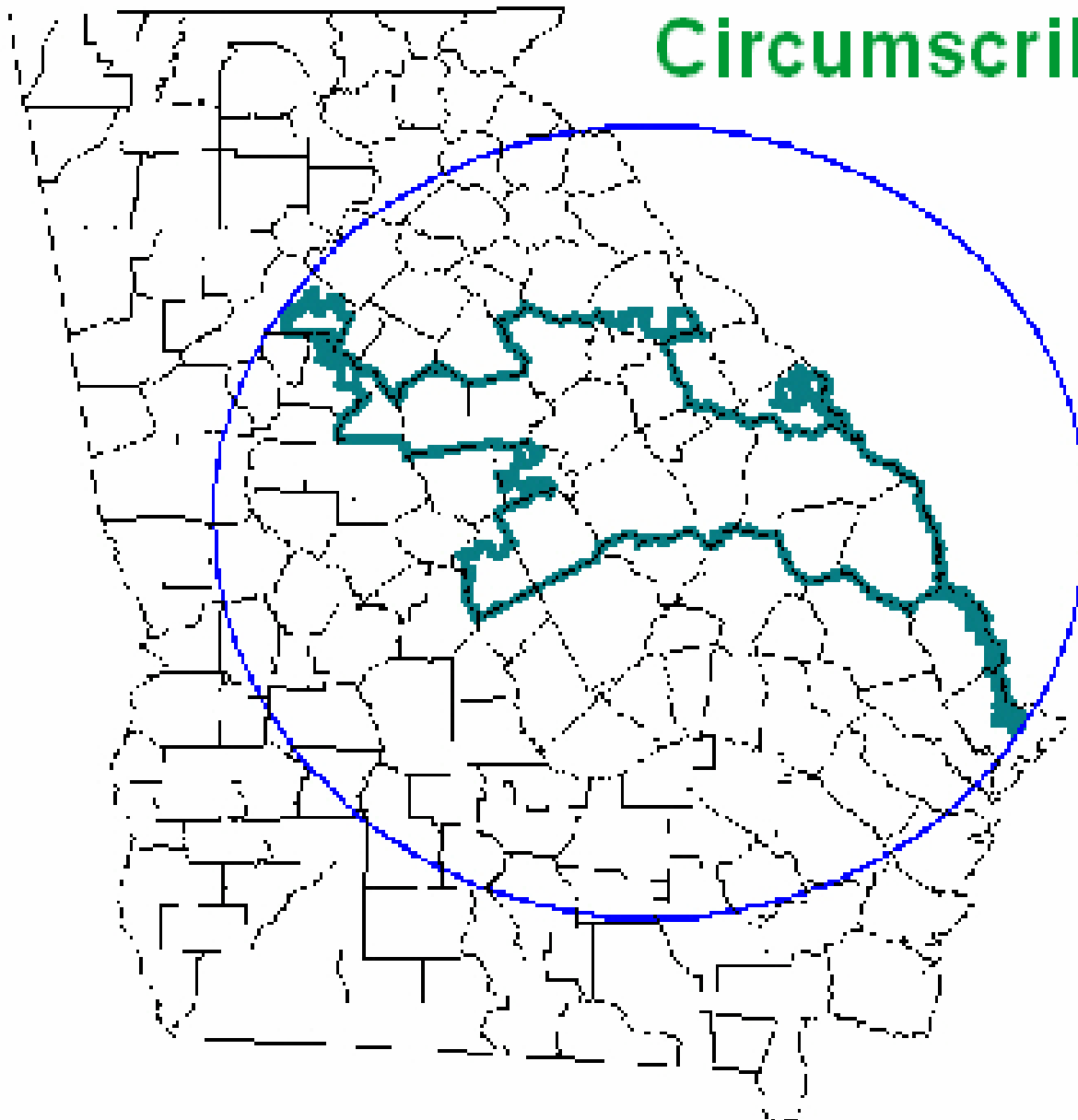
- Area Measures

- Compares district area with areas of other compact figures (Circles, Ovals, Compact Hulls)
- Advantage is Simplicity
- Misses meandering districts (coiled snake)
- Misses indentations

# DISPERSION MEASURES

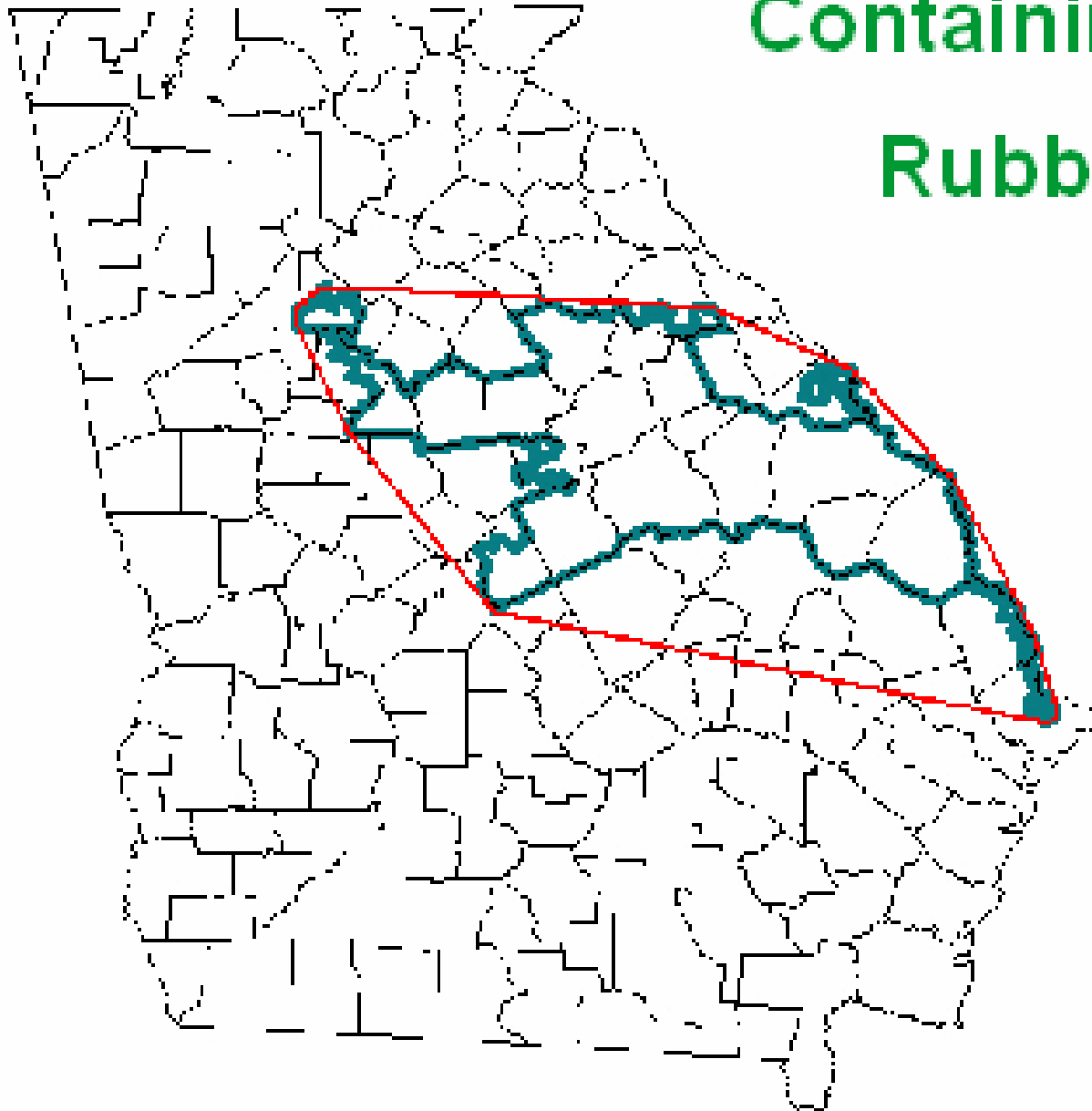
- Area Measures (cont.)
  - Common Measure is called the CIRCUMSCRIBING CIRCLE (Reock Test)
  - Ratio of Area of District to the Area of the SMALLEST Circle that can be drawn around the district

# Minimum Circumscribing Circle



# Minimum Convex Figure Containing District

## Rubber-Band



# DISPERSION MEASURES

- Moment of Inertia
  - Measures distance from center of gravity (or areal center) to points in district boundary (Schwartzberg)
  - Too Complex
  - Misses indentations
  - Dependent on Scale



# DISPERSION MEASURES

- All may give bad scores to stretched out districts that may have quite regular boundaries and be perfectly justified
- Can miss irregular shapes in urban areas if combined with much larger rural areas

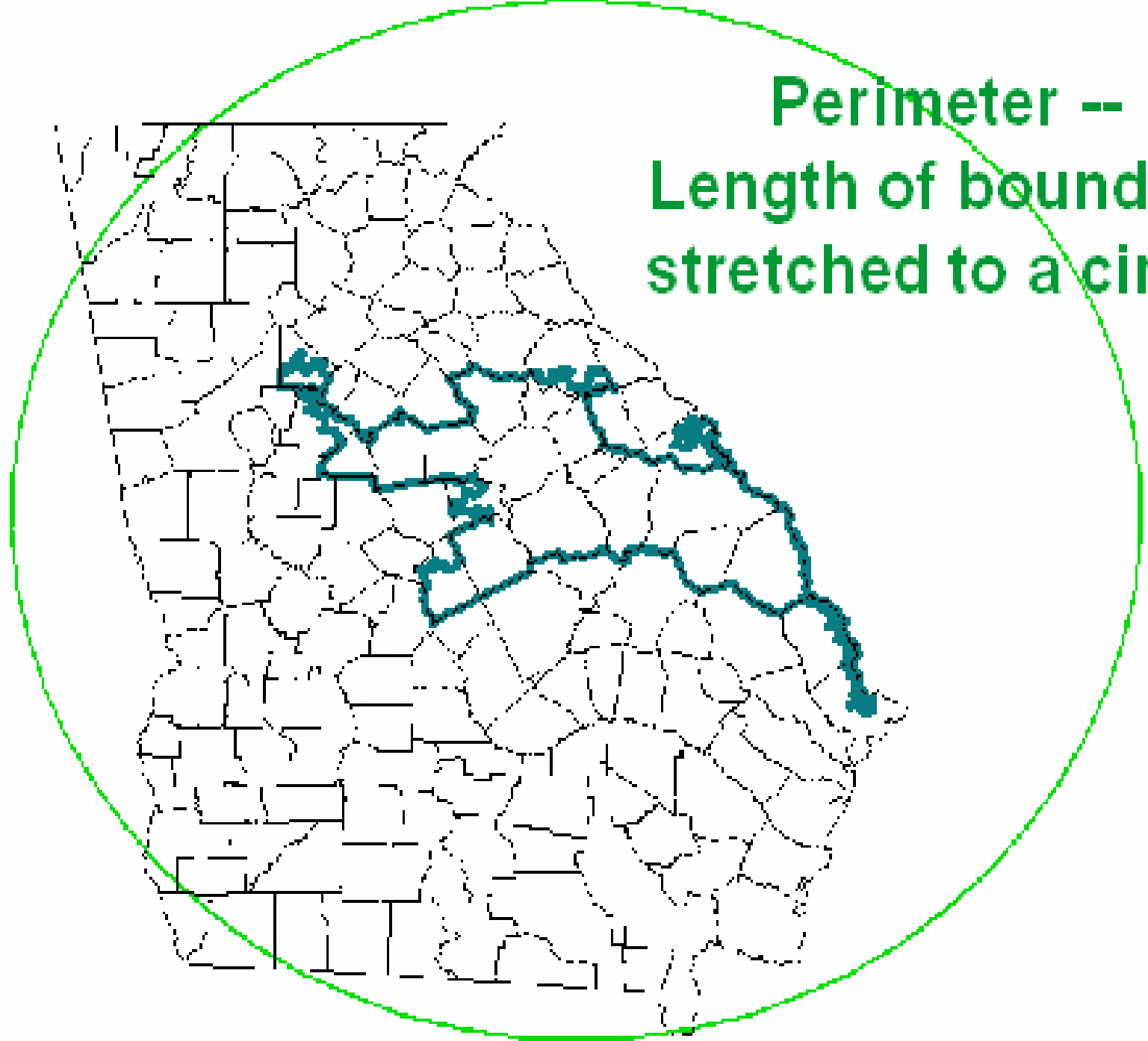
# PERIMETER MEASURES

- Sum of Perimeters
  - Compares one plan to another
  - Plan with shortest perimeter wins
  - All must use same boundary file
  - Simple
  - Allows gerrymanders of urban areas
  - Dependent on Scale

# PERIMETER MEASURES

- Comparison of District Perimeter to Perimeters of Other Compact Figures
- Most Common – PERIMETER CIRCLE
  - Ratio of district area to area of circle with same perimeter
  - Just think of district being filled with air until it expands to be a circle.

**Perimeter --  
Length of boundary  
stretched to a circle**



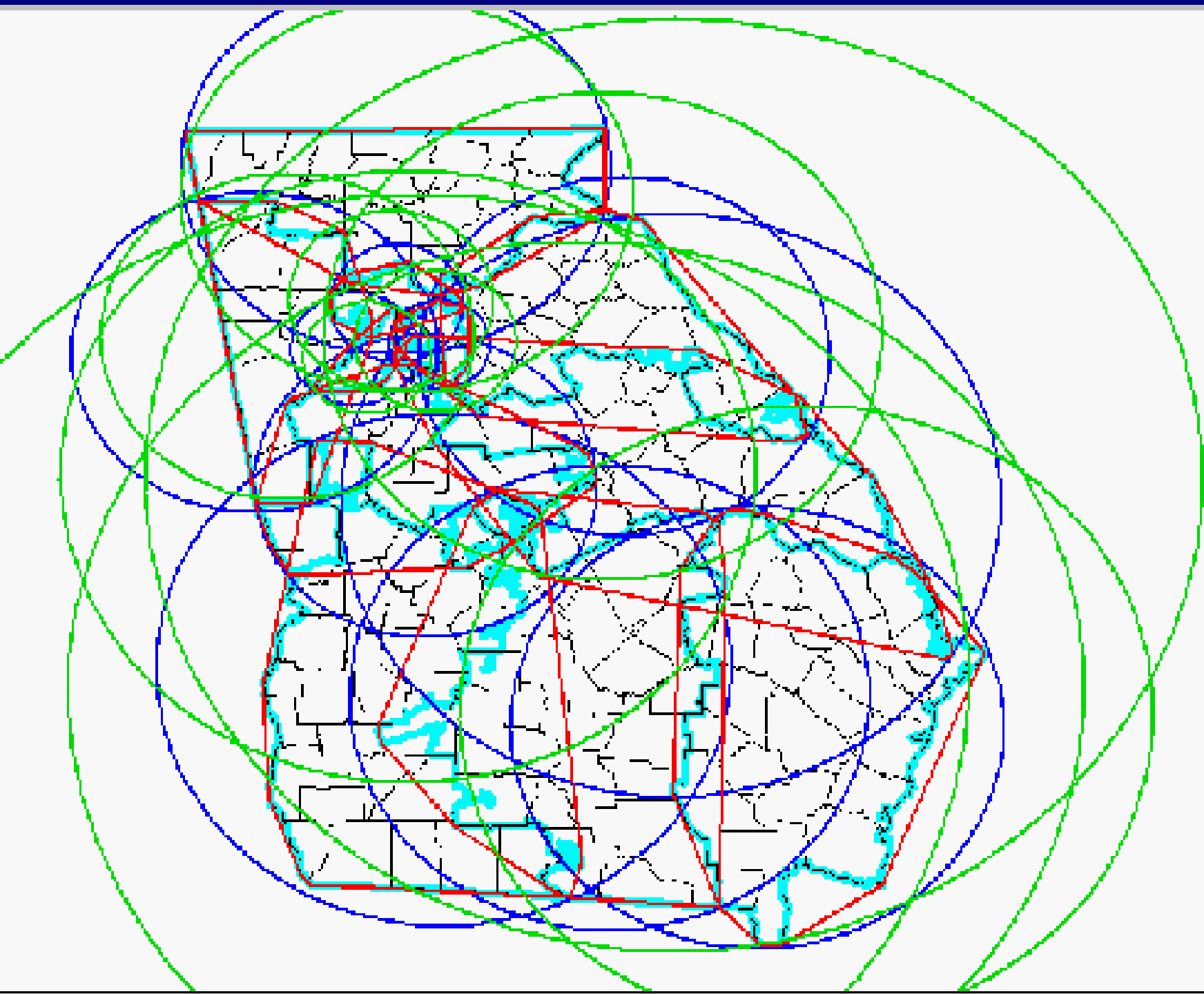
# PERIMETER MEASURES

- Perimeter Circle (Continued)

- Finds “Squiggles”
- Simple to understand
- Penalizes coastlines, rivers & mountain range boundaries (particularly county & state boundaries).
- Misses single protrusions
- Ignores where people are located

# PERIMETER MEASURES

- Sum of Perimeters
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# POPULATION MEASURES

- Based on People – where do they live in comparison to others within and outside the district.
- Two common measures:
  - District population compared with population of compact figure
  - Moment of Inertia



# POPULATION MEASURES

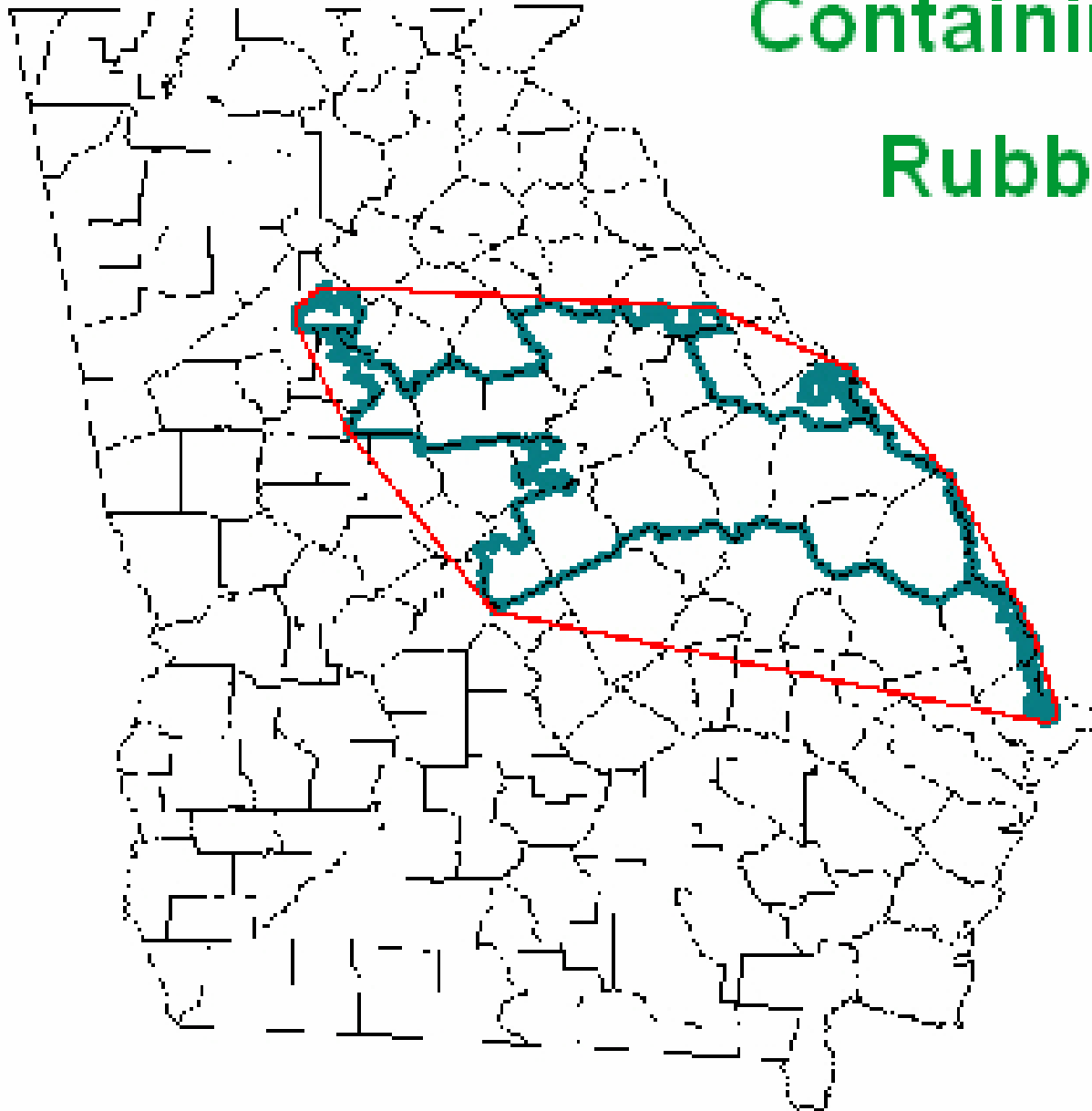
- “Rubber Band
- Ratio of Population within District to Population of Convex Hull drawn around District. “Rubber Band” (Grofman-Hofeller)
  - Measures people bypassed to include other distant people
  - Not subject to scale
  - Complex (difficult to explain to Judges)

# POPULATION MEASURES

- “Rubber Band” (Continued).
  - Is now not difficult to compute
  - Usually involves census blocks – their centroids and populations
  - Can over exaggerate effects of extreme points of vacant geography if unadjusted

# Minimum Convex Figure Containing District

## Rubber-Band



# POPULATION MEASURES

- Moment of Inertia
- Measures distance of centroids of population units from center of district weighted by those points' populations
  - Complex to use
  - Difficult to understand
  - Conflicts with notions of spatial compactness and may be difficult to justify.

# Scholars' Views

## Use of Mathematical Compactness Tests

**“There is no score for any one [compactness] measure ... that on the face of it indicates unsatisfactory compactness...”**

**“Characteristics of the area being districted made identification of such levels impossible.”**

**Richard Niemi, et al  
Journal of Politics (1990)**

# Scholars' Views

## Comparisons of Compactness between States

**“Comparisons [using compactness measures] should be limited to the state or jurisdiction being districted.”**

**“Because of different initial shapes, along with rivers, coasts, and other natural boundaries, [different states' districts] are unlikely to achieve comparable degrees of compactness.”**

**Richard Niemi, et al  
Journal of Politics (1990)**

# Scholars' Views

## Of Trying to Achieve Compactness

“A district pattern of symmetrical squares, although conceivable, well can operate to submerge a significant element of the electorate ...”

“As a practical matter, **absolute compactness** (districts forming perfect circles that are even shorter lines than squares) **is an impossibility.**”

“Rigid adherence to a compactness, however phrased, should be avoided.”

Robert G. Dixon, Jr.  
Political Scientist (1982)




# IN SUMMARY

- Compactness Measures are:
  - All extremely interesting (especially to academics)
  - All produce varied (and often conflicting) results
  - Unlikely to be adopted by courts (specific models)
  - Leave us with the “know it when you see it” standard

# IN SUMMARY

- Compactness Measures (cont.):
  - Only cause trouble in racial gerrymandering unless a very specific state test is mandated
  - Still allow plenty of room for political and racial gerrymandering
  - Are one of the Expert Witnesses' best friends
  - Should, nonetheless, be included in viable software packages
  - Deserve yet another round through the academic grist mill during the this decade

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# COMPACTNESS IN THE REDISTRICTING PROCESS