

Eastern Shawnee Tribe of Oklahoma

“Focusing Title V Permit Reviews Using Backward-trajectory Modeling”

Presented By:

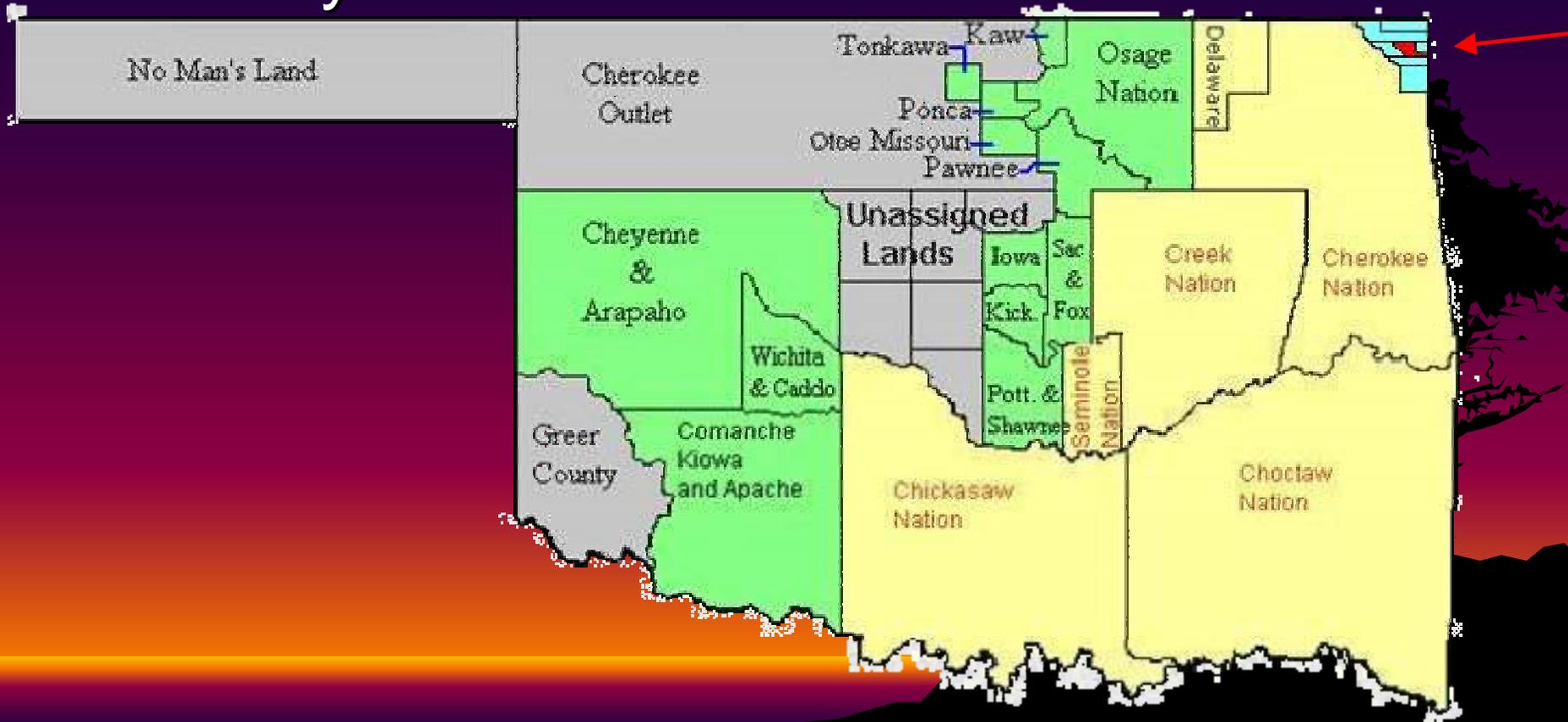
April Crouch

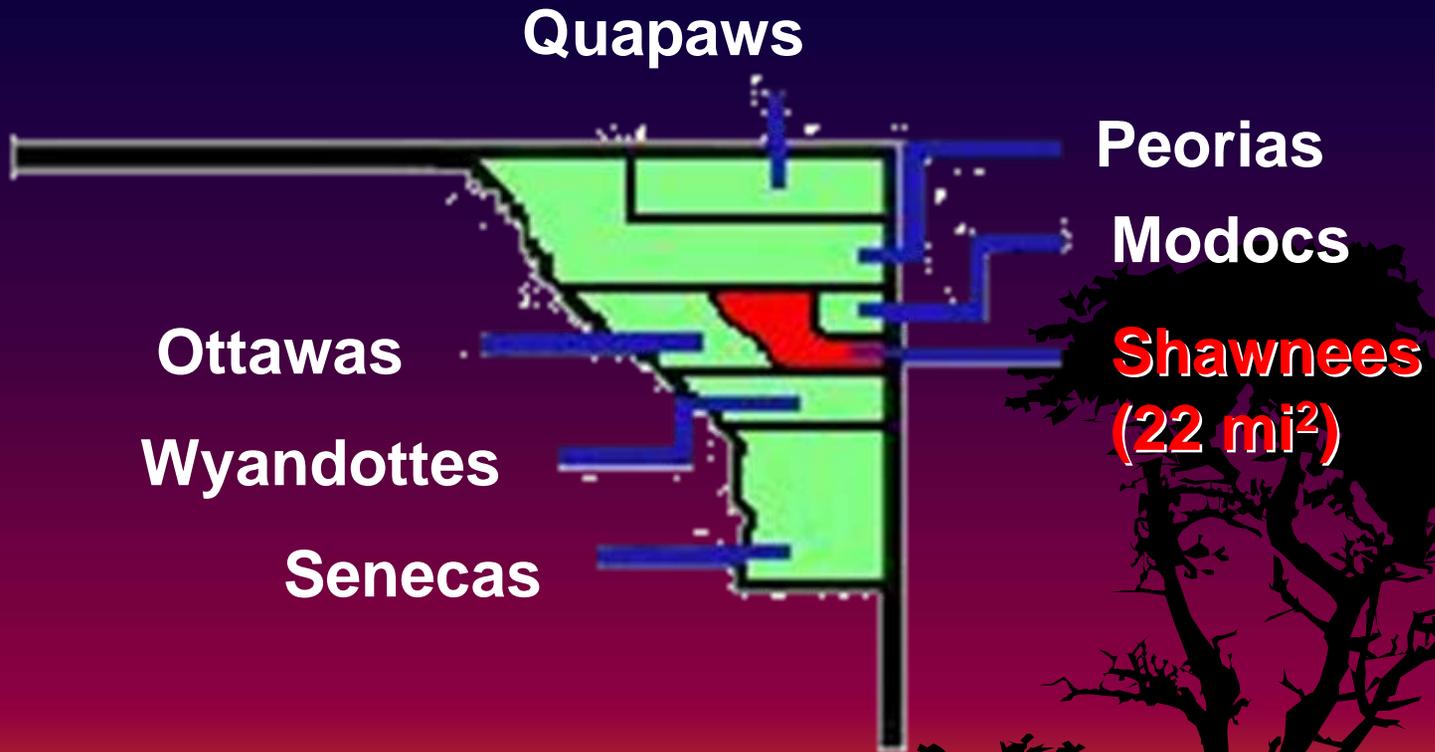
Air Quality Officer



Eastern Shawnee Treaty Boundaries

- 22 square miles of Eastern Shawnee Treaty Boundaries





Buffalo on Tribal Land



Tribal members

- In 2005, the tribe had an enrollment of 2,362 members

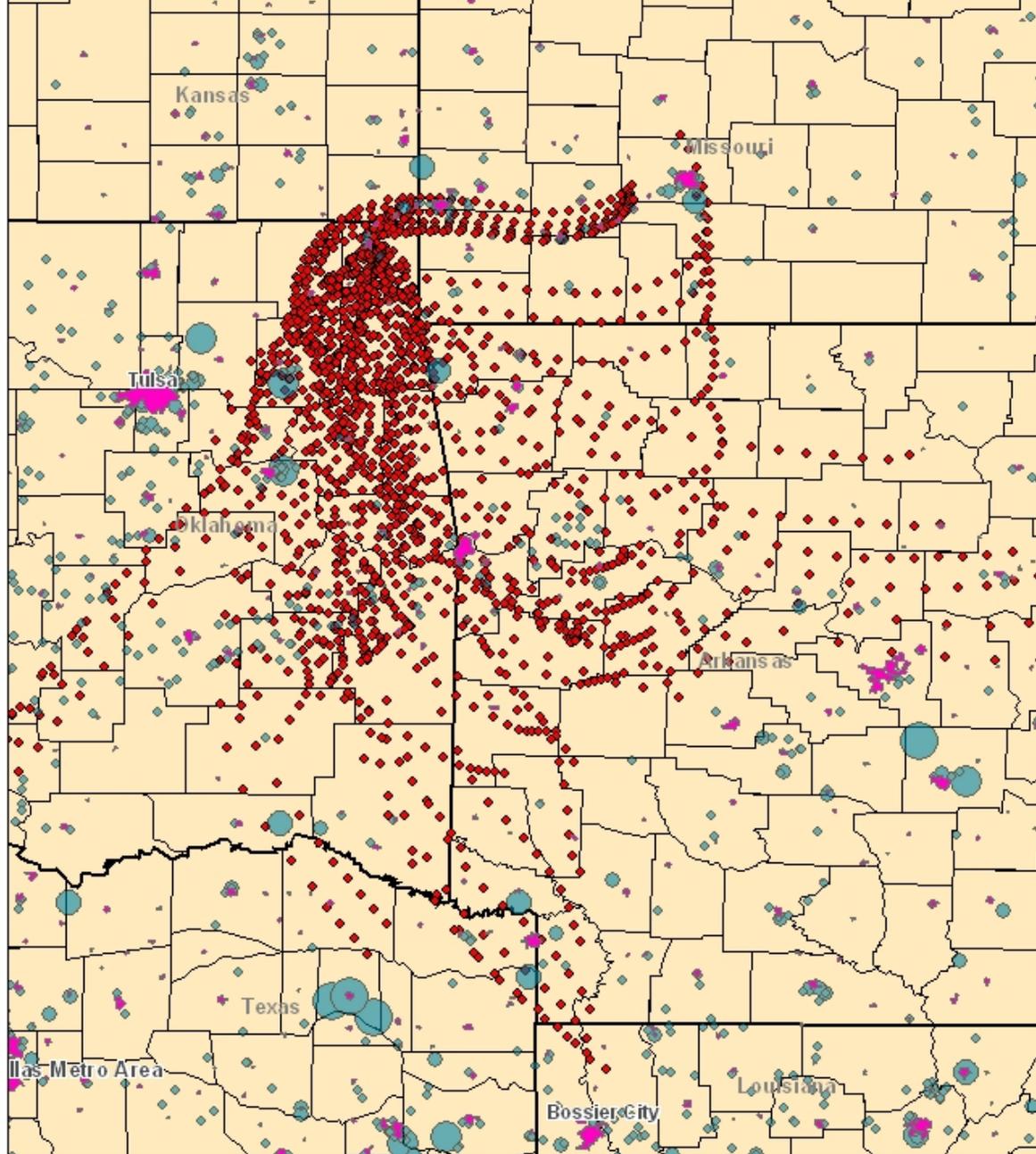


AIR PROGRAM

- Smoke-free Homes
 - Pledge to keep your home and car smoke-free to protect children's' health
 - EPA Region 6 H.E.L.P. for Kids
 - Conduct environmental assessments of homes and daycares to assess hazards to children
 - Burn barrels
 - Discourage burning of residential trash
 - Wood burning stoves
 - Inform community how to burn firewood more efficiently to reduce particle pollution
 - Perform backward-trajectory modeling of ozone to focus Title V permit reviews
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- A silhouette of a tree is positioned on the right side of the slide, set against a background of a sunset or sunrise. The sky transitions from a deep purple at the top to a bright orange and yellow near the horizon, where a thin line of light is visible. The tree's branches are dark and detailed, extending towards the top right corner.

Backward Trajectory Modeling

- Trajectories represent the flow path of a parcel of air over time
- 6 trajectories per day, starting at peak hours (11 a.m. – 4 p.m.)
- Each trajectory goes backward for a period of 24 hours
- Obtain ozone concentration data from Quapaw Tribe's air monitor (5.5 mi. NW)
- Map 20% highest concentration days for ozone to focus permit reviews
- HYSPLIT SOP- email: april@easternshawnee.org



Legend

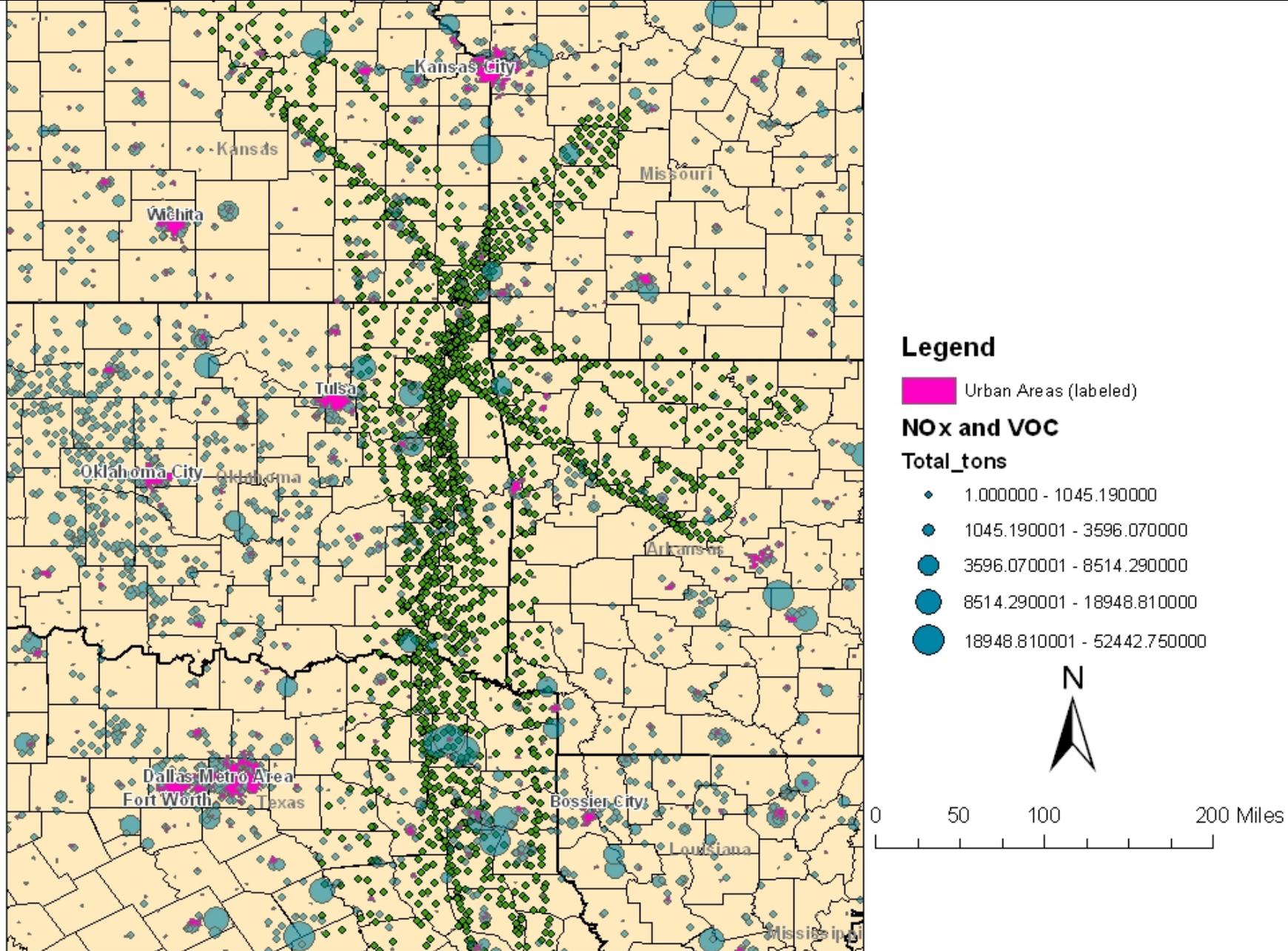
NOx and VOC

Total_tons

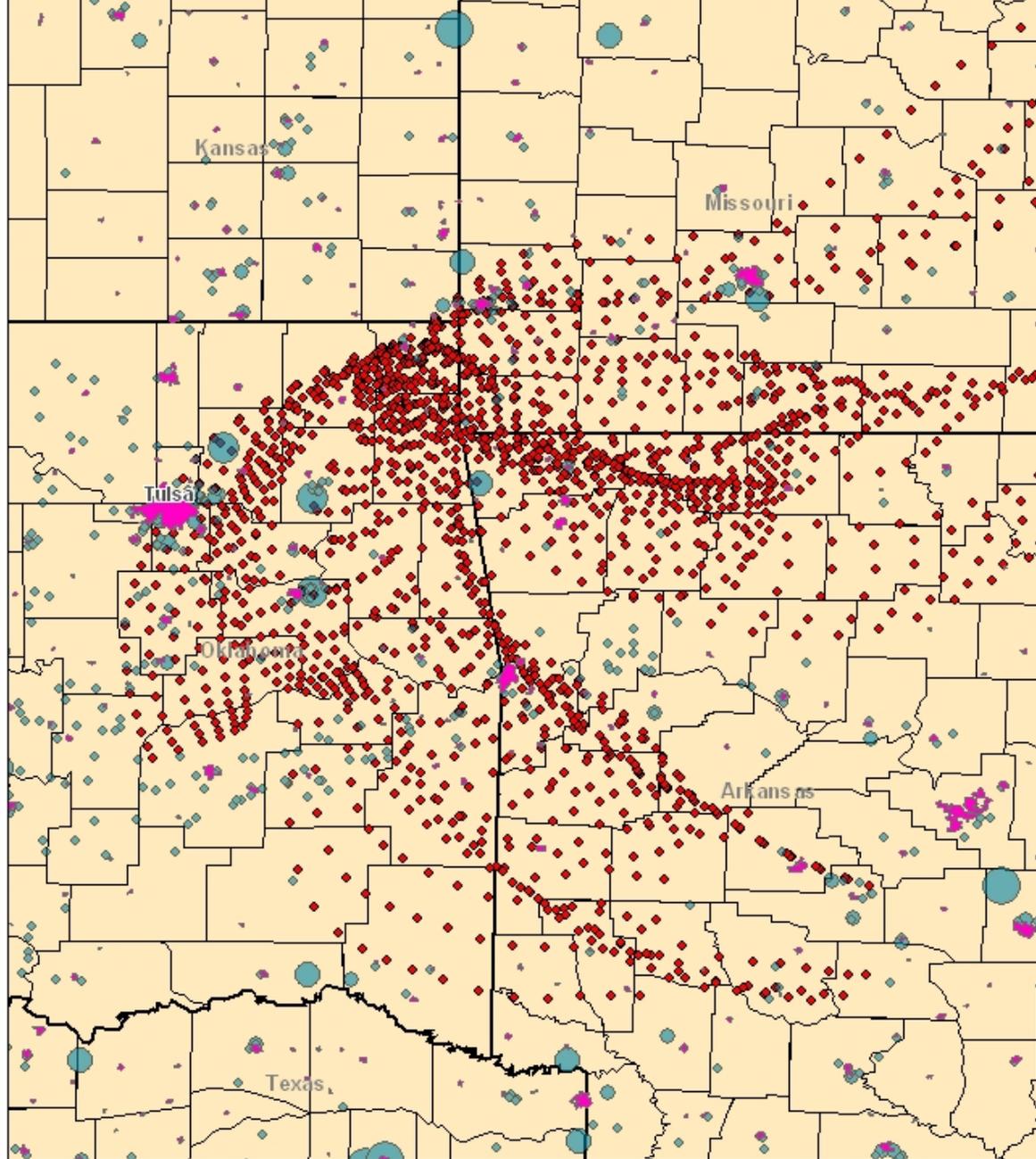
- ◆ 1.000000 - 1045.190000
- 1045.190001 - 3596.070000
- 3596.070001 - 8514.290000
- 8514.290001 - 18948.810000
- 18948.810001 - 52442.750000
- Urban Areas (labeled)



2001 Worst 5% Ozone Days



2001 Best 5% Ozone Days



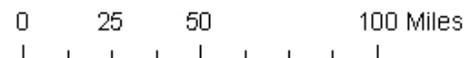
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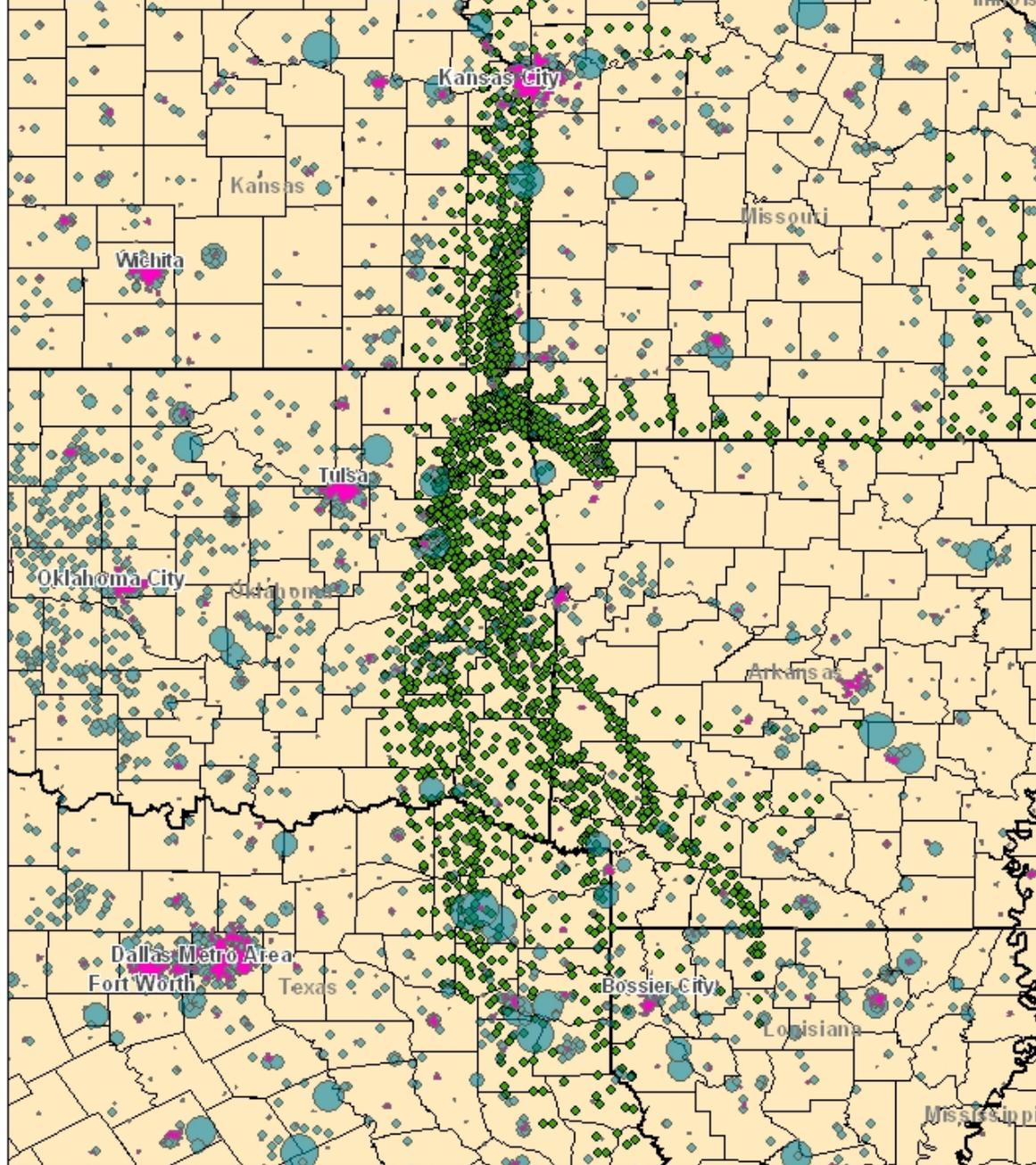
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2002 Worst 5% Ozone Days



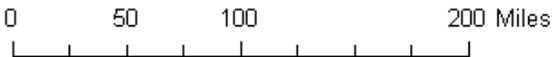
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Urban Areas (labeled)

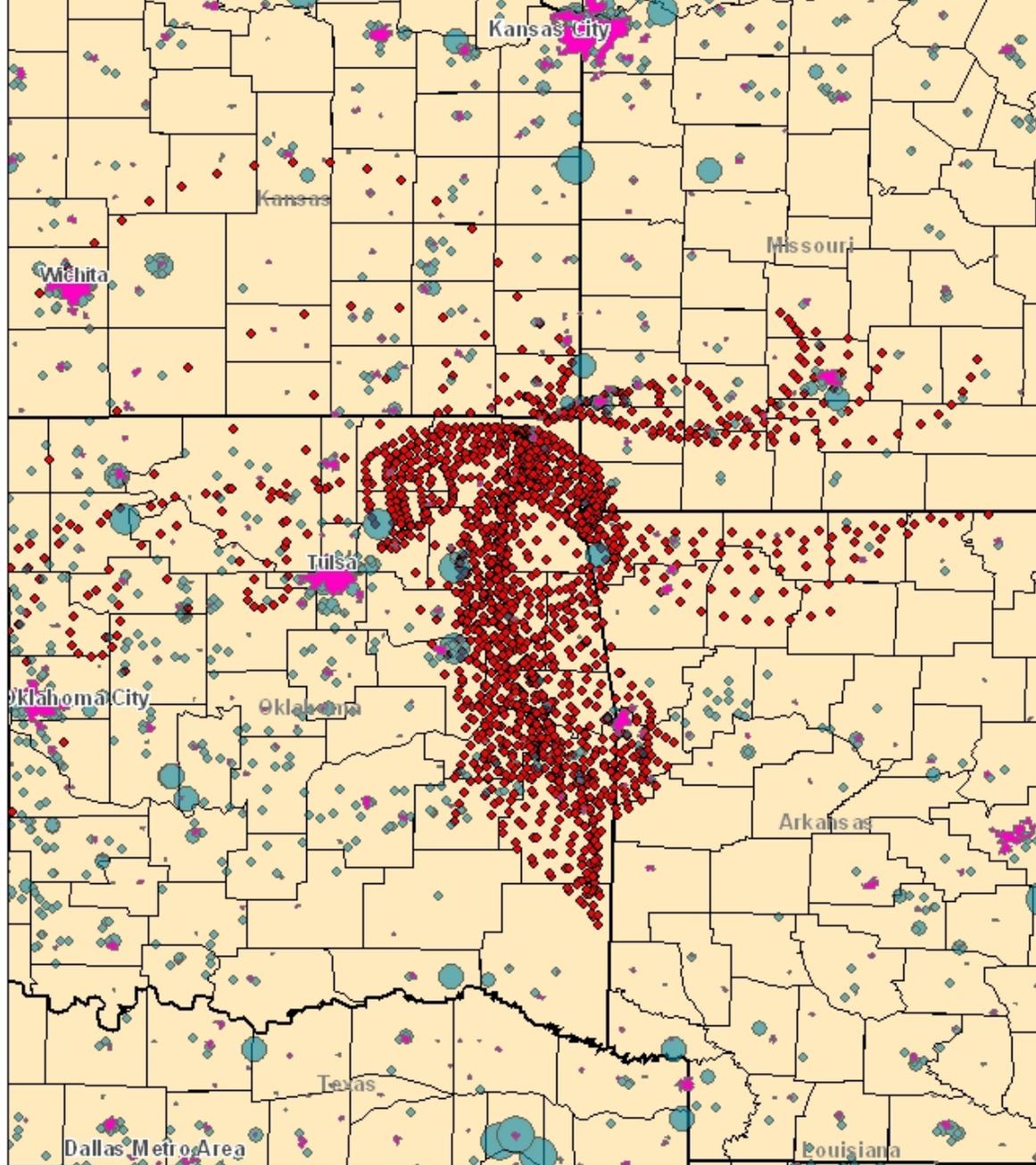
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2002 Best 5% Ozone Days



Legend

 Urban Areas (labeled)

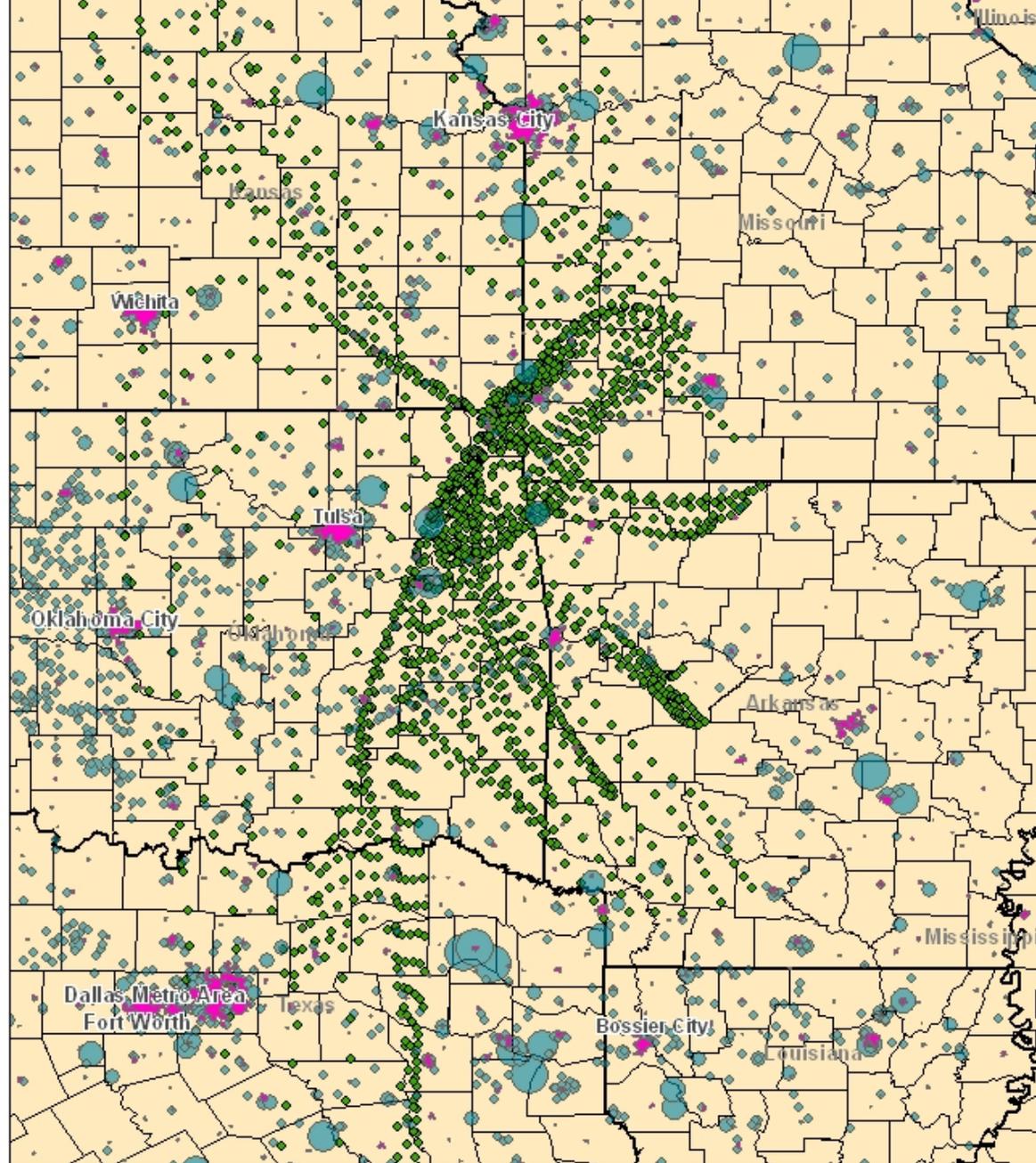
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2003 Worst 5% Ozone Days



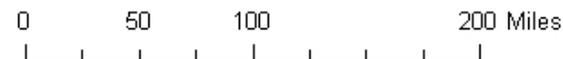
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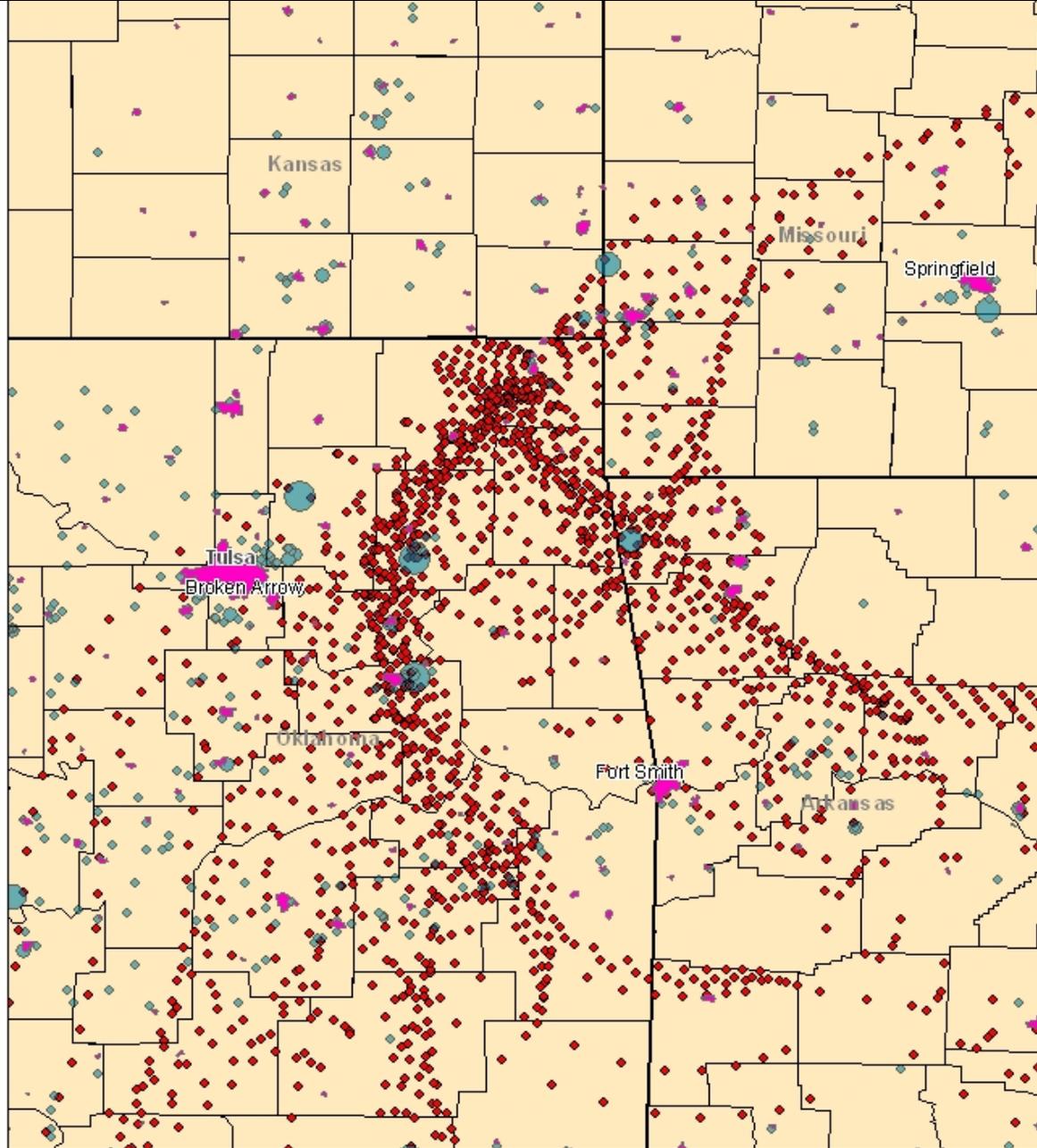
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2003 Best 5% Ozone Days



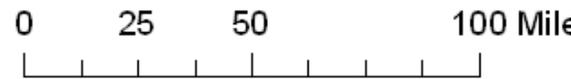
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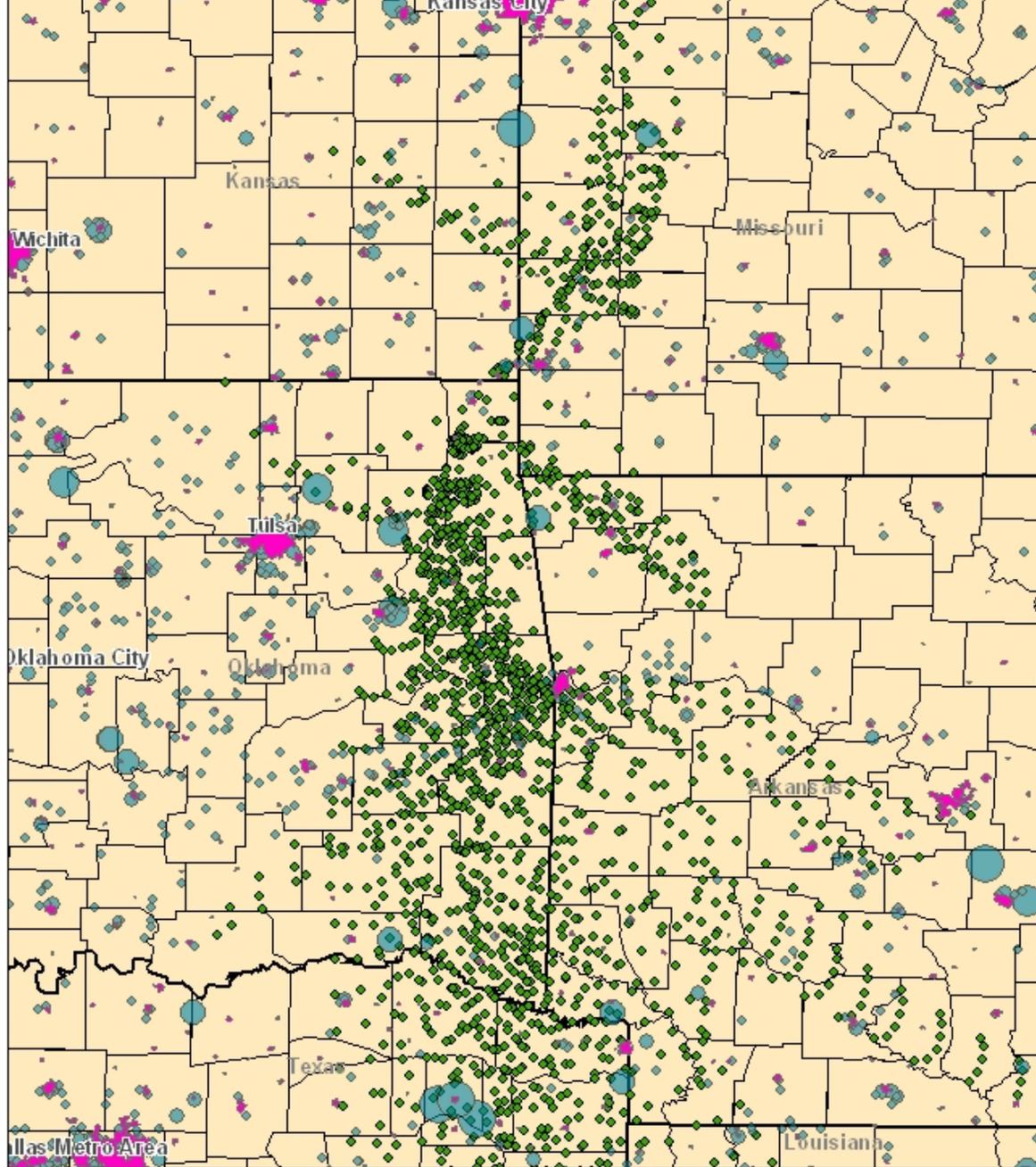
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2004 Worst 5% Ozone Days



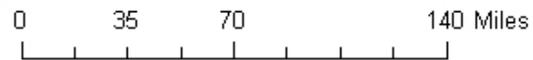
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Urban Areas (labeled)

NOx and VOC

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2004 Best 5% Ozone Days

Environmental Programs

- The tribe's environmental department was established in 1997.
- Grants we received for fiscal year 2006 are:
 - **106 Watershed**
 - **103 Air**
 - **Wetlands**
 - **Pesticide groundwater monitoring**
 - **Radon testing**
 - **GAP**
 - **HUD grant**
 - **Self-governance**



Environmental Services

- Drinking water testing for coliforms
- Groundwater pesticide monitoring
- Radon Testing
- Recycling program
- Environmental assessments
- Food service inspections



RADON PROGRAM

- Radon testing in homes and daycares that tribal members attend
 - Place a 4-inch activated charcoal canister in the home for 7 days in rooms that are most occupied (i.e., living room, bedroom)
 - If results above 4.0 picoCuries per liter, then we place a second test and average the two results
 - May need long-term testing or mitigation if average exceeds 4.0 pc/L
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- A silhouette of a tree is visible on the right side of the slide, set against a background of a sunset or sunrise with a gradient from purple to orange.

Explaining Radon Test

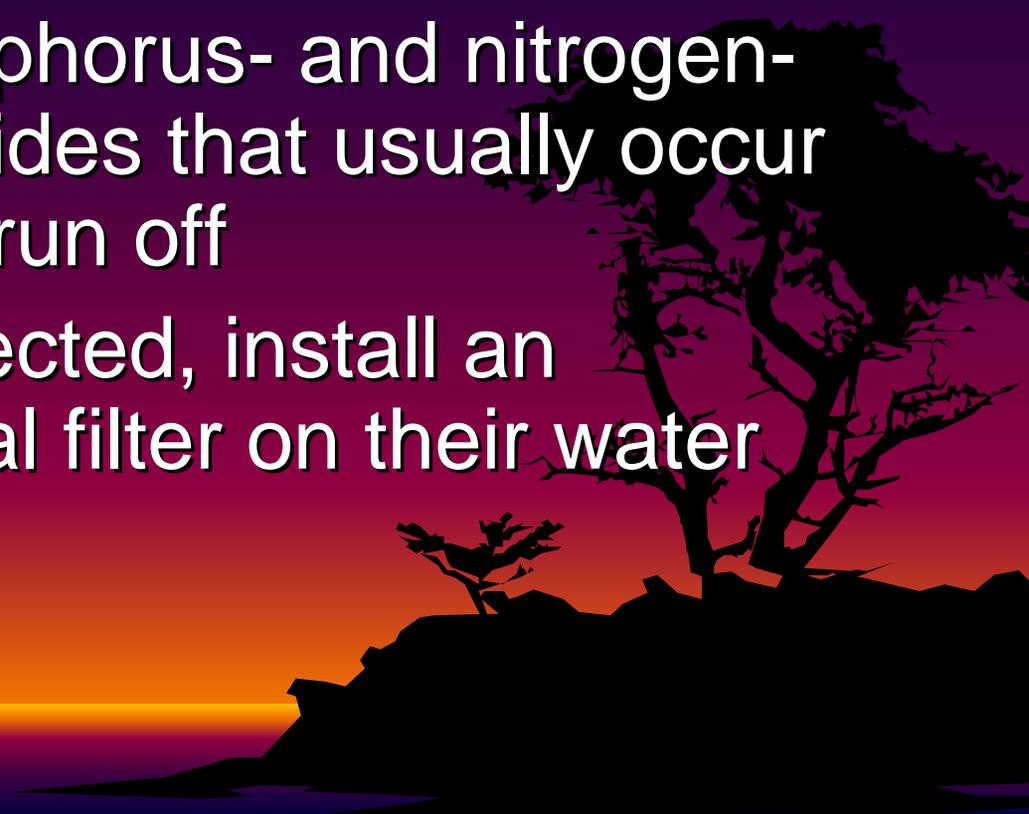


Placing Radon Canister in Home



PESTICIDE PROJECT

- Take groundwater well samples at tribal members homes
- Analyze for phosphorus- and nitrogen-containing pesticides that usually occur from agricultural run off
- If high levels detected, install an activated charcoal filter on their water system



Pesticide Water Sampling in Home



Lost Creek Bridge Replacement

- Low-water style bridge did not allow fish to swim through
- Replaced old bridge with one that allows more water flow and fish to pass through



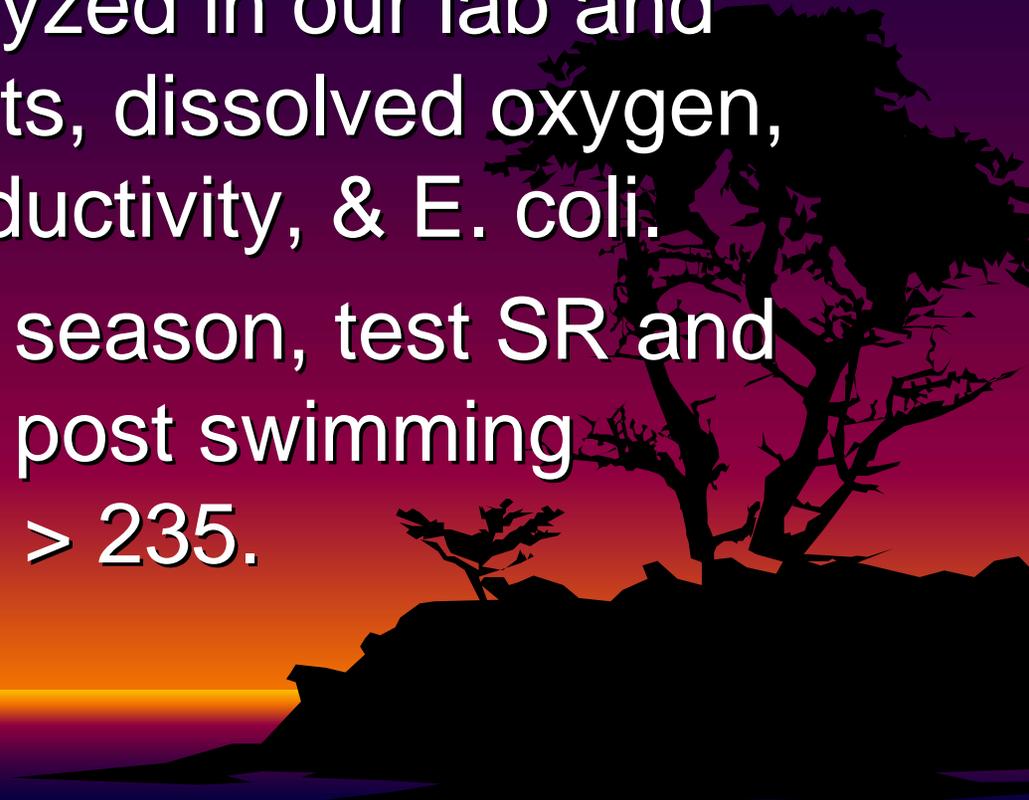
Old Lost Creek Bridge



New Lost Creek Bridge



EPA 106 WATERSHED GRANT

- Monthly water quality monitoring in Lost Creek, Flint Creek & Spring River
 - Samples are analyzed in our lab and tested for: nutrients, dissolved oxygen, turbidity, pH, conductivity, & E. coli.
 - During recreation season, test SR and LC for E. coli and post swimming advisories if MPN > 235.
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- The background of the slide features a sunset or sunrise scene with a gradient from orange at the bottom to purple at the top. Silhouettes of trees and a rocky landscape are visible on the right side of the slide.

Eastern Shawnee Lab



Spring River at Hwy 10



E. Coli Sample at Spring River



Spring River at Seneca Piers



Flint Creek



E. Coli Sample at Lost Creek



Cattle in Lost Creek



TAR CREEK SUPERFUND SITE

- Ottawa County, Oklahoma is part of the Tri-State Mining District which comprises approximately 300 square miles in Missouri, Kansas, and Oklahoma.
 - It was the largest lead and zinc-mining operation in the history of the United States.
 - Billions of dollars of ore was extracted in mining activity lasting into the late 60's and early 70's, the result of which has become "Tar Creek Superfund Site".
 - 48 million tons of mining waste left above ground ("chat piles")
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- The background of the slide features a sunset or sunrise scene. The sky transitions from a deep purple at the top to a bright orange and yellow near the horizon. In the foreground, there are dark silhouettes of trees and rolling hills, creating a stark contrast with the bright sky.

Tar Creek Superfund Site

- 1979- water spewed out of abandoned mines. Water ran blood-red every time it rained because of the acid-tainted water that seeps out of the old mine shafts.
- Added to the National Priority List in 1982
- 1996- EPA spent more than \$100 million cleaning up lead-polluted yards
- \$5 million state buyout moved out 52 families with children age six years and younger
- EPA is attempting to buyout the remaining 1600 residents.
- Schools and utilities will be shut down within a year.
- More info: <http://www.leadagency.org>

“Chat” pile (mining waste)



Eroding Mountain of Chat



Aerial view of mining sites



Homes Near Mining Waste



Tar Creek



Tar Creek

