Special Topics

Payne County Disaster Resiliency Assessment

The purpose of this section is to assess at the county level key components of disaster resiliency. Housing location and quality as well as planning activities can help reduce impacts from disaster events and allow for faster recovery. Disasters can include tornadoes, extreme weather, high winds, as well as man-made events. These events may largely be inevitable, but the ability to reduce damage and casualties as well recovery can be improved with good planning.

C.0 Comprehensive Plans & Hazard Mitigation Plans

There are 8 key cities within the county (Stillwater, Cushing, Perkins, Yale, Ripley, Glencoe, Drumright, Quay).

Comprehensive plans are the guiding documents for cities of various sizes to address key aspects of their community from land use, transportation, environment, housing, and economic development.

The other key plan for a city to manage, mitigate and plan for recovery related to disasters is a **Hazard Mitigation Plan** (or Emergency Management Plan). Often low density counties, the Hazard Mitigation Plan is done at the county level, though some cities may augment the county plan with a city plan.

> Payne County does have a Hazard Mitigation Plan, but it was not available for use for this study.
>
> Oklahoma State University also has a mitigation plan to address the safety of the students, faculty and staff on the campus.

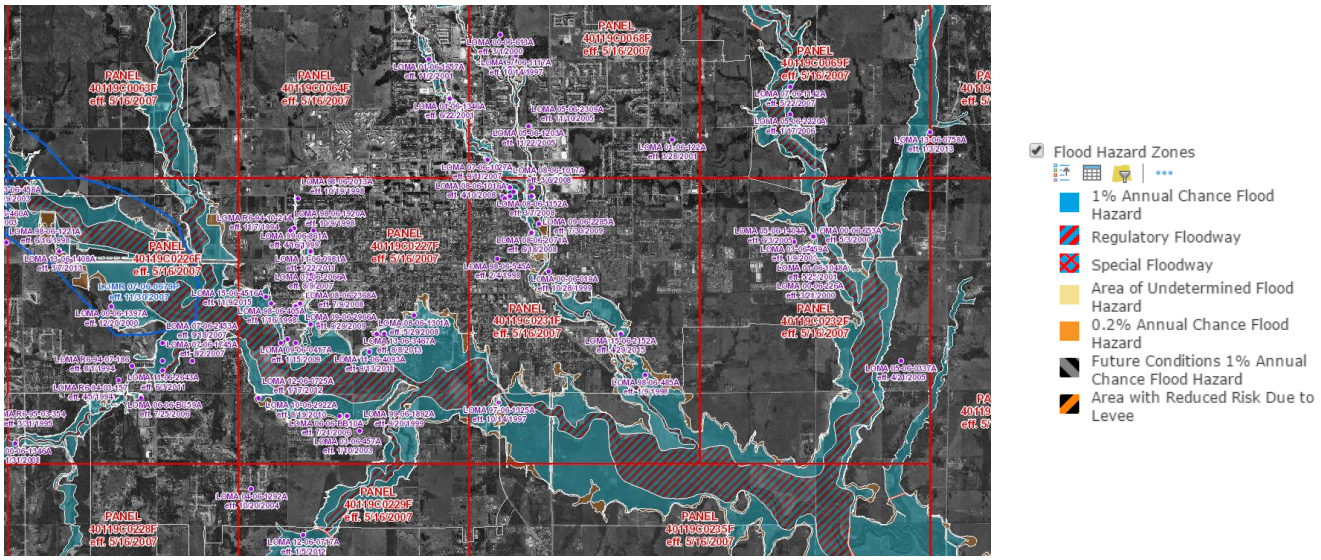
C.2.1.1. Historical Data on Natural Disasters and Other Hazards

Data on historical damages and casualties is typically collected as part of a **Hazard Mitigation Plan** preparation to determine the appropriate planning measures and actions to take before and after an event.

Flooding

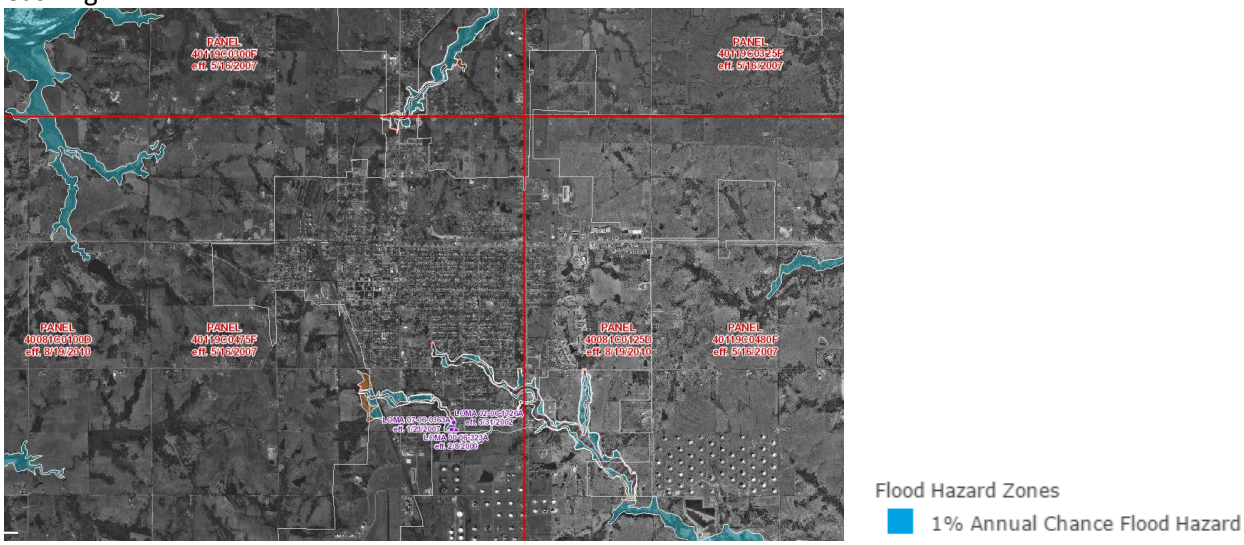
All parts of the county may be subject to flash flooding, freeze-thaw flooding and extreme precipitation that can cause flooding, unrelated to the streams and rivers. Development in the floodplain, however, increases risk of damages and property loss potentially repeatedly.

Stillwater



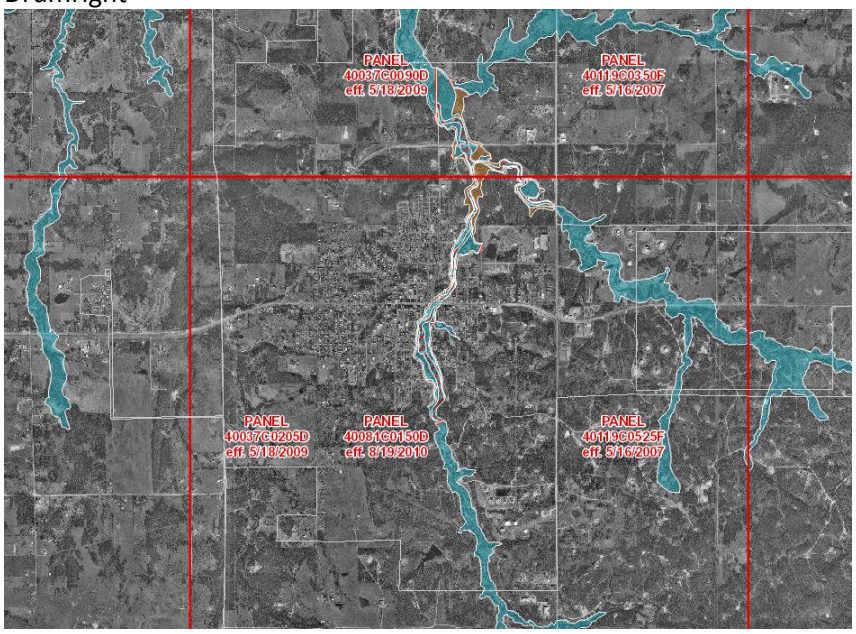
FEMA's National Flood Hazard Layer http://fema.maps.arcgis.com/

Cushing



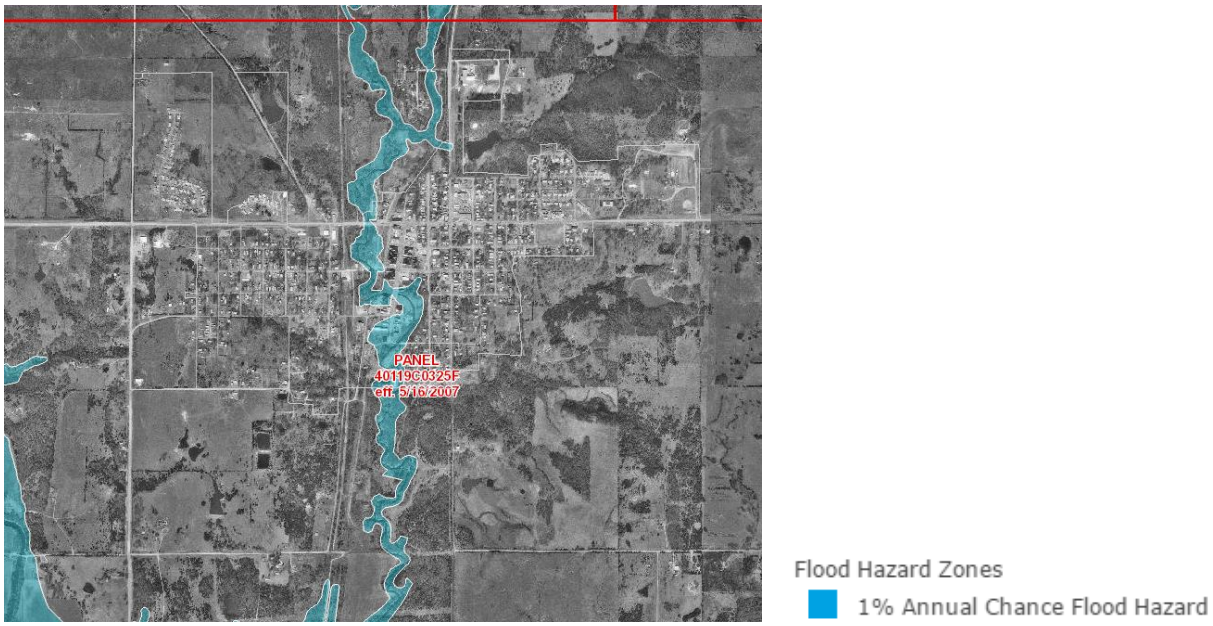
FEMA's National Flood Hazard Layer http://fema.maps.arcgis.com/

Drumright



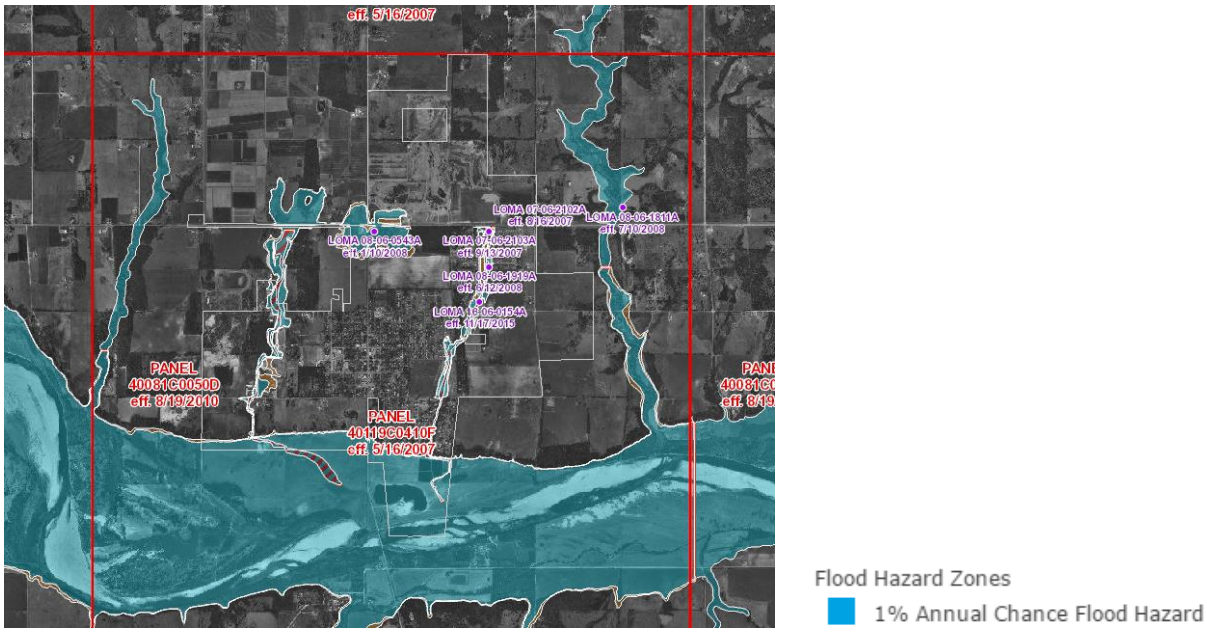
FEMA's National Flood Hazard Layer http://fema.maps.arcgis.com/

Yale



FEMA's National Flood Hazard Layer http://fema.maps.arcgis.com/

Perkins



FEMA's National Flood Hazard Layer http://fema.maps.arcgis.com/

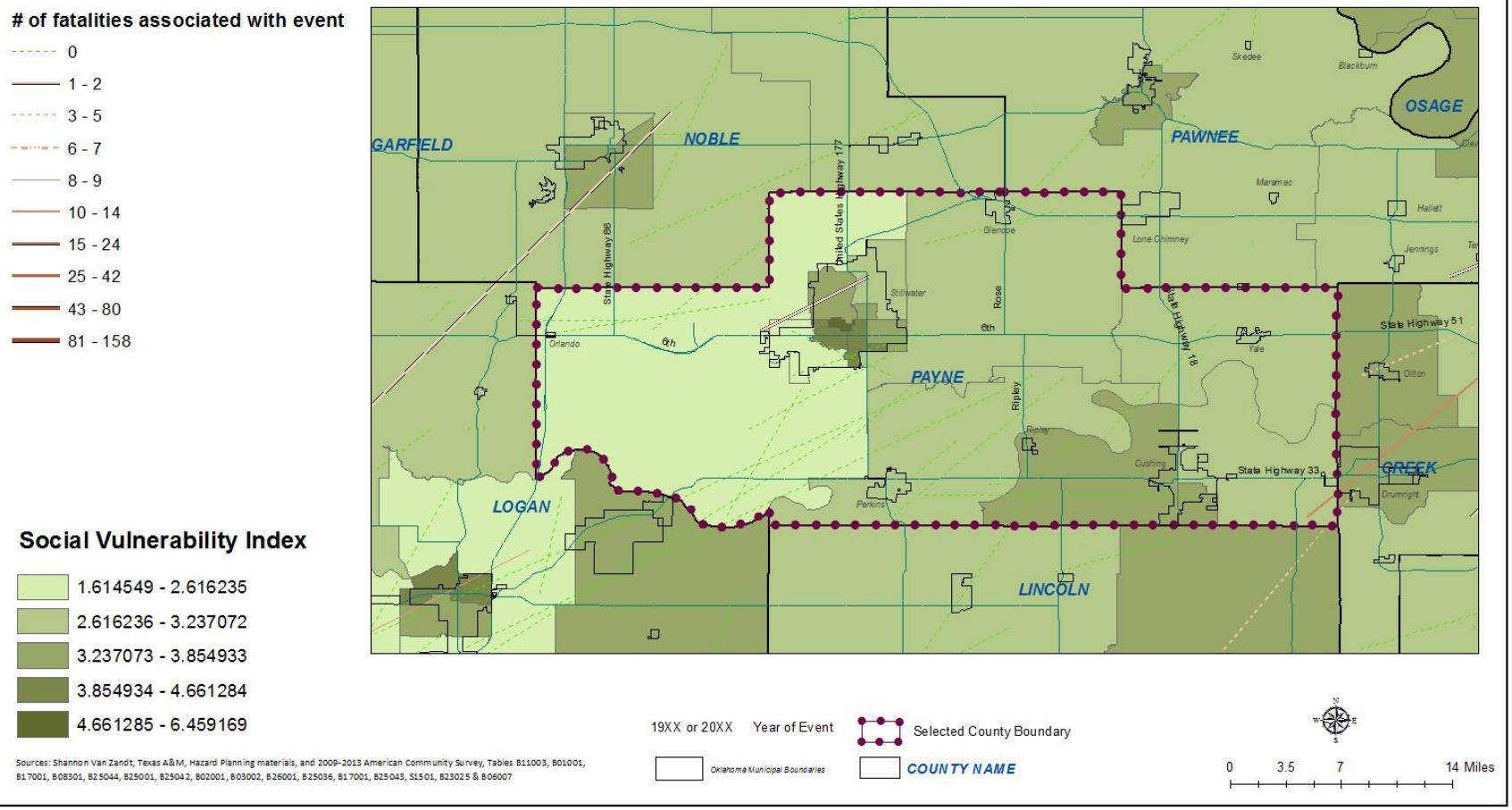
NOAA data shows the following historic data on disaster events for the county:

Historic data on tornados between 1950-2014 there are 52 tornados documented. There were 275 injuries that occurred connected to these tornados, with 18 of those injuries happening in the 2011 tornado. There were 20 fatalities connected to tornadoes during this time period, 14 of which occurred in 1974. Property losses between 1950-1996 ranged from $2,935,601.00 to $29,356,050.00. (The accounting methods used for losses changed in 1996.) The losses estimated between 1996-2014 was $60,000.00.

Social Vulnerability - Impacts on Housing & Disaster Resiliency

Tornado Events 1950 - 2014

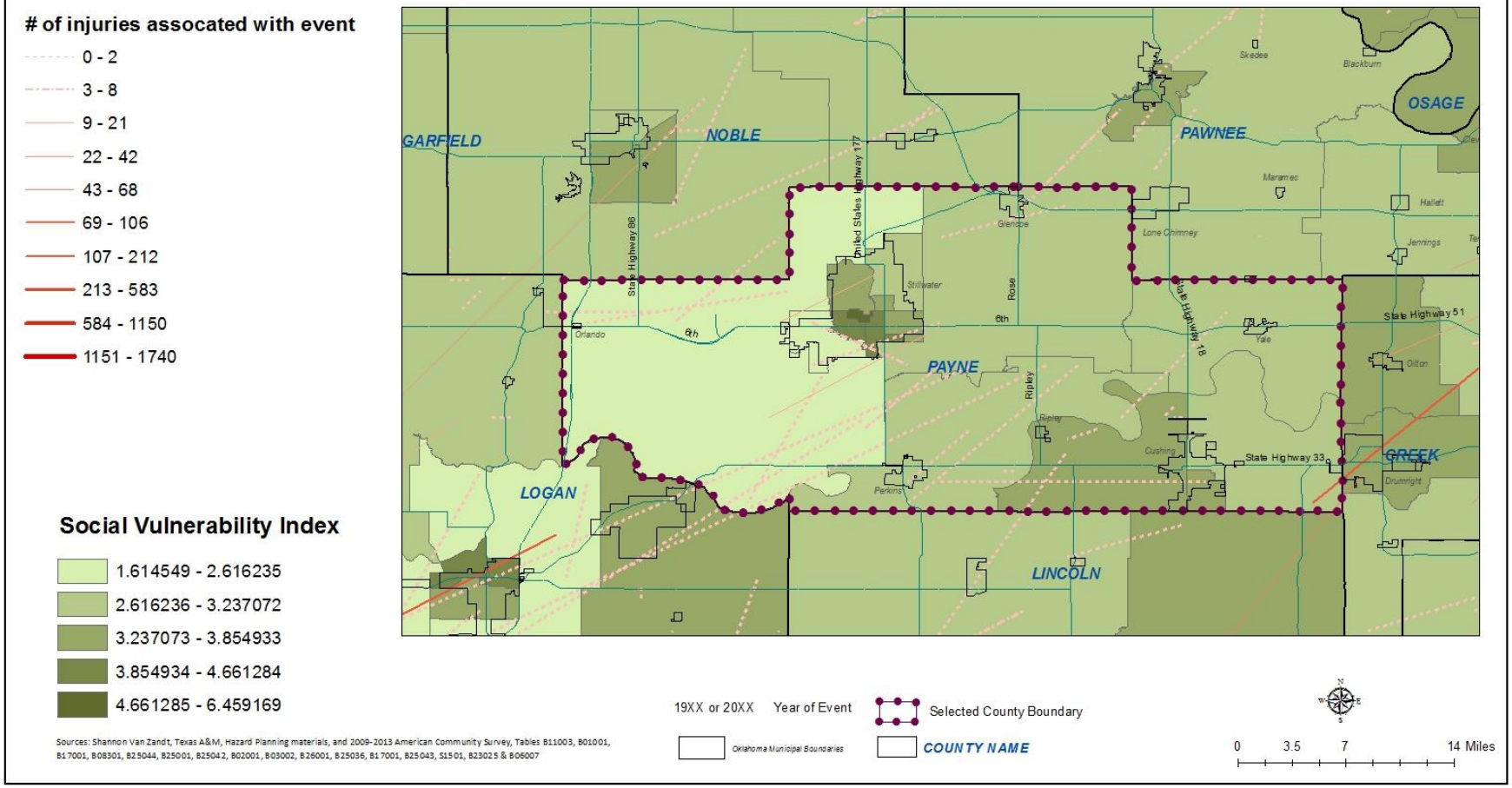
Payne County



Social Vulnerability - Impacts on Housing & Disaster Resiliency

Tornado Events 1950 - 2014

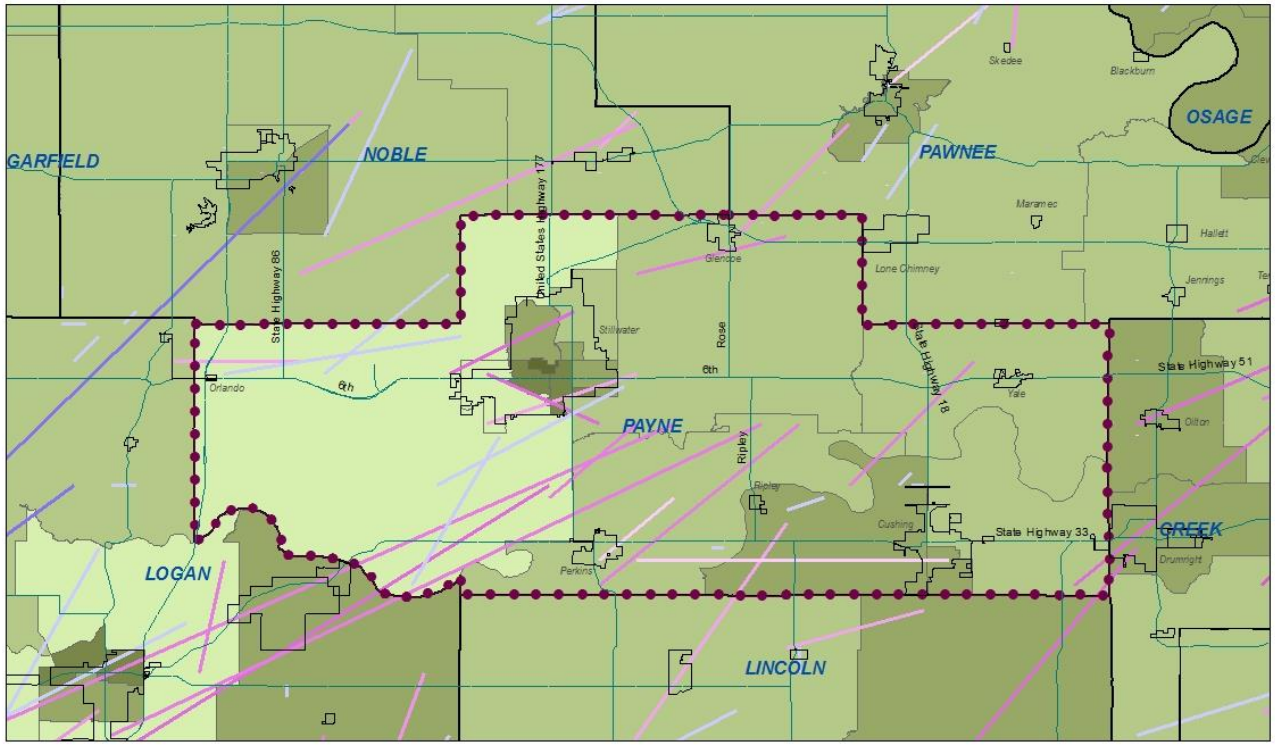
Payne County



Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

Social Vulnerability - Impacts on Housing & Disaster Resiliency

Tornado Events 1950 - 2014
Payne County



Tornado prior to 1996

$ losses associated with event

- >$50
- $50-$500
- $500-$5,000
- $5,000-$50,000
- $50,000-$500,000
- $500,000-$5,000,000
- $5,000,000-$50,000,000
- $5000,000,000

Tornados after 1996

$ in millions in losses associated with event (accounting categories changed in 1996)

- 0.00 - 0.91
- 0.92 - 3.20
- 3.21 - 8.50
- 8.51 - 13.11
- 13.12 - 125.34
- 125.35 - 370.00
- 370.01 - 1000.00
- 1000.01 - 2800.10

Social Vulnerability Index

- 1.614549 - 2.616235
- 2.616236 - 3.237072
- 3.237073 - 3.854933
- 3.854934 - 4.661284
- 4.661285 - 6.459169

19XX or 20XX Year of Event

Selected County Boundary

Oklahoma Municipal Boundaries

COUNTY NAME

0 3.5 7 14 Miles

Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007

C.2.1.2; C.2.1.6; C.2.1.7;C.2.1.8 Shelters from Disaster Event

Payne County online registration:

http://www.paynecounty.org/storm-shelter-registry/

City of Stillwater online registration:

http://stillwater.org/shelter.php

City of Perkins online registration:

Shelters may be registered at the cityofperkins.net or by calling Perkins City Hall at 547-2445.

C.2.1.3 Public Policy and Governance to Build Disaster Resiliency

No information available.

C.2.1.4 Local Emergency Response Agency Structure

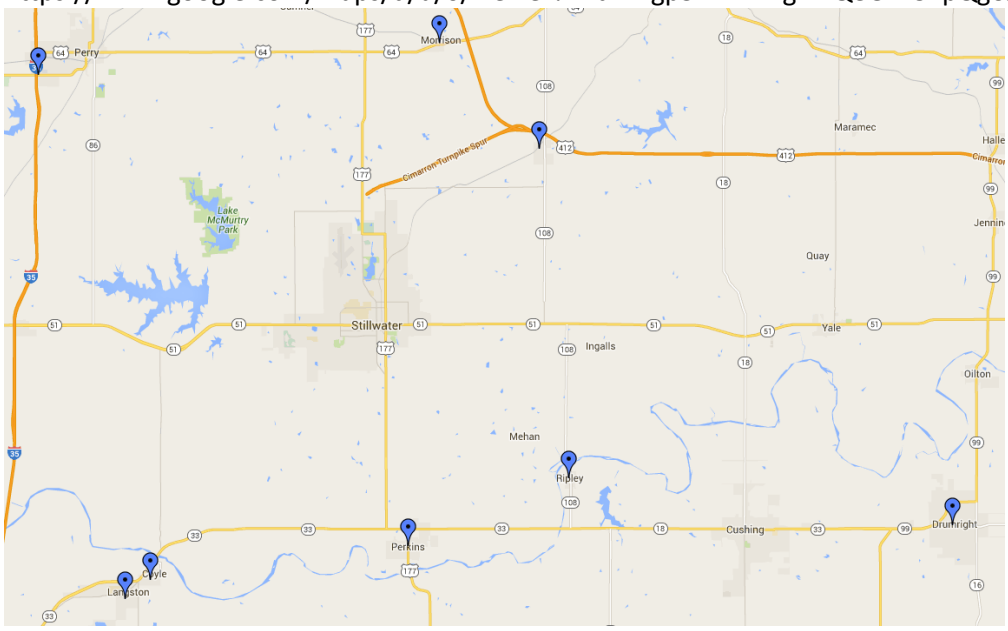
No information available.

C.2.1.5 Threat & Hazard Warning Systems

City of Stillwater now has forty-two outdoor warning sirens. With Oklahoma State University's three sirens, there are forty-five warning sirens covering the University and the City.

City of Perkins uses Nixle for broadcasting message notifications during an event.

Google Mapped sirens in Oklahoma:
https://www.google.com/maps/d/u/0/viewer?mid=zkgp3PmLxLzg.kXQeGF45FpQg&hl=en



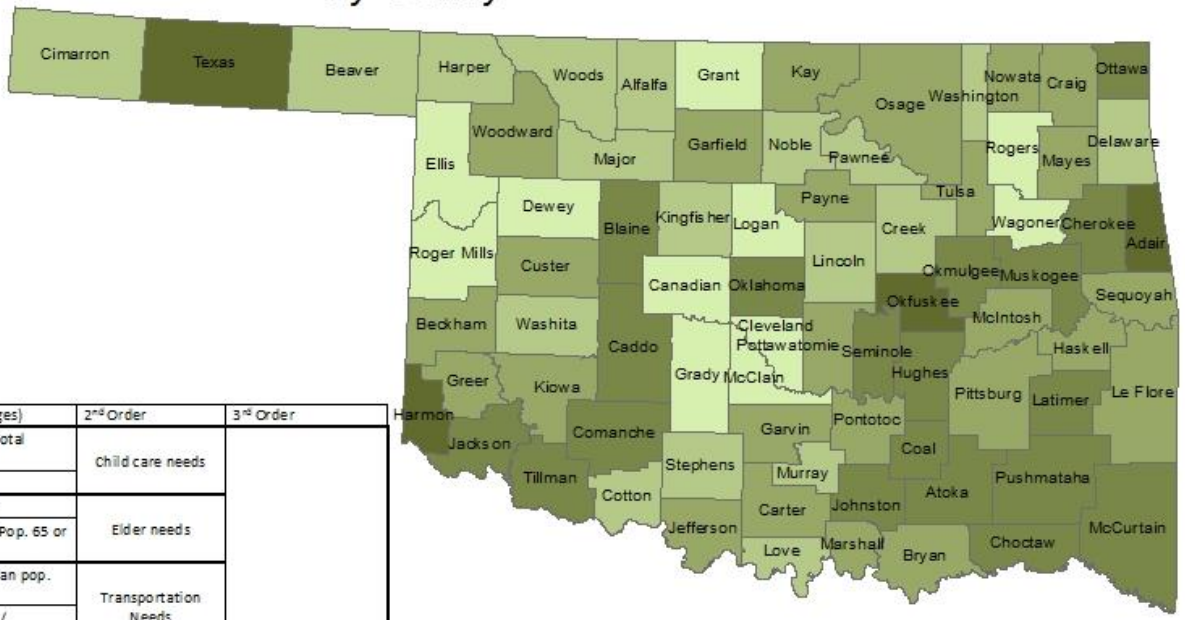
Social Vulnerability

Based on the research work done by the Texas A&M University Hazard Reduction and Recovery Center, an added component is being included in this section. Social vulnerability can place households at a further disadvantage during and after a disaster. This analysis is assessing for the county the levels of social vulnerability based on demographic indicators to highlight 'hotspots' or counties that have higher social vulnerability. That combined with Hazard Mitigation Plans – or lack thereof – can highlight places where additional work is needed to reduce impacts on households.

Social Vulnerability Analysis - Payne County			
Base Social Vulnerability Indicators (%)		**2nd Order**	**3rd Order**
1.) Single Parent Households	13.82%	0.196 (Child Care Needs)	**3.38 Social Vulnerability 'Hotspot' or Area of Concern**
2.) Population Under 5	5.81%		
3.) Population 65 or Above	10.59%	0.188 (Elder Needs)	
4.) Population 65 or Above & Below Poverty Rate	8.18%		
5.) Workers Using Public Transportation	1.39%	0.073 (Transportation Needs)	
6.) Occupied Housing Units w/o Vehicle	5.86%		
7.) Housing Unit Occupancy Rate	88.03%	2.702 (Temporary Shelter and Housing Recovery Needs)	
8.) Rental Occupancy Rate	49.08%		
9.) Non-White Population	21.00%		
10.) Population in Group Quarters	10.43%		
11.) Housing Units Built Prior to 1990	64.92%		
12.) Mobile Homes, RVs, Vans, etc.	11.02%		
13.) Poverty Rate	25.72%		
14.) Housing Units Lacking Telephones	3.03%	0.221 (Civic Capacity Needs)	
15.) Age 25+ With Less Than High School Diploma	10.00%		
16.) Unemployment Rate	6.14%		
17.) Age 5+ Which Cannot Speak English Well or Not At All	2.98%		
Sources: Shannon Van Zandt, Texas A&M, Hazard Planning materials, and 2009-2013 American Community Survey, Tables B11003, B01001, B17001, B08301, B25044, B25001, B25042, B02001, B03002, B26001, B25036, B17001, B25043, S1501, B23025 & B06007			

Social Vulnerability Index

By County



Levels of Social Vulnerability Analysis

Base Social Vulnerability Indicators (Percentages)	2nd Order	3rd Order
1. Single parent households with children/ Total Households	Child care needs	Social vulnerability "Hotspot" or area of concern
2. Population 5 or below/Total Population		
3. Population 65 or above/Total Population	Elder needs	
4. Population 65 or above & below poverty/Pop. 65 or above		
5. Workers using public transportation/Civilian pop. 16+ and employed	Transportation Needs	
6. Occupied housing units without a vehicle / Occupied housing units (Hus)		
7. Occupied housing units / Total housing units	Temporary Shelter and housing Recovery needs	
8. Persons in renter occupied housing units/ Total housing units		
9. Non-white population/Total population		
10. Population in group quarters / Total population		
11. Housing units built 20 years ago / Total housing units		
12. Mobile Homes/ Total housing units		
13. Persons in poverty / Total population		
14. Occupied housing units without a telephone/ Total occupied HU	Civic Capacity needs	
15. Population above 25 with less than high school/ Total pop above 25		
16. Population 16+ in labor force an unemployed/ Pop in Labor force 16+		
17. Population above 5 that speak English not well or not at all / Pop >5		

Source: Shannon VanZandt, Texas A&M, Hazard Planning materials; 2009-2013 American Community Survey, Tables B11003, B01001, B17001,

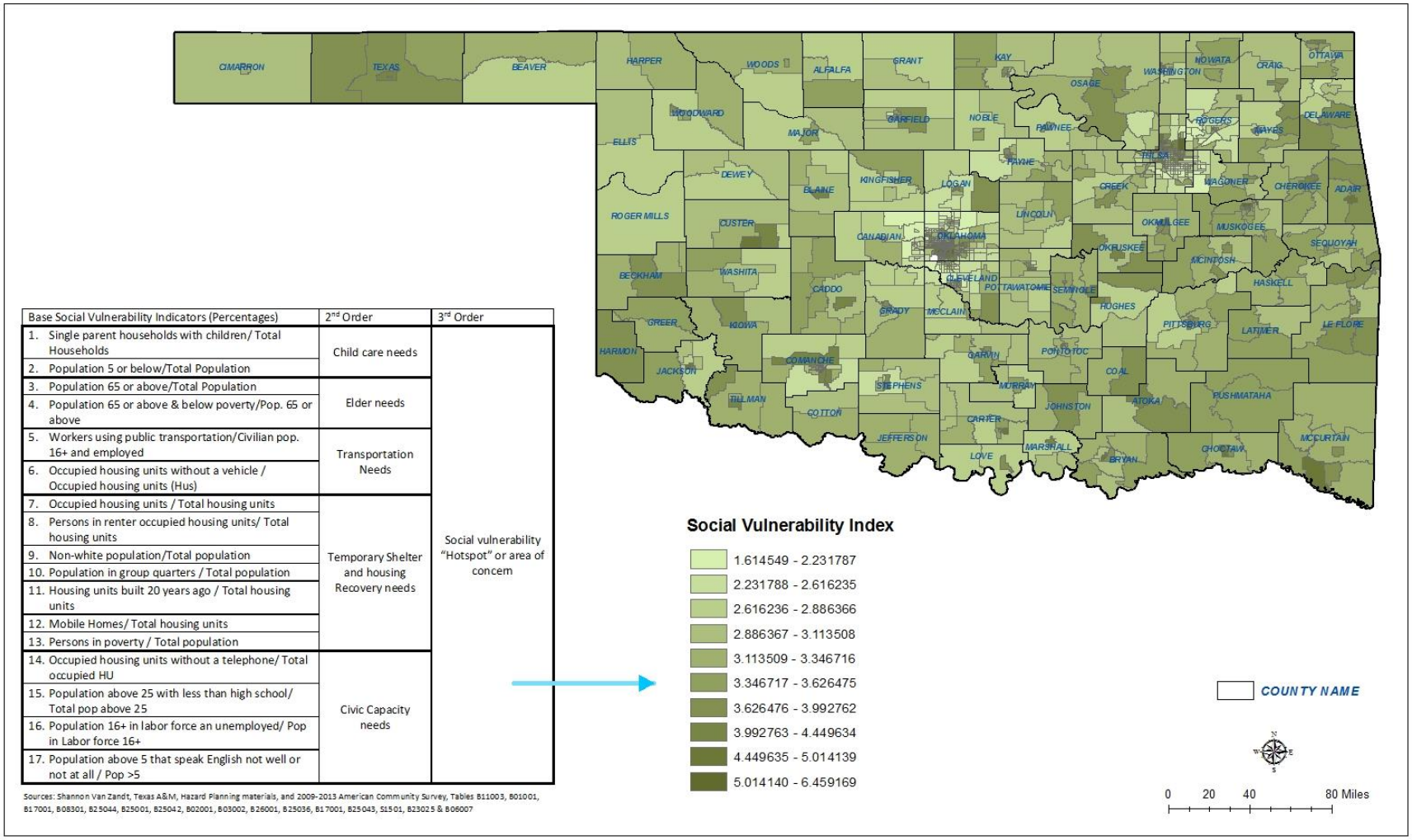
Legend

Social Vulnerabiity "Hot Spots"

- 2.6340 - 2.9760
- 2.9761 - 3.2170
- 3.2171 - 3.4180
- 3.4181 - 3.6370
- 3.6371 - 3.9500

0 25 50 100 Miles

Social Vulnerability - Impacts on Housing & Disaster Resiliency



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2. Population 5 or below/Total Population		
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4. Population 65 or above & below poverty/Pop. 65 or above		
5. Workers using public transportation/Civilian pop. 16+ and employed	Transportation Needs	
6. Occupied housing units without a vehicle / Occupied housing units (Hus)		
7. Occupied housing units / Total housing units	Temporary Shelter and housing Recovery needs	
8. Persons in renter occupied housing units/ Total housing units		
9. Non-white population/Total population		
10. Population in group quarters / Total population		
11. Housing units built 20 years ago / Total housing units		
12. Mobile Homes/ Total housing units		
13. Persons in poverty / Total population		
14. Occupied housing units without a telephone/ Total occupied HU	Civic Capacity needs	
15. Population above 25 with less than high school/ Total pop above 25		
16. Population 16+ in labor force an unemployed/ Pop in Labor force 16+		
17. Population above 5 that speak English not well or not at all / Pop >5		

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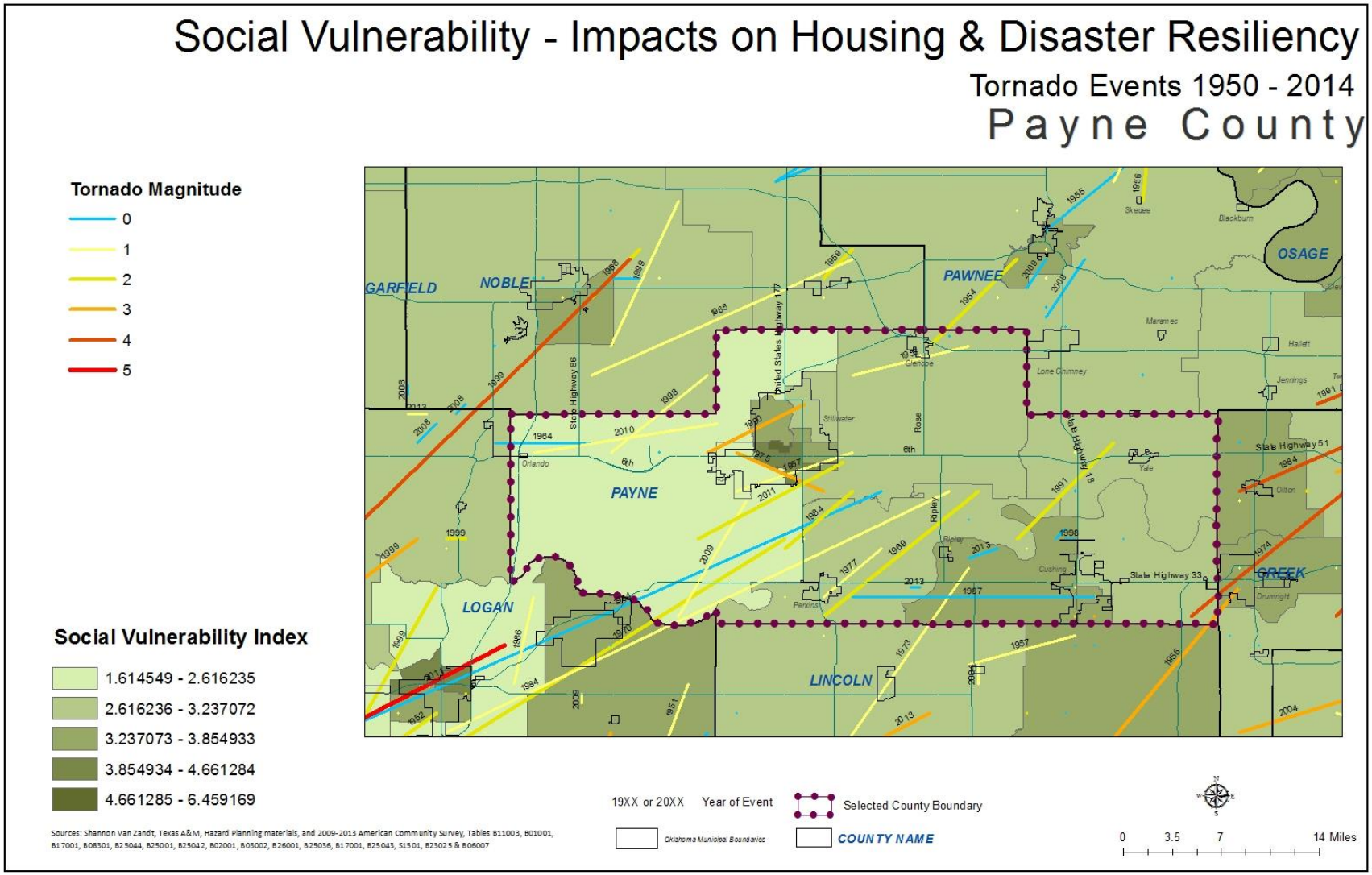

Social vulnerability combined with the devastating impacts of a natural or man-made disaster can compound a household's ability to recover and in fact can place those individuals at an even great gap or disadvantage prior to the event (Shannon Van Zandt, Texas A&M, Hazard Planning).

This county falls about average per this index for social vulnerability when comparing as a county to other counties in the state. Looking at the census tract level, the areas near Stillwater and Cushing have increased social vulnerability and therefore attention to providing transportation during an evacuation and assistance for recovery may be needed.

Recommendations for this county:

- Continue to update and maintain the county HMP and include attention to areas within the county that in addition to physical vulnerability may have compounding social vulnerability factors.
- Efforts to strengthen building codes related to tornadoes and natural disasters should be considered.
- Planning for shelters from disaster events for multifamily, HUD and LIHTC units, in addition to all housing in the community should be incorporated with any effort to increase housing.