

Dallas County Hazard Mitigation Plan Update Meeting #2

January 24, 2018

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Southwest Missouri Council of Governments



Southwest Missouri
Council of Governments

Outline

- ▶ Participation overview
- ▶ Process recap
- ▶ Risk assessment
- ▶ Mitigation strategies preview
- ▶ Future meeting dates

Local Plan Participation

- ▶ Attend a minimum of two Mitigation Planning Committee meetings
- ▶ Documentation of Time and Effort
- ▶ Adoption of the Hazard Mitigation Plan
- ▶ Complete Capabilities Survey
 - ▶ Current Plans
 - ▶ Additional Questions
 - ▶ Provide Insured Replacement Cost for Structures and Contents

Time & Effort Reporting

- ▶ Hourly rate for volunteer time in Missouri:
 - ▶ \$21.57
- ▶ Federal mileage rate
 - ▶ 54¢ per mile

9 Tasks in the Planning Process

- ▶ Task 1: Determine the Planning Area and Resources → Completed
- ▶ Task 2: Build the Planning Team- Completed → YOU ARE THE TEAM!
- ▶ Task 3: Create an Outreach Strategy→ December 6 - What's the plan?
- ▶ Task 4: Review Community Capabilities→ Questionnaire - any questions?
- ▶ Task 5: Conduct a Risk Assessment → Today
- ▶ Task 6: Develop a Mitigation Strategy→ Meetings #3 and #4
- ▶ Task 7: Review and Adopt the Plan → Meeting #5 and on your own
- ▶ Task 8: Keep the Plan Current → That's YOU!
- ▶ Task 9: Create a Safe and Resilient Community→ That's YOU!

Risk Assessment

- ▶ Is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazard events by assessing the vulnerability of people, buildings, and infrastructure to natural hazards
- ▶ Evaluates the degree to which injuries and damages may occur
- ▶ Provides the foundation for the rest of the mitigation planning process

Hazard Identification and Vulnerability

- ▶ Code of Federal Regulations Title 44 Emergency Management and Assistance Part §201.6

- ❖ (c) Plan content. The plan shall include the following:

- ☐ (i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction
- ☐ The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events
- ☐ (ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section; **This description shall include an overall summary of each hazard and its impact on the community**

Presidential Disaster Declarations 1990-Present

14

Disaster Number	Description	Declaration Date	Incident Period	Individual Assistance(IA) Public Assistance(PA)
4317	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	June 2, 2017	April 28- May 11, 2017	Public Assistance
4250	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	January 21, 2016	December 23, 2015- January 9, 2016	Public Assistance
4238	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	August 7, 2015	May 15, 2015 - July 27, 2015	Public Assistance
4144	Severe Storms, Straight-Line Winds, Flooding	September 6, 2013	August 2- August 14, 2013	Public Assistance
1961	Severe Winter Storm and Snowstorm	March 23, 2011	January 31, 2011 - February 5, 2011	Public Assistance
1847	Severe Storms, Tornadoes, Flooding	June 19, 2009	May 8 - May 16, 2009	Public Assistance
1749	Severe Storms & Flooding	March 19, 2008	March 17 - May 9, 2008	Individual and Public Assistance
1742	Severe Storms, Tornadoes, Flooding	February 5, 2008	January 7 - January 10, 2017	Public Assistance
1728	Severe Storms and Flooding	September 21, 2007	August 19 - August 21, 2007	Public Assistance
1676	Severe Winter Storms and Flooding	January 15, 2007	January 12 - January 22, 2007	Public Assistance
1463	Severe Storms Tornadoes, and Flooding	May 6, 2003	May 4 - May 30, 2003	Individual & Public Assistance
1412	Severe storms, Tornadoes, and Flooding	May 6, 2002	April 24 - June 10, 2002	Individual & Public Assistance
1054	Severe storms, Tornadoes, Hail, and Flooding	June 2, 1995	May 13 - June 23, 1995	Individual & Public Assistance
995	Severe storms & Flooding	July 9, 1993	June 10 - October 25, 1993	Individual & Public Assistance

Hazards Identified

- ▶ Dam Failure
- ▶ Drought
- ▶ Earthquake
- ▶ Extreme Heat
- ▶ Flooding: Riverine and Flash
- ▶ Severe Thunderstorms
- ▶ Tornadoes
- ▶ Severe Winter Weather
- ▶ Wildfire
- ▶ Levee Failure - **Omitted**

Identified Hazard: Dam Failure

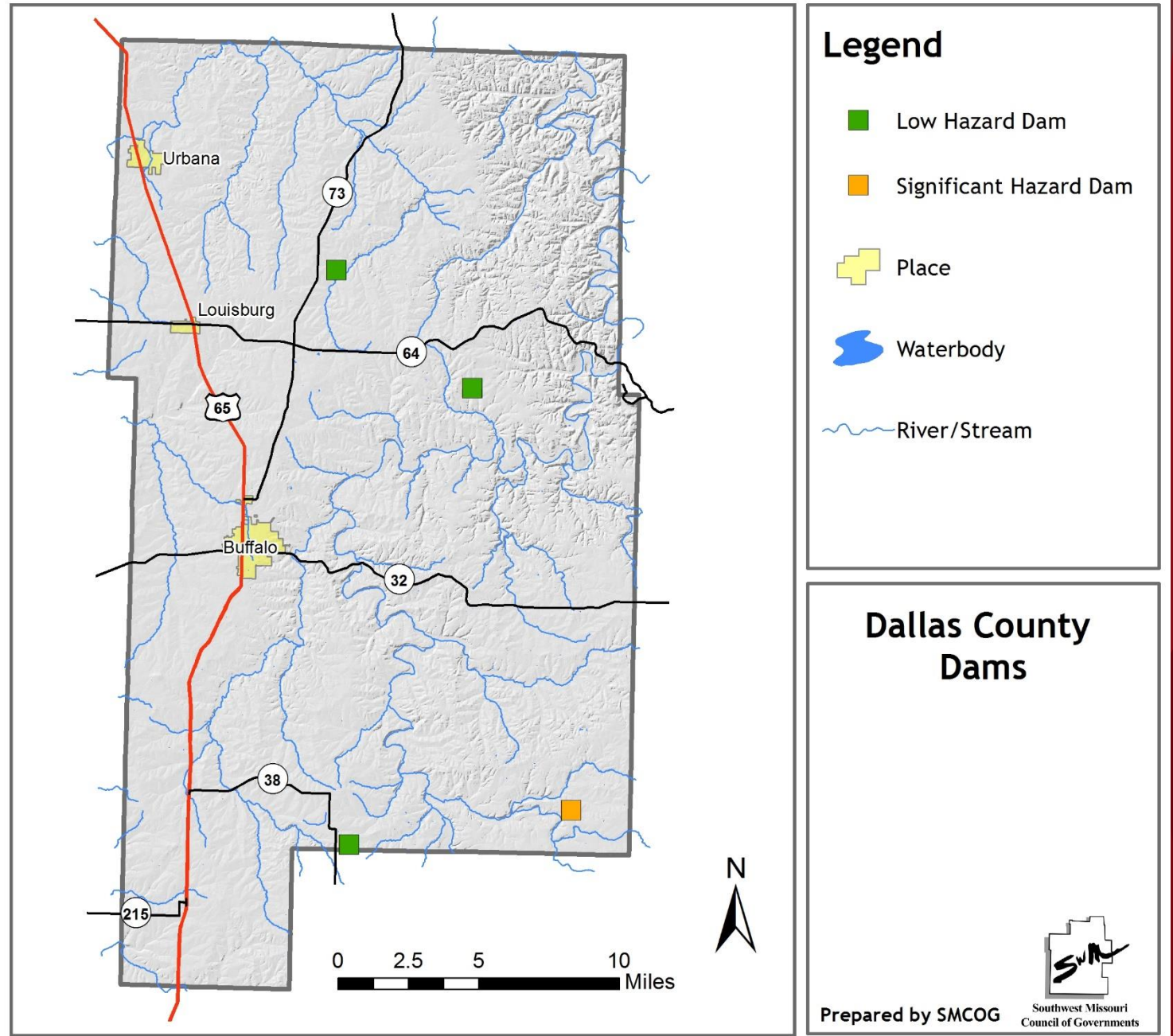
MDNR Dam Hazard Classification Definitions	
Hazard Class	Definition
Class I	The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspection of these dams must occur every two years
Class II	The area downstream from the dam that would be affected by inundation contains one to nine permanent dwelling, or one (1) or more campgrounds with permanent water, sewer and electrical services or one (1) or more industrial buildings. Inspection of these dams must occur once every three years.
Class III	The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspection of these dams must occur once every five years

National Inventory of Dams Hazard Classification Definitions	
Hazard Class	Definition
Low Hazard	Failure results in only minimal property damage.
Significant Hazard	Failure could possibly result in the loss of life and appreciable property damage.
High Hazard	If the dam were to fail, lives would be lost and extensive property damage could result.

There is not a direct correlation between the State Hazard classification and the NID classifications. However, most dams that are in the State's Classes I and II are considered NID High Hazard Dams.

Identified Hazard: Dam Failure

- ▶ 4 NID dam in Dallas County
 - ▶ 3 Low Hazard
 - ▶ 1 Significant Hazard
- ▶ 0 dams outside of Dallas County that could have an impact



Past Occurrences

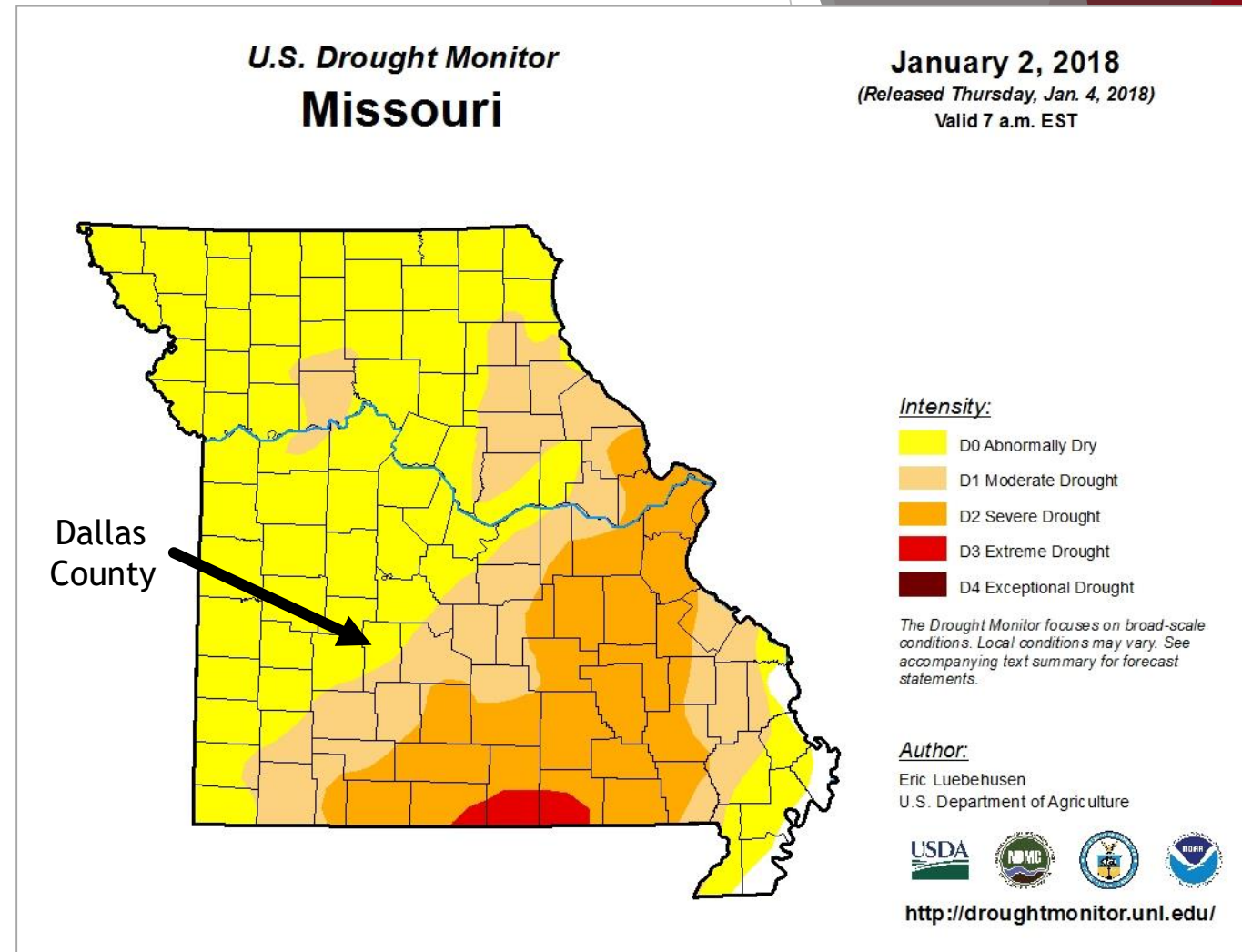
- ▶ No previously recorded dam failure
- ▶ Dam failure rare in Dallas County; probability difficult to determine
- ▶ Potential impact from other dams, but advanced warning would result in low impact.

Identified Hazard: Drought

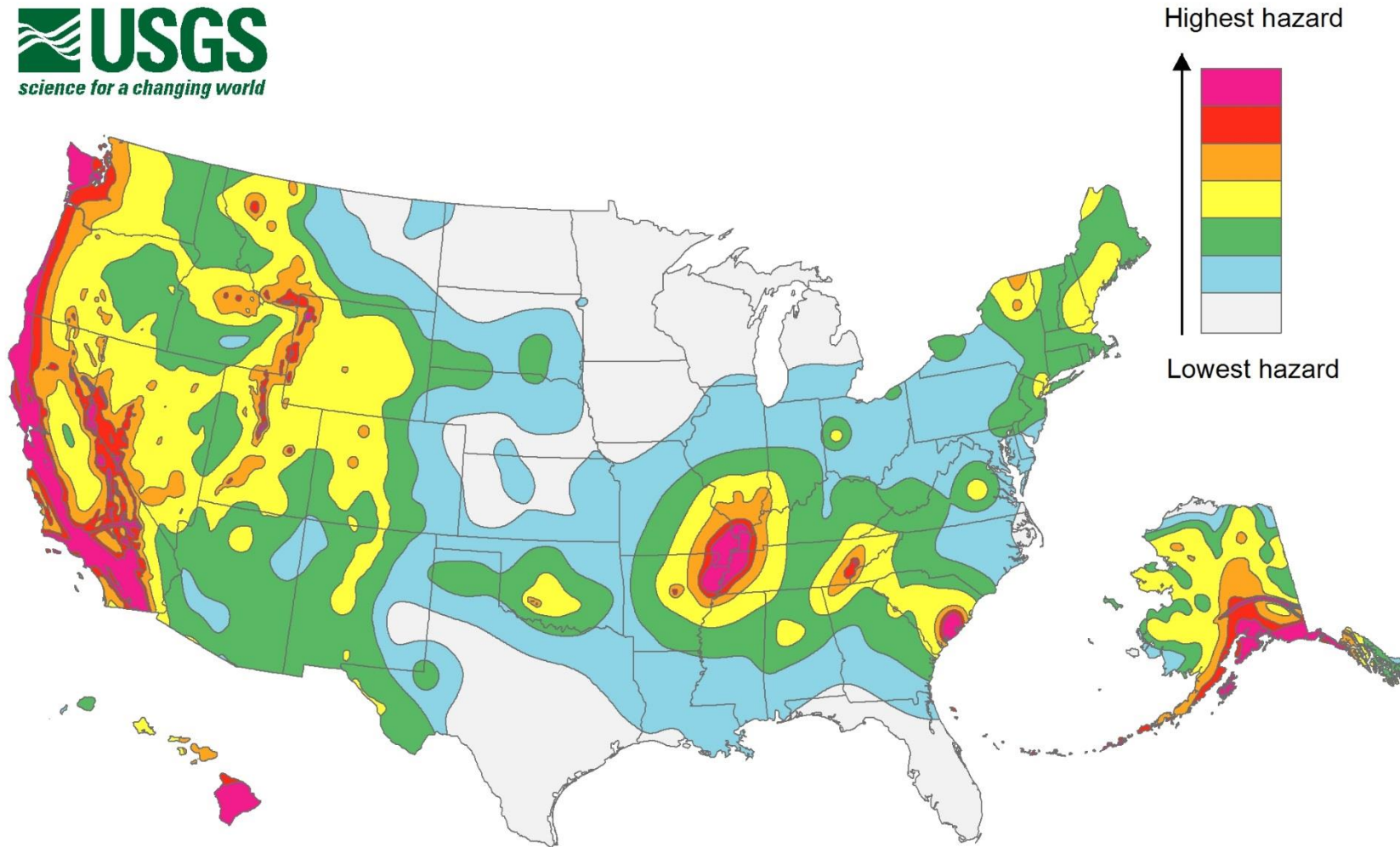
- ▶ **Meteorological Drought:** Regionally based; in the United States, indicated by less than 2.5 mm of rainfall in 48 hours, which is the first indication of drought
- ▶ **Agricultural Drought:** Soil moisture cannot meet the demands of a crop; after a meteorological drought but before a hydrological drought
- ▶ **Hydrological Drought:** Reduction in surface and subsurface water supplies; measured through stream flow and lake, reservoir, and ground water levels
- ▶ **Socioeconomic Drought:** Water shortages affect people, either in terms of water supply or economic impacts (i.e. loss of crops so price increases)

Past Occurrences

- ▶ 14 events from 1998-2017
 - ▶ 2 events resulted in damages
 - ▶ 10% probability of a damaging event in a given year; average losses of \$4,350,000 in crop damages per damaging event

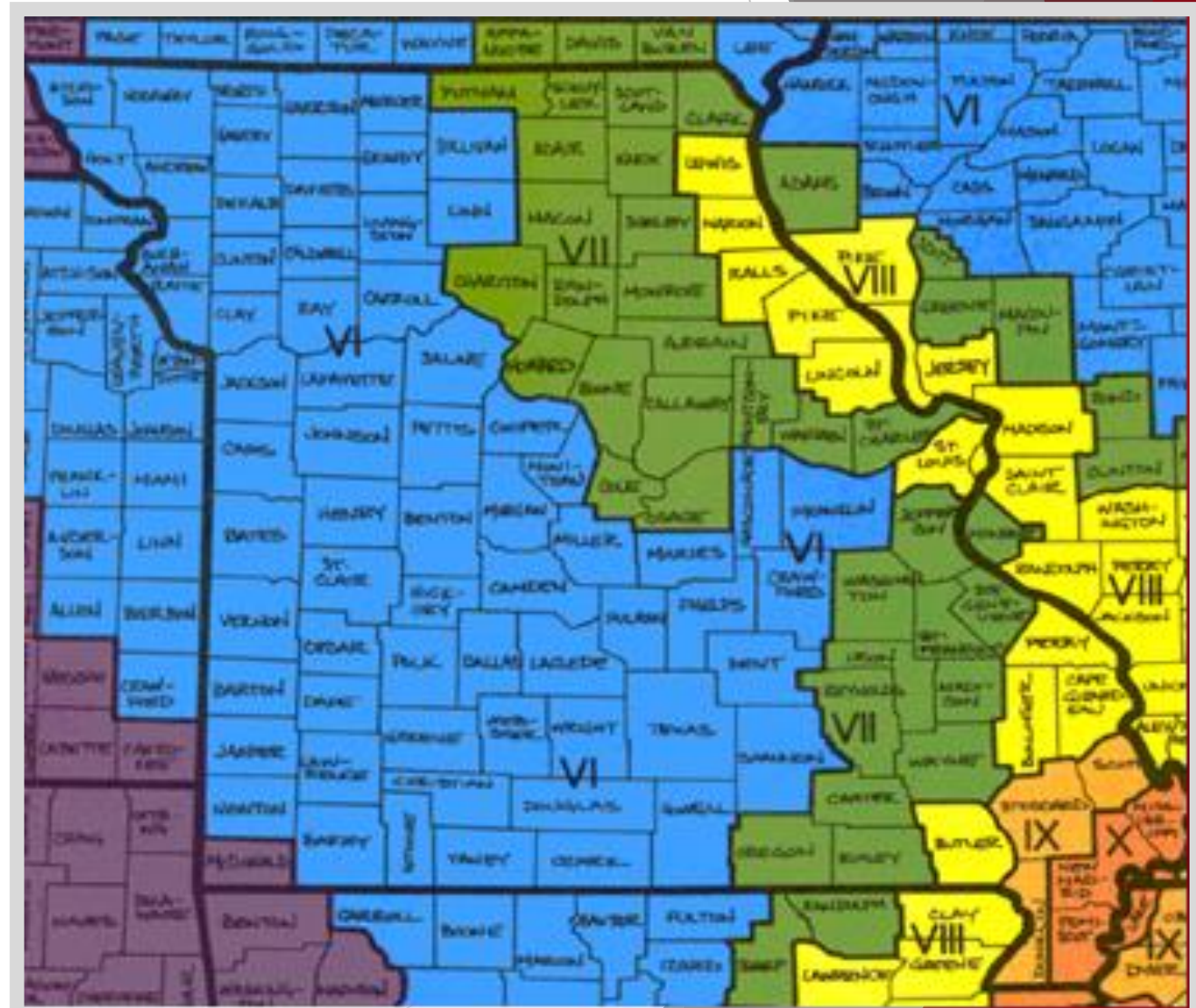


Identified Hazard: Earthquake

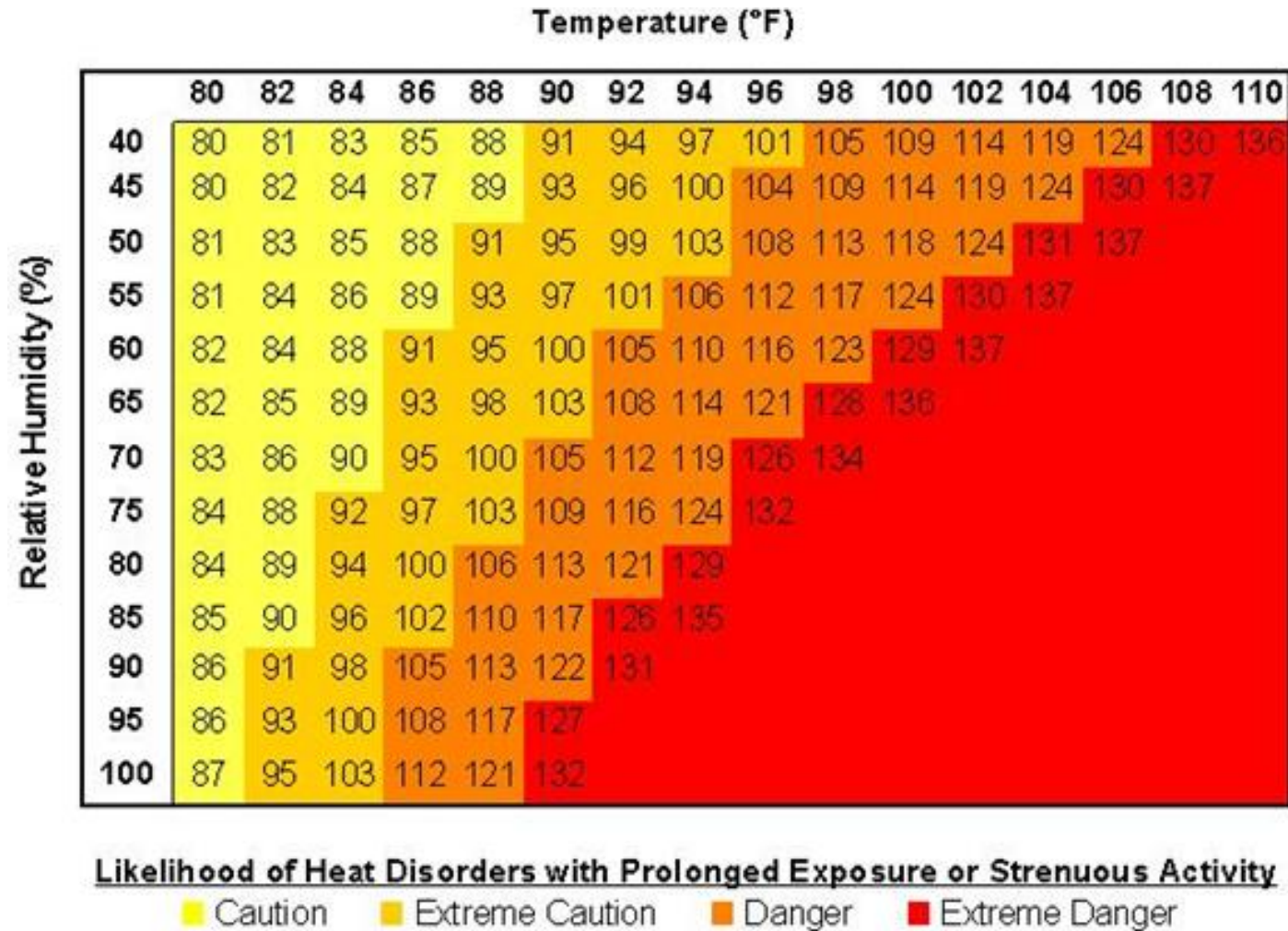


Identified Hazard: Earthquake

- ▶ Modified Mercalli Scale Based on a 7.6 Magnitude Earthquake along the New Madrid Fault
- ▶ Zone VI
 - ▶ Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster; damage slight.
- ▶ Past Occurrences: No recorded significant earthquakes in Dallas County



Identified Hazard: Extreme Heat

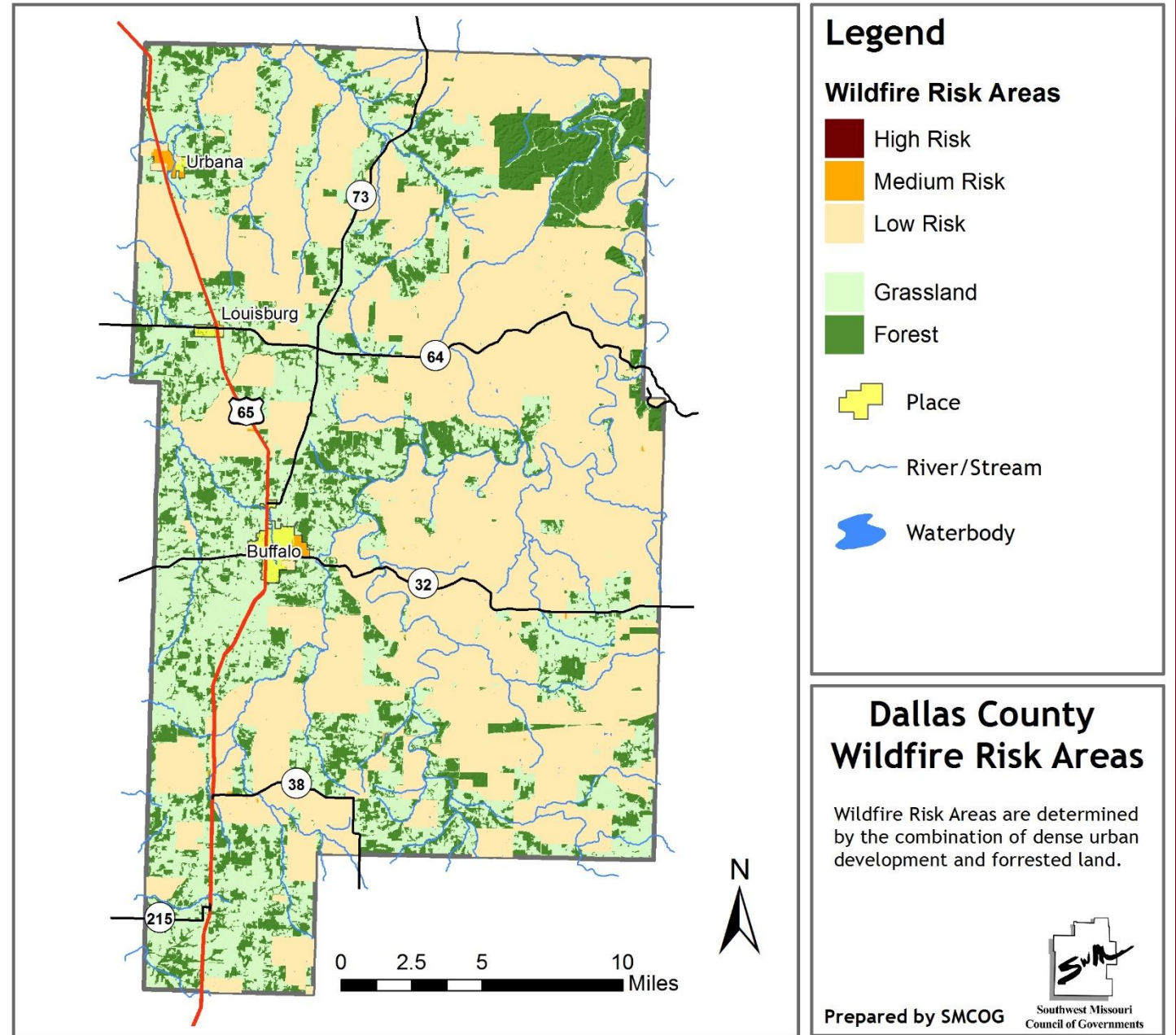


Past Occurrences

- ▶ 9 events from 1998-2017; 4 years with events
- ▶ No reported injuries, deaths, or damages
- ▶ 20% probability of extreme heat event in any given year

Identified Hazard: Wildfire

- ▶ Areas that abut wildland vegetation and that intermingle with wildland are most at risk for wildfire
- ▶ Buffalo and Urbana have or are near wildfire prone areas
- ▶ Large areas of low risk
- ▶ Few areas of medium risk



Past Occurrences

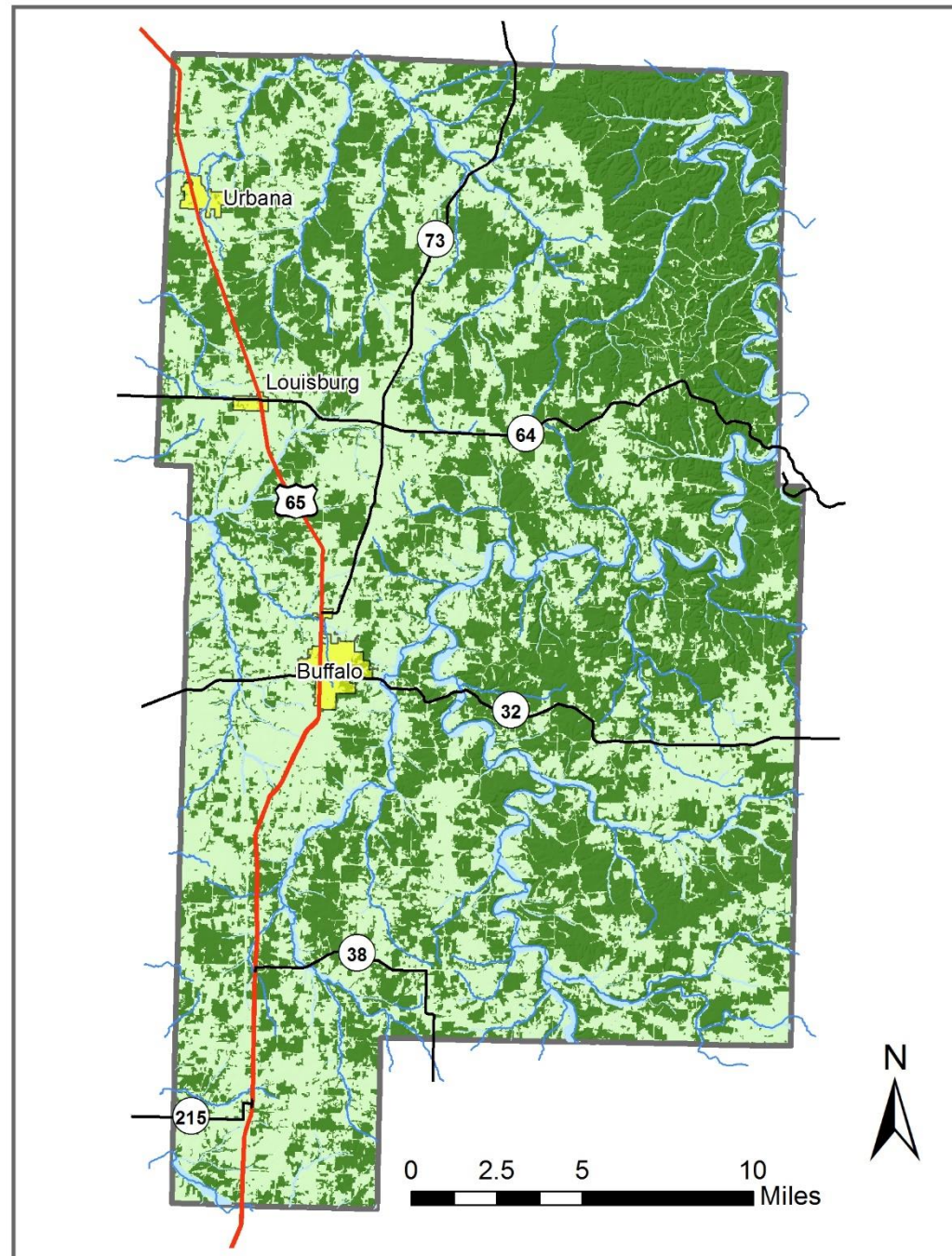
▶ NOAA/NCDC

- ▶ 3 events from 1998-2017
 - ▶ 1 damaging event resulted in \$30,000 in property losses
 - ▶ 5% probability of a damaging event
 - ▶ \$30,000 average loss per damaging event

▶ MDC Fire Reporting

- ▶ 649 events from 2008-2017
 - ▶ 32,427.57 acres burned
 - ▶ 32 buildings destroyed
 - ▶ 23 buildings damaged
 - ▶ 1,095 buildings threatened

Identified Hazard: Riverine and Flash Flood



Legend

- Grassland
- Forest
- Place
- River/Stream
- Waterbody
- 100-Year Floodplain

Dallas County 100-Year Floodplain

Prepared by SMCOG



Past Occurrences

▶ **Riverine Flood - 29 recorded events from 1998-2017**

- ▶ 5 damaging events resulting in \$3,670,000 in property damage; 3 years with damaging events
- ▶ 15% probability of a damaging event in any given year with average losses of **\$734,000** per damaging event

▶ **Flash Flood - 70 events from 1998-2017**

- ▶ 9 damaging events resulting \$966,000 in damages; 7 years with damaging events
- ▶ 35% probability of a damaging event in any given year with average losses of **\$107,333** per damaging event

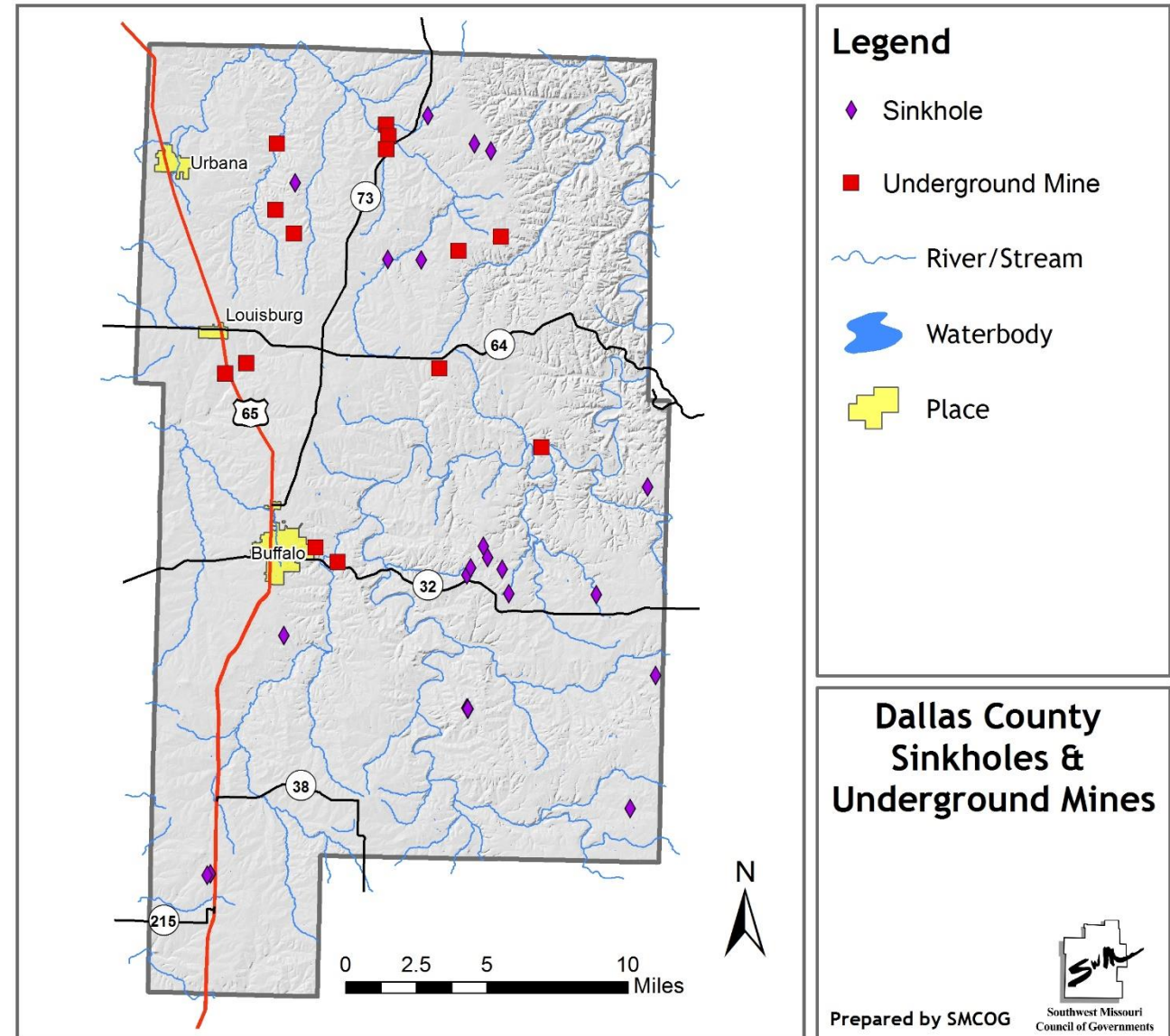
Past Occurrences

NCEI Dallas County Riverine Flood Events Summary, 1998 to 2017					
Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2002	2	0	0	\$3,520,000	\$0
2005	2	0	0	\$0	\$0
2007	1	0	0	\$0	\$0
2008	2	0	0	\$0	\$0
2010	9	0	0	\$0	\$0
2011	5	0	0	\$0	\$0
2013	1	0	0	\$130,000	\$0
2015	1	0	0	\$0	\$0
2016	3	0	0	\$20,000	\$0
2017	3	0	0	\$0	\$0
Total	29	0	0	\$3,670,000	\$0

NCEI Dallas County Flash Flood Events Summary, 1998 to 2017					
Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1998	2	0	0	\$0	\$0
1999	1	0	0	\$0	\$0
2000	1	0	0	\$0	\$0
2002	1	0	0	\$0	\$0
2003	1	0	0	0	\$0
2004	1	0	0	0	\$0
2005	3	0	0	0	\$0
2006	2	0	0	0	\$0
2007	4	0	0	\$50,000	\$0
2008	16	0	0	\$1,000	\$0
2009	7	1	0	\$5,000	\$0
2010	4	0	0	\$0	\$0
2013	6	0	0	\$275,000	\$0
2015	14	1	0	\$525,000	\$0
2016	5	0	0	\$10,000	\$0
2017	2	0	0	\$100,000	\$0
Total	70	2	0	\$966,000	\$0

Identified Hazard - Sinkholes (Severe Land Subsidence)

- ▶ 23 known sinkholes
 - ▶ DNR/USGS
- ▶ 14 underground mines
- ▶ No communities have sinkholes in city limits

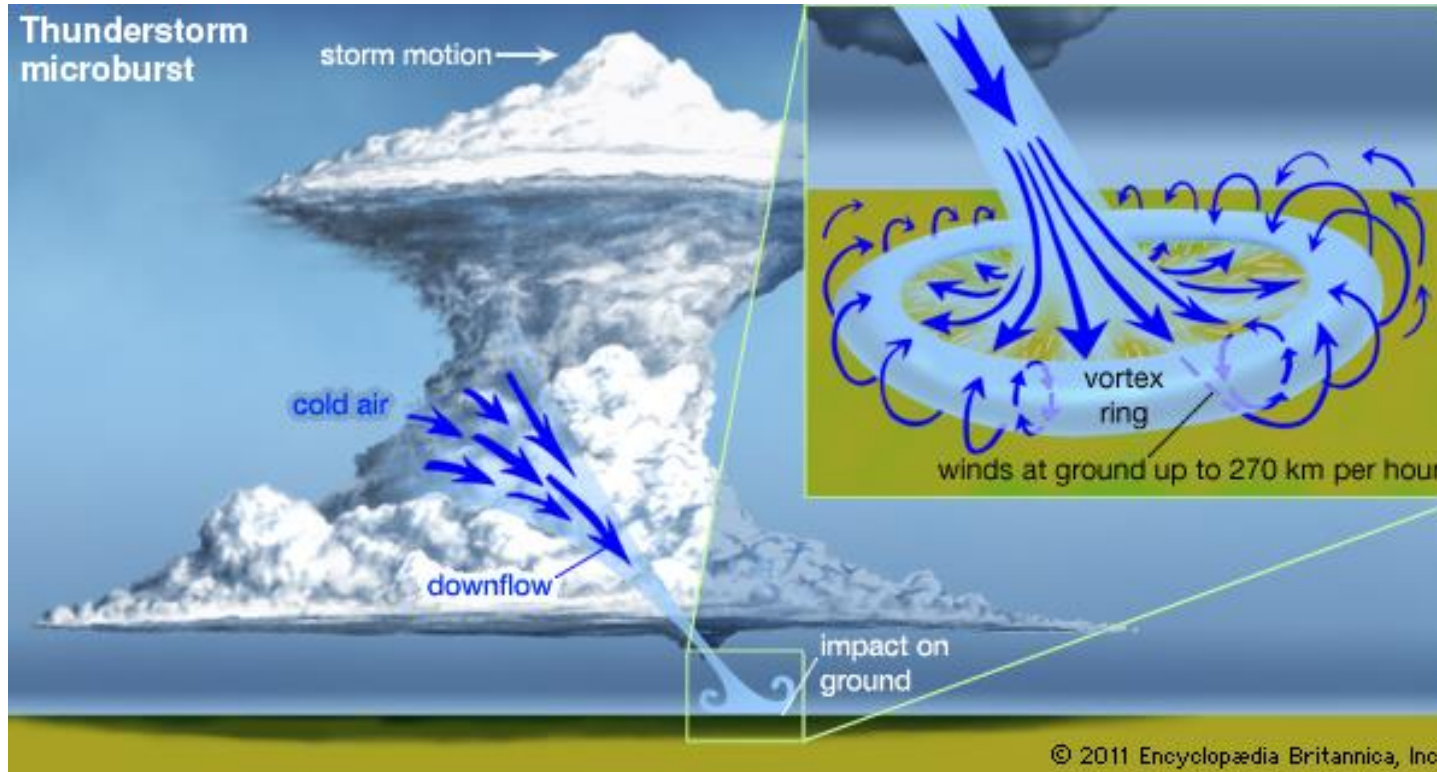


Past Occurrences

- ▶ Regular occurrence in Missouri; rarely significant
- ▶ Known occurrences?

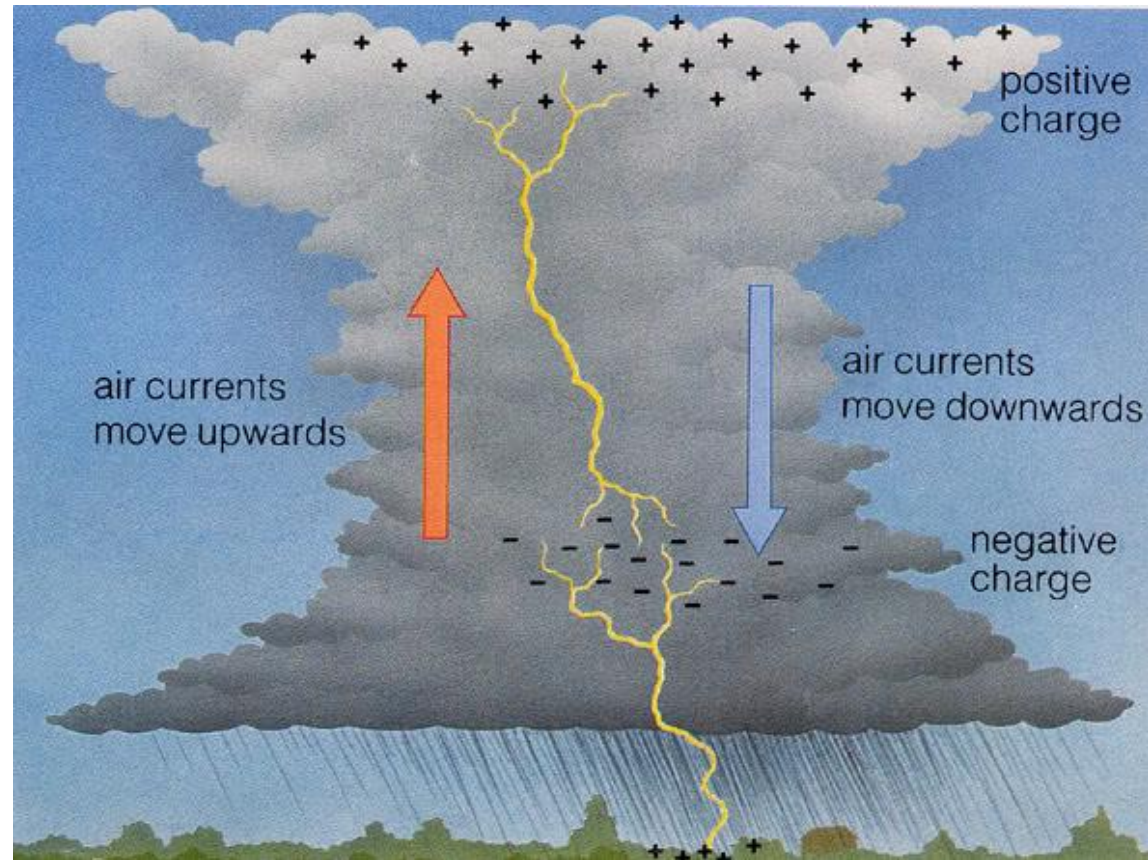
Identified Hazard: Severe Thunderstorm

- ▶ High Winds
 - ▶ Straight Line Wind, Microburst:
Can exceed 100 mph



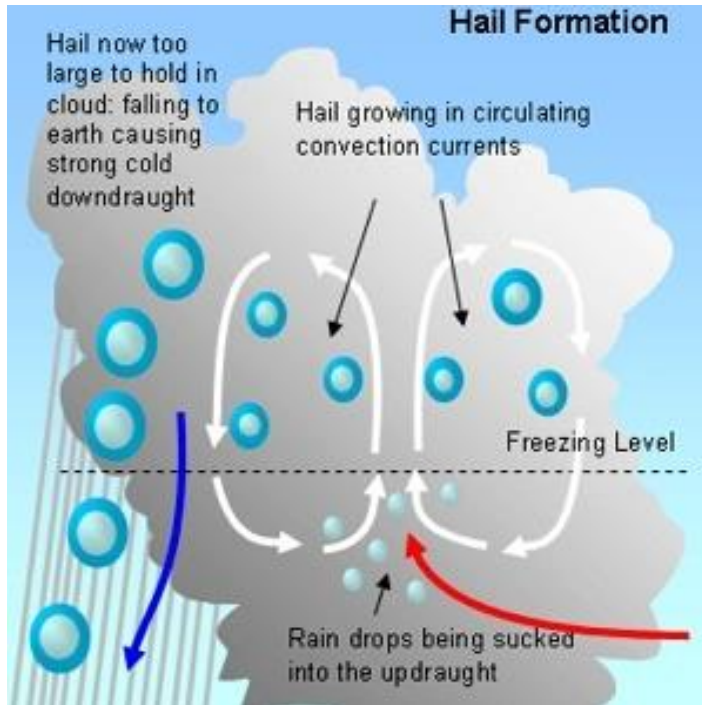
Identified Hazard: Severe Thunderstorm

- ▶ Lightning
 - ▶ Resulting in fires and power outages



Identified Hazard: Severe Thunderstorm

- ▶ Hail
 - ▶ Hail can reach the size of grapefruit



How do I measure hail?

- *Measure at its widest point
- *Estimate size to common objects

NO MARBLES!

Description	Hail Size (in.)
Pea	$\frac{1}{4}$
Penny	$\frac{3}{4}$
Quarter	1
Half-Dollar	$1 \frac{1}{4}$
Ping Pong Ball	$1 \frac{1}{2}$
Golfball	$1 \frac{3}{4}$
Tennis Ball	$2 \frac{1}{2}$
Baseball	$2 \frac{3}{4}$
Softball	4
Grapefruit	$4 \frac{1}{2}$

A collage of images showing hail of various sizes. It includes a large hailstone in a cup, a hand holding several hailstones, a hand holding a single large hailstone, a yellow highlighter, a US quarter coin, a US penny, and a golf ball for size comparison.

Past Occurrences

▶ Thunderstorm Wind

- ▶ 91 reported occurrences from 1998-2017 with wind speeds from 50 - 80 mph
- ▶ 27 damaging events resulting in \$3,446,000 in damages
- ▶ 75% probability of a *damaging* event in any given year with average losses of **\$127,630** per damaging event
 - ▶ 5 years without damaging event

▶ Hail

- ▶ 110 reported occurrences 1998-2017; Largest size 2.75 inches in diameter
- ▶ 3 damaging events resulting in property damages of \$115,000
- ▶ 15% probability of a damaging event; average losses of **\$38,333** per damaging event

▶ Lightning

- ▶ 2 damaging events from 1998-2017 : \$2,000 in property damage, 14 injuries
- ▶ 10% probability of a damaging event with average losses per damaging event of **\$1,000**, 7 injuries

Past Occurrences

NCEI Summary of Thunderstorm Wind Events by Location, 1998-2017

Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Buffalo	25	0	0	\$343,000	\$0
Urbana	5	0	0	\$0	\$0
Louisburg	4	0	0	\$25,000	\$0
Dallas Unincorporated	57	0	1	\$3,078,000	\$0
Total	91	0	1	\$3,446,000	\$0

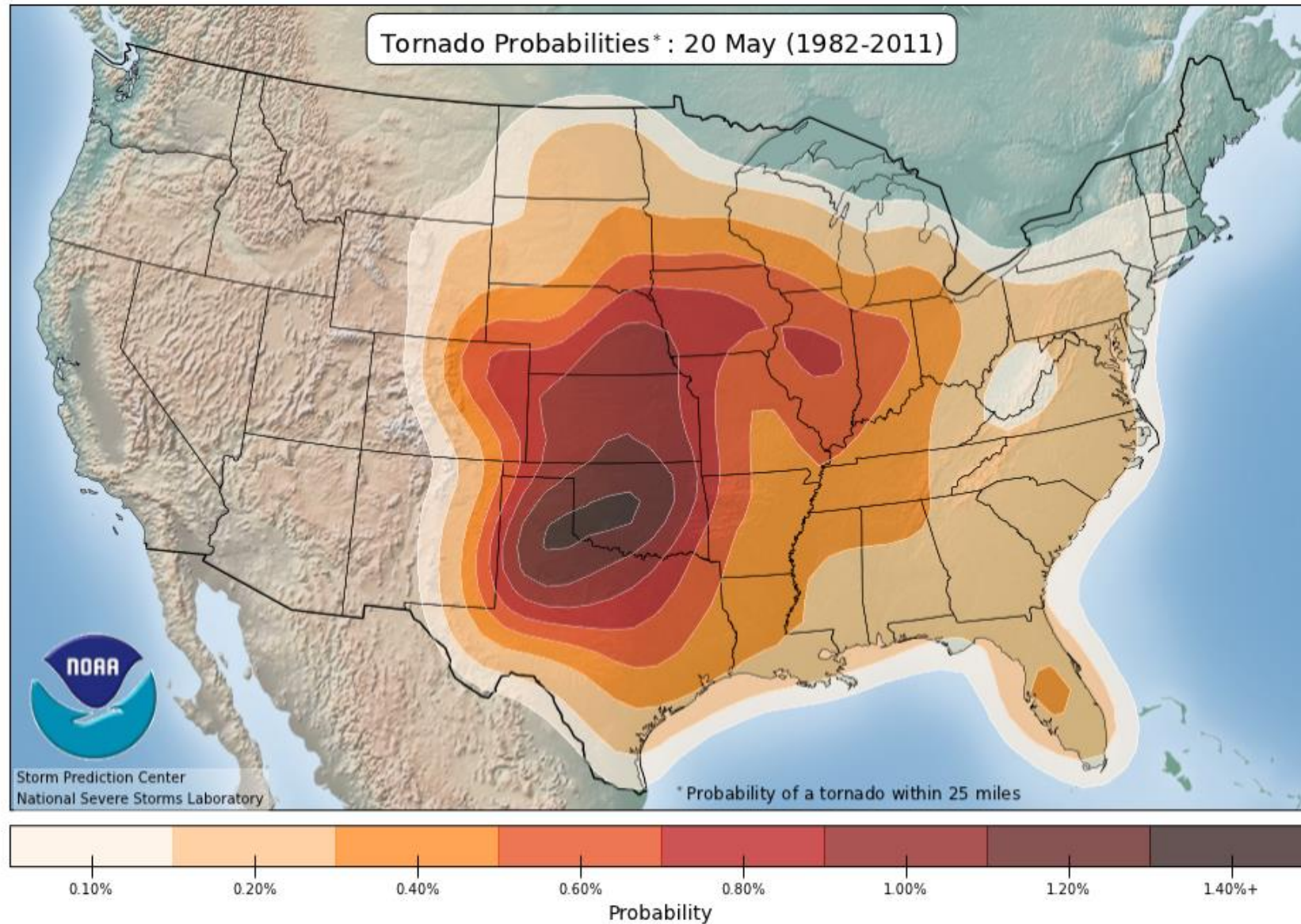
NCEI Reported Damaging Hail Events, 1998-2017

Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Buffalo	6/18/1998	1.75 in	0	0	\$5,000	\$0
Buffalo	6/30/2005	2.75 in	0	0	\$10,000	\$0
Buffalo	6/15/2008	2.75 in	0	0	\$100,000	\$0
Total			0	0	\$115,000	\$0

NCEI Reported Lightning Events with Damages, 1998-2017

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Buffalo	10/31/2008	0	14	\$0	\$0
Buffalo	7/1/2015	0	0	\$2,000	\$0
Total		0	14	\$2,000	\$0

Identified Hazard: Tornado



Fujita Scale

Fujita and Enhanced Fujita Tornado Damage Scale

FUJITA SCALE			OPERATIONAL EF SCALE		Typical Damage
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	
0	40-72	45-78	0	65-85	Light damage - Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	73-112	79-117	1	86-110	Moderate damage - Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	113-157	118-161	2	111-135	Considerable damage - Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	158-207	162-209	3	136-165	Severe damage - Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	208-260	210-261	4	166-200	Devastating damage - Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
5	261-318	262-317	5	Over 200	Incredible damage - Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

Past Occurrences

- ▶ 9 Tornado events from 1998-2017
- ▶ 6 Events resulted in \$7,480,000 in Property Damage, \$0 in Crop Damage, 27 injuries and 3 fatalities
 - ▶ One event accounted for \$3,800,000 in property damage
- ▶ 30% probability of a damaging event in any given year; property damages of \$1,246,667 per damaging event.

Scale	Occurrences/%	Damages	Injuries/Fatalities
F0/EF0	5/56%	\$30,000	0/0
F1/EF1	0/0%	\$0	0/0
F2/EF2	3/33%	\$3,650,000	17/1
F3/EF3*	1/11%	\$3,800,000	10/2
F4/EF4	0/0%	\$0	0/0
F5/EF5	0/0%	\$0	0/0
Total	9/100%	\$12,350,000	27/3

Past Occurrences

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
5/4/2003	Louisburg	Leadmine	14	880	F3	2	10	\$3,800,000	\$0
5/4/2003	Tunas	Tunas	0.2	20	F0	0	0	\$0	\$0
5/6/2003	Olive	Olive	0.2	25	F0	0	0	\$0	\$0
1/7/2008	Handley	Handley	1.33	150	EF0	0	0	\$0	\$0
3/31/2008	Foose	Buffalo	4.67	300	EF2	0	3	\$1,000,000	\$0
5/8/2009	March	Spring Grove	4.25	400	EF2	0	2	\$2,000,000	\$0
2/28/2012	Foose	Cloverdale	9	100	EF2	1	12	\$650,000	\$0
5/17/2015	Wood Hill	Wood Hill	0.1	40	EF0	0	0	\$5,000	\$0
3/1/2017	Buffalo	Buffalo	1	100	EF0	0	0	\$25,000	\$0
Total						3	27	\$7,480,000	\$0

Identified Hazard: Severe Winter Weather

- ▶ A Winter Storm is a winter weather event containing a mixture of snow, cold, wind, sleet and freezing rain; It can cause driving to be dangerous and can cause power outages.
- ▶ **Heavy Snow:** Large amount of just snowing falling over a period of time; Large amounts of snow can cause travel to become dangerous and the sheer weight of the snow can cause roofs and structures to collapse.
- ▶ **Ice Storm-Freezing Rain:** Freezing rain falls onto a surface with a temperature below freezing; heavy accumulations of ice can bring down trees, electric power lines and poles, telephone lines and communications towers.
- ▶ **Blizzard:** Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- ▶ **Severe Cold:** A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria, on a widespread or localized basis.

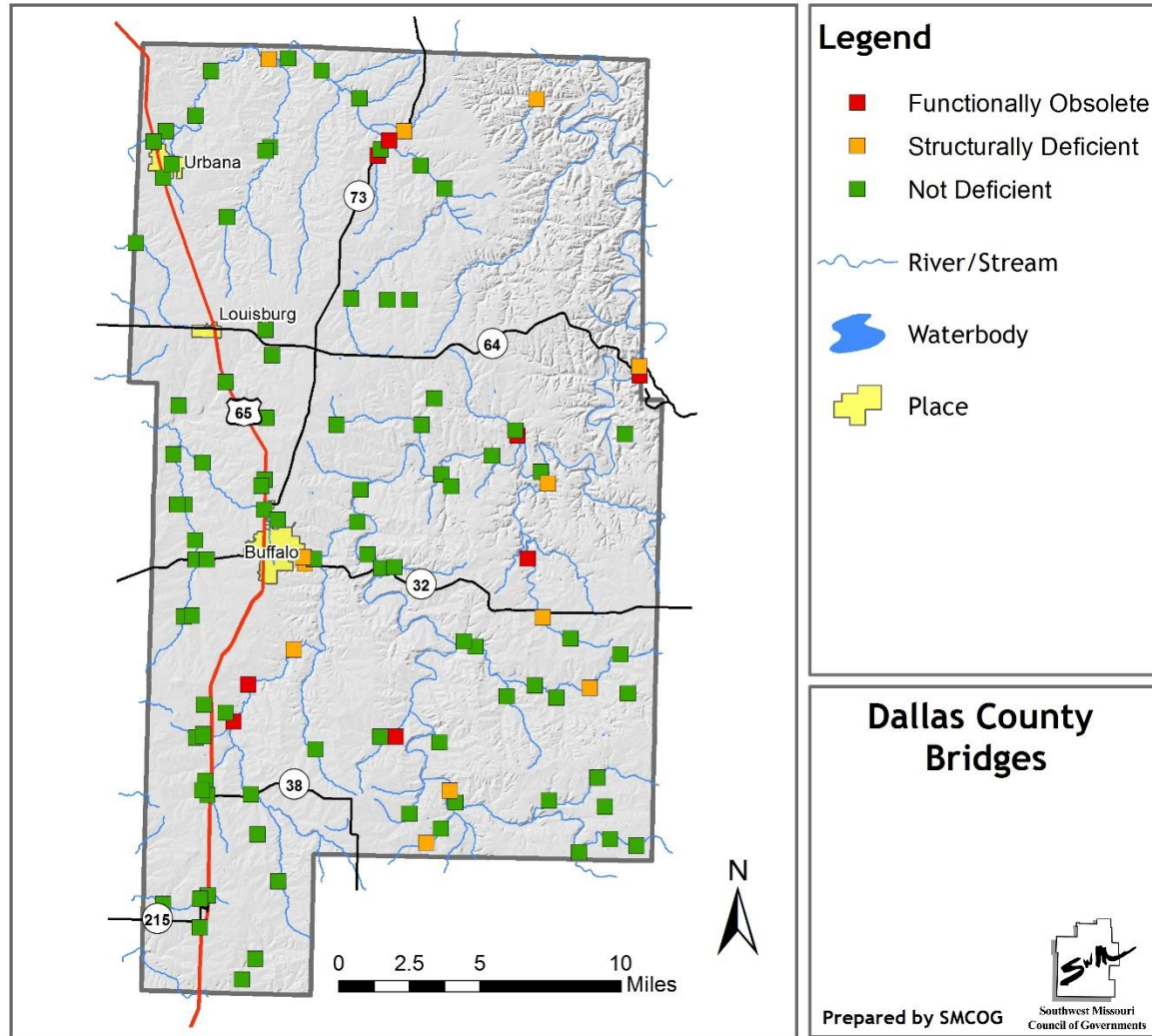
Past Occurrences

- ▶ Winter Storm - 20 recorded events from 1998-2017
 - ▶ 2 damaging events resulting in \$75,000 of damages
 - ▶ 10% probability of a damaging event in any given year; property damages of **\$37,500** per damaging event
- ▶ Heavy Snow - 3 events from 1998-2017
 - ▶ No Damages
- ▶ Ice Storm/Freezing Rain - 7 events from 1998-2017
 - ▶ 2 damaging event resulted in \$105,000,000 of property damage
 - ▶ One ice storm in January, 2007 caused \$100,000,000 in damage

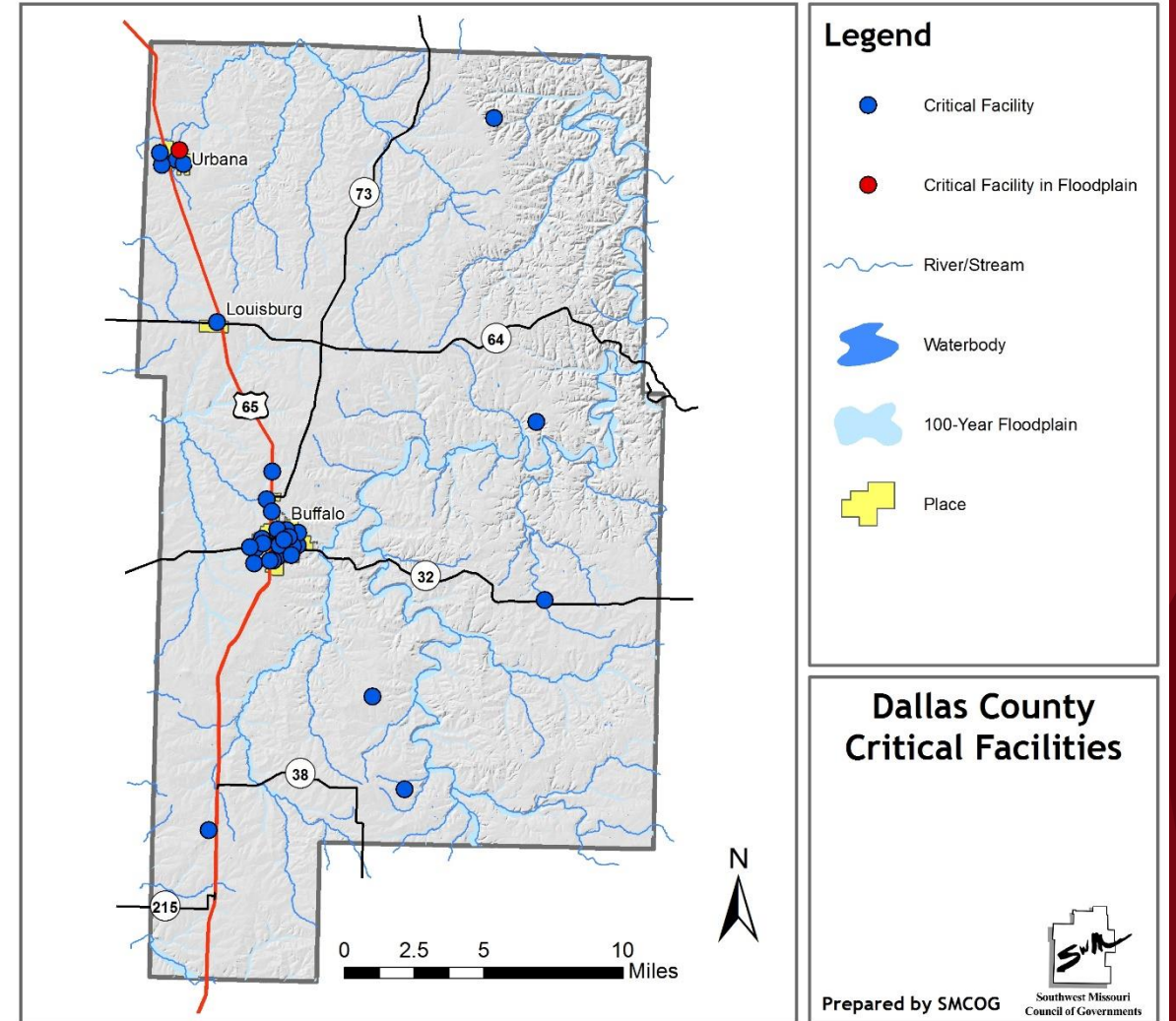
Past Occurrences

- ▶ Severe Cold - 2 events from 1998-2017
 - ▶ 0 damaging events
- ▶ Frost/Freeze- 1 event from 1998-2017
 - ▶ Resulted in \$2,840,000 of crop damage (2007)
- ▶ 33 total events from 1998-2017; 17 years with events
 - ▶ 85% probability of event in any given year
 - ▶ 5 damaging events in 3 years; 15% probability of damaging event in any given year

Critical and Essential Facilities



Source: National Bridge Inventory, 2016



Source: MISDIS, 2014

Vulnerability

- ▶ Which hazards is your jurisdiction most at risk?
- ▶ What facilities and/or areas are most at risk to those hazards?
- ▶ What existing mechanism are in place to help mitigate negative consequences?

Mitigation Strategies

- ▶ Review old strategies from previous Dallas County Hazard Mitigation Plan
- ▶ Determine current status and relevance
- ▶ Modify, keep, remove previous strategies
- ▶ Develop new strategies

Future Meetings

- ▶ Meeting 3: February 21, 1:30 p.m.
 - ▶ Review Goals, Objectives & Mitigation Strategies
 - ▶ Questions
- ▶ Meeting 4: March 28, 1:30 p.m.
 - ▶ STAPLEE Scoring of Mitigation Strategies
 - ▶ Questions
- ▶ Meeting 5: May 2, 1:30 p.m.
 - ▶ Final Wrap-Up
 - ▶ Plan Maintenance

Draft Plan Submitted to SEMA: June 4, 2018
Final Plan Approval By: September 3, 2018

Contact Information

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For more information, visit our website:

www.smcog.org