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What if the 3 April 1974 Tornado Super Outbreak in North Alabama Occurred Now?

April 3, 1974 Satellite Damage Photo



ERTS-1 (Earth Resources Technology Satellite) Image



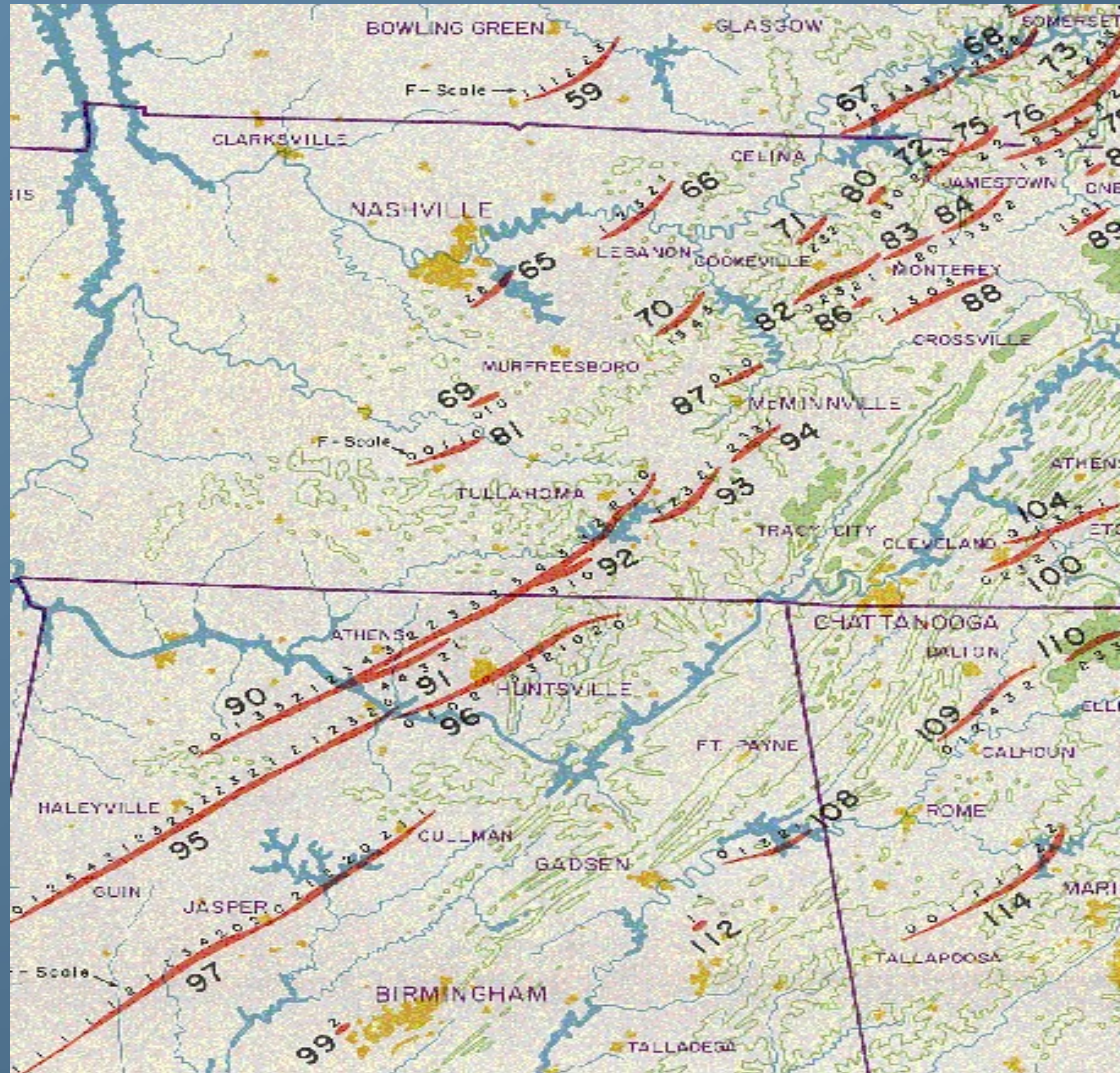
Limestone County AL Damage Photo



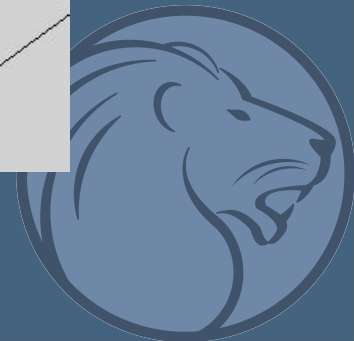
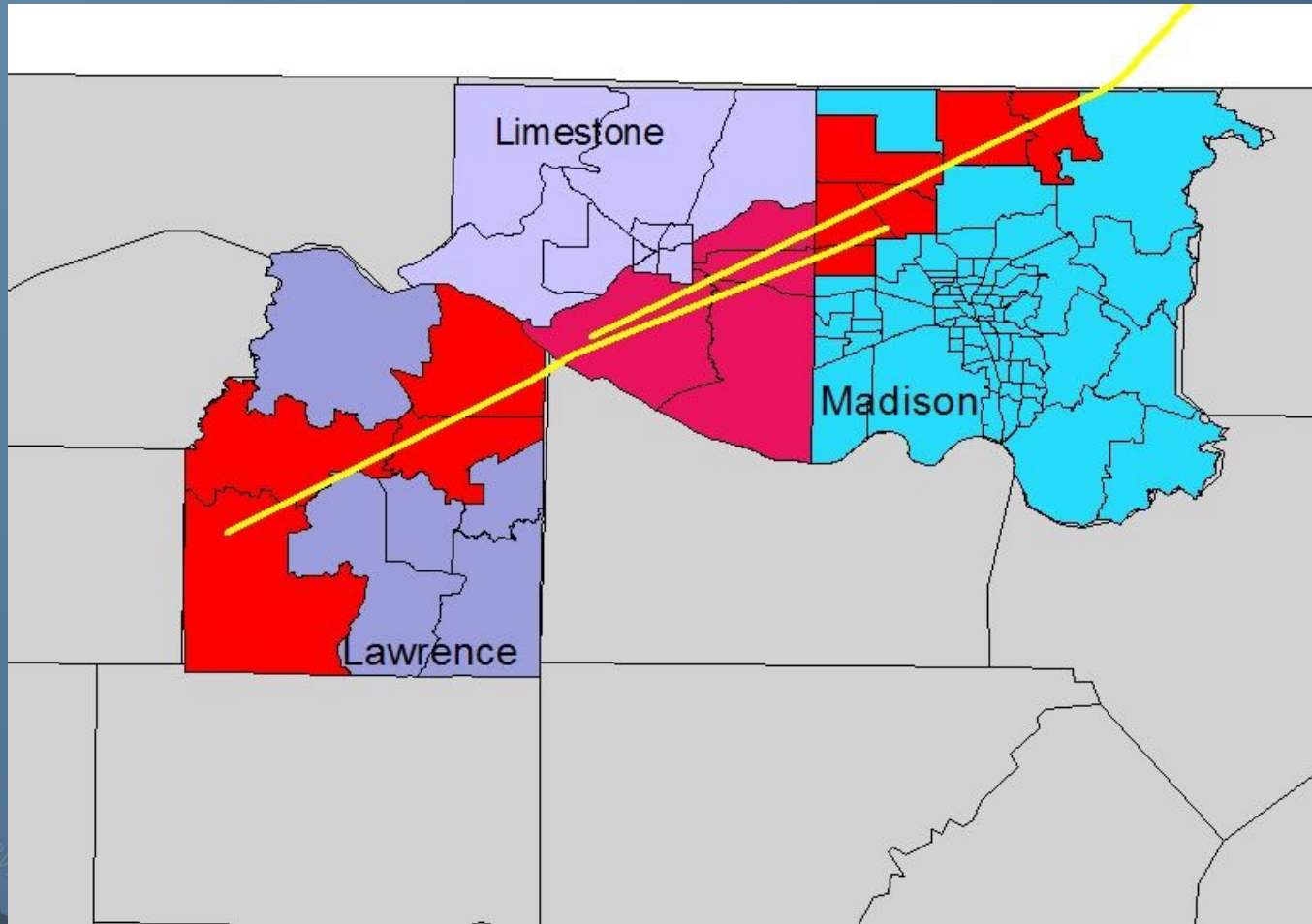
Southeast Huntsville AL Damage



April 3, 1974 Tennessee Valley Tornado Track



Impacted Areas in North Alabama



NWS Huntsville Affected



Why April 3, 1974 Event Comparison

- Provides a hazardous mitigation study to shed light on future tornado threats to the Tennessee Valley region
- Fujita post event analysis provided good spatial representation of damage and tornado tracks
- Historical data was found in NWS Stormdata publication and “Significant Tornado” book



Methodology

- Storm tracks created from latitude/longitude records provided from NWS historical data
- Population data for 1970 and 2000 were collected for the US Census tracts that were impacted by the 1974 events
- Storm tracks created in GIS software and imported into Google Earth, which made it possible to evaluate conditions present on the ground

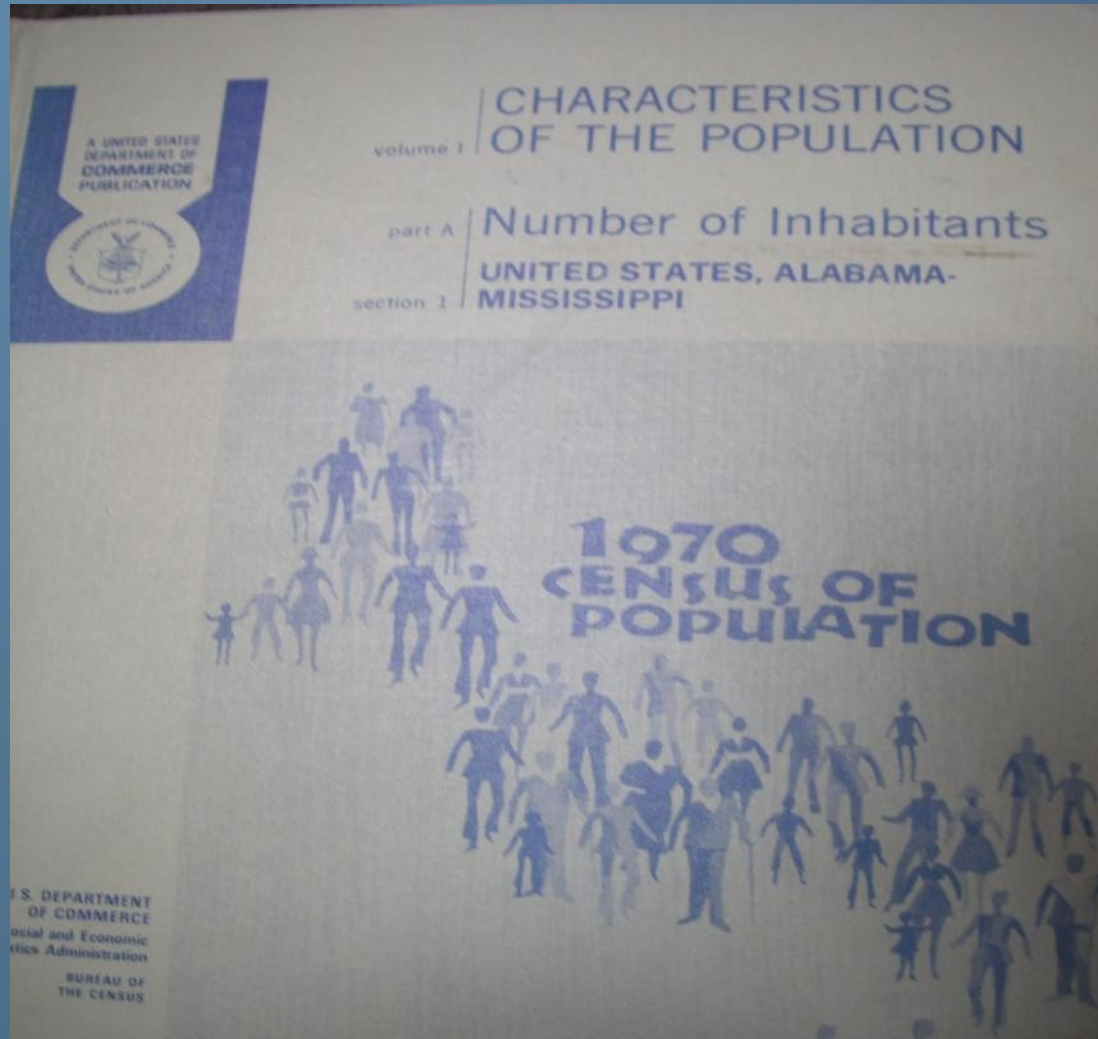


Methodology (cont.)

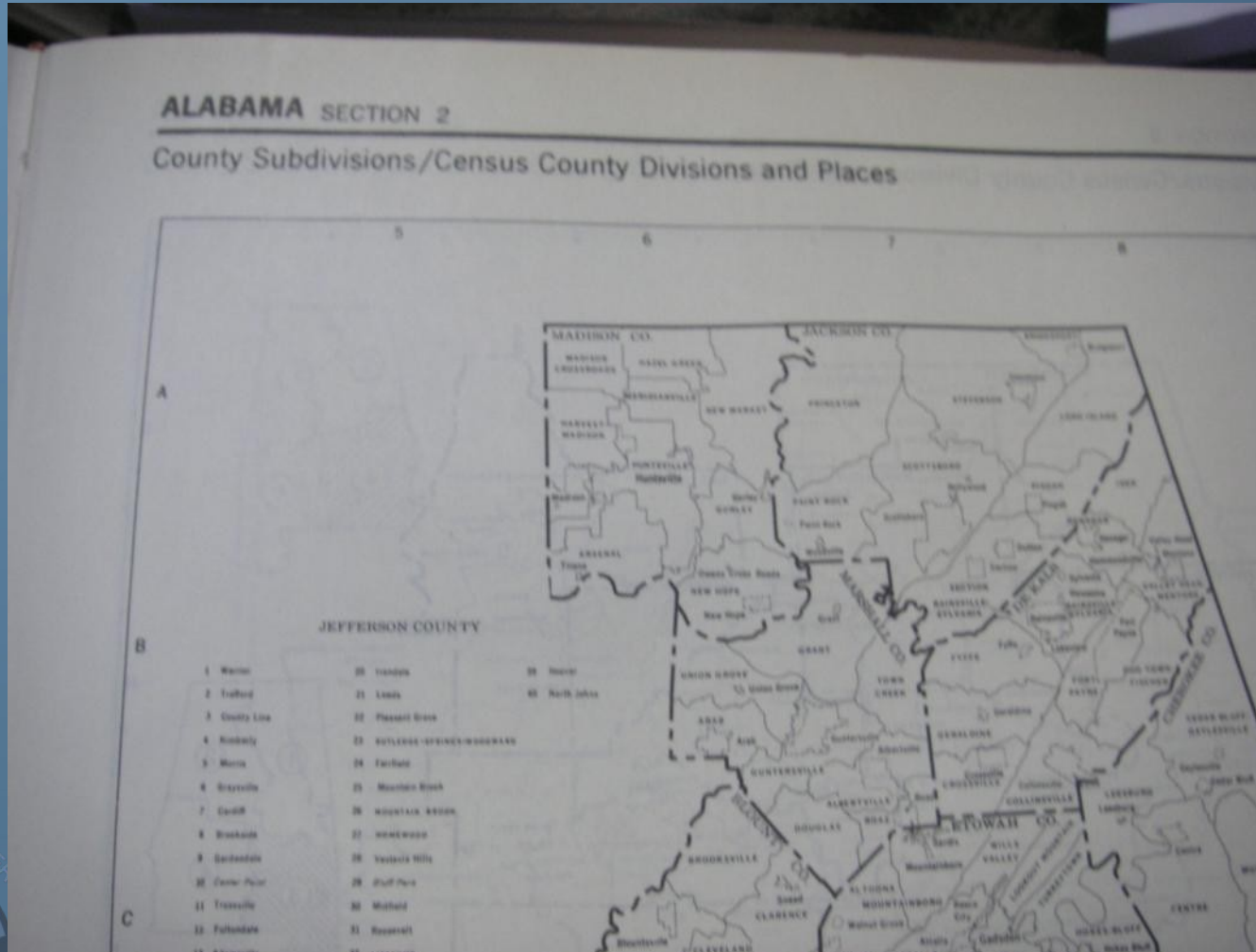
- Obvious changes in growth and development were highlighted and changes were quantified using standard image interpretation techniques
- Estimates of damage were extrapolated based on changes in population statistics for the impacted Census tracts and Economic impacts of 'new' construction extrapolated from image interpretation.



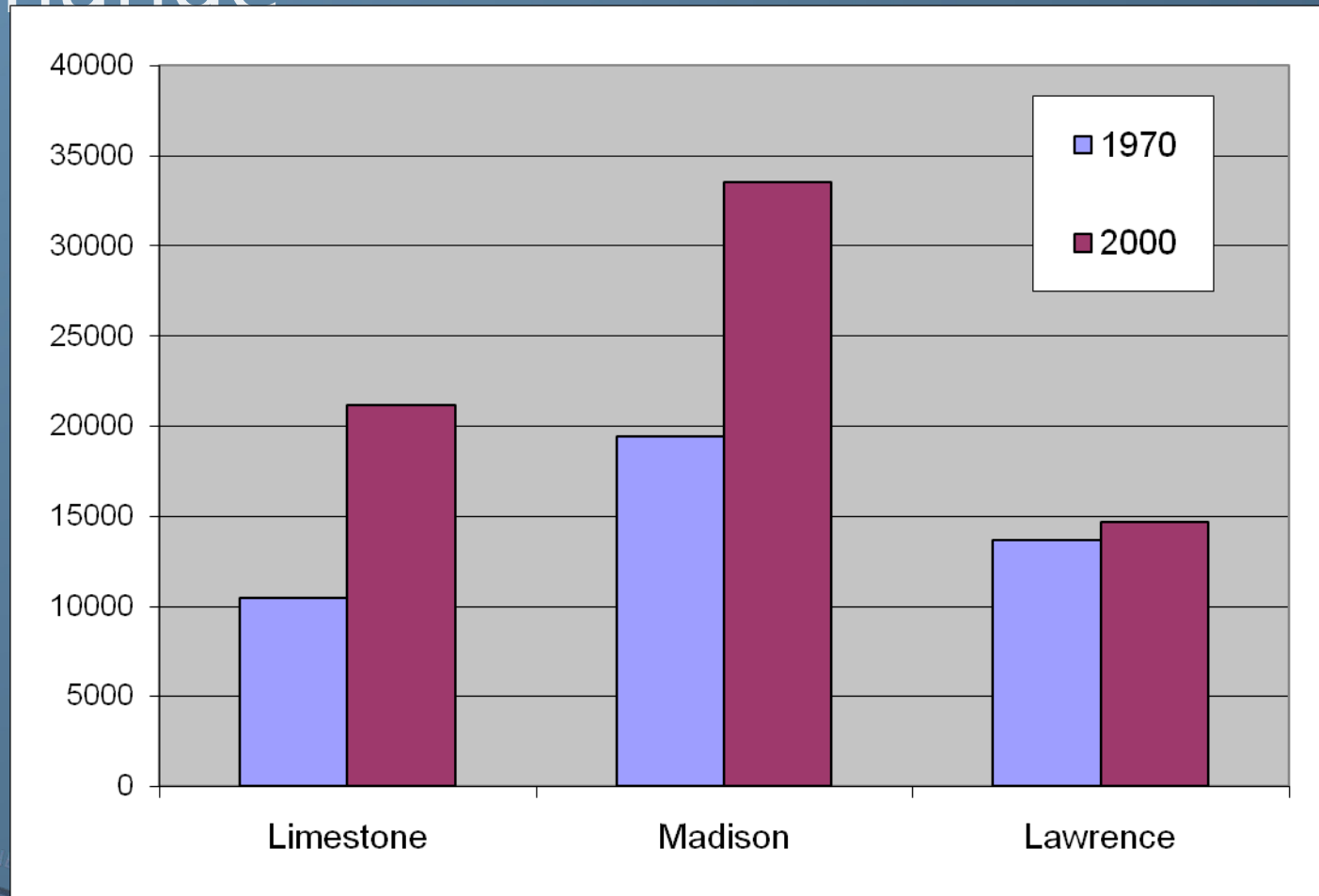
1970 Census Bureau Data



1970 Census Bureau Subdivisions



Impact Area Population Change

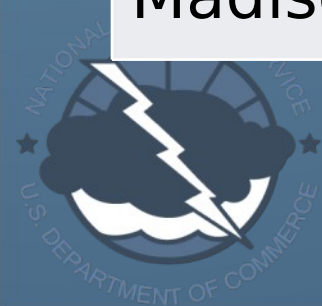


County Population Change 1970-2000

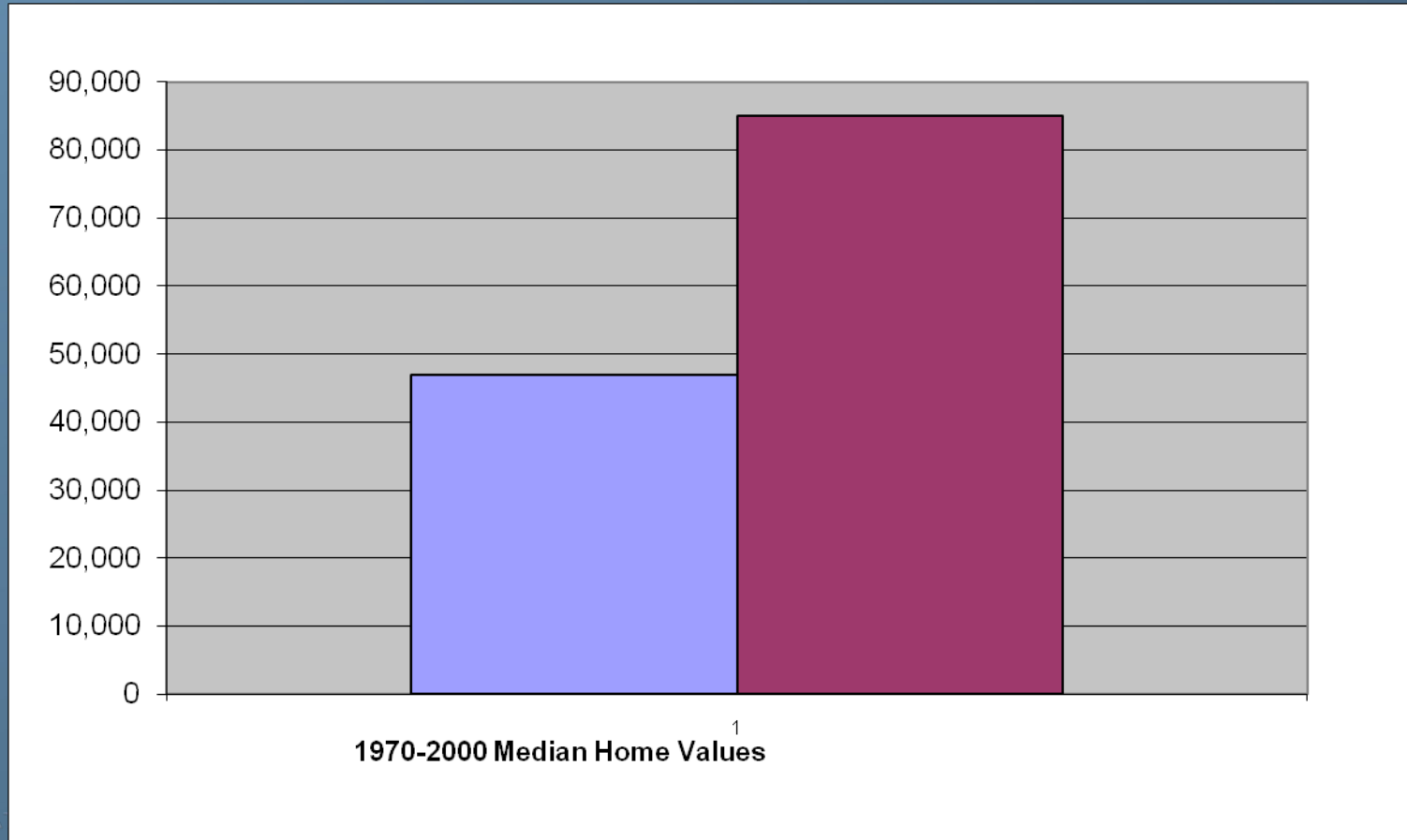
Population	1970	2000	Pct. Change
Limestone Co	41,699	65,676	+37%
Madison Co.	186,540	276,700	+33%

Tornado Track Pop. Change 1970-2000

Population	1970	2000	Pct. Change
Limestone Co	10,416	21,161	+51%
Madison Co.	19,430	33,517	+42%



Alabama Median Home Values

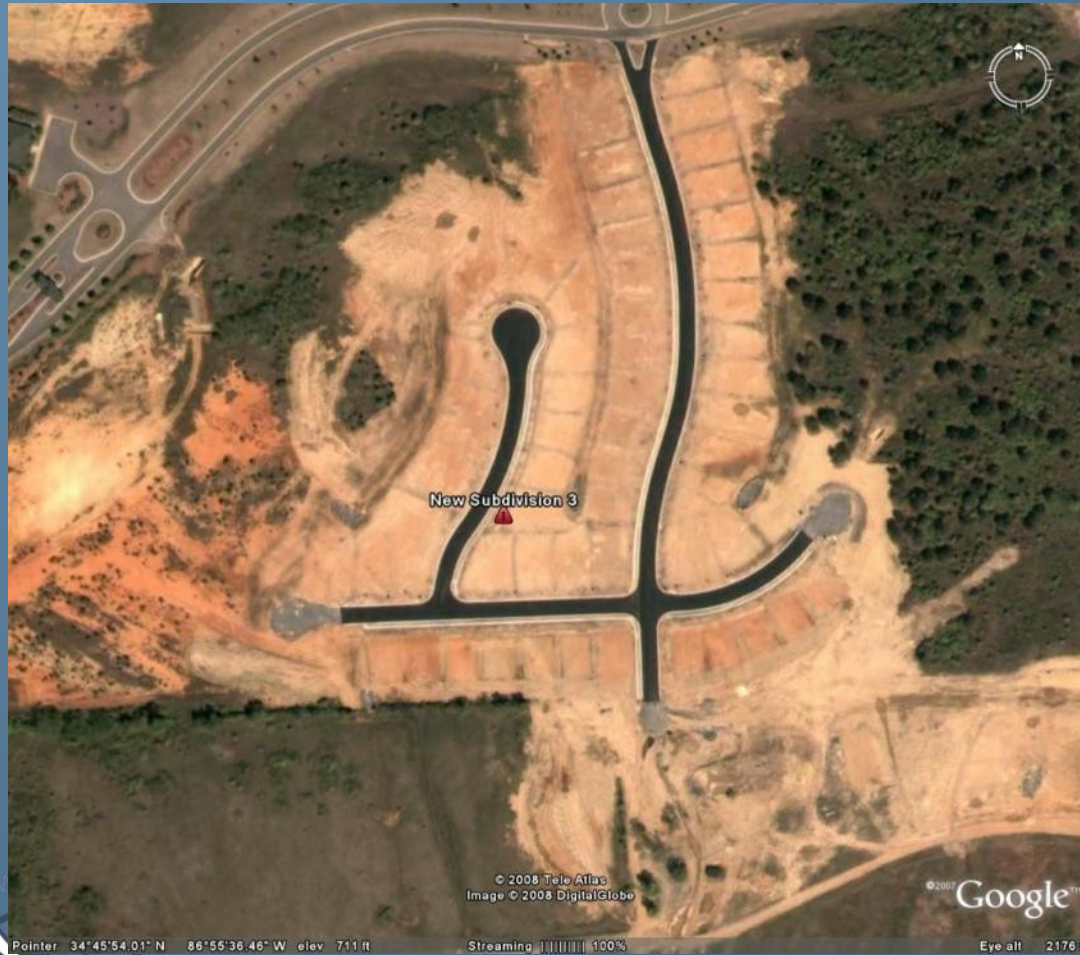


Changes in Madison County, Alabama

- In 1974, over 1,100 buildings in north Alabama were completely destroyed
- In Madison county, A 3.2 mile part of storm track has over 500 homes, and at least 10 new subdivisions
- 2 new K-8th grade schools have been built inside track, totaling 1,743 more students



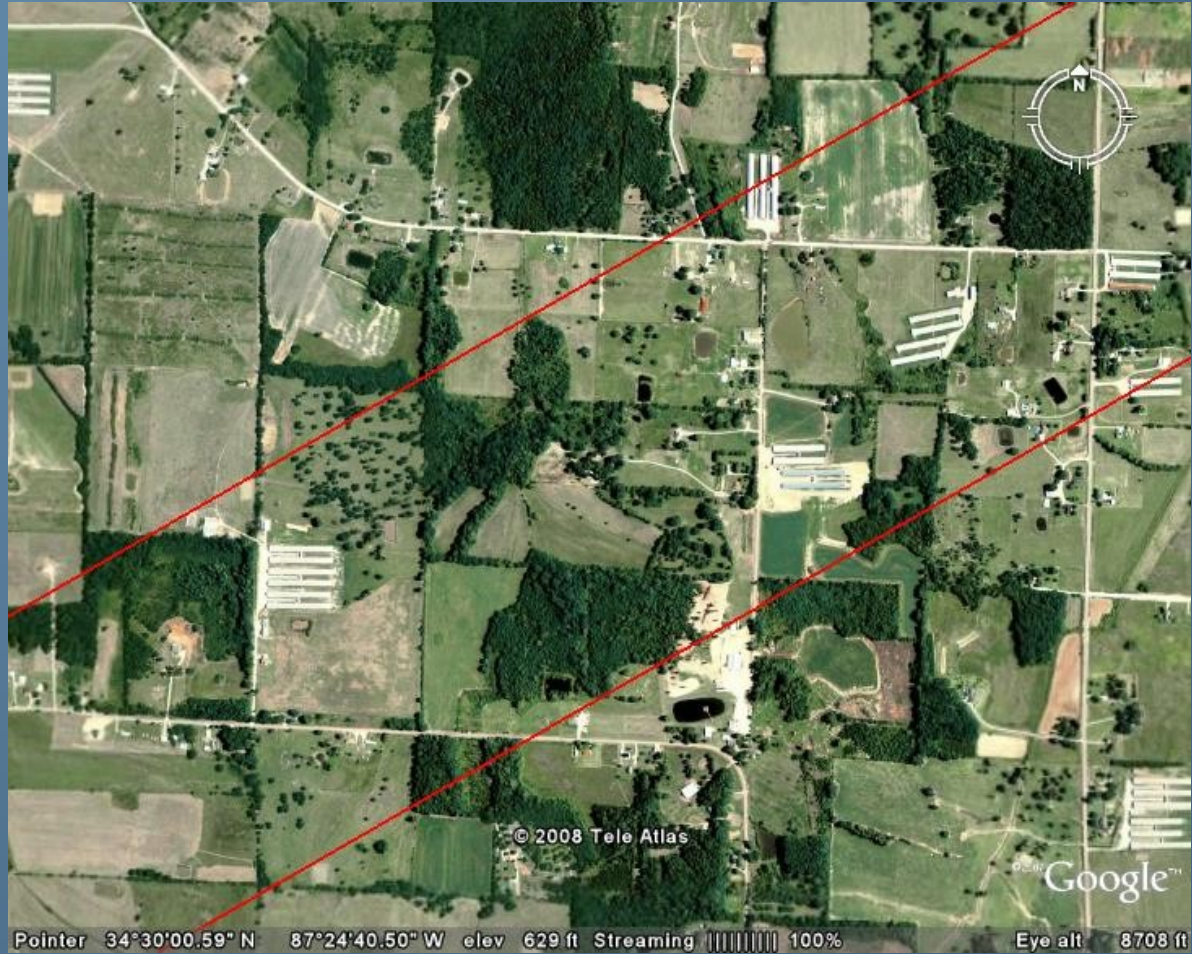
Track 1-Limestone County Effects



63 homes with potential for complete destruction just southeast of Athens, Alabama



Track 2- 22 Chicken houses in Tornado Path



Southwest Lawrence County, Alabama



Limestone County's Increased Population



69 New Mobile homes in eastern Limestone County, Alabama in direct path of tornado



Densely Populated Area Affected



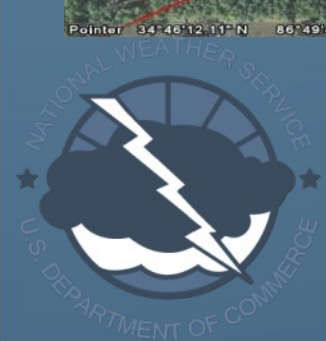
3.22 mile area
in eastern
Limestone
County, 3 miles
east of Athens



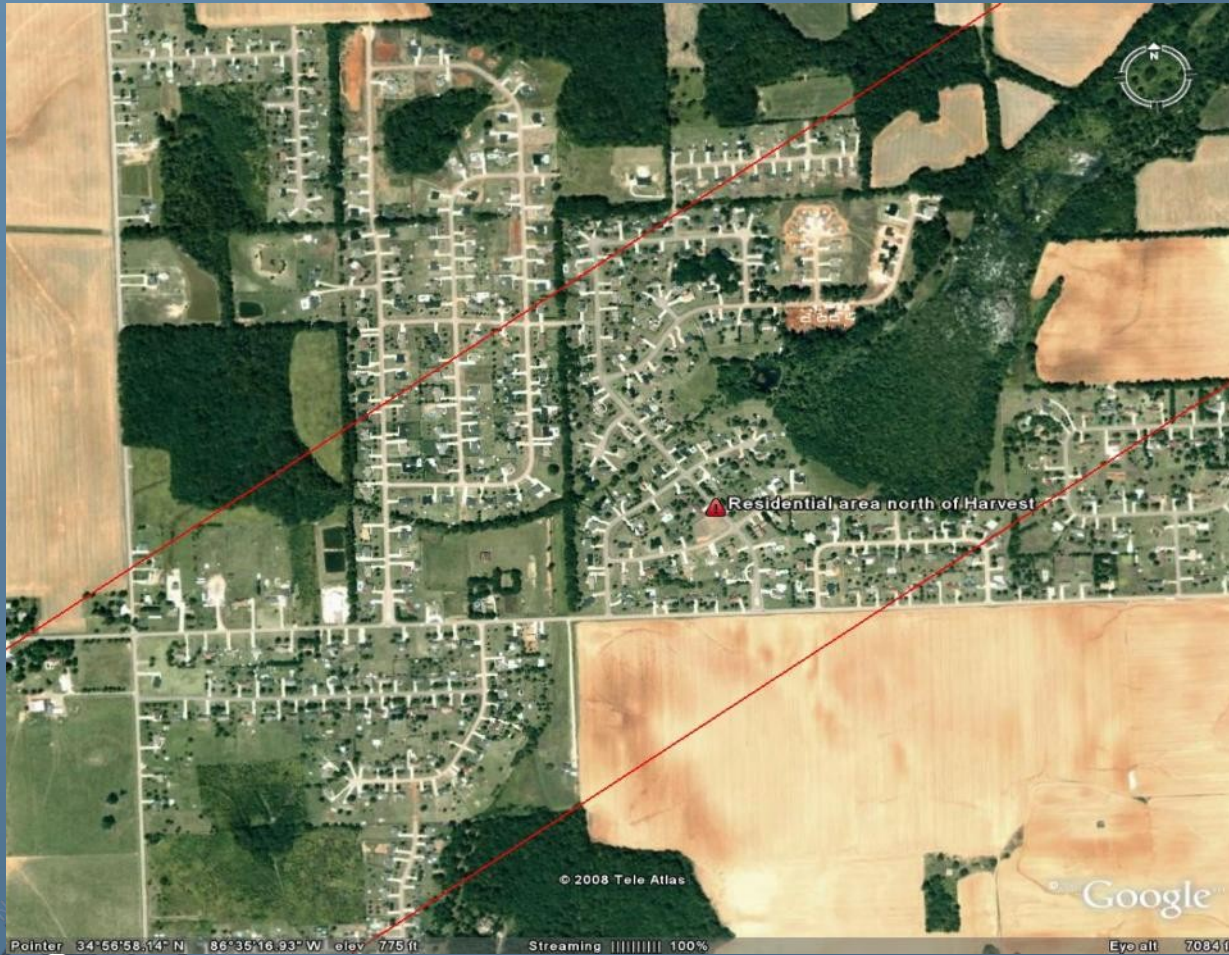
Madison County Subdivision Construction



106 homes in
the Harvest
area



Harvest Area



New
Construction in
path of 1974
tornado



Damage Estimates

- 1974 \$50 million dollar damage would be over \$231 million dollars in 2000 dollars
- Population increase plus over 600 new homes built in tracks would add \$170 million dollars to projected damage
- Total estimated damage=\$401 million



Fatality Estimates

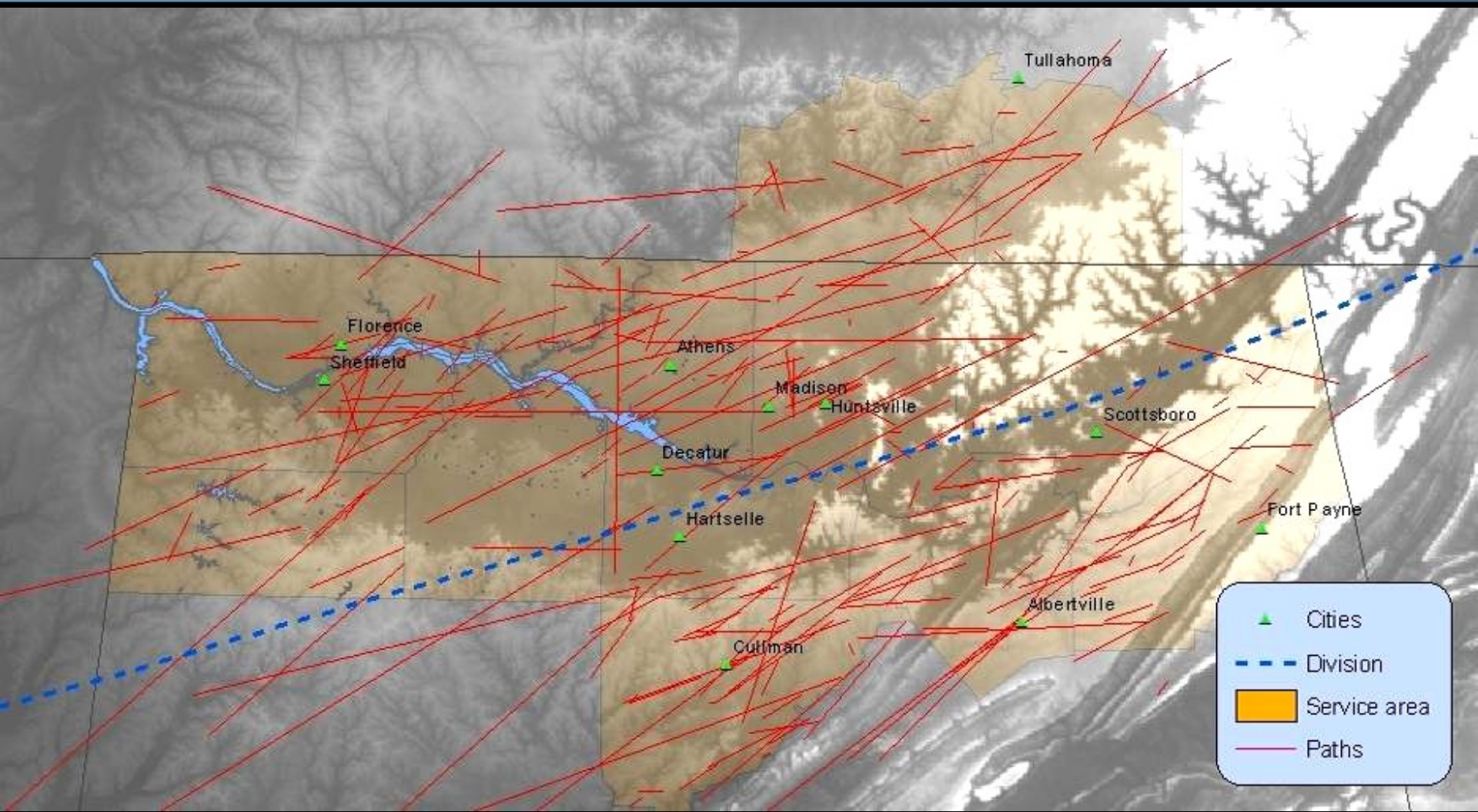
	1974	2000
Limestone County	15	23
Madison County	17	24
Lawrence County	17	24



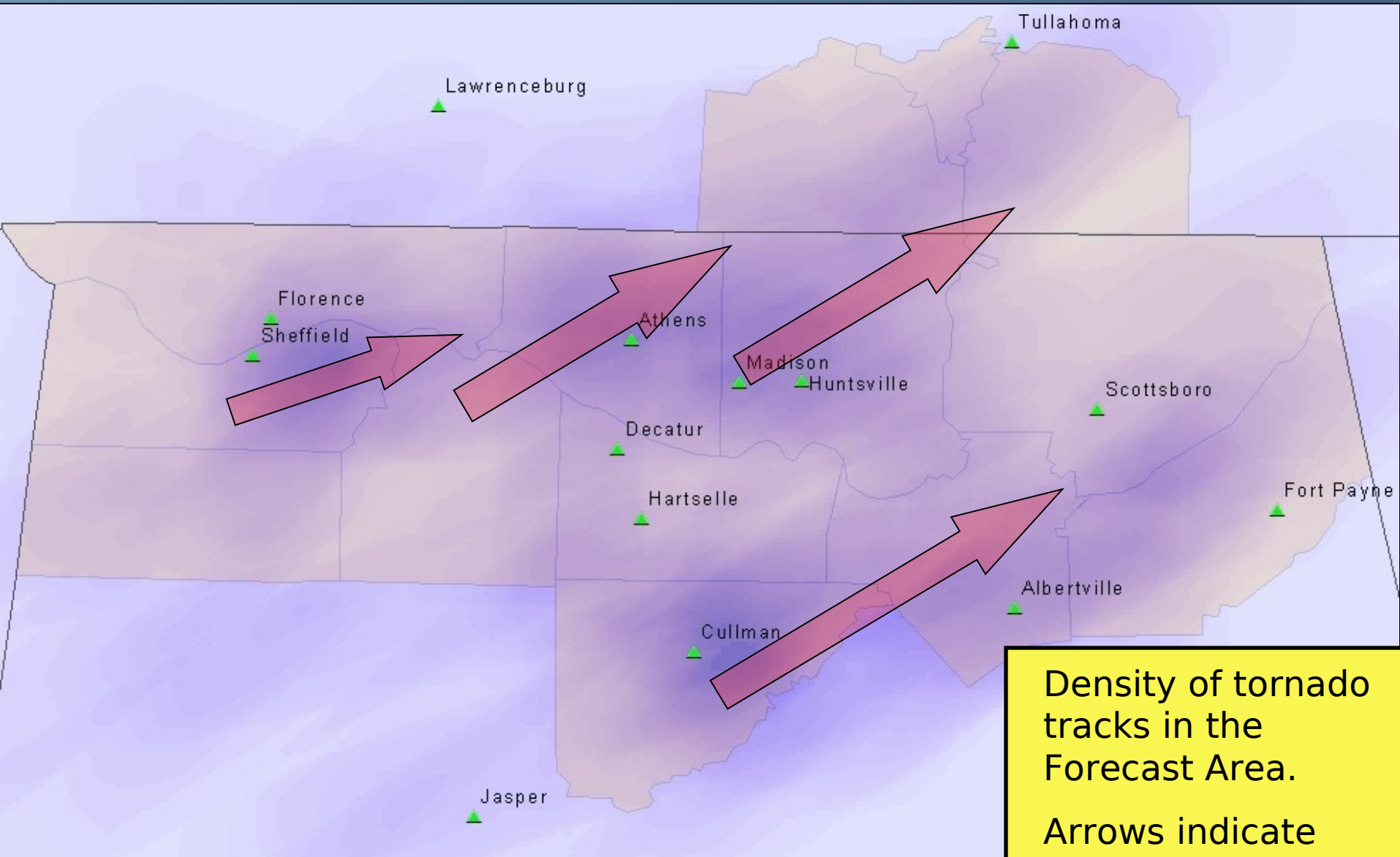
Opportunities in Severe Weather Climatology:

- Using Historical Event data with current 'on the ground data'.
- Identifying spatial patterns in historical data.
- Developing visualization and data extraction tools for use with severe weather predictions.



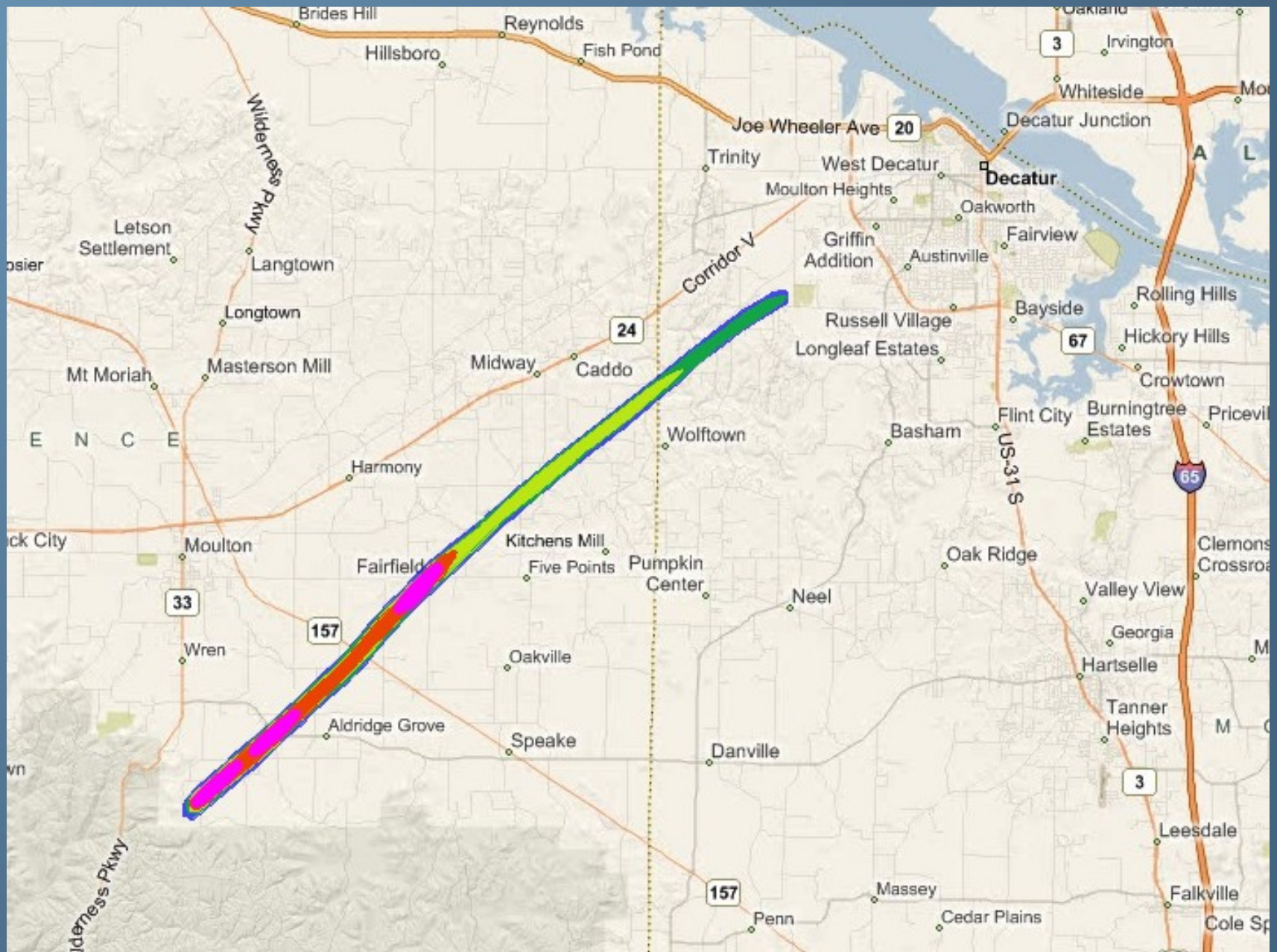


Tornado Tracks Huntsville Forecast Area 1874-2006



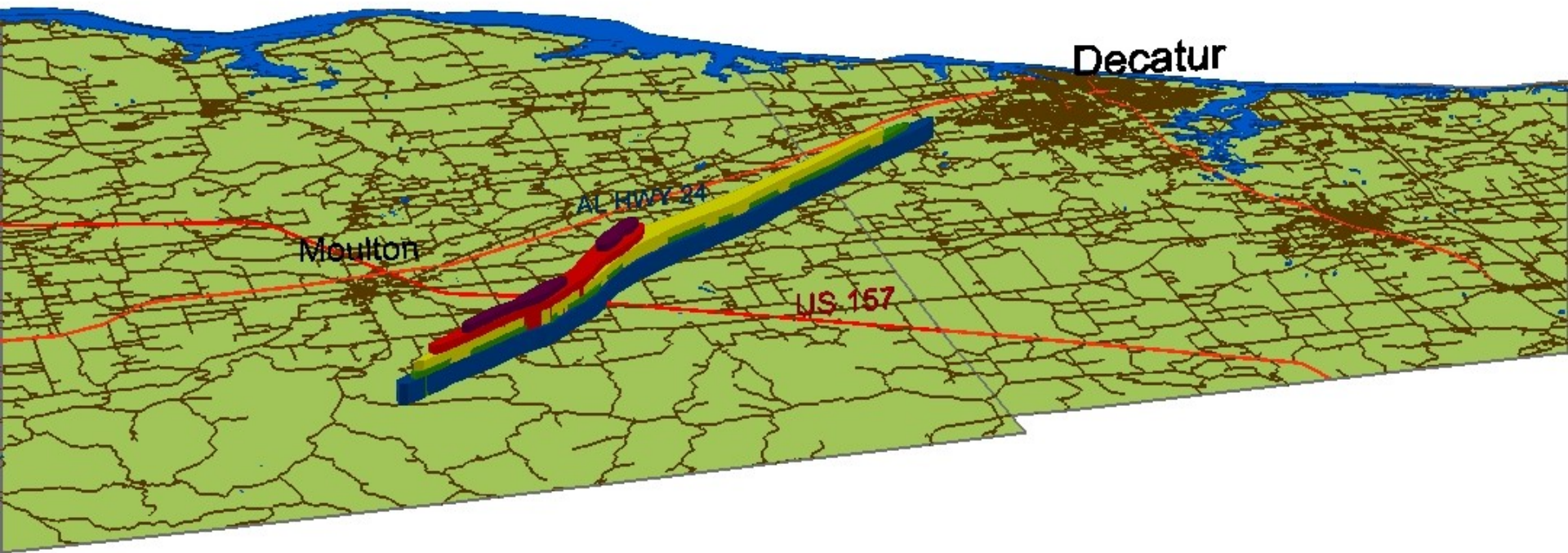
Density of tornado tracks in the Forecast Area.

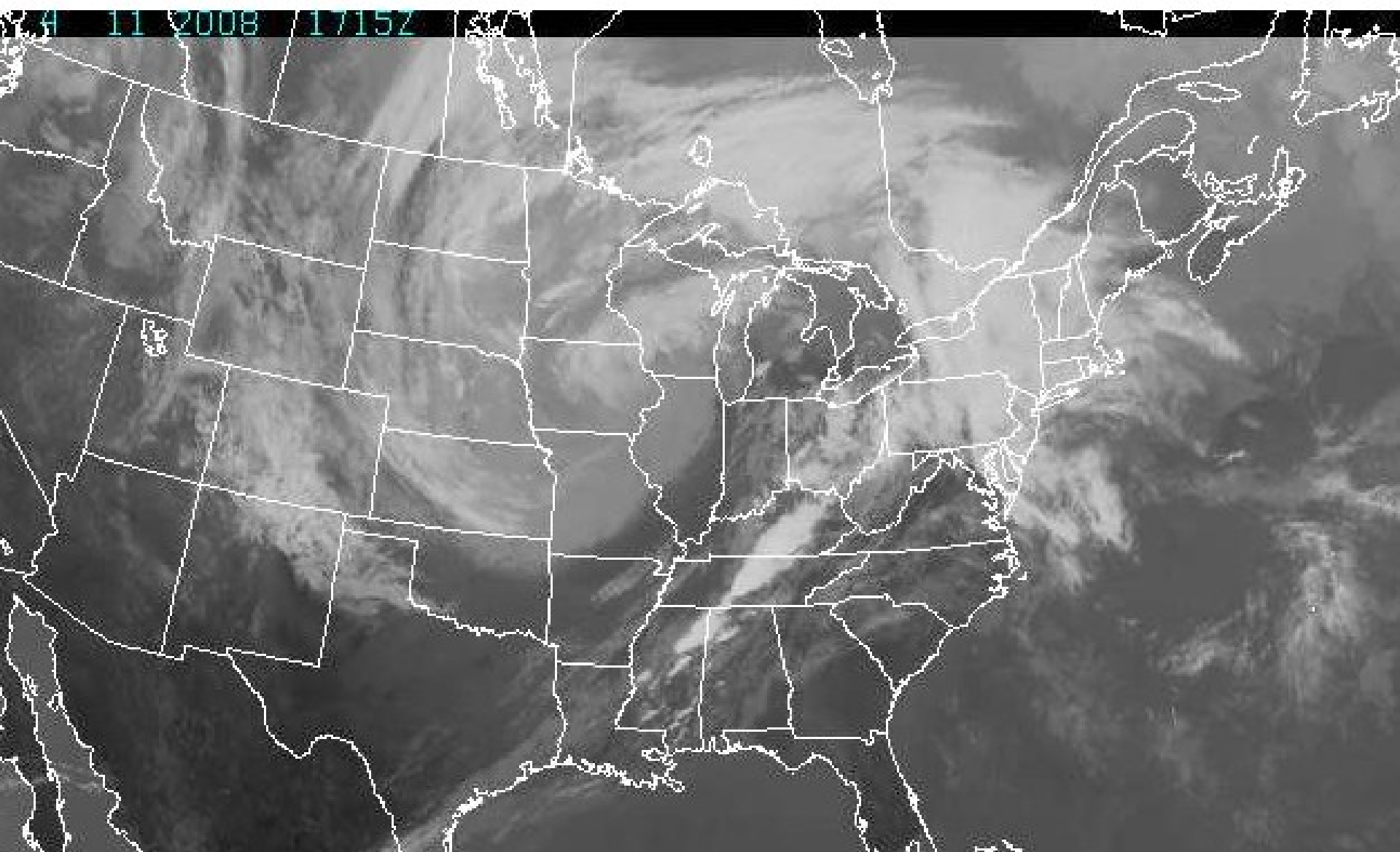
Arrows indicate what appear to be 'preferred' storm tracks.



February 2008

Tornado Track as a 3D image





Classic Mid-Latitude Cyclone... Severe
Weather in the Tennessee Valley 11 April
2008

Composite Reflectivity

NWS Memphis, TN

12:57 PM CDT Fri Apr 11 2008



Short Range Images

Reflectivity:
Composite Loop
Base Loop

Velocity:
Storm Relative Loop
Base Loop

Rainfall:
1-Hour Total Loop
Storm Total Loop

MouseOver Off

Long Range Images

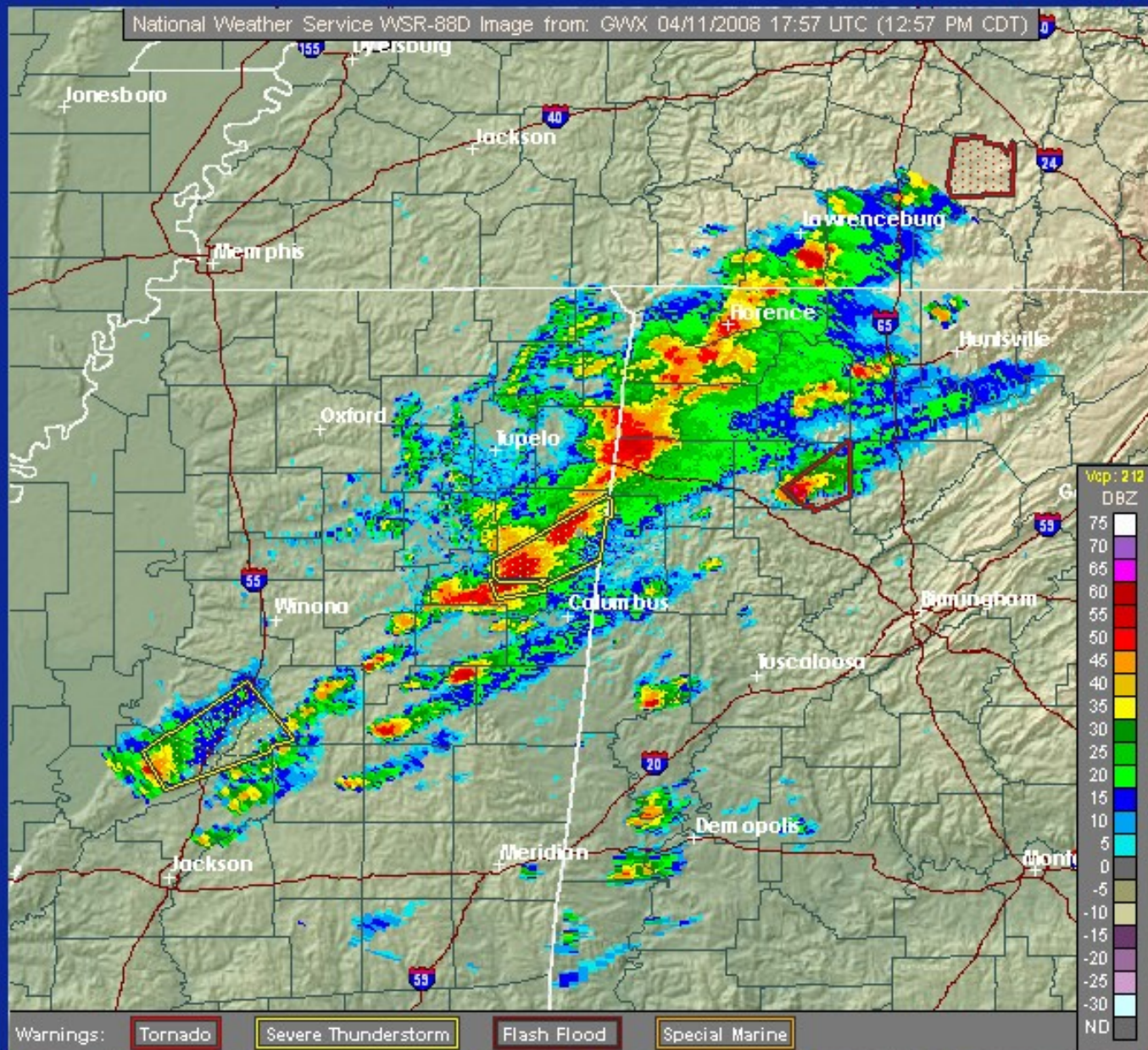
Reflectivity:
Base Loop

U.S. Views

Reflectivity:
National Loop
Alaska Loop
Hawaii Loop
Guam Loop
Puerto Rico Loop
Radars by State

Additional Info:

Radar FAQ
Downloading Images
Mobile Users
GIS Users **KML**
Doppler University
Color Blindness Tool
Credits

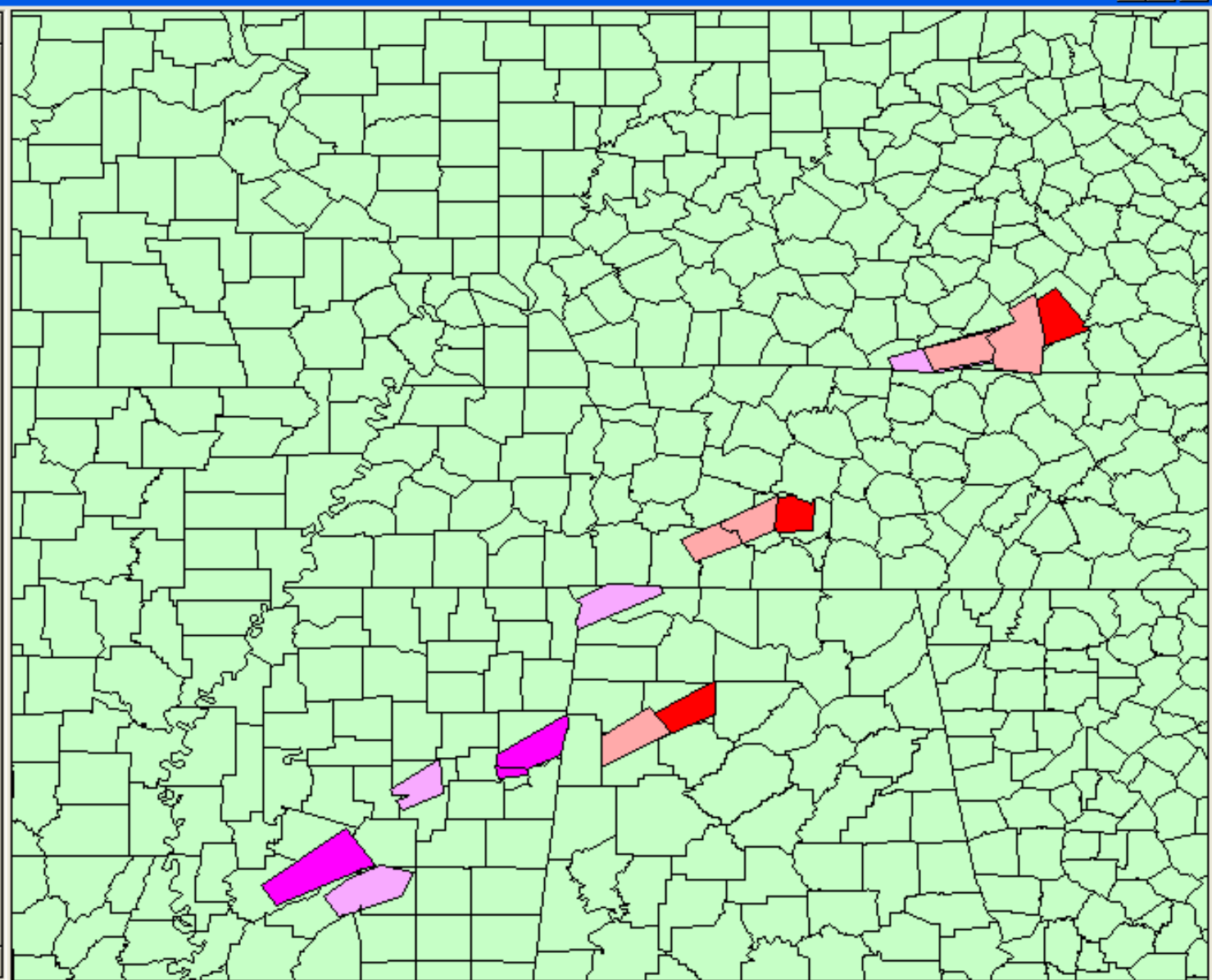


Warnings: Tornado Severe Thunderstorm Flash Flood Special Marine

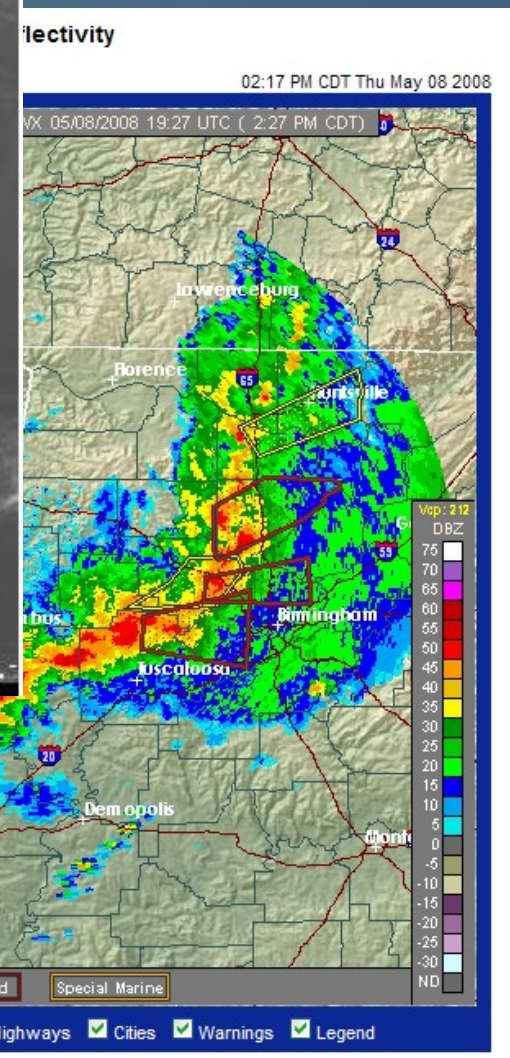
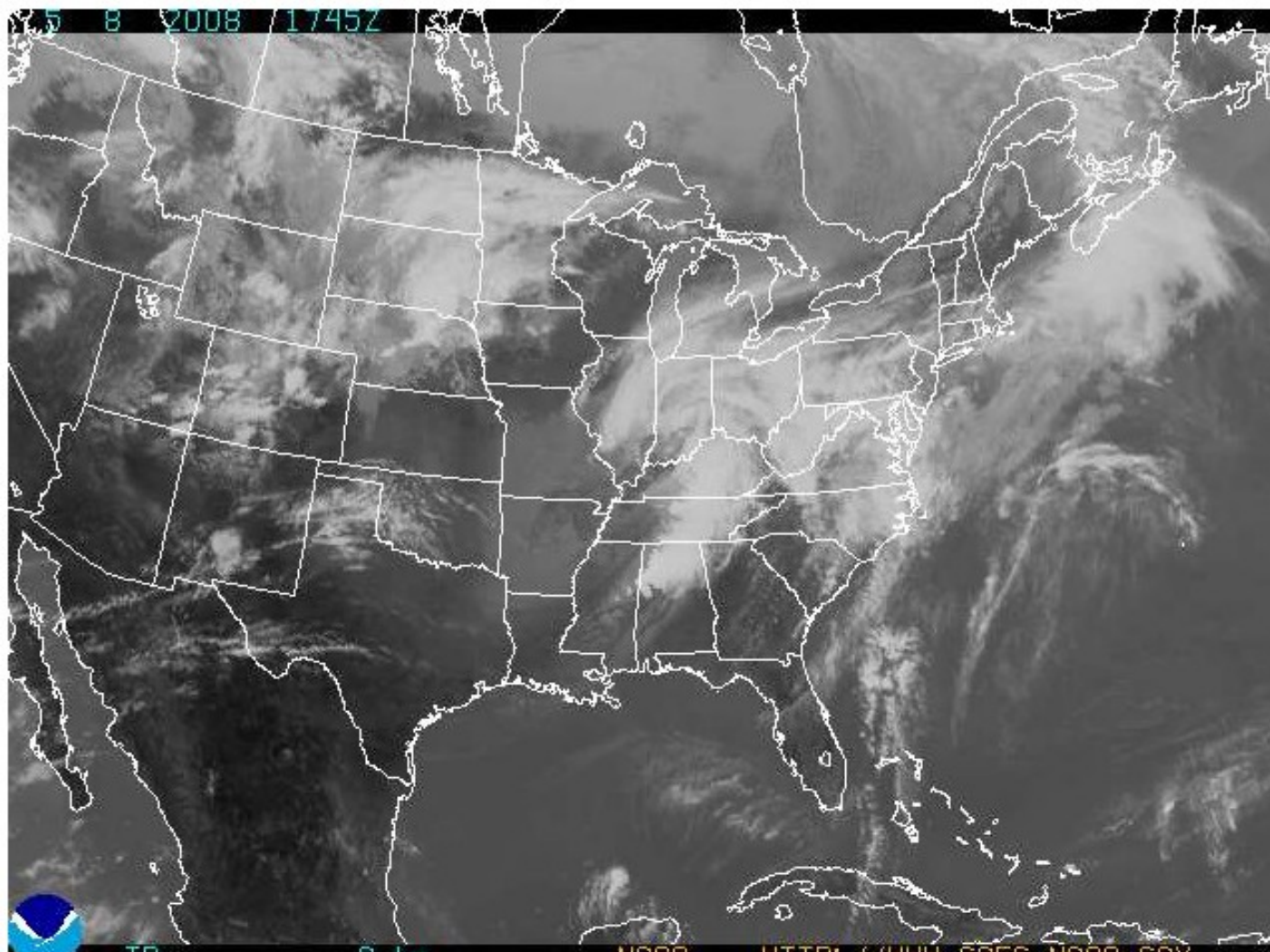
Topo Radar Counties Rivers Highways Cities Warnings Legend

National Weather Service - Since 1870

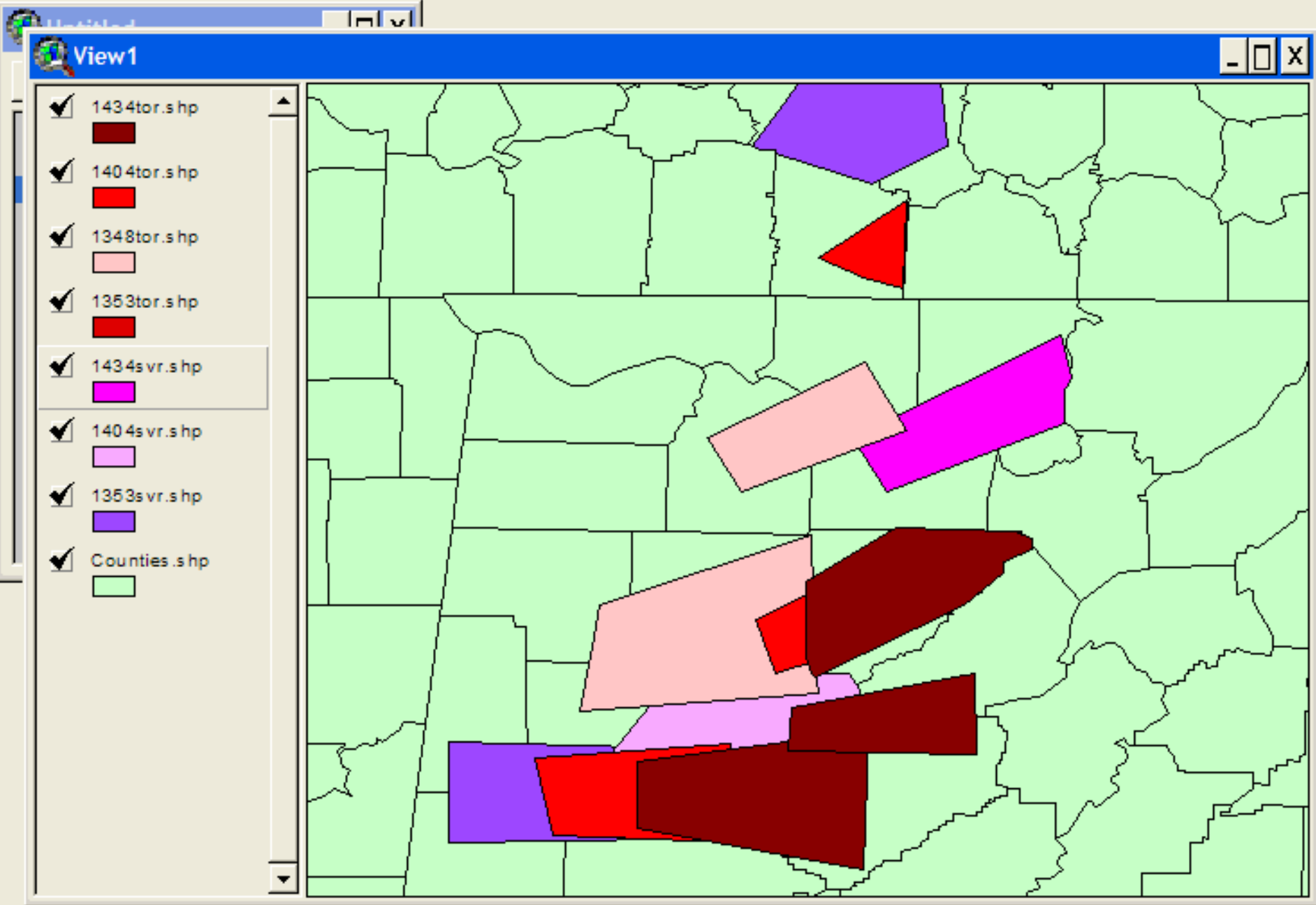
- Tor1.shp
- Tor.shp
- Svr1.shp
- Svr.shp
- Counties.shp



11 April 2008



8 May
2008



8 May 2008

Acknowledgments

Special thanks to Misty White and Andrew Gatlin, University of north Alabama for their assistance.

Thank You!

