



Risk Assessment

Bastrop County Hazard Mitigation Plan Update

Presented September 23rd, 2021



AGENDA

1. Welcome & Introduction
2. Preliminary Risk Analysis Presentation
3. Consideration of Hazards by Planning Team
4. Next Steps
5. Timeline
6. Questions

PURPOSE

This risk assessment was conducted for Bastrop County and the cities of Bastrop, Elgin, and Smithville. Also included in the planning process: Bastrop ISD, Elgin ISD, McDade ISD, Smithville ISD, MUD#1, WCID#2, and WCID#3:

- Support long-term hazard mitigation planning efforts
- Meet the state of Texas goal for developing local mitigation plans
- Satisfy the Disaster Mitigation Act of 2000 requirements

HAZARDS ASSESSED

1. Wildfire

2. Flood

3. Lightning

4. Hurricane Wind

5. Extreme Heat

6. Drought

7. Thunderstorm Wind

8. Hail

9. Tornado

10. Winter Storm

11. Expansive Soils

12. Earthquake

13. Dam/Levee Failure

14. Infectious Disease

15. Cyber Attack

16. Pipeline Failure

17. Hazardous
Materials

Probability =

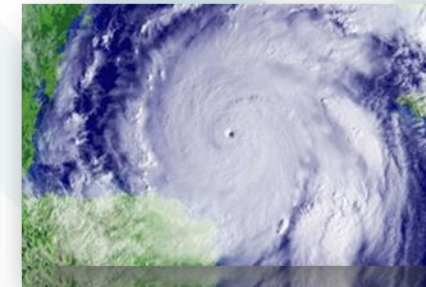
$$\frac{\text{Historical Event Counts}}{\text{Time period}}$$

***Average
Annualized Loss =***

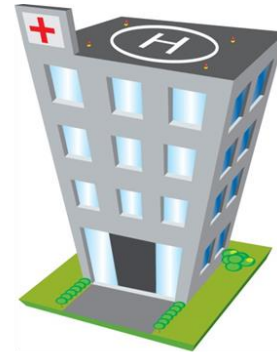
$$\frac{\text{Historical Loss Amount}}{\text{Time period}}$$

GUIDELINES FOR ELEMENTS OF RISK ASSESSMENT IN THE PLAN

- Location
- Extent
- Probability
- Vulnerability



INVENTORY (ASSETS)



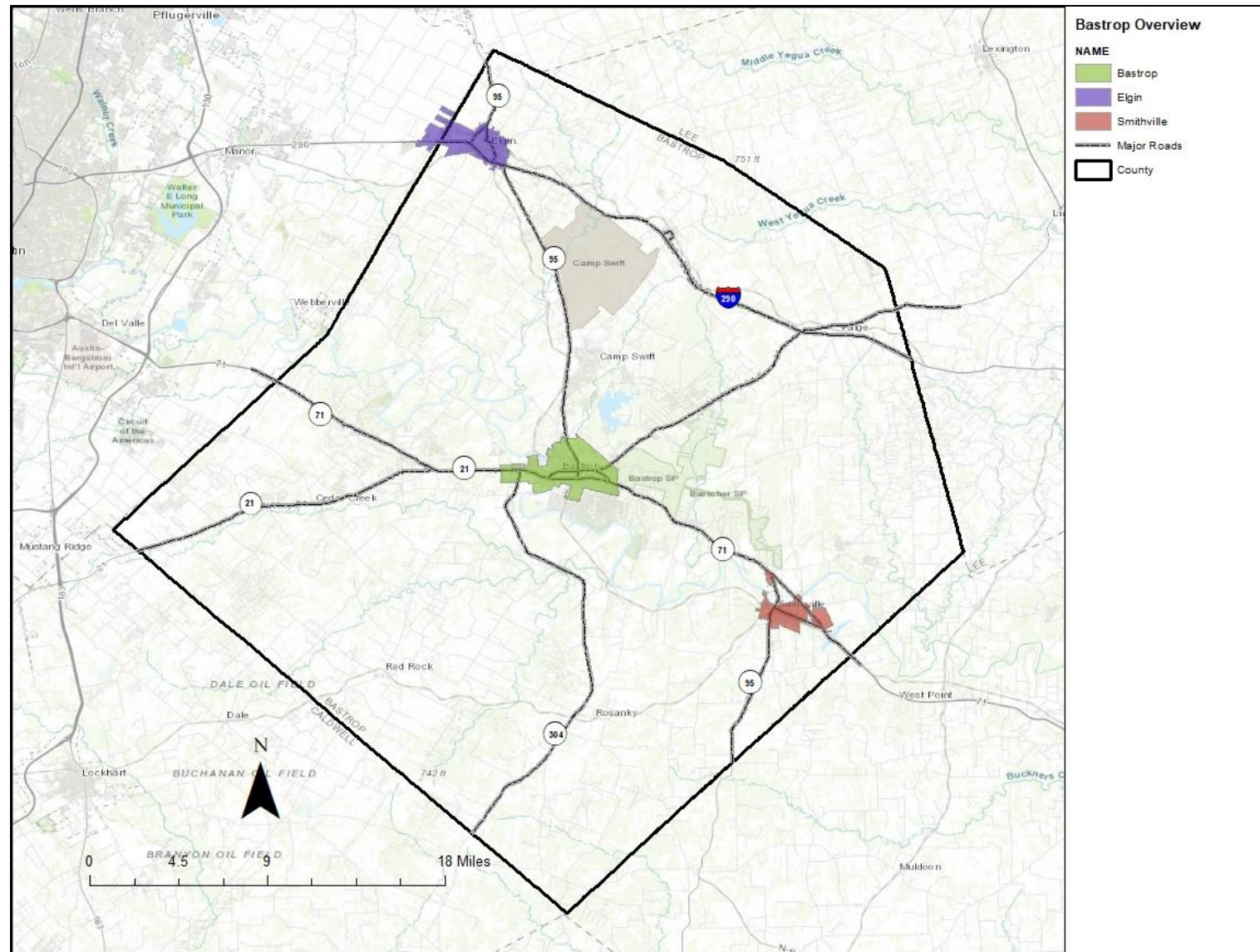
INVENTORY: POPULATION, PROPERTY, AND CRITICAL FACILITIES

JURISDICTION	POPULATION (2019 American Community Survey Estimate)	HOUSING UNITS (2019 American Community Survey Estimate)
Bastrop County	84,522	30,035
City of Bastrop	8,776	3,381
City of Elgin	10,064	3,078
City of Smithville	4,363	2,033
Bastrop ISD	12,486 (students & employees)	N/A
Elgin ISD	5,420 (students & employees)	N/A

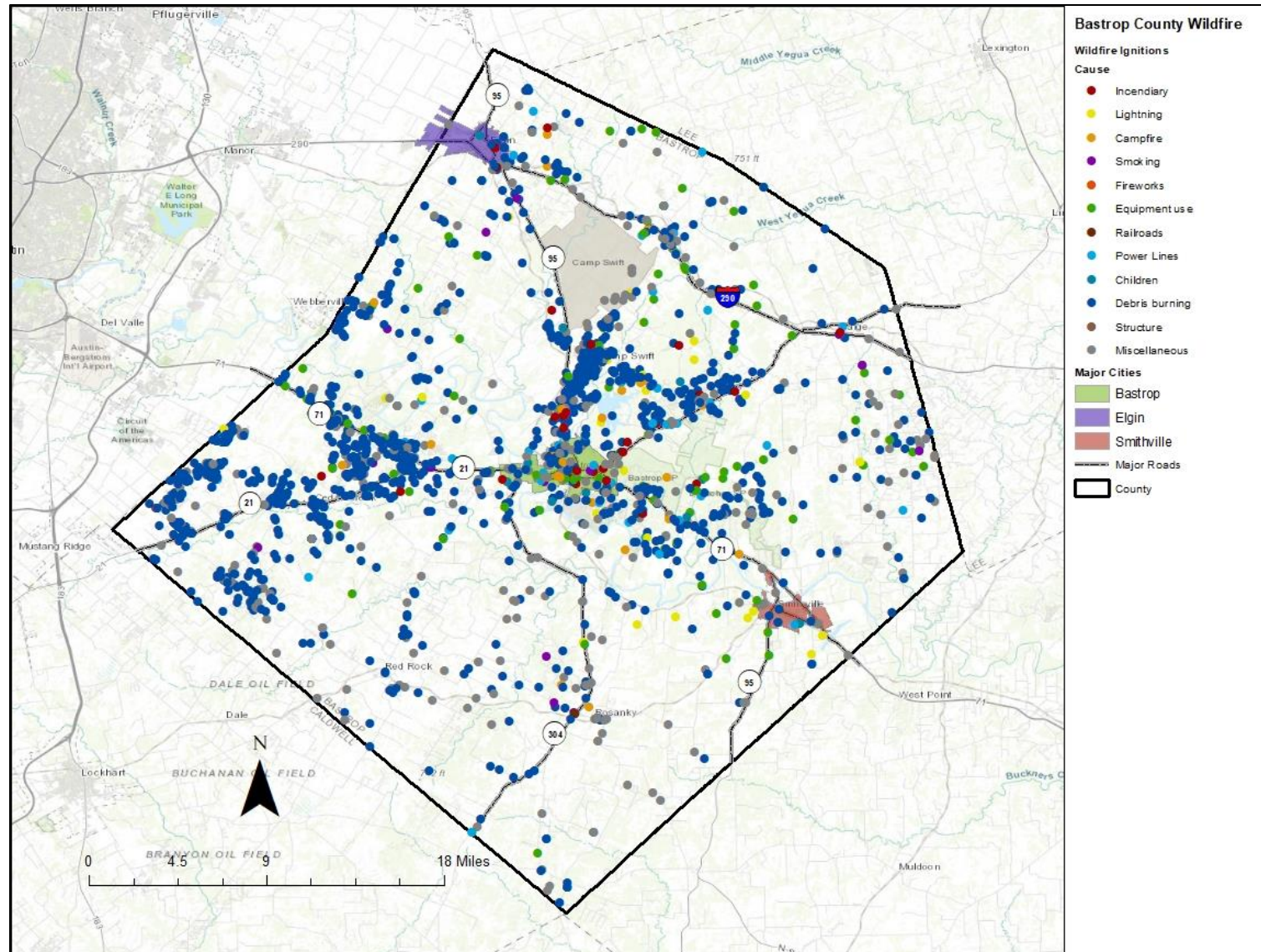
INVENTORY: POPULATION, PROPERTY, AND CRITICAL FACILITIES

JURISDICTION	POPULATION (2019 American Community Survey Estimate)	HOUSING UNITS (2019 American Community Survey Estimate)
McDade ISD	Data not available	N/A
Smithville ISD	2,000 (student & employees)	N/A
MUD #1	500 (residents served)	N/A
WCID #2	5,500 (residents served)	N/A
WCID #3	213 (residents served)	N/A

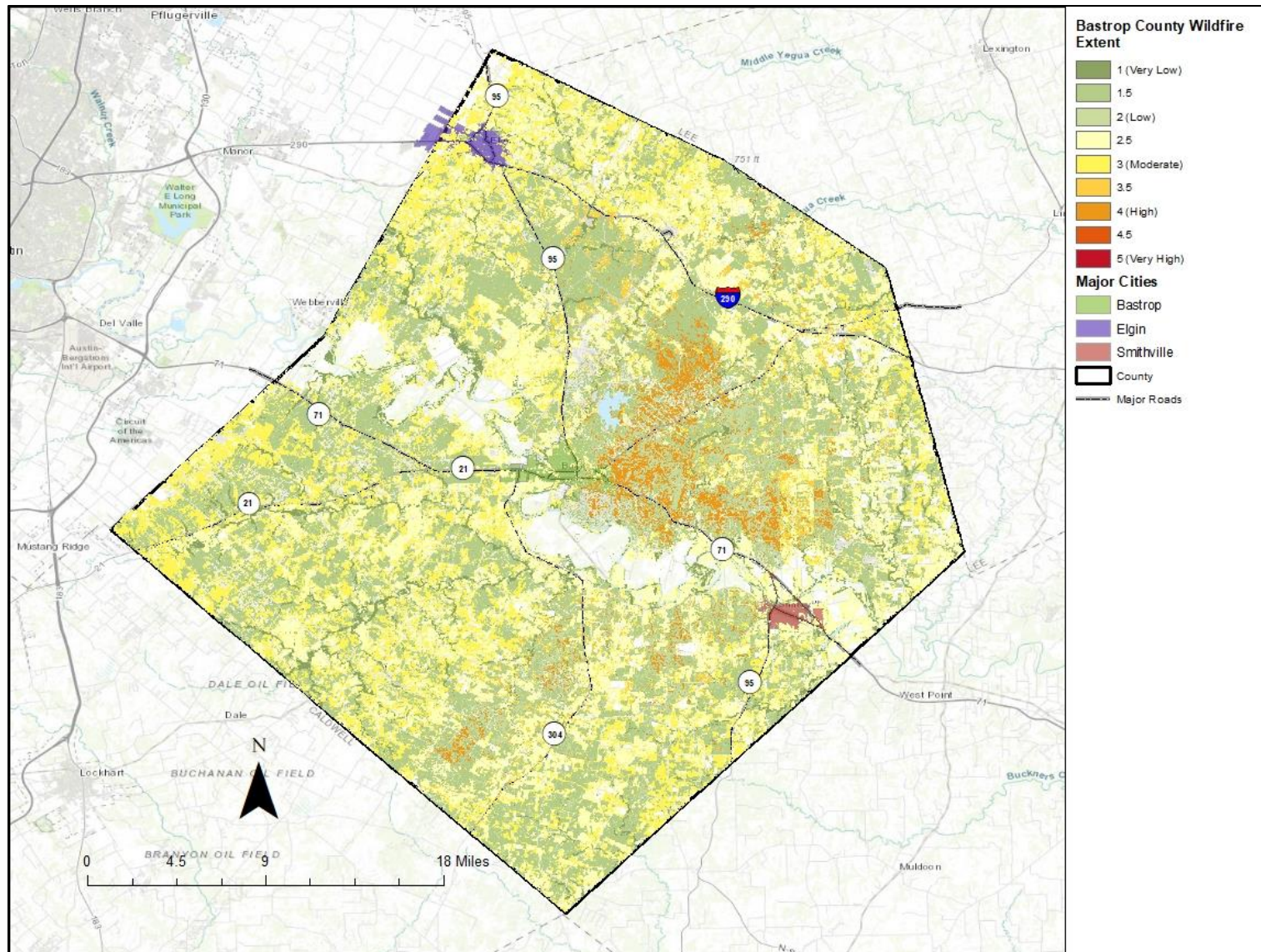
PLANNING AREA



WILDFIRE



WILDFIRE: EXTENT



WILDFIRE: HISTORICAL EVENTS SUMMARY, 2005 – 2020

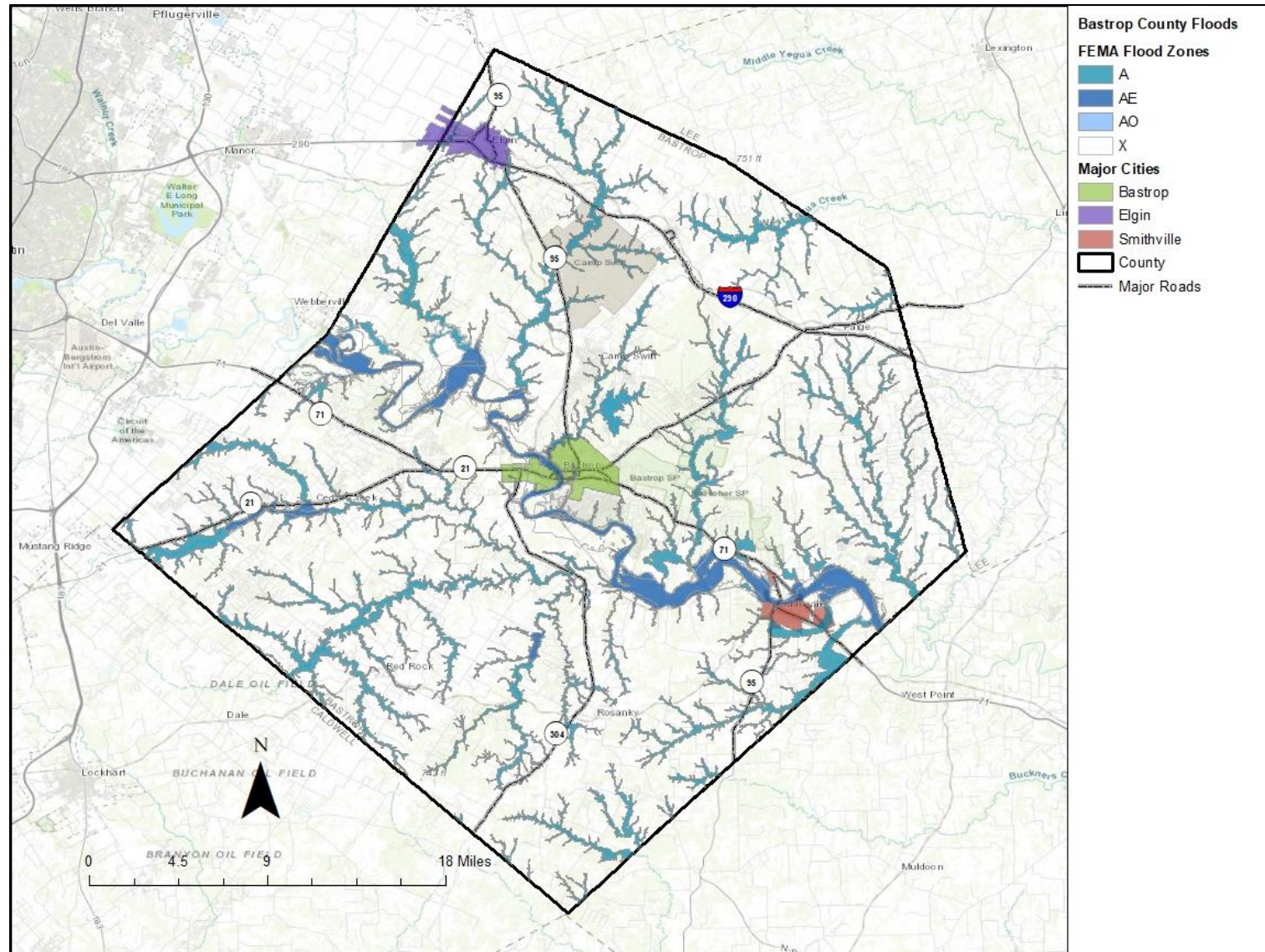
JURISDICTION	Number of Events	ACRES BURNED	FATALITIES	PROPERTY AND CROP DAMAGE
Bastrop County	1,741	3,479	2	\$289,804,706
City of Bastrop	81	141	0	\$0
City of Elgin	18	20	0	\$0
City of Smithville	9	1	0	\$0
Bastrop ISD	0	n/a	0	\$0
Elgin ISD	0	n/a	0	\$0
McDade ISD	0	n/a	0	\$0
Smithville ISD	2*	n/a	0	\$0

WILDFIRE: HISTORICAL EVENTS SUMMARY, 2005 – 2020

JURISDICTION	Number of Events	ACRES BURNED	FATALITIES	PROPERTY AND CROP DAMAGE
MUD #1	1*	n/a	0	\$11,035.28
WCID #2	0	n/a	0	\$0
WCID #3	0	n/a	0	\$0
Total Losses	1,849	3,641	2	\$289,815,741.28

- Probability of Future Events for the Bastrop County planning area is 115.56 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$26,346,885.57 and approximately 227.6 acres burned per year.

FLOOD



FLOOD: HISTORICAL EVENTS SUMMARY, 1996 – 2021

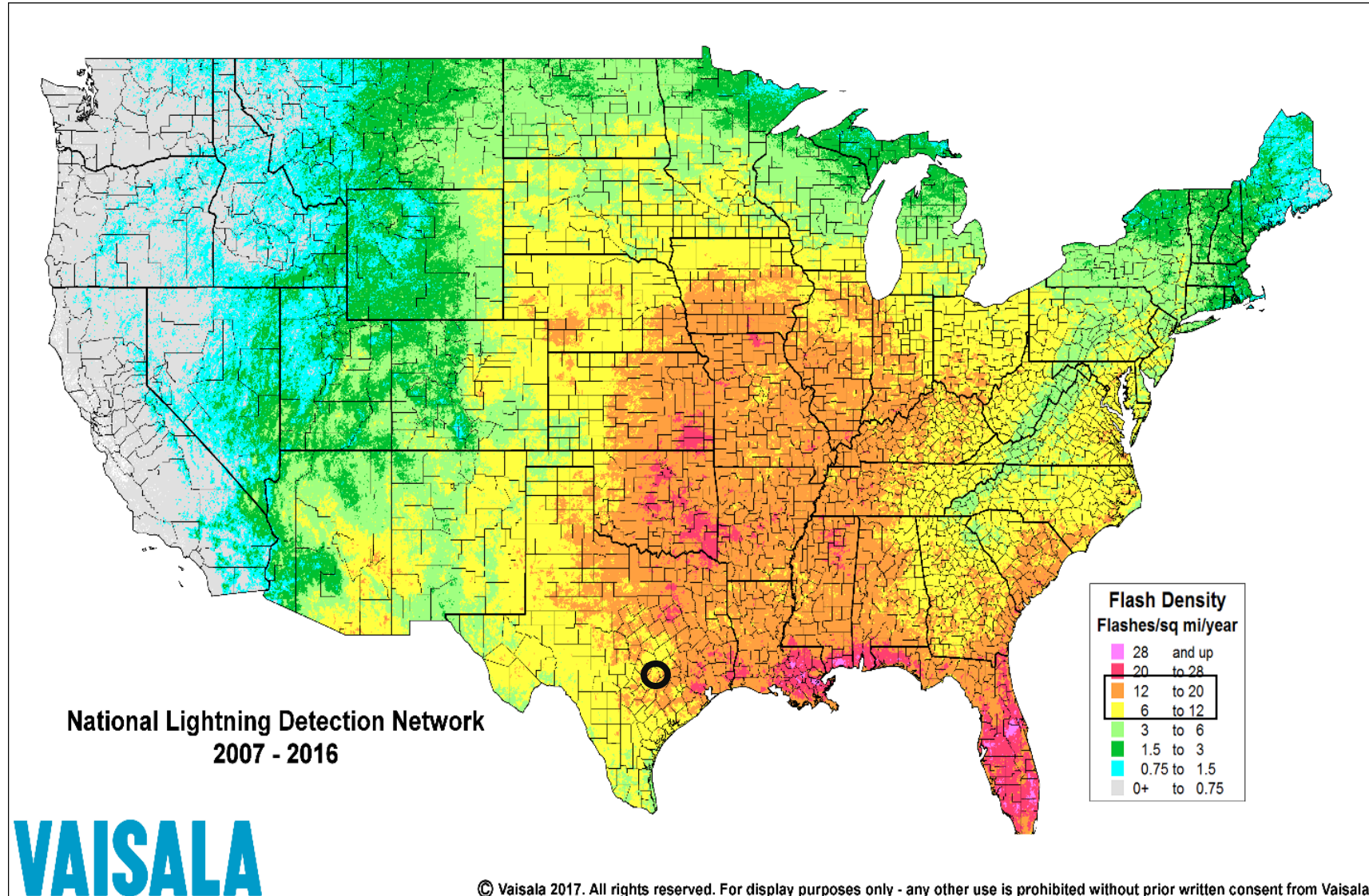
JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	62	115	1	\$20,334,206	\$322,599
City of Bastrop	15	0	1	\$3,818,900	\$0
City of Elgin	12	0	0	\$26,396	\$0
City of Smithville	11	0	0	\$0	\$0
Bastrop ISD	0	0	0	\$0	\$0
Elgin ISD	1*	0	0	\$888	\$0
McDade ISD	0	0	0	\$0	\$0
Smithville ISD	0	0	0	\$0	\$0

FLOOD: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	1*	0	0	\$345,525	\$0
WCID #2	0	0	0	\$0	\$0
WCID #3	0	0	0	\$0	\$0
Total Losses	100	115	2	\$24,848,514	

- Probability of Future Events for the Bastrop County planning area is 3.92 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$974,451.53 per year.

LIGHTNING



LIGHTNING: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	0	0	0	\$0	\$0
City of Bastrop	0	0	0	\$0	\$0
City of Elgin	1	0	0	\$5,000	\$0
City of Smithville	0	0	0	\$0	\$0
Bastrop ISD	0	0	0	\$0	\$0
Elgin ISD	1*	0	0	\$0	\$0
McDade ISD	0	0	0	\$	\$0
Smithville ISD	1*	0	0	\$6,000	\$0

LIGHTNING: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	0	0	\$0	\$0
WCID #2	0	0	0	\$0	\$0
WCID #3	0	0	0	\$0	\$0
Total Losses	1	0	0	\$11,000	

- Probability of Future Events for the Bastrop County planning area is 0.08* per year or an event probable in the next year. *Based on lightning flash density due to limited reporting.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$431.37 per year.

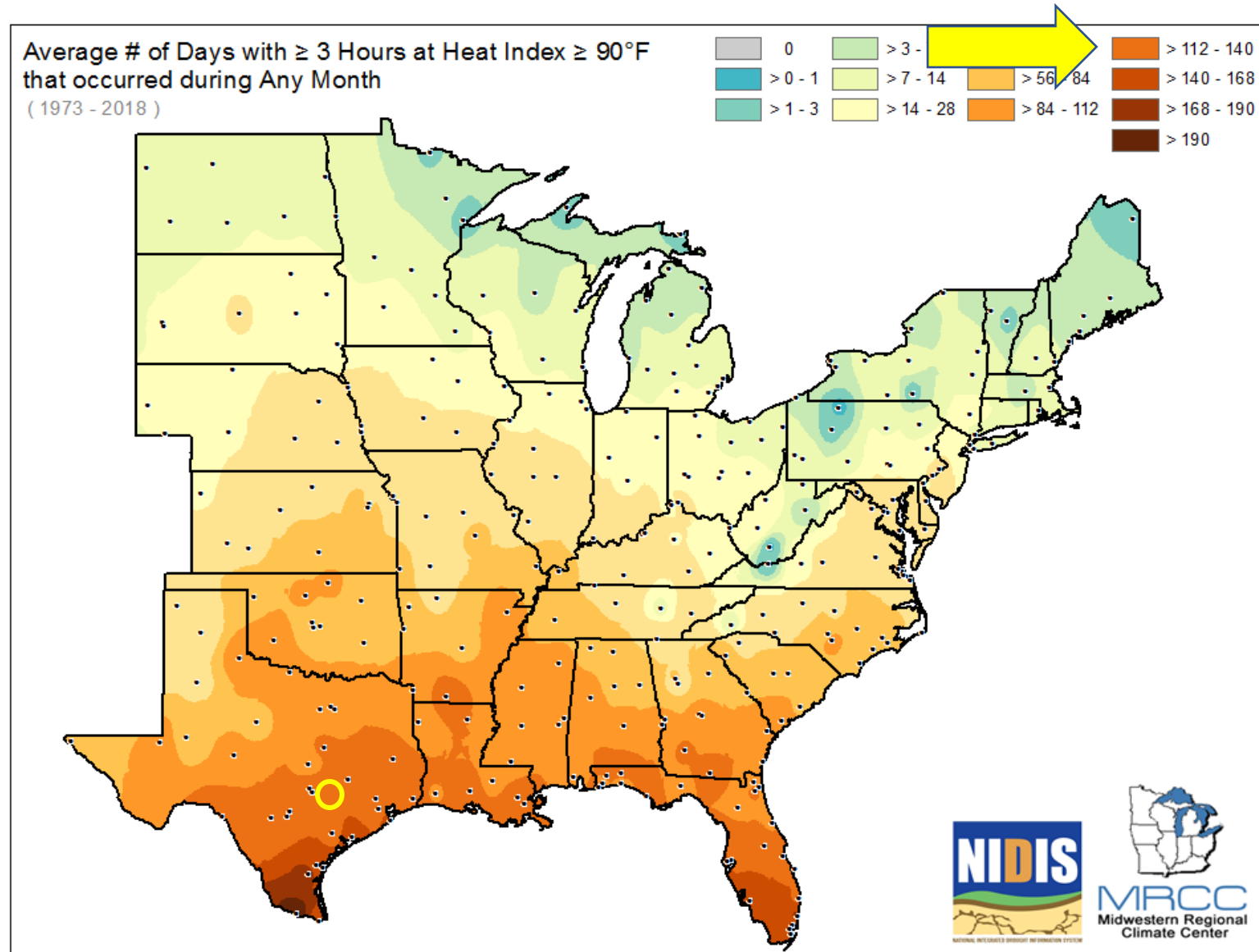
HURRICANE: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	1	0	0	\$192,325	\$0
Total Losses	1	0	0	\$192,325	

- Probability of Future Events for the Bastrop County planning area is 0.04 per year or an event probable in the next ten years.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$7,542.16 per year.

* MUD #1 provided data which included \$192,325.00 of damages.

EXTREME HEAT



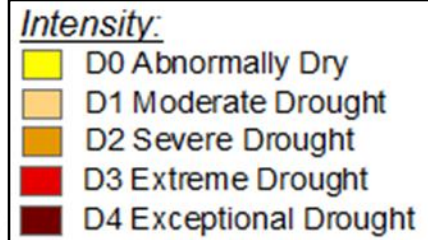
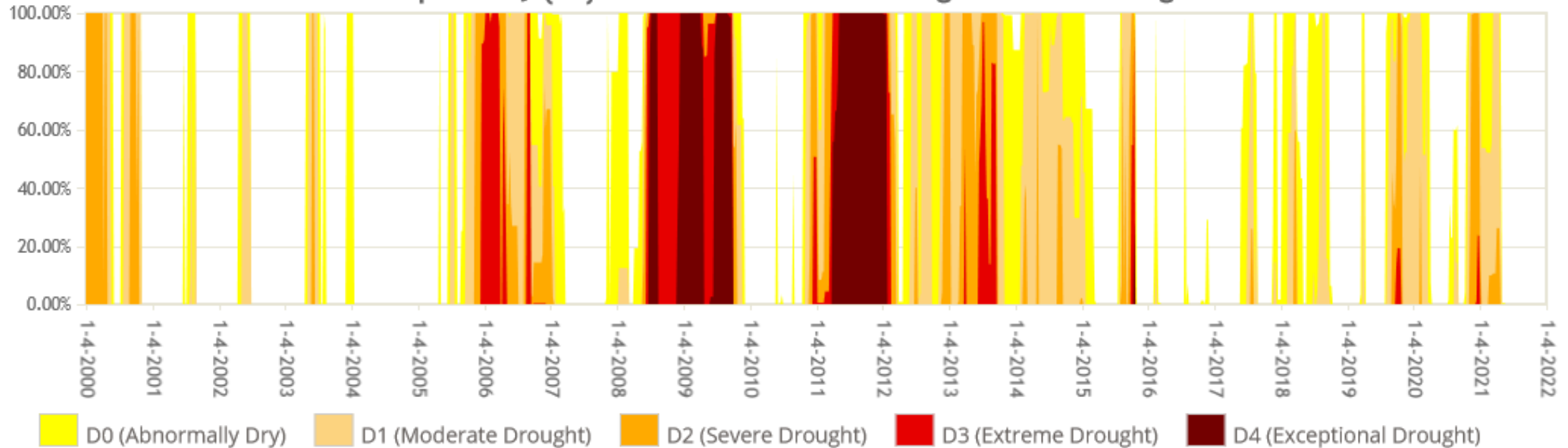
EXTREME HEAT: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	2	0	0	\$0	\$0
Total Losses	2	0	0	\$0	

- Probability of Future Events for Bastrop County is assumed to be greater than 0.08* due to the average daily temperatures throughout the summer and an event is probable in the next year.
- The Average Annualized Loss for Bastrop County is considered negligible.

DROUGHT

Bastrop County (TX) Percent Area in U.S. Drought Monitor Categories



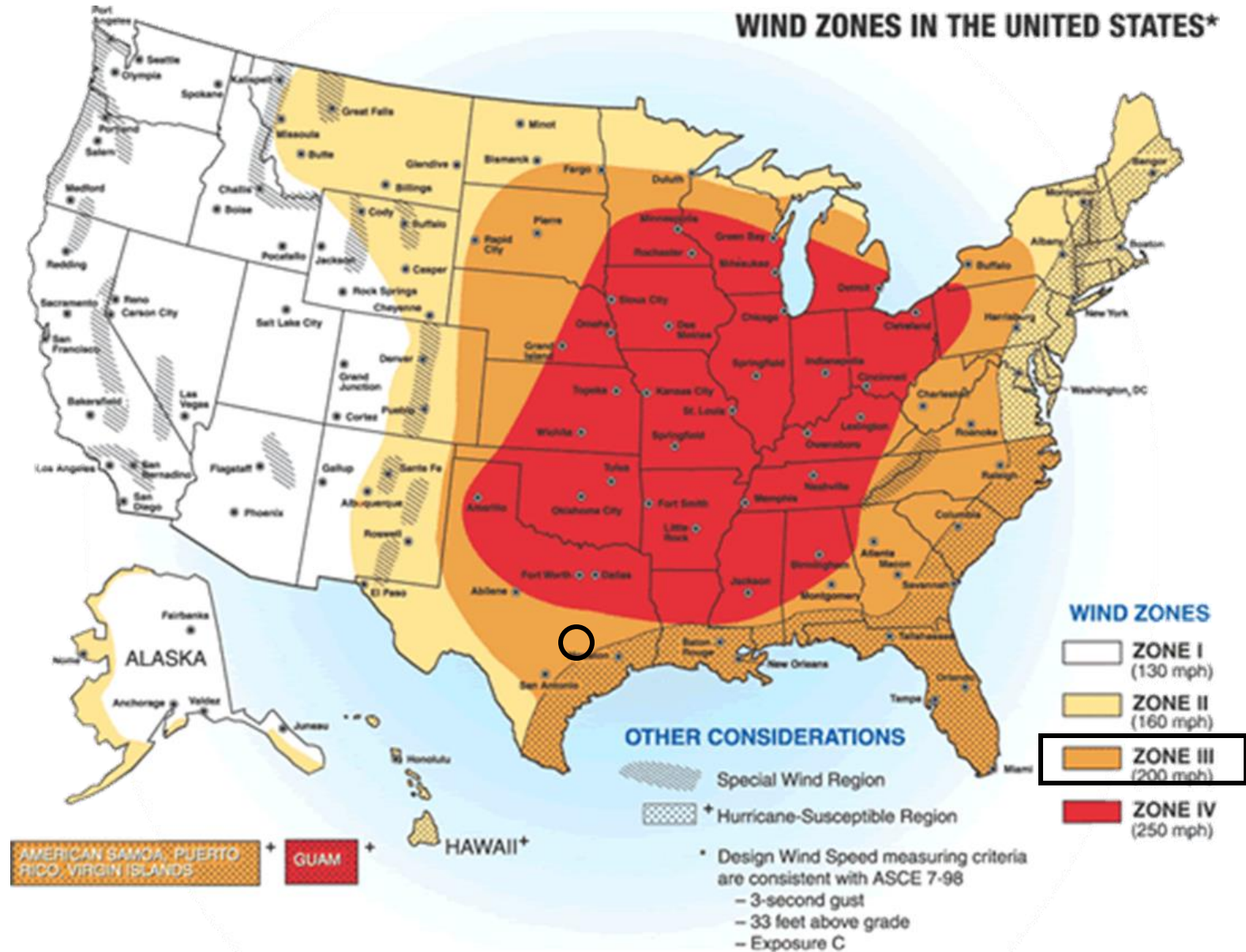
DROUGHT: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	9	0	0	\$119,110*	\$0
Total Losses	9	0	0	\$119,110	

- Probability of Future Events for Bastrop County is 0.35 per year or an event probable in the next year.
- The Average Annualized Loss for Bastrop County is approximately \$4,670.98 per year.

*MUD #1 provided data which included \$119,110.00 of damages.

THUNDERSTORM WIND



THUNDERSTORM WIND: HISTORICAL EVENTS SUMMARY, 1996 – 2021

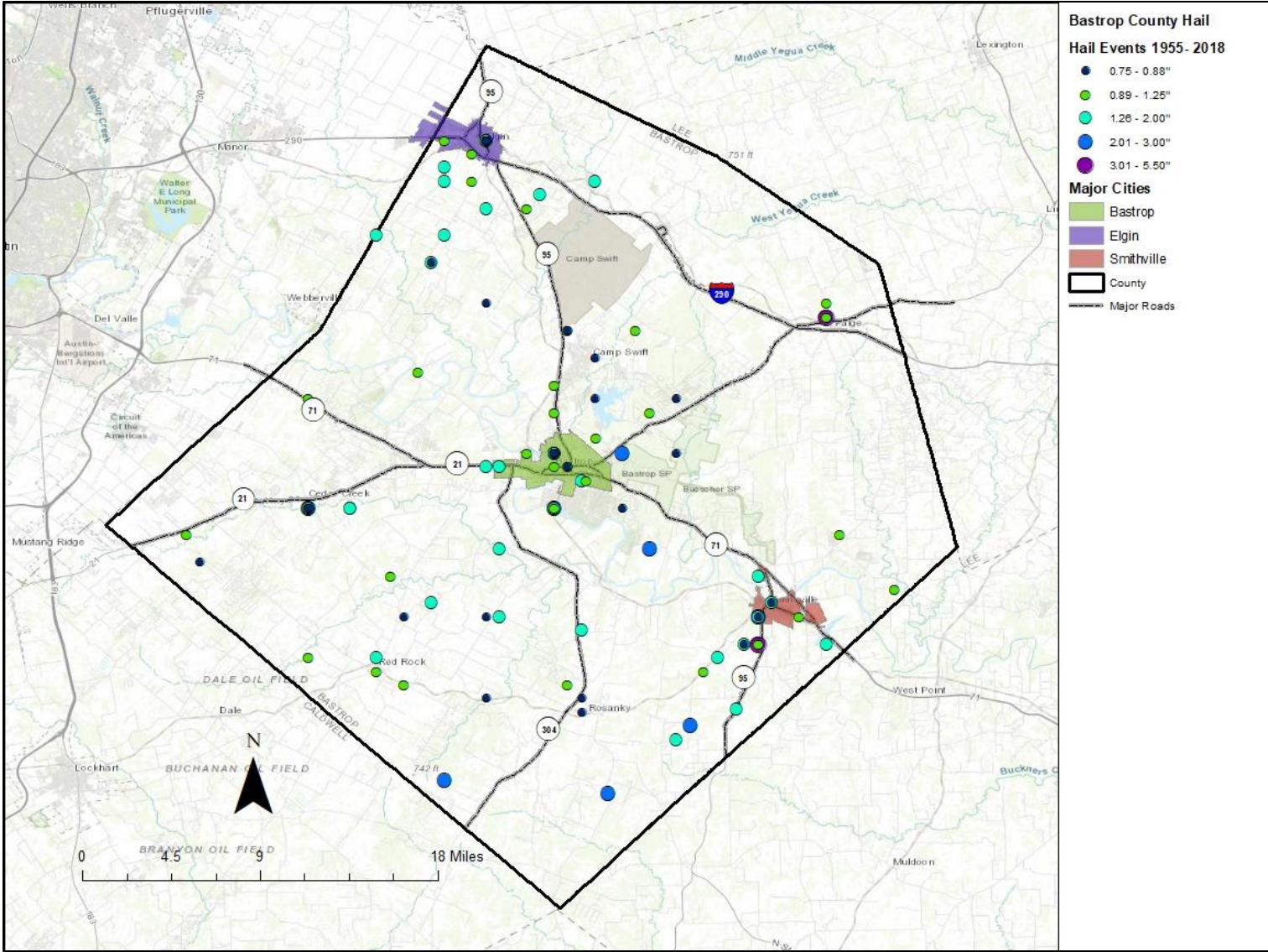
JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	53	100 mph	0	0	\$695,760	\$164,347
City of Bastrop	20	70 mph	0	0	\$463,566	\$5,271
City of Elgin	11	65 mph	0	0	\$463,399	\$32,836
City of Smithville	11	70 mph	0	0	\$123,852	\$0
Bastrop ISD	0	n/a	0	0	\$0	\$0
Elgin ISD	4*	n/a	0	0	\$172,115	\$0
McDade ISD	0	n/a	0	0	\$0	\$0
Smithville ISD	0	n/a	0	0	\$0	\$0

THUNDERSTORM WIND: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	n/a	0	0	\$0	\$0
WCID #2	0	n/a	0	0	\$0	\$0
WCID #3	0	n/a	0	0	\$0	\$0
Total Losses	95	100 mph	0	0	\$2,121,146	

- Probability of Future Events for the Bastrop County planning area is 1.43 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$31,896.93 per year.

HAIL



HAIL: HISTORICAL EVENTS SUMMARY, 1955 – 2021

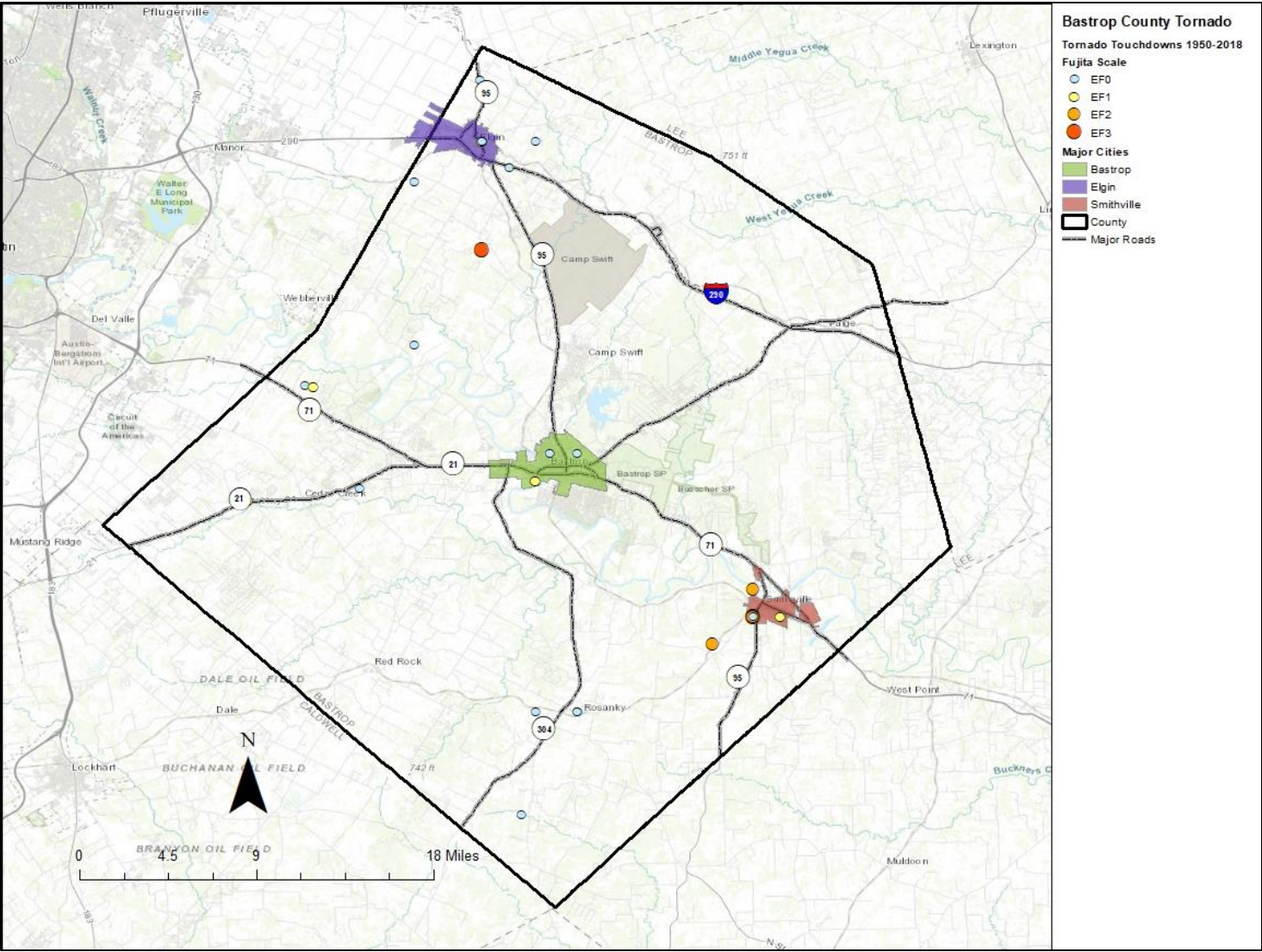
JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	68	4.5 inches	0	0	\$14,531	\$0
City of Bastrop	25	1.75 inches	0	0	\$0	\$0
City of Elgin	16	1.75 inches	0	0	\$0	\$0
City of Smithville	14	5.5 inches	0	0	\$2,328	\$0
Bastrop ISD	0	n/a	0	0	\$0	\$0
Elgin ISD	3*	n/a	0	0	\$3,958,494	\$0
McDade ISD	0	n/a	0	0	\$0	\$0
Smithville ISD	0	n/a	0	0	\$0	\$0

HAIL: HISTORICAL EVENTS SUMMARY, 1955 – 2021

JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	n/a	0	0	\$0	\$0
WCID #2	0	n/a	0	0	\$0	\$0
WCID #3	0	n/a	0	0	\$0	\$0
Total Losses	123	5.5 inches	0	0	\$3,975,353	

- Probability of Future Events for the Bastrop County planning area is 1.85 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$59,779.74 per year.

TORNADO



Fujita Scale No.	Old Fujita Scale (mph)	Enhanced Fujita Scale (mph)
0	40-72	65-85
1	73-112	86-110
2	113-157	111-135
3	158-206	136-165
4	207-260	166-200
5	261-318	Over 200

TORNADO: HISTORICAL EVENTS SUMMARY, 1950 – 2021

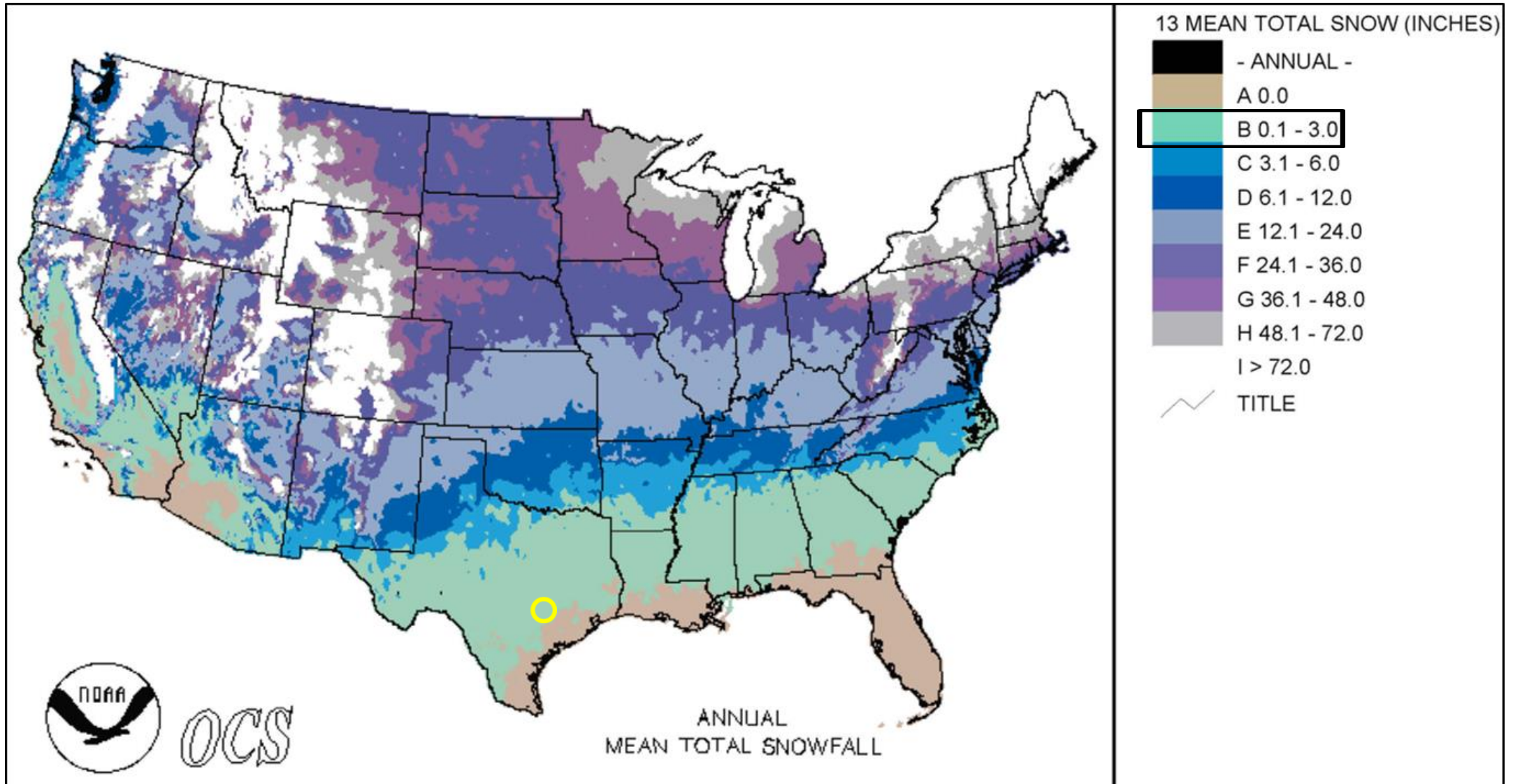
JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	28	EF3	5	0	\$5,668,690	\$17,832
City of Bastrop	0	n/a	0	0	\$0	\$0
City of Elgin	5	EF1	1	0	\$290,195	\$0
City of Smithville	1	EF0	0	0	\$51,291	\$0
Bastrop ISD	0	n/a	0	0	\$0	\$0
Elgin ISD	0	n/a	0	0	\$0	\$0
McDade ISD	0	n/a	0	0	\$0	\$0
Smithville ISD	0	n/a	0	0	\$0	\$0

TORNADO: HISTORICAL EVENTS SUMMARY, 1950 – 2021

JURISDICTION	Number of Events	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	n/a	0	0	\$0	\$0
WCID #2	0	n/a	0	0	\$0	\$0
WCID #3	0	n/a	0	0	\$0	\$0
Total Losses	34	EF3	6	0	\$6,028,008	

- Probability of Future Events for the Bastrop County planning area is 0.48 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$84,307.80 per year.

WINTER STORM



WINTER STORM: HISTORICAL EVENTS SUMMARY, 1996 – 2021

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	18	0	0	\$0	\$0
City of Bastrop	0	0	0	\$0	\$0
City of Elgin	0	0	0	\$0	\$0
City of Smithville	0	0	0	\$0	\$0
Bastrop ISD	0	0	0	\$0	\$0
Elgin ISD	1*	0	0	\$160,000	\$0
McDade ISD	0	0	0	\$0	\$0
Smithville ISD	0	0	0	\$0	\$0

WINTER STORM: HISTORICAL EVENTS SUMMARY, 1996 – 2021

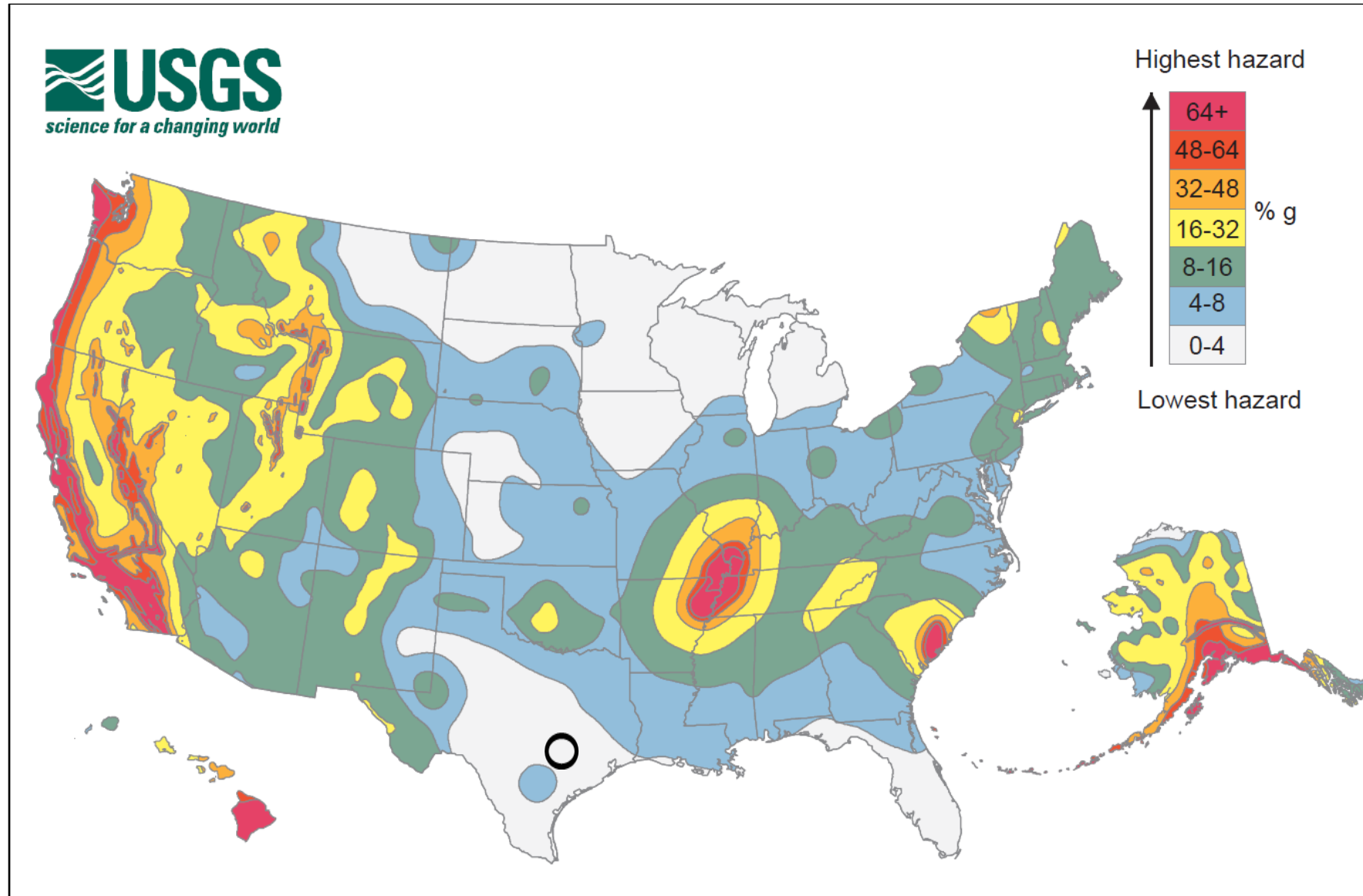
JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	0	0	\$0	\$0
WCID #2	0	0	0	\$0	\$0
WCID #3	0	0	0	\$0	\$0
Total Losses	18	0	0	\$160,000	

- Probability of Future Events for the Bastrop County planning area is 0.71 per year or an event probable in the next year.
- The Average Annualized Loss for the Bastrop County planning area is approximately \$6,274.51 per year.

SOILS OF TEXAS/BASTROP COUNTY



EARTHQUAKE



EARTHQUAKE

- The NOAA database shows no recorded earthquake in the planning area or in close proximity to the planning area. Earthquakes with a magnitude below 2.5 are not reported on the USGS site.
- Bastrop County is located within the 0 to 4% g range on USGS map. Meaning the planning area is in a low risk area.
- With there being no recent historic losses reported in the planning area and no future losses are anticipated, it is optional to include Earthquake as a hazard in this Plan.

DAM FAILURE: HISTORICAL EVENTS SUMMARY, 1960– 2020

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	2	0	0	\$0	\$0
City of Bastrop	0	0	0	\$0	\$0
City of Elgin	0	0	0	\$0	\$0
City of Smithville	0	0	0	\$0	\$0
Bastrop ISD	0	0	0	\$0	\$0
Elgin ISD	0	0	0	\$0	\$0
McDade ISD	0	0	0	\$0	\$0
Smithville ISD	0	0	0	\$0	\$0

DAM FAILURE: HISTORICAL EVENTS SUMMARY, 1960 – 2020

JURISDICTION	Number of Events	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
MUD #1	0	0	0	\$0	\$0
WCID #2	0	0	0	\$0	\$0
WCID #3	0	0	0	\$0	\$0
Total Losses	2	0	0	\$0	\$0

- Probability of Future Events for the Bastrop County planning area is 0.03 per year or an event probable in the next ten years.
- The Average Annualized Loss for the Bastrop County planning area is negligible.

GUIDELINES FOR PROFILING DAMS IN THE HMAP

- Location
- Topography
- Capacity
- Area Development

HAZARDS ASSESSED

HAZARD	PROBABILITY	ANNUAL OCCURRENCE	AVERAGE ANNUALIZED LOSS
Wildfire	115.56	Highly Likely	\$26,346,885.57 227.56 acres/year
Flood	3.92	Highly Likely	\$974,451.53
Lightning	0.08*	Highly Likely	\$431.37
Hurricane Wind	0.04	Unlikely	\$7,542.16
Extreme Heat	0.08*	Highly Likely	\$0
Drought	0.35	Highly Likely	\$4,670.98
Thunderstorm Wind	1.43	Highly Likely	\$31,896.93
Hail	1.85	Highly Likely	\$59,779.74
Tornado	0.48	Highly Likely	\$84,307.80
Winter Storm	0.71	Highly Likely	\$6,274.51
Expansive Soils	0.0	Unlikely	\$0
Earthquake	0.0	Unlikely	\$0
Dam/Levee Failure	0.0	Unlikely	\$0

VULNERABILITY DISCUSSION

HAZARD	VULNERABILITY*
Wildfire	Critical Facilities, Vulnerable Structures
Flood	Critical Facilities in floodplain
Lightning	Critical Facilities, Vulnerable Structures
Hurricane Wind	Critical Facilities, Vulnerable Structures
Extreme Heat	Vulnerable populations
Drought	Vulnerable populations
Thunderstorm Wind	Critical Facilities, Vulnerable Structures
Hail	Critical Facilities, Vulnerable Structures
Tornado	Critical Facilities, Vulnerable Structures
Winter Storm	Vulnerable populations
Expansive Soils	Critical Facilities, Vulnerable Structures
Earthquake	Critical facilities, Vulnerable structures
Dam/Levee Failure	Structures in Estimated Inundation Zones

*Quantifiable. We also address agricultural impacts, utility impacts, infrastructure impacts, and emergency operation disruptions in narrative form.

TIMELINE



A coastal scene with a dark, stormy sky and a sandy beach. The sky is filled with heavy, dark clouds, and the water is calm. In the distance, a small island or peninsula is visible with some buildings and palm trees. The overall mood is dramatic and somewhat ominous.

NEXT MEETING

- Mitigation Workshop to be held in November 2021.
- Public Meeting will follow that evening once scheduled.

- Develop a mitigation strategy and determine eligible projects (referred to as mitigation actions).
- Create actions within state and FEMA guidelines.
- Solicit input from the public by encouraging completion of the Public Survey.

MITIGATION WORKSHOP PREVIEW

A coastal scene with a beach, ocean, and a cloudy sky, serving as a background for the title. The sky is filled with dark, dramatic clouds, and the ocean is a deep blue. A sandy beach is visible in the foreground, and some distant structures and palm trees are on the horizon.

- Mitigation Goals
 - Based upon findings of the Risk and Capability Assessments
 - Lessons learned from previous and ongoing mitigation projects
- Identification and analysis of mitigation projects addressing natural hazards.

MITIGATION STRATEGY

The background image is a photograph of a beach scene under a dramatic, dark, and cloudy sky. The sky is filled with heavy, dark blue and grey clouds, suggesting an approaching storm or late evening. The ocean is visible in the middle ground, with white foam from breaking waves washing onto a sandy beach in the foreground. On the right side of the image, there are some palm trees and a small structure, possibly a lifeguard stand or a small building, near the water's edge. The overall mood is somber and urgent, which complements the 'MITIGATION STRATEGY' title.

Minimum of 2 actions per hazard, and of two different types:

1. Local Plans and Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection
4. Education and Awareness


TYPES OF MITIGATION ACTIONS

The background of the right side of the slide is a dark, atmospheric photograph. It shows a beach with a pebbly shore in the foreground, meeting a calm sea. In the distance, a small structure with a yellow roof is visible on the right side of the horizon. The sky is filled with heavy, dark clouds, creating a somber and dramatic mood. The overall color palette is dominated by deep blues, greys, and blacks, with a hint of yellow from the distant structure.

A coastal scene with a dark, stormy sky and a sandy beach. The sky is filled with heavy, dark clouds, and the water is a deep blue-grey. In the distance, a small island or peninsula is visible with some buildings and palm trees. The foreground shows a sandy beach with some small waves washing onto it.

NEXT STEPS

- Date and time for the next workshop will be distributed by email.
- Please review and download the mitigation documentation.
- Post and forward the public survey link to friends, family, neighbors, etc.
 - Residents are encouraged to go online and take the Public Survey



Please direct questions or comments to H2O Partners:

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