Christian County Hazard Mitigation Plan Update Meeting #2

October 2, 2019

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Southwest Missouri Council of Governments

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"Enhancing the quality of our communities through regional cooperation"

Outline

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

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Local Plan Participation

- Attend a minimum of 2 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

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Time & Effort Reporting

- Hourly rate for volunteer time in Missouri:
  - $23.96
- Federal mileage rate:
  - 58¢ per mile

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9 Tasks in the Planning Process

- Task 1: Determine the Planning Area and Resources → Completed
- Task 2: Build the Planning Team → YOU ARE THE TEAM!
- Task 3: Create an Outreach Strategy → August 7, 2019
- Task 4: Review Community Capabilities → Questionnaire
- 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!

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Risk Assessment

- Measures 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

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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

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Christian County Disaster Declarations 2000-Present (17)

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
4317	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	June 2, 2017	Public Assistance
3374	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	January 2, 2016	Public Assistance
4238	Severe Storms, Tornadoes, Straight-line Winds, Flooding	August 7, 2015	Public Assistance
1980	Severe Storms, Tornadoes, and Flooding	May 9, 2011	Public Assistance
3317	Severe Winter Storm	February 3, 2011	Public Assistance
1847	Severe Storms, Tornadoes, Flooding	June 19, 2009	Public Assistance
3303	Severe Winter Storms	January 30, 2009	Public Assistance
1809	Severe Storms, Flooding, Tornado	November 13, 2008	Public Assistance
1773	Severe Storms, Flooding	June 25, 2008	Individual & Public Assistance
1749	Severe Storms, Flooding	March 19, 2008	Individual & Public Assistance
1748	Severe Winter Storms, Flooding	March 12, 2008	Public Assistance
3281	Severe Winter Storms	December 12, 2007	Public Assistance
1676	Severe Winter Storms, Flooding	January 15, 2007	Public Assistance
1631	Severe Storms, Tornadoes, Flooding	March 16, 2006	Individual & Public Assistance
3232	Hurricane Katrina Evacuation	September 10, 2005	Public Assistance
1463	Severe Storms, Tornadoes, Flooding	May 6, 2003	Individual & Public Assistance
1412	Severe Storms, Tornadoes, Flooding	May 6, 2002	Individual & Public Assistance

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Hazards Identified

- Dam Failure
- Drought
- Earthquake
- Extreme Temperature
- Land Subsidence/Sinkholes
- Riverine and Flash Flood
- Severe Thunderstorm/High Winds/ Lightning/Hail
- Tornado
- Wildfire
- Severe Winter Weather

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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.

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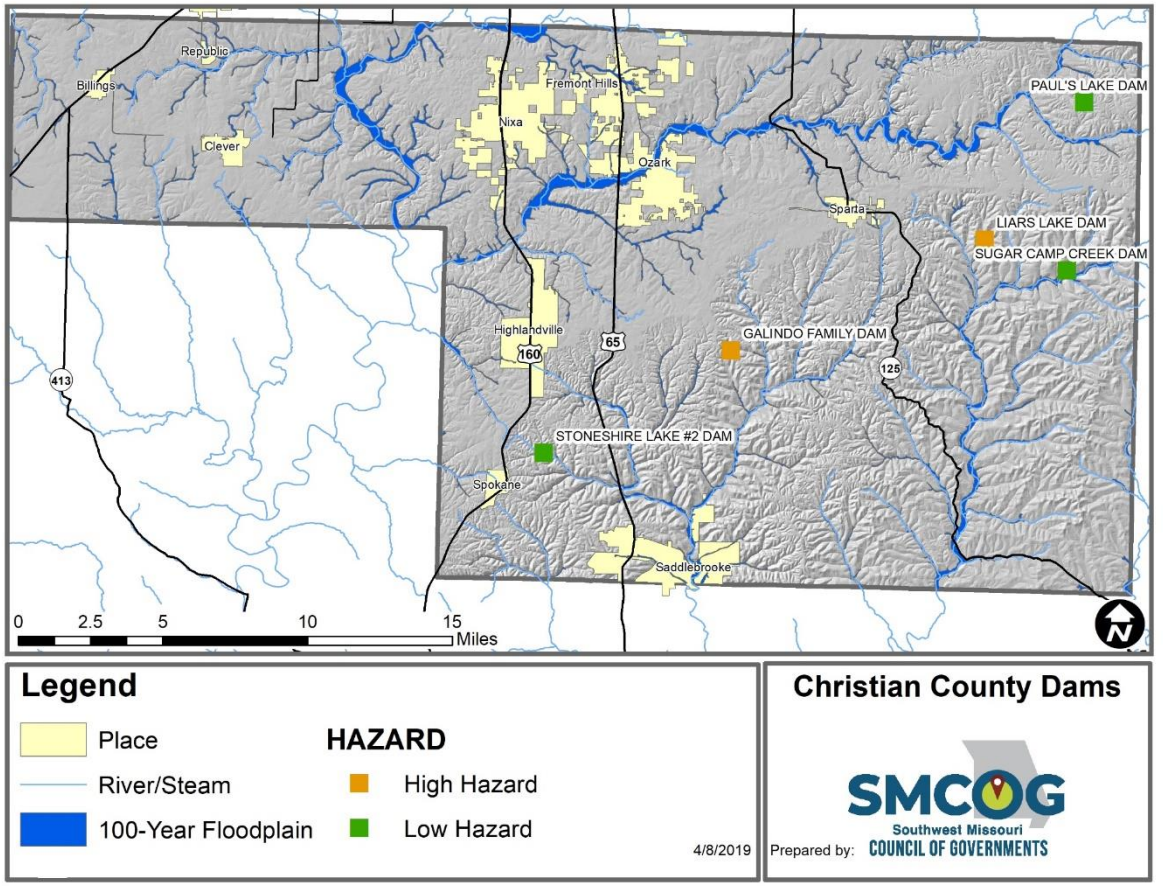
There is not a direct correlation between the State Hazard classification and the NID classifications. However, most dams that are in the State's Classes I and II are considered NID High Hazard Dams.

Identified Hazard: Dam Failure

- 5 NID dams in Christian County
  - 3 Low Hazard
    - Failure results in only minimal property damage
  - 2 Significant Hazard
    - Failure could possibly result in the loss of life and appreciable property damage
- 0 accounts of previous dam failure
- Potential impact from other dams, but advanced warning would result in low impact.
- Any local known risks of dam failure?



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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)

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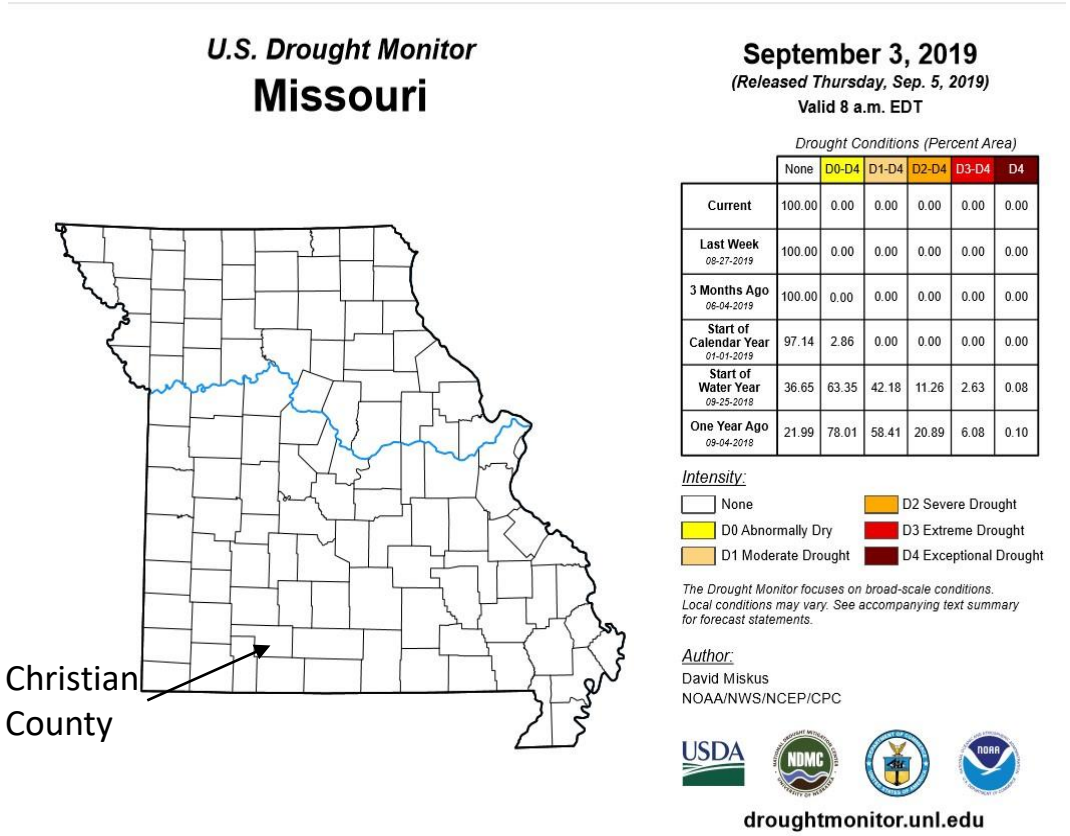
Drought: Previous Occurrences

- 16 events from 2000-2019
  - 2 events resulting in damages:
    - $2.47 million losses in Crop Damages
- 80% chance of event occurring within a given year, with 10% chance that they will be damage-causing



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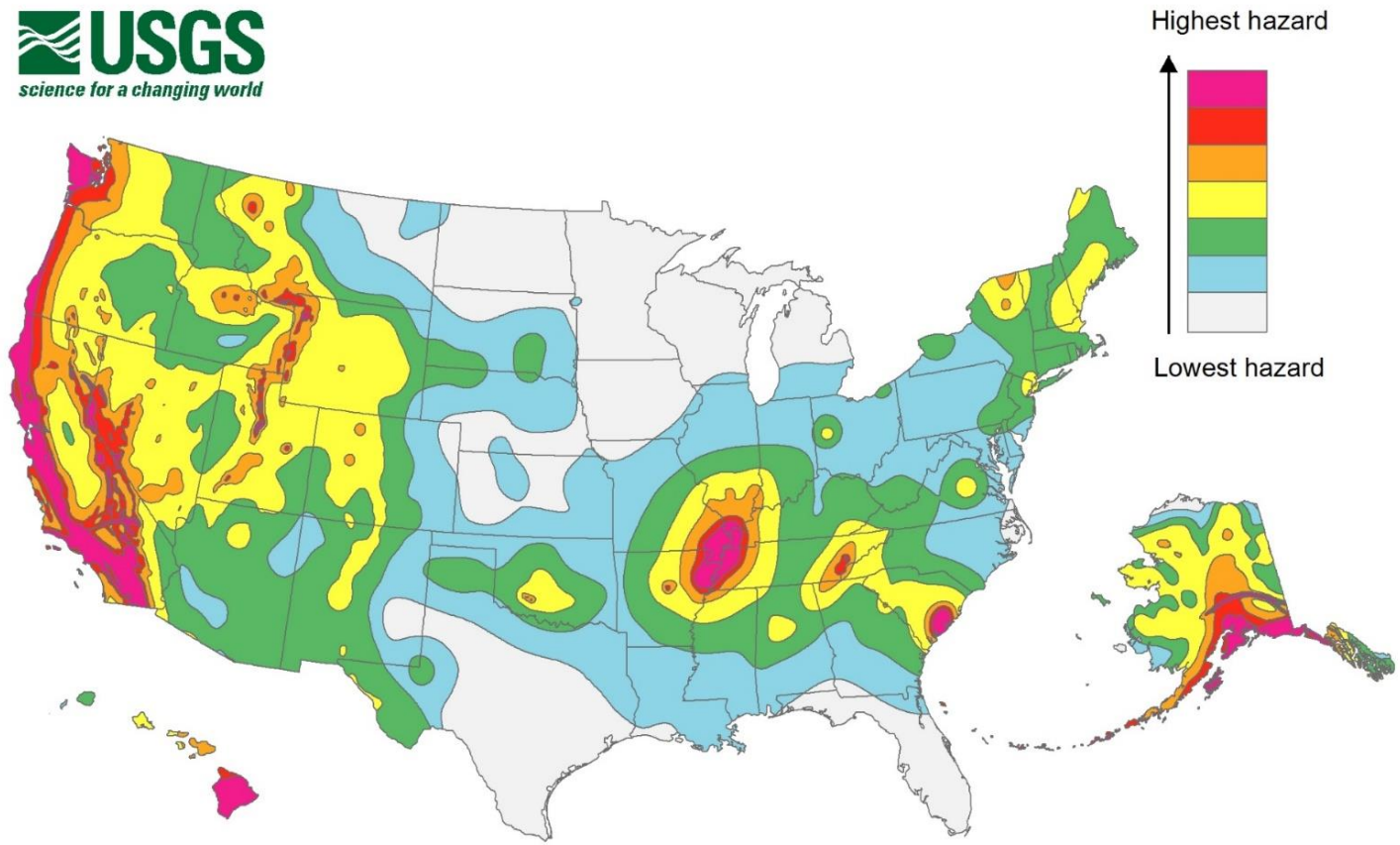
Identified Hazard: Earthquake



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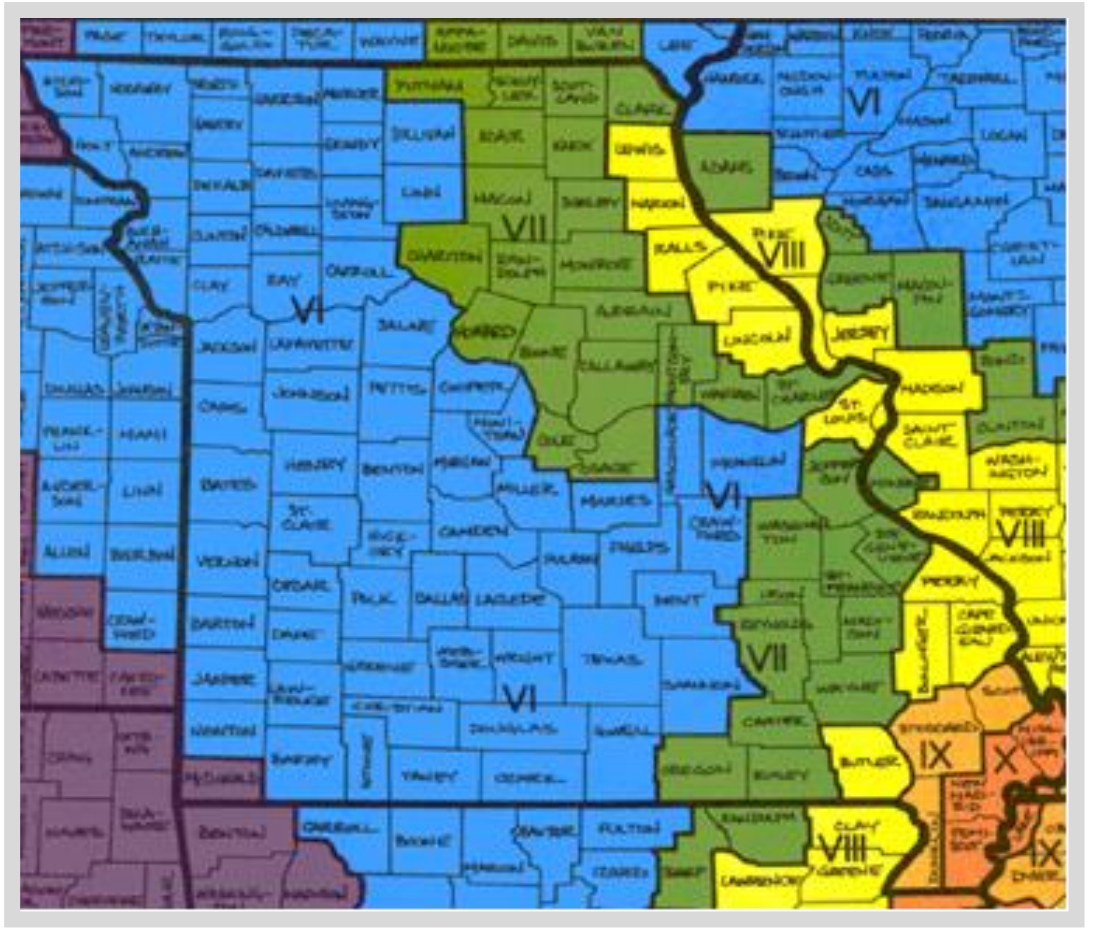
Identified Hazard: Earthquake

- Modified Mercali Scale Based on a 7.6 Magnitude Earthquake along the New Madrid Fault
- Located in Zone VI
  - Felt by everyone, trouble walking, furniture can be overturned, pictures fall off walls and objects off shelves; damage slight
- No previous records of earthquakes in Christian County
- Any experience feeling earthquakes?



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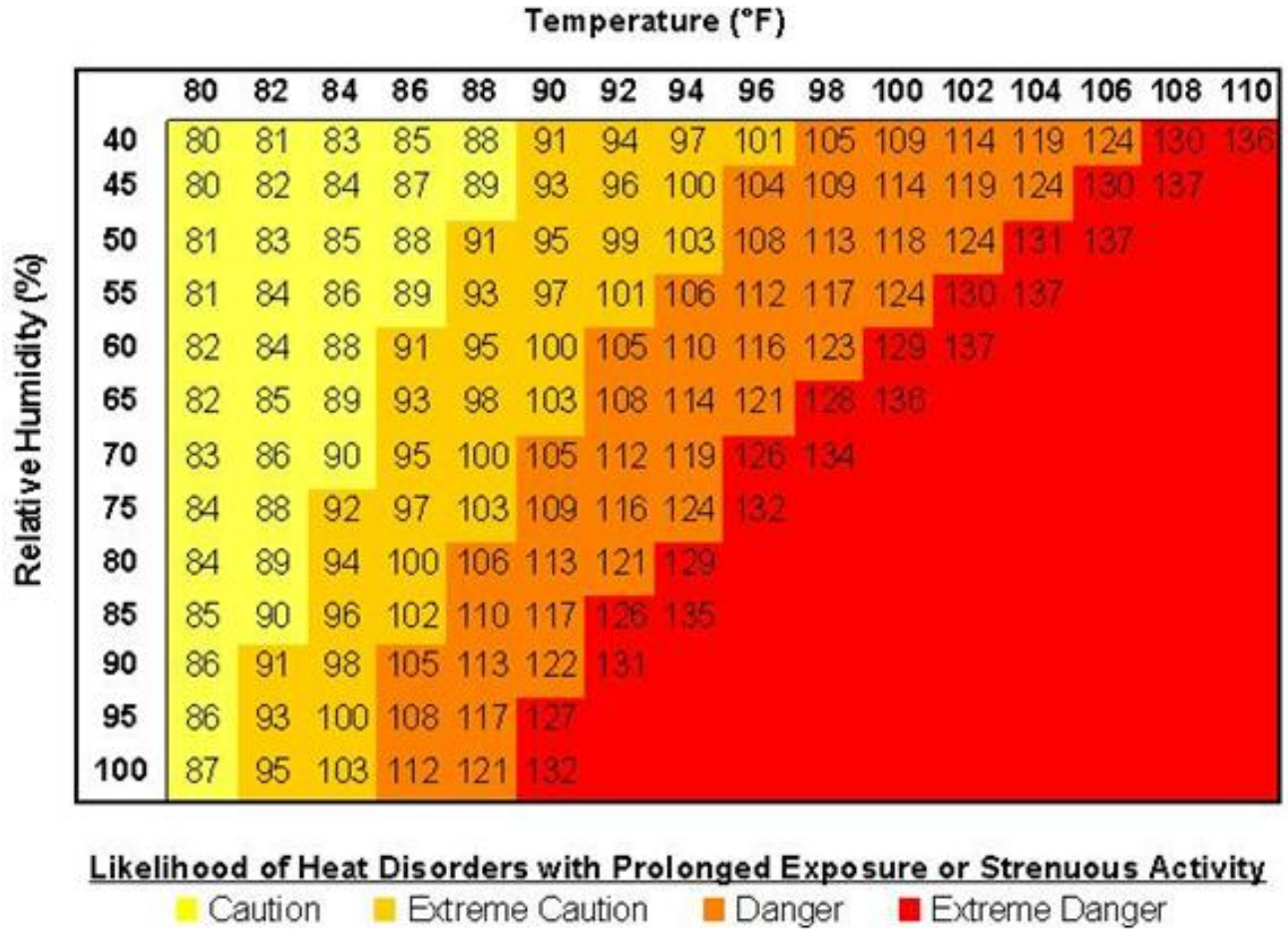
Identified Hazard: Extreme Heat

- 7 events from 2000-2019
  - No fiscal damages
  - 1 death
    - 77-year-old woman
- 5% chance of another heat-related death in any given year
- 35% chance of extreme heat in any given year



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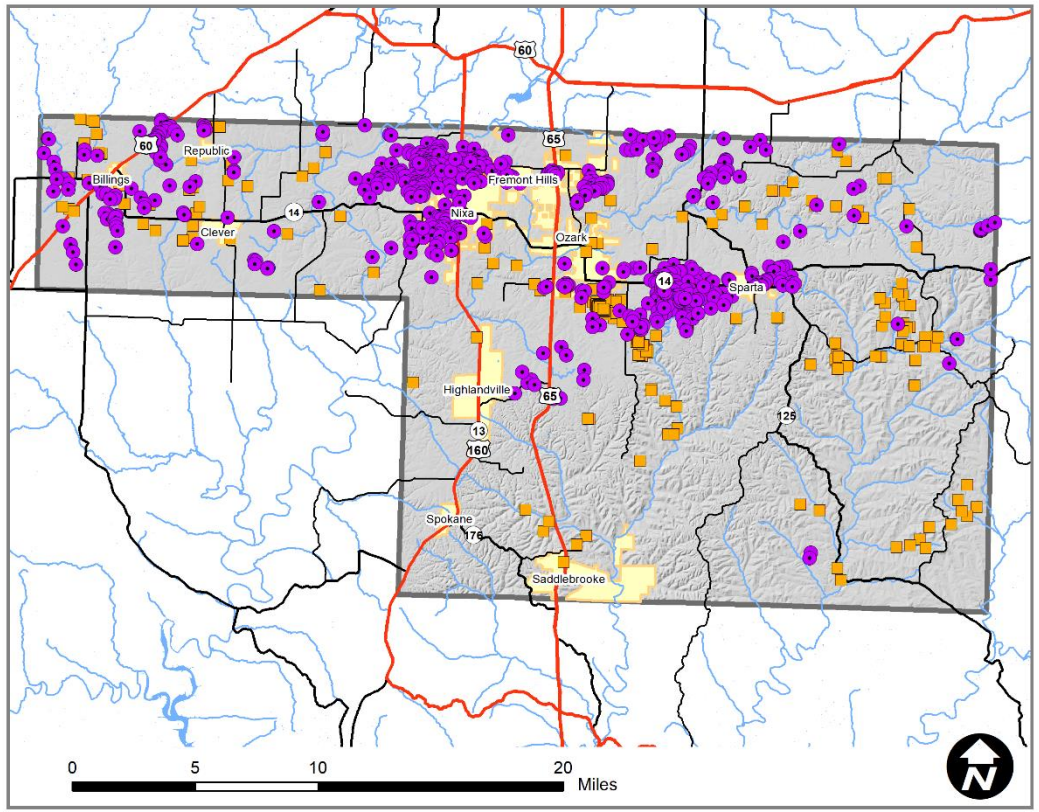
Identified Hazard: Land Subsidence/ Sinkholes

- 534 known sinkholes
  - DNR/USGS
- 237 underground mines
- Common in Missouri, rarely significant
- Any other known sinkholes?



Legend

- Sinkhole 2014
- Mines 2018
- Place
- US Highway
- MO highway
- Route
- River/Stream

Christian County Sinkholes and Mines

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Prepared by: 9/24//2019

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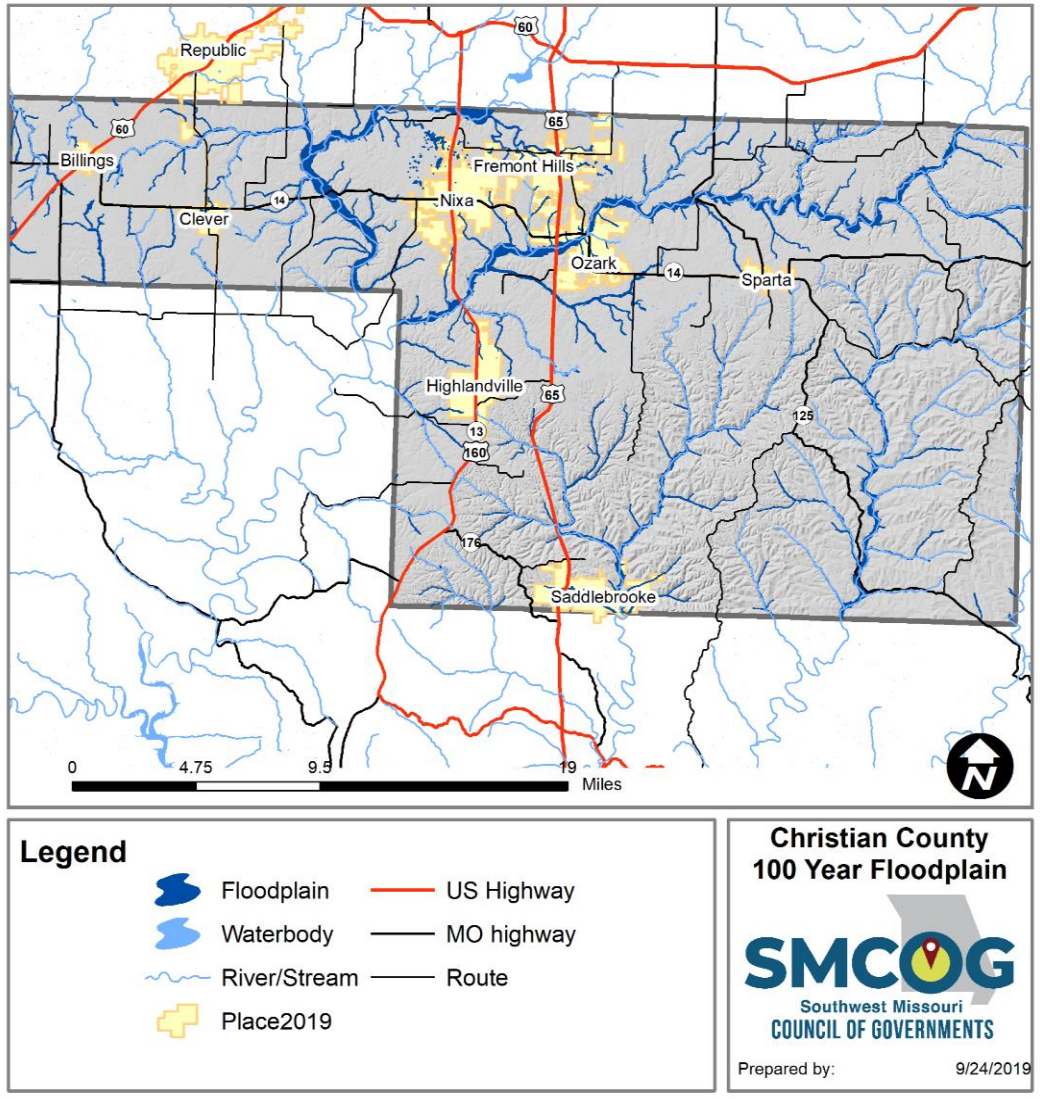
Identified Hazard: Flood and Flash Flood



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Identified Hazard: Flood and Flash Flood

- **Flood**
  - 23 occurrences from 2000-2019
  - 4 events totaling $2.26 million in property damage
  - 35% chance occurring in any given year
- **Flash Flood**
  - 83 occurrences of flash flood from 2000-2019
  - 6 damaging events totaling $8.13 million in property damage
  - 95% chance occurring in any given year

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Identified Hazard: Flood and Flash Flood

- Flash Flood events (2000-2019)

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2000	4	0	0	$0	$0
2001	3	0	0	$0	$0
2002	1	0	0	$0	$0
2003	2	0	0	$0	$0
2004	1	0	0	$0	$0
2005	2	0	0	$0	$0
2006	2	0	0	$0	$0
2007	5	0	0	$0	$0
2008	**11**	0	0	**$5,500,000**	$0
2009	6	0	0	$0	$0
2010	7	0	0	$10,000	$0
2011	3	0	0	$1,000,000	$0
2013	**10**	0	0	$0	$0
2014	1	0	0	$0	$0
2015	**11**	0	0	$870,000	$0
2016	2	0	0	$0	$0
2017	6	1	0	$752,000	$0
2018	4	0	0	$0	$0
2019	1	0	0	$0	$0
Total	**83**	**1**	**0**	**$8,132,000**	**$0**

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Identified Hazard: Flood and Flash Flood

- Riverine Flood events (2000-2019)

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2001	2	0	0	$0	$0
2002	3	0	0	$150,000	$0
2004	2	0	0	$10,000	$0
2005	2	0	0	$0	$0
2007	1	0	0	$0	$0
2008	1	0	0	$0	$0
2009	1	0	0	$0	$0
2010	2	0	0	$0	$0
2015	2	0	0	**$2,100,000**	$0
2018	**6**	0	0	$5,000	$0
2019	1	0	0	$0	$0
Total	**23**	**0**	**0**	**$2,265,000**	**$0**

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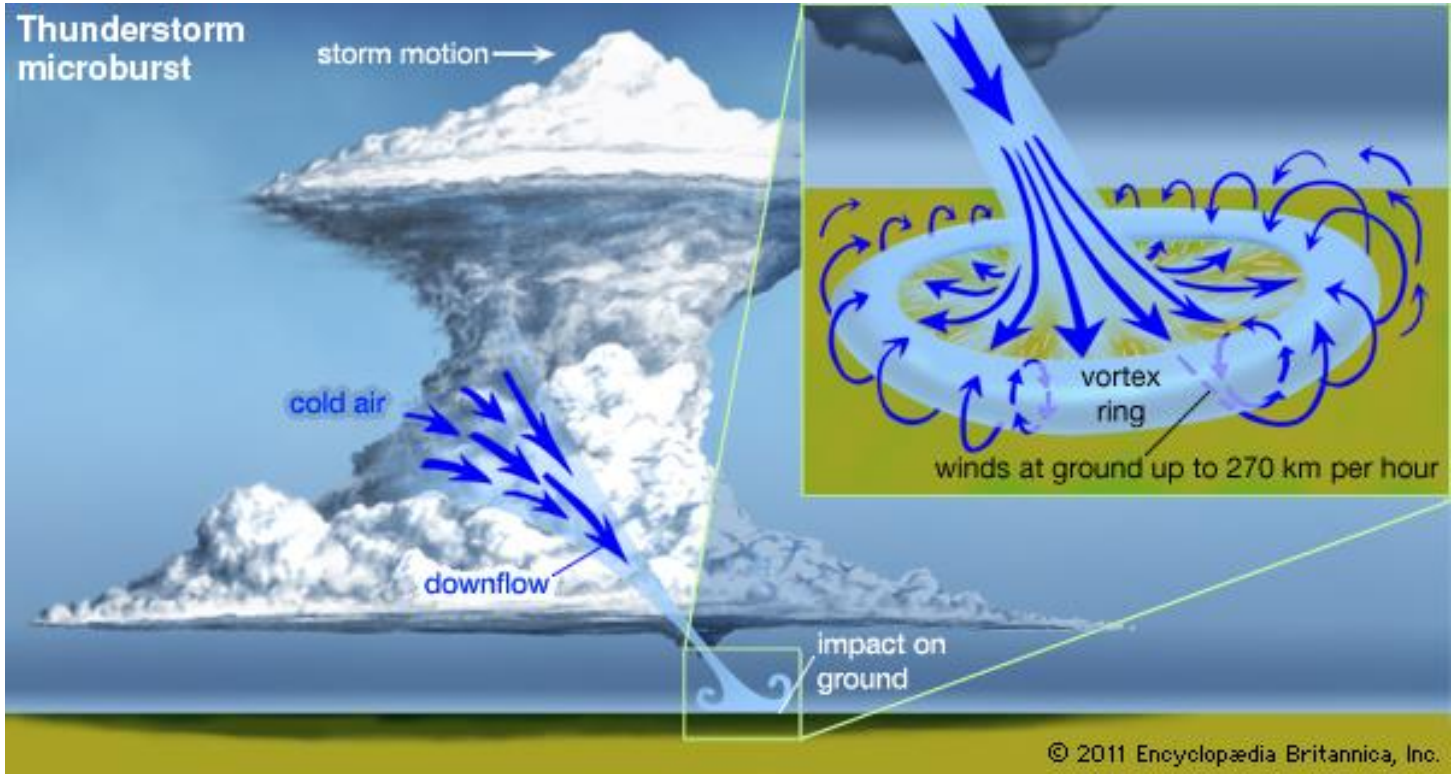
Identified Hazard: Severe Thunderstorm/ High Winds/ Lightning/ Hail

High Winds

- Straight Line Wind, Microburst: Can exceed 100 mph



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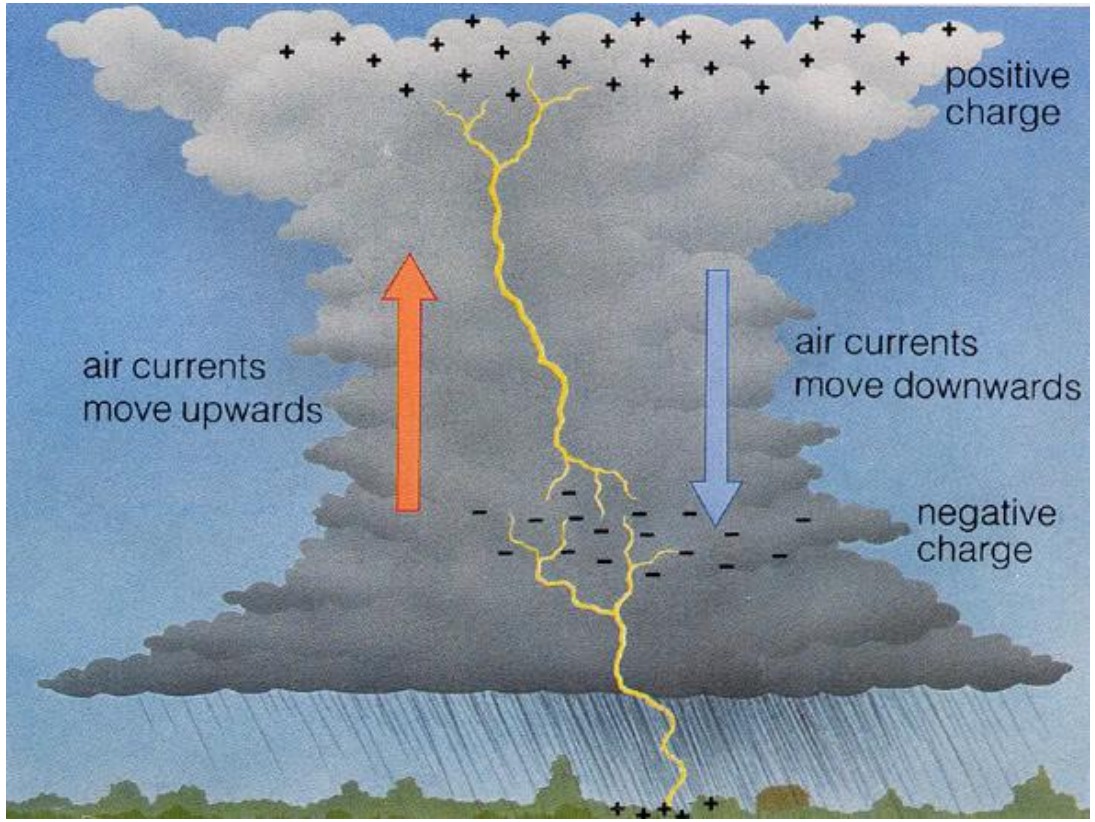
Identified Hazard: Severe Thunderstorm/ High Winds/ Lightning/ Hail

Lightning

- Resulting in fires and power outages



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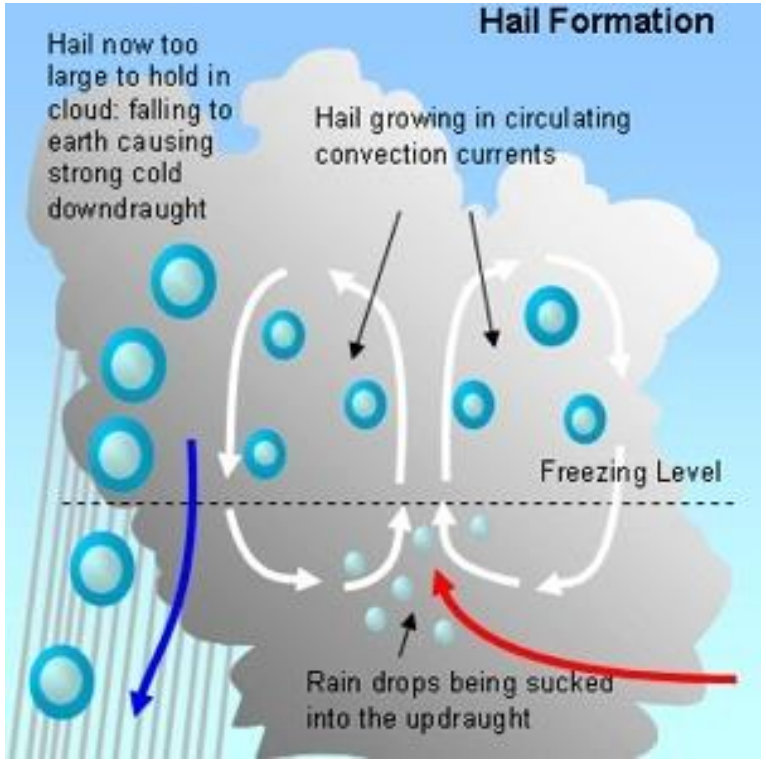
Identified Hazard: Severe Thunderstorm/ High Winds/ Lightning/ Hail

Hail

- Hail can reach the size of grapefruit



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Identified Hazard: Severe Thunderstorm/High Winds/Lightning/Hail

- **Thunderstorm Wind**
  - 120 occurrences from 2000-2019
  - 49 damaging events
    - Total property damage: $8.29 M
    - Worst event in Billings and surrounding cities in 2009; $7M in property damage with winds of 60-90 mph
  - 100% chance of occurrence in any given year

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Identified Hazard: Severe Thunderstorm/ High Winds/ Lightning/ Hail

- **High Winds**
  - 3 occurrences from 2000-2019
    - 1 damaging event totaling at $10,000 in property damages
  - 15% chance of occurrence in any given year
- **Lightning**
  - 7 occurrence from 2000-2019
    - Property damage totaled $695,000
    - 35% chance of occurrence in any given year

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Identified Hazard: Severe Thunderstorm/ High Winds/ Lightning/ Hail

- **Hail**
  - 85 occurrences from 2000-2019
  - 1 damaging event in Bruner (2017) with 1.75 inch hail
    - $10,000 in property damage
    - 100% chance of occurrence in a given year

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Identified Hazard: Severe Thunderstorm

Thunderstorm Winds					
Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	58	0	0	$297,000	$0
Billings	14	0	0	**$7,071,000**	$0
Clever	10	0	0	$80,000	$0
Fremont Hills	0	0	0	$0	$0
Highlandville	17	0	0	$51,000	$0
Nixa	42	0	0	$429,000	$0
Ozark	40	0	0	$170,000	$0
Saddlebrooke	0	0	0	$0	$0
Sparta	14	0	0	$42,000	$0
Spokane	3	0	0	$150,000	$0
Total	**198**	**0**	**0**	**$8,290,000**	**$0**

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Identified Hazard: High Winds

High Winds					
Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	3	0	0	**$10,000**	$0
Billings	0	0	0	$0	$0
Clever	0	0	0	$0	$0
Fremont Hills	0	0	0	$0	$0
Highlandville	0	0	0	$0	$0
Nixa	0	0	0	$0	$0
Ozark	0	0	0	$0	$0
Saddlebrooke	0	0	0	$0	$0
Sparta	0	0	0	$0	$0
Spokane	0	0	0	$0	$0
Total	**3**	**0**	**0**	**$10,000**	**$0**

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Identified Hazard: Lightning

Lightning					
Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	0	0	0	$0	$0
Billings	1	0	0	$40,000	$0
Clever	0	0	0	$0	$0
Fremont Hills	0	0	0	$0	$0
Highlandville	1	0	0	$300,000	$0
Nixa	2	0	0	$260,000	$0
Ozark	3	0	0	$95,000	$0
Saddlebrooke	0	0	0	$0	$0
Sparta	0	0	0	$0	$0
Spokane	0	0	0	$0	$0
Total	**7**	**0**	**0**	**$695,000**	**$0**

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Identified Hazard: Hail

Hail					
Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	38	0	0	$10,000	$0
Billings	14	0	0	$0	$0
Clever	8	0	0	$0	$0
Fremont Hills	0	0	0	$0	$0
Highlandville	20	0	0	$0	$0
Nixa	19	0	0	$0	$0
Ozark	36	0	0	$0	$0
Saddlebrooke	0	0	0	$0	$0
Sparta	11	0	0	$0	$0
Spokane	11	0	0	$0	$0
Total	**157**	**0**	**0**	**$10,000**	**$0**

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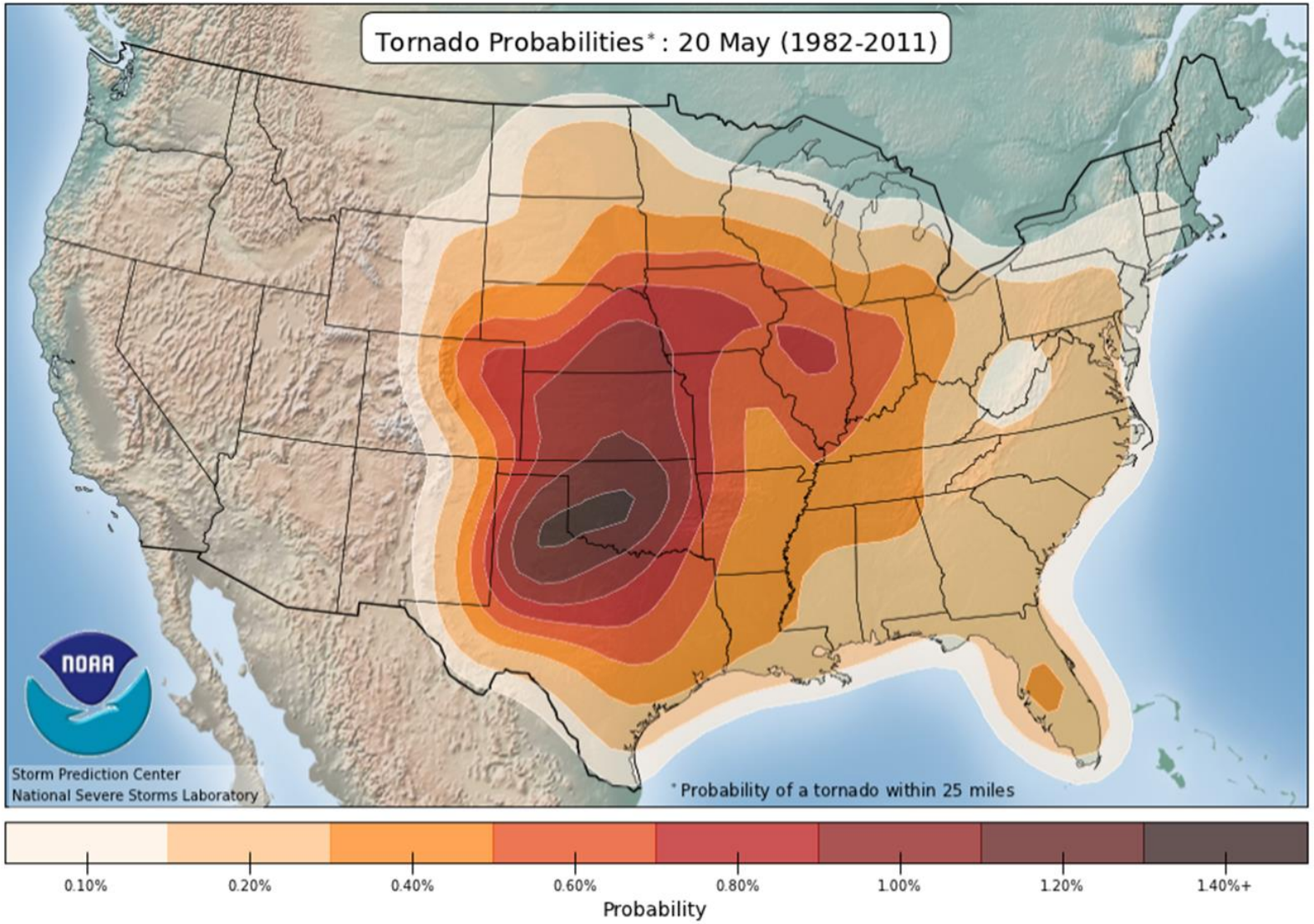
Identified Hazard: Tornado



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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.

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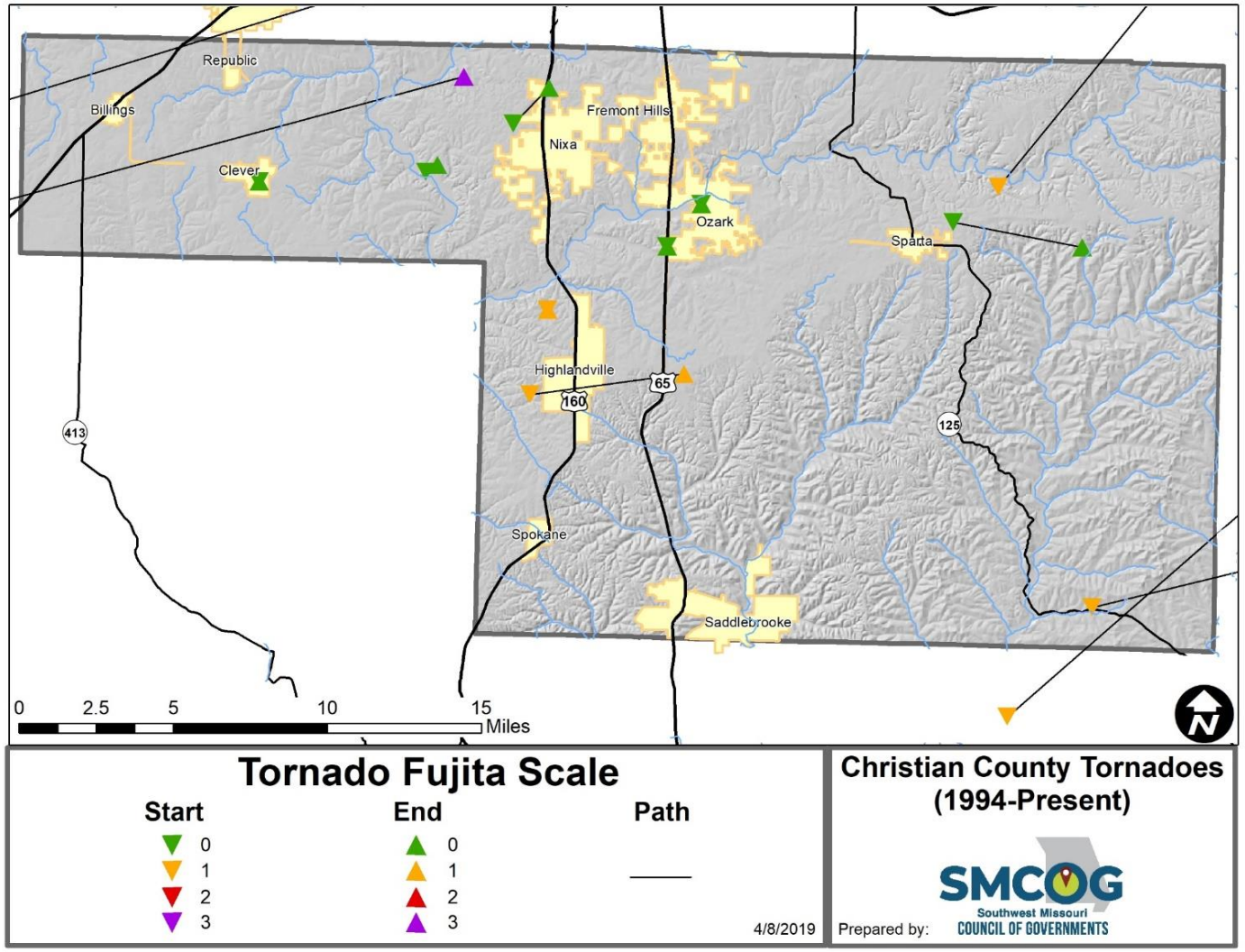
Identified Hazard: Tornado & Fujita Scale



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Identified Hazard: Tornado & Fujita Scale

- 21 occurrences in Christian County from 2000-2019
- 14 events resulted in $65,327,000 in property damage, $0 in crop damage, 12 injuries, and 1 fatality
- 85% chance of a tornado in any given year
  - 65% chance of it being a damaging event
- Highest tornado ranked at F3/EF3

Scale	Occurrences/%	Damages	Injuries/Fatalities
F0/EF0	11/ 52%	$442,000	0/0
F1/EF1	8/ 38%	$2,985,000	0/0
F2/EF2	1/4.7%	$6,800,000	0/0
F3/EF3	1/4.7%	$55,100,000	0/0
F4/EF4	0/0	$0	0/0
F5/EF5	0/0	$0	0/0
Total		**$65,327,000**	**0/0**

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Identified Hazard: Tornado & Fujita Scale

Tornadoes in Christian County 2000-2019									
Date	Beginning Location	Ending Location	Length (Miles)	Width (Yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damage
5/4/2003	Billings	Boaz	13mi	880yd	F3	0	3	$5,100,000	$0
11/5/2005	Garrison	Garrison	4mi	530yd	F1	0	0	$0	$0
3/12/2006	Clever	Nixa	17mi	250yd	F3	0	3	$50,000,000	$0
6/18/2006	Ozark	Ozark	1mi	75yd	EF0	0	1	$0	$0
6/30/2006	Ozark	Ozark	0.1mi	50yd	EF0	0	0	$0	$0
9/6/2007	Clever	Clever	0.5mi	50yd	EF0	0	0	$2,000	$0
1/7/2008	Billings	Billings	0.04mi	50yd	EF0	0	0	$0	$0
1/7/2008	Riverdale	Riverdale	0.36mi	100yd	EF1	0	1	$200,000	$0
1/8/2008	Montague	Selmore	4.98mi	100yd	EF1	0	0	$250,000	$0
4/9/2009	Nixa	Nixa	1.64mi	150yd	EF0	0	0	$100,000	$0
5/8/2009	Garrison	Garrison	7.19mi	880	EF1	0	0	$2,000,000	$0
5/13/2010	Sparta	Bruner	4.25mi	200yd	EF0	0	0	$50,000	$0
9/15/2010	Boaz	Boaz	0.43mi	100yd	EF0	0	0	$0	$0
12/31/2010	Bruner	Abadyl	5.27mi	250yd	EF1	0	2	$200,000	$0
5/19/2017	Chadwick	Oldfield	3mi	500yd	EF0	0	0	$100,000	$0
5/3/2013	Ozark Airpark ARPT	Ozark Airport ARPT	1.5mi	100yd	EF1	0	0	$100,000	$0
12/1/2018	Clever	Clever	2.11mi	40yd	EF0	0	0	$190,000	$0
12/1/2018	Billings	Billings	1.24mi	75yd	EF1	0	0	$150,000	$0
4/30/2019	Keltner	Keltner	0.02mi	50yd	EF0	0	0	$0	$0
4/30/2019	Ozark Airpark ARPT	Ozark Airpark ARPT	1.93mi	400yd	EF2	0	2	$6,800,000	$0
4/30/2019	Spokane	Christian Center	12.15mi	100yd	EF1	0	0	$85,000	$0

Identified Hazard: 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.

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Identified Hazard: Winter Weather

Previous events 2000-2019

- Winter Storm: 16 occurrences
  - No losses
- Heavy Snow: 3 occurrences
  - $10,000 in property damage
- Ice Storm: 6 occurrences
  - $100K total losses in property damage
- Severe Cold: 0 occurrences
  - No losses
- Frost/Freeze: 2 occurrences
  - $3,020,000 in crop damage
- 27 Total events from 2000-2019; 15 years with events
  - 75% probability of event in any given year

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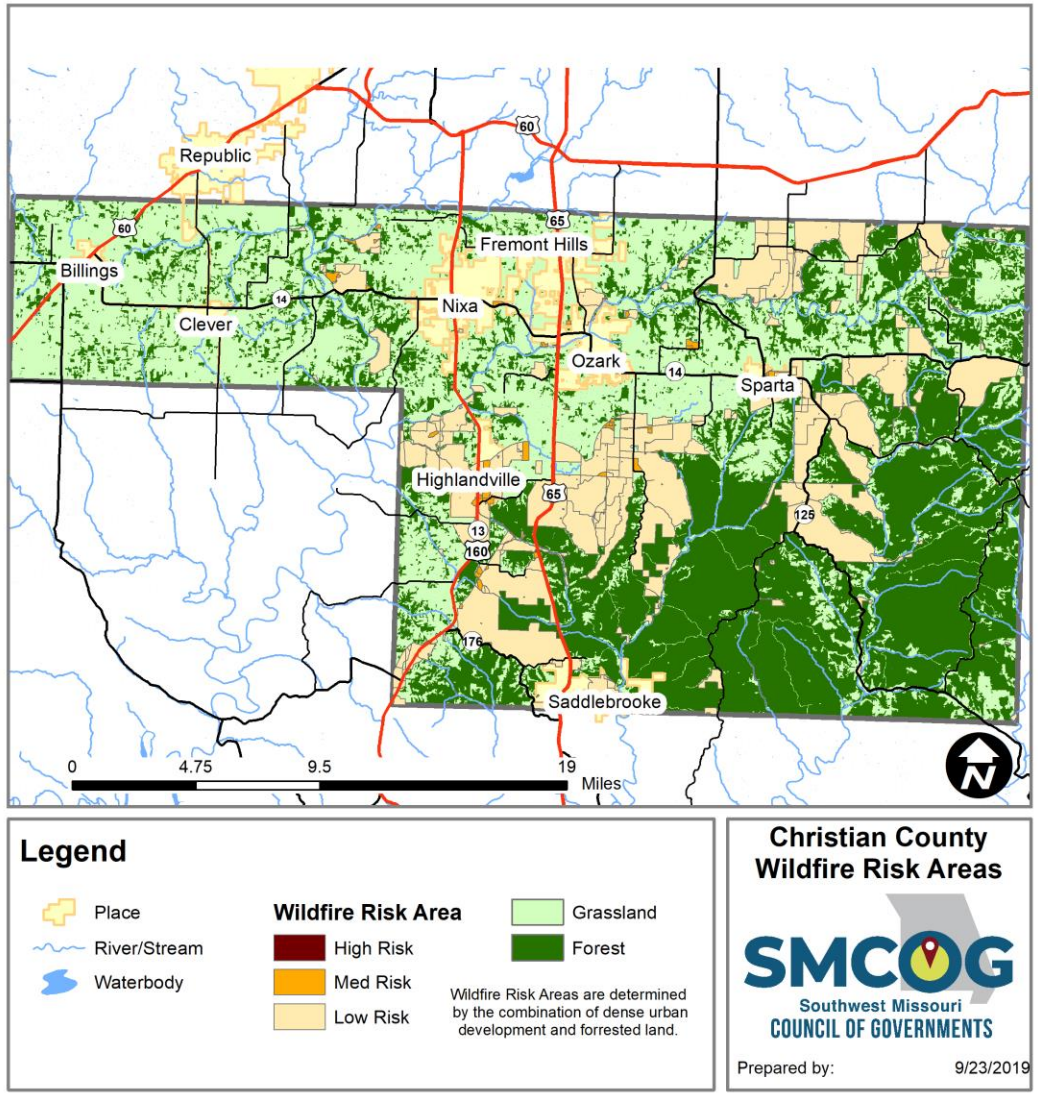
Identified Hazard: Wildfire

- Areas that abut wildland vegetation and that intermingle with wildland are most at risk for wildfire
- Highlandville and Sparta have areas of medium risk



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Identified Hazard: Wildfire

- (NCEI) reported 2 wildfires from 2000-2019
  - These incidents caused $30,000 in damages
- MDC reports 404 wildfires from 2000-2019
  - Some events reported by multiple agencies

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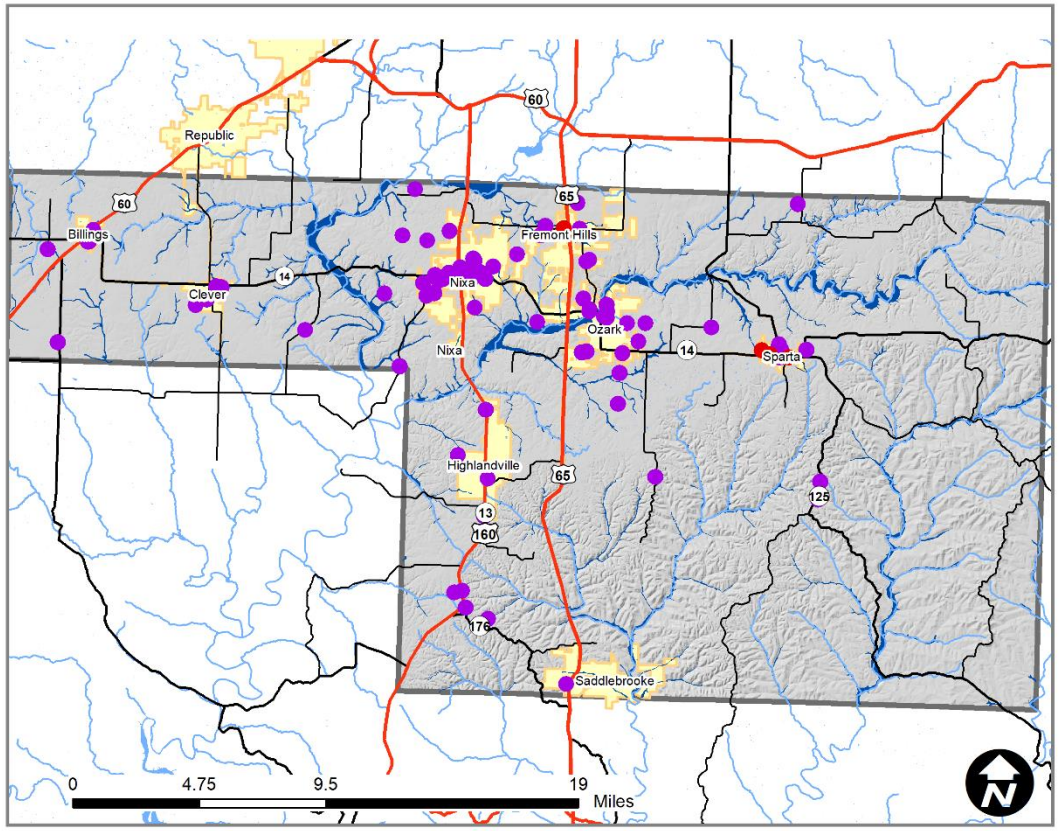
Critical and Essential Facilities



Legend

- Critical Facilities in Floodplain
- Critical Facility
- River/Stream
- Place
- Waterbody
- 100-Year Floodplain

Christian County Critical Facilities

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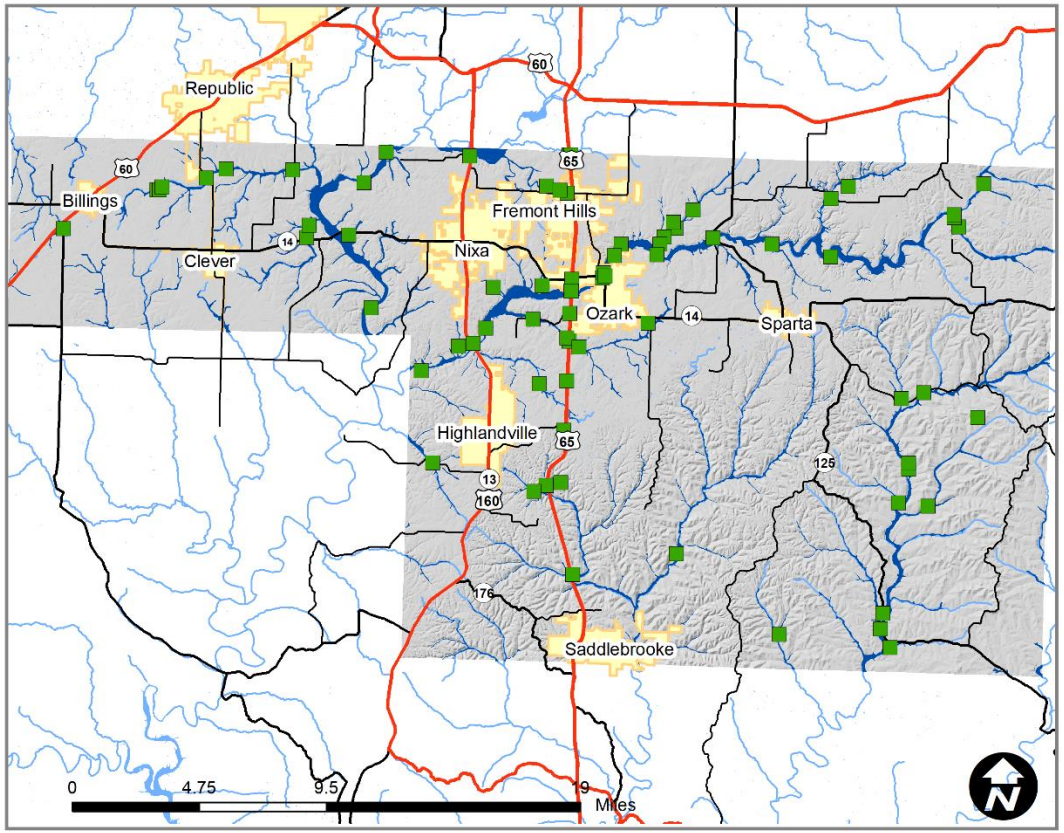
Prepared by: 9/23/2019



Legend

- Bridge
- River/Stream
- Waterbody
- Place
- Floodplain

Christian County Bridges

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Prepared by: 5/31/2019

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?

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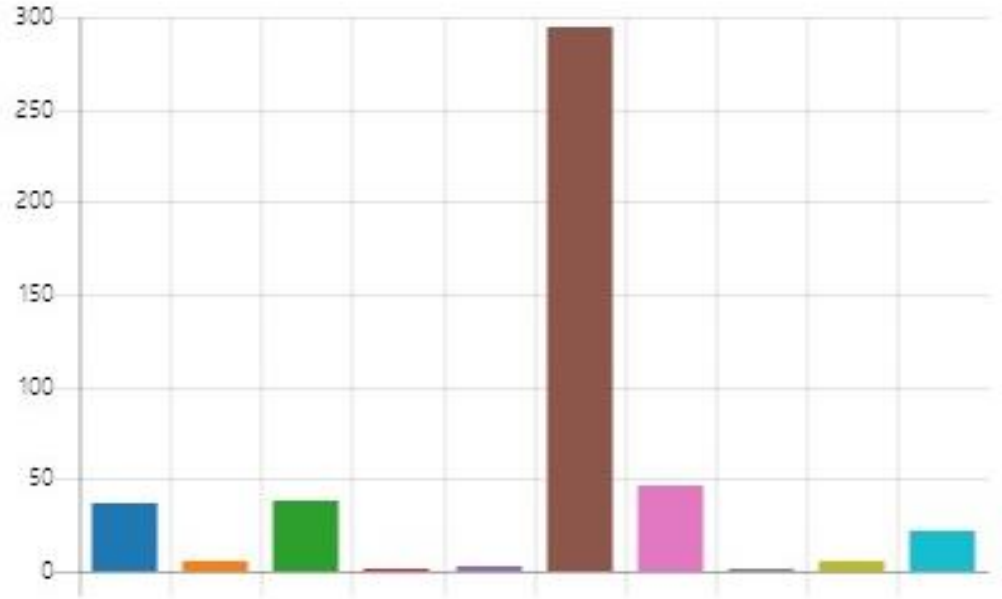
Survey Results

Where do you live?

Unincorporated Christian Cou...	37
Billings	5
Clever	38
Fremont Hills	1
Highlandville	3
Nixa	295
Ozark	46
Saddlebrooke	1
Sparta	5
Other	22



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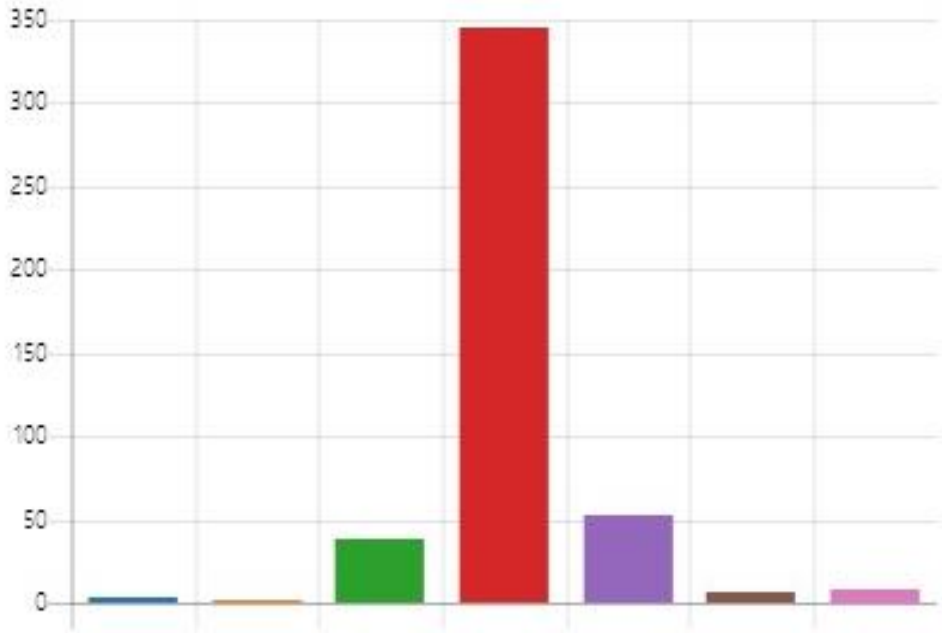
Survey Results

In what school district do you live?

Billings R-IV	3
Chadwick R-I	1
Clever R-V	38
Nixa Public Schools	345
Ozark R-VI	52
Sparta R-III	6
Spokane R-VII	8



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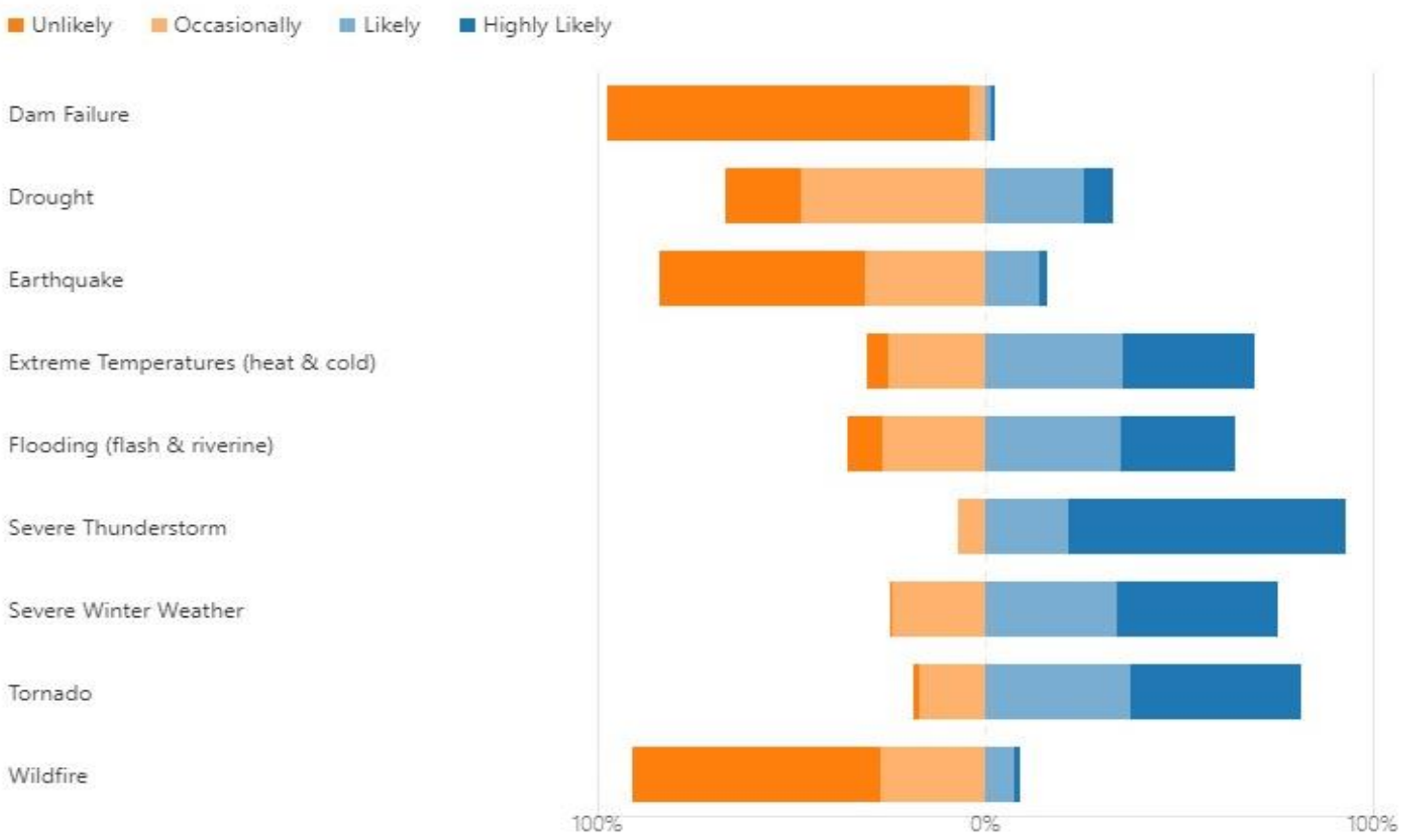
Survey Results

Overall perception of hazard likelihoods



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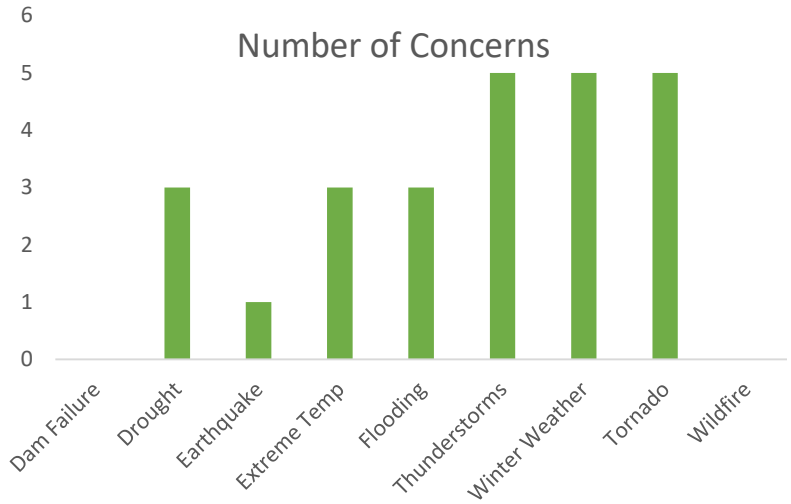
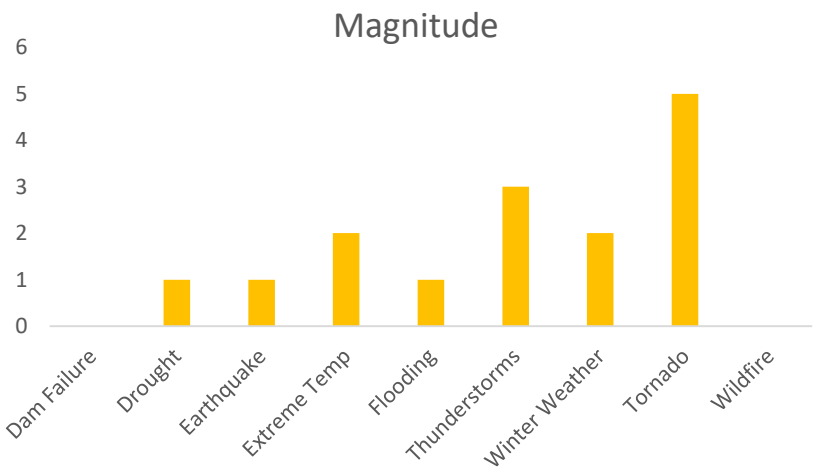
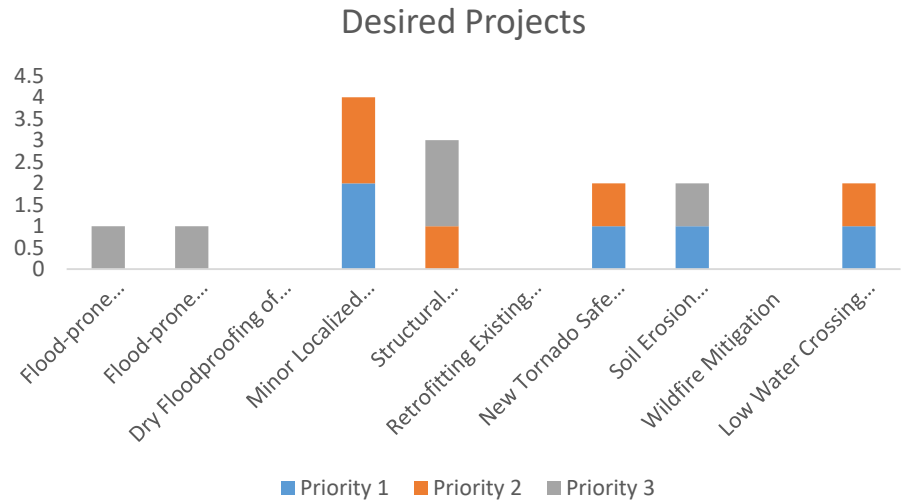
City Profile: Billings (5 participants)







Primary Concerns

1. T-storm
2. Winter Weather
3. Tornado

Perceived Magnitude

1. Tornado
2. T-storm
3. Extreme Temperature

Desired Projects

1. Minor Localized Flood Reduction Projects
2. New Tornado Safe Room Construction
2. Low Water Crossing Replacement

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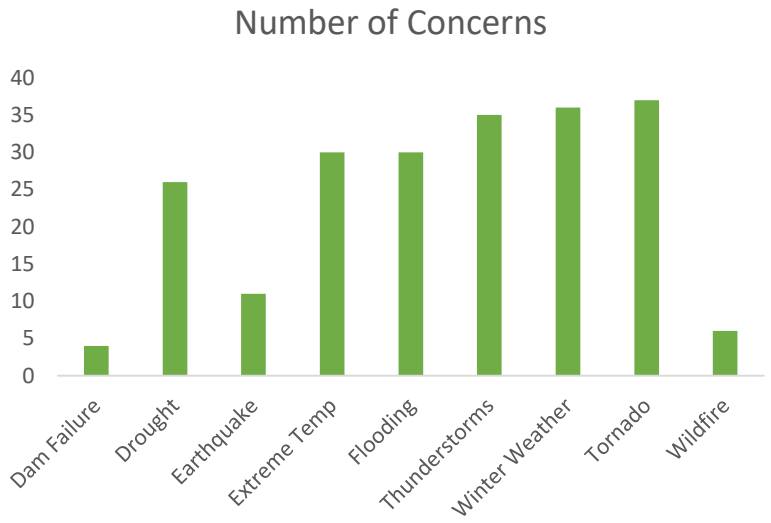
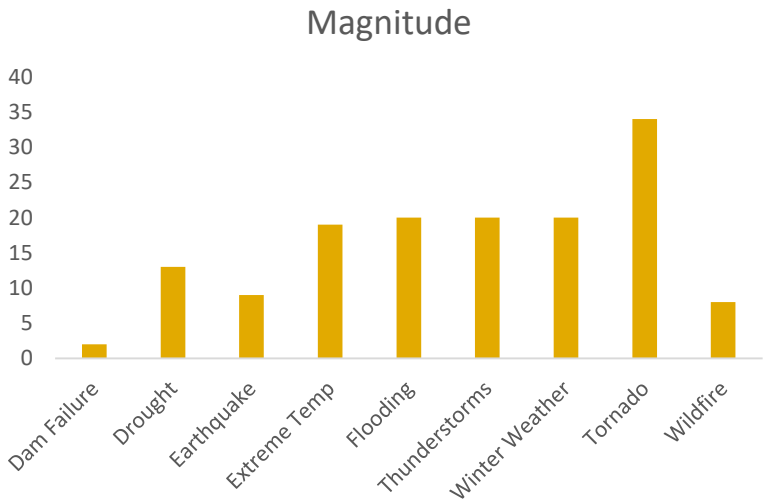
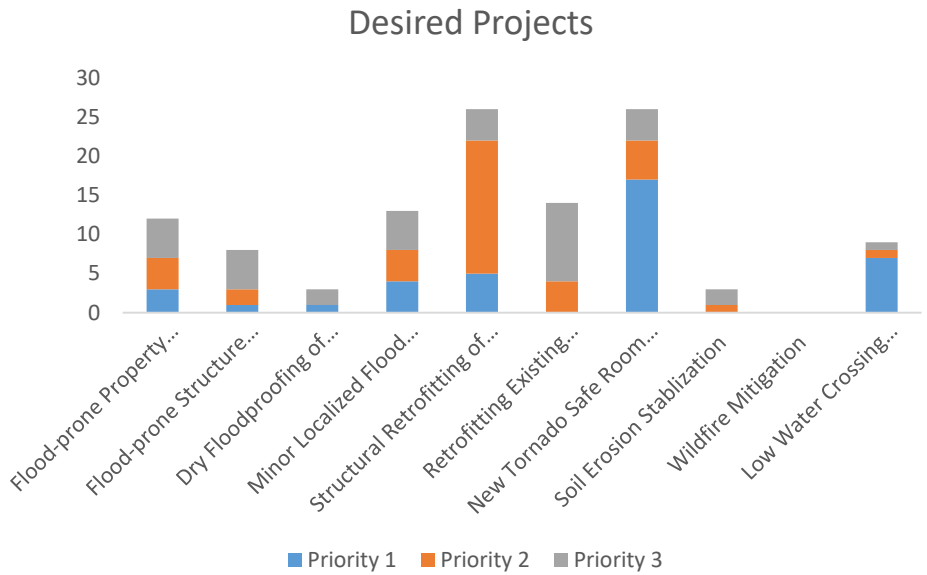
City Profile: Clever (38 participants)







Primary Concerns

1. Tornado
2. Winter Weather
3. T-storm

Perceived Magnitude

1. Tornado
2. Flooding, T-Storm, Winter weather
3. Extreme Temperature

Desired Projects

1. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
2. New Tornado Safe Room Construction
3. Minor Localized Flood Reduction Projects

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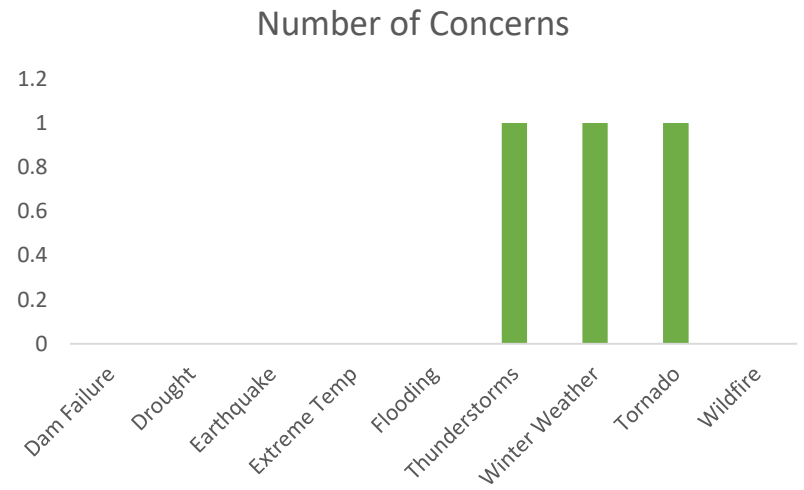
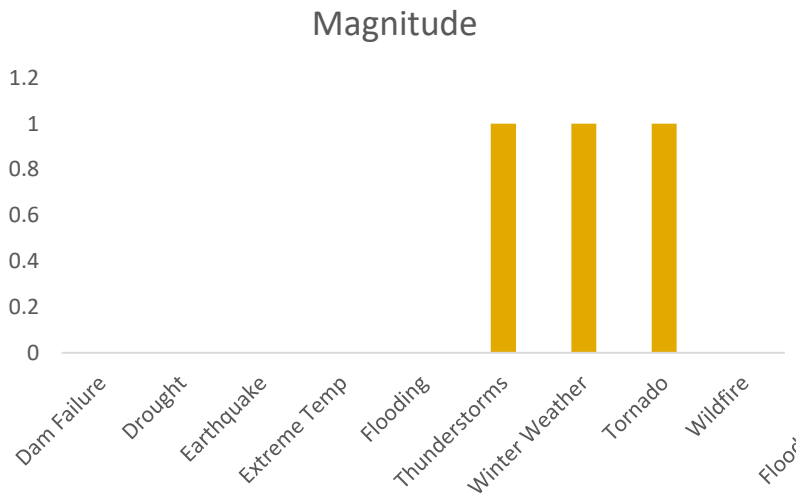
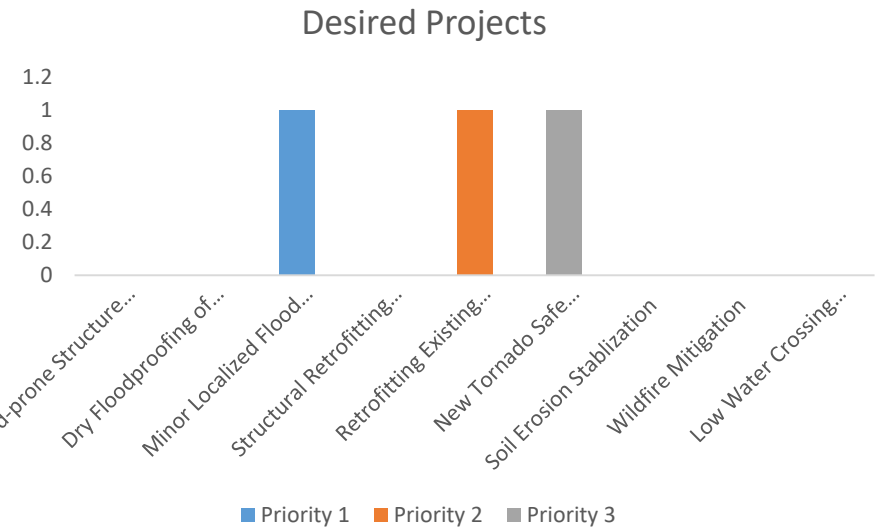
City Profile: Fremont Hills (1 participant)







Primary Concerns

- T-storms
- Winter weather
- Tornado

Perceived Magnitude

- T-storm
- Winter weather
- Tornado

Desired Projects

1. Minor Localized Flood Reduction Projects
2. Retrofitting Existing Buildings and Facilities to protect from Wind Damage
3. New Tornado Safe Room Construction

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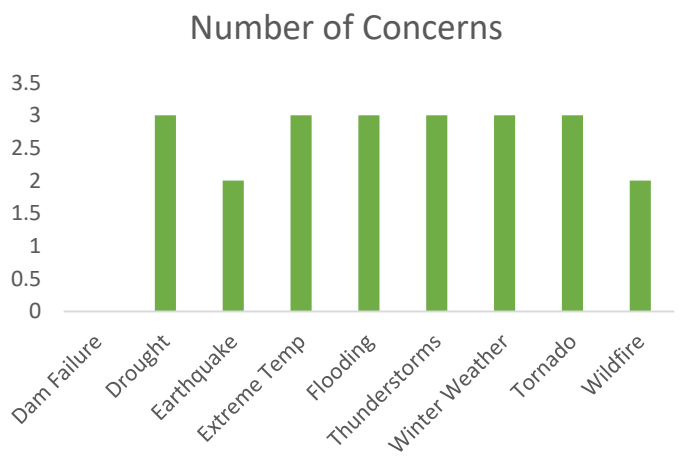
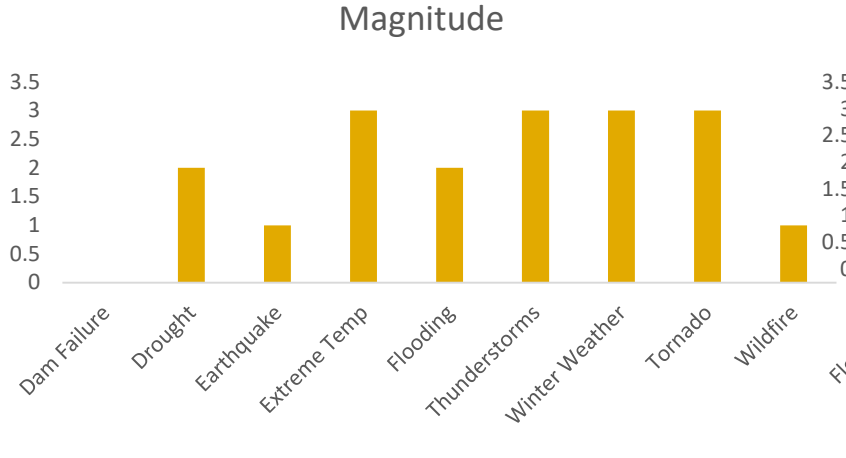
COUNCIL OF GOVERNMENTS

City Profile: Highlandville (3 participants)



Primary Concerns

- Drought
- Extreme Temperature
- Flooding
- T-storm
- Winter weather
- Tornado



Perceived Magnitude

- Extreme Temperature
- T-Storm
- Winter Weather
- Tornado

Desired Projects

1. Flood-prone Property Acquisition & Structure Demolition/Relocation
2. Flood-prone Structure Elevation
3. New Tornado Safe Room Construction

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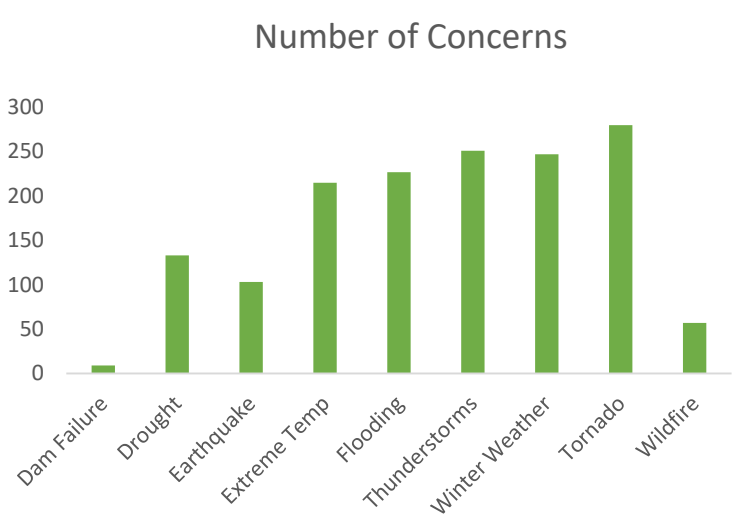
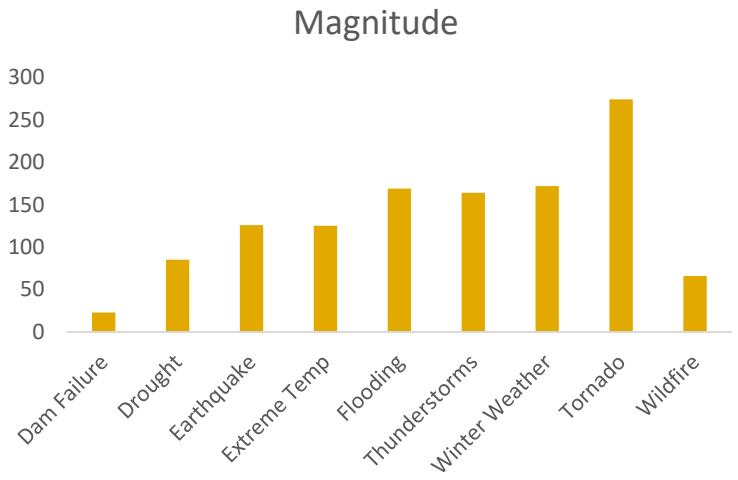
City Profile: Nixa (295 participants)



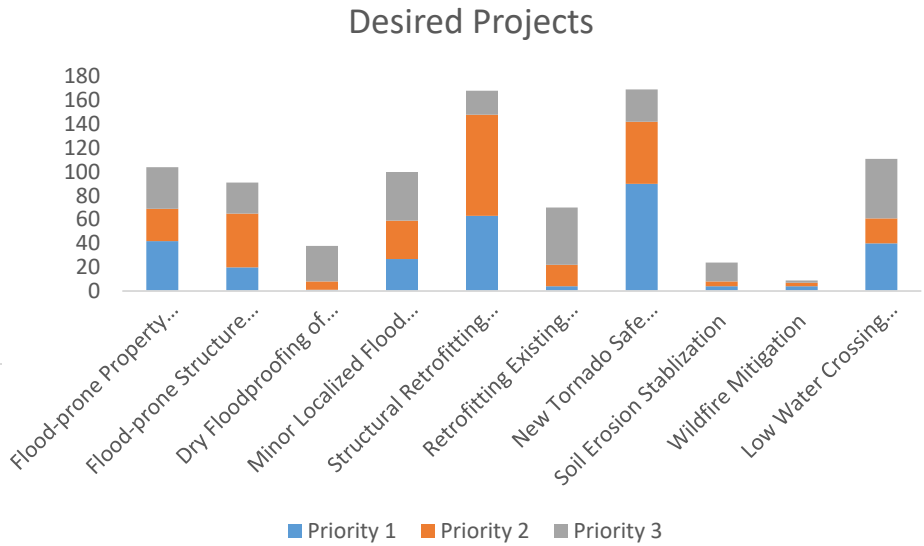
Primary Concerns

1. Tornado
2. T-storm
3. Winter weather



Perceived Magnitude

1. Tornado
2. Winter weather
3. Flooding
4. T-storm



Desired Projects

1. New Tornado Safe Room Construction
2. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
3. Flood-prone Property Acquisition & Structure Demolition/Relocation

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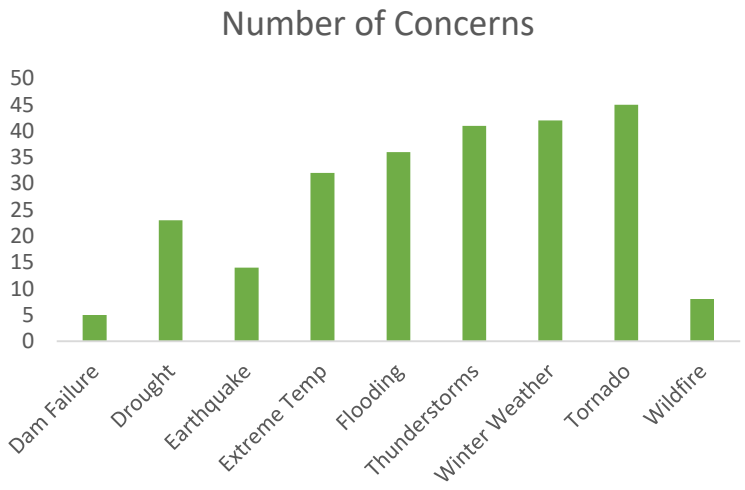
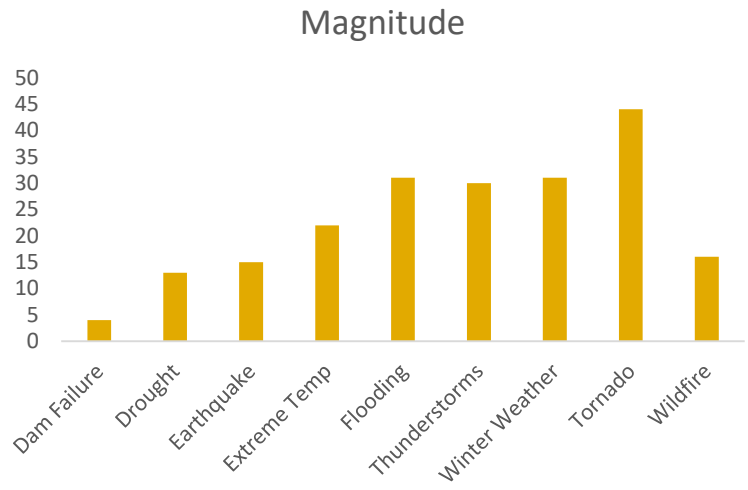
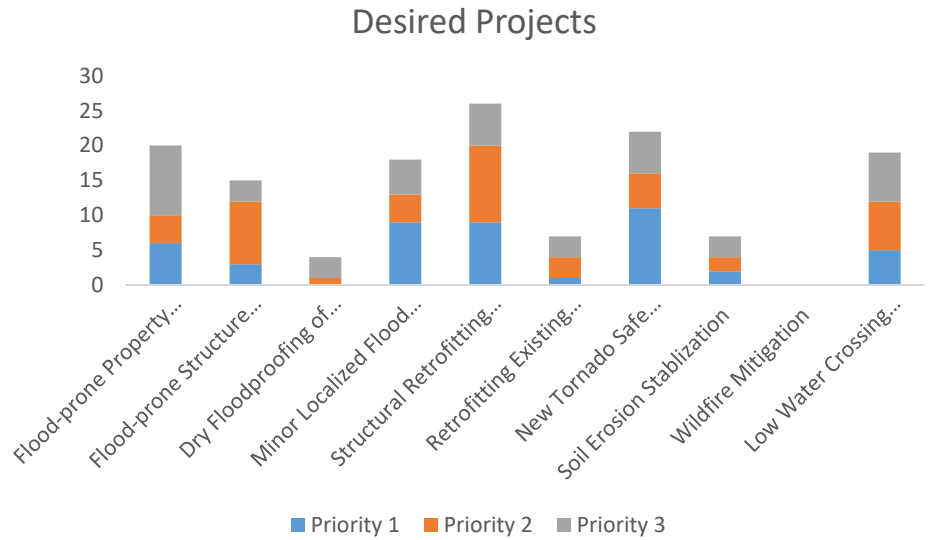
COUNCIL OF GOVERNMENTS

City Profile: Ozark (46 participants)







Primary Concerns

1. Tornado
2. Winter weather
3. T-storm

Perceived Magnitude

1. Tornado
2. Winter weather/Flooding
3. T-storm

Desired Projects

1. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
2. New Tornado Safe Room Construction
3. Minor Localized Flood Reduction Projects

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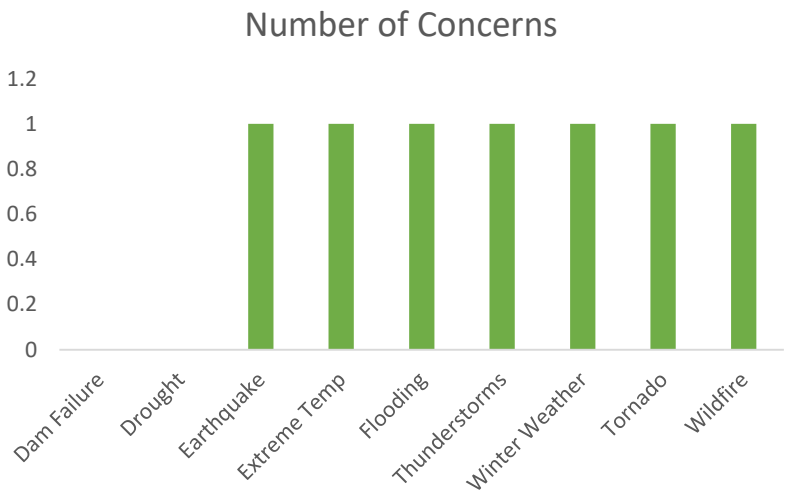
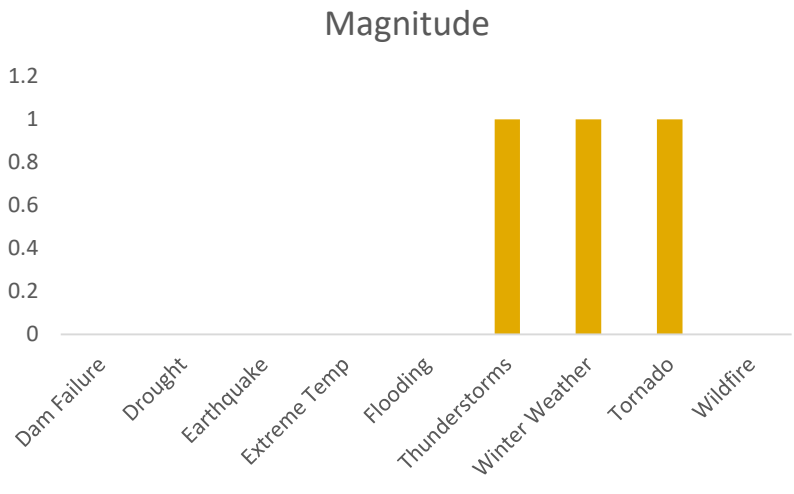
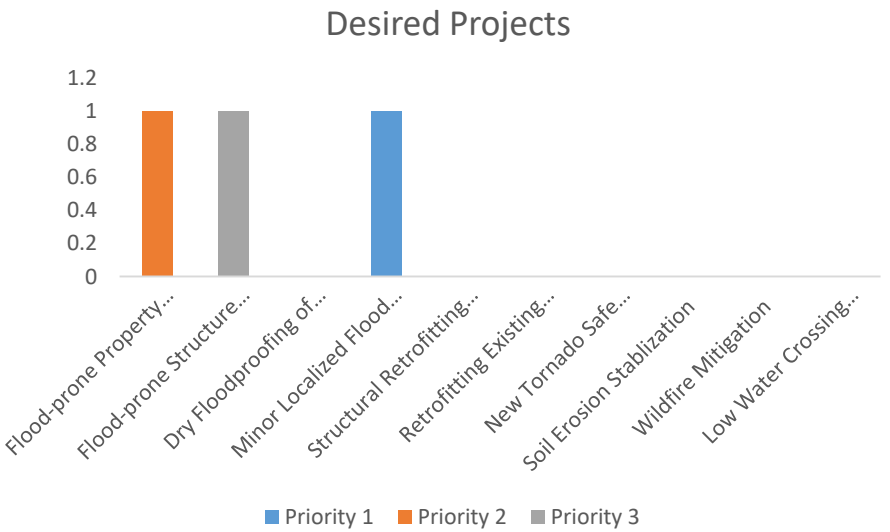
COUNCIL OF GOVERNMENTS

City Profile: Saddlebrooke (1 participant)







Primary Concerns

- Earthquake
- Extreme temperature
- Flooding
- T-storm
- Tornado
- Winter weather
- Wildfire

Perceived Magnitude

- Tornado
- T-storm
- Winter weather

Desired Projects

1. Minor Localized Flood Reduction Projects
2. Flood-prone Property Acquisition & Structure Demolition/Relocation
3. Flood-prone Structure Elevation

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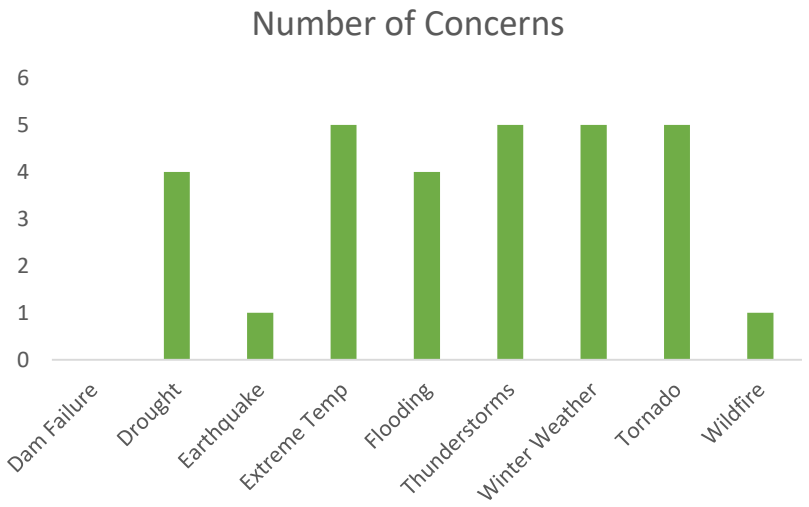
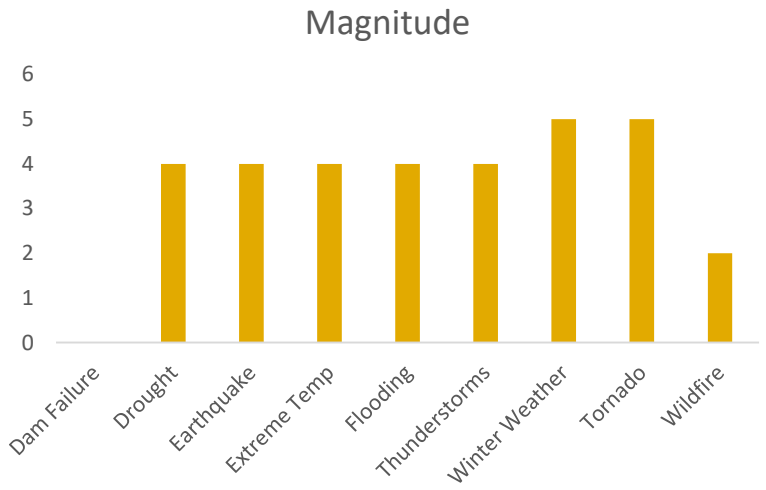
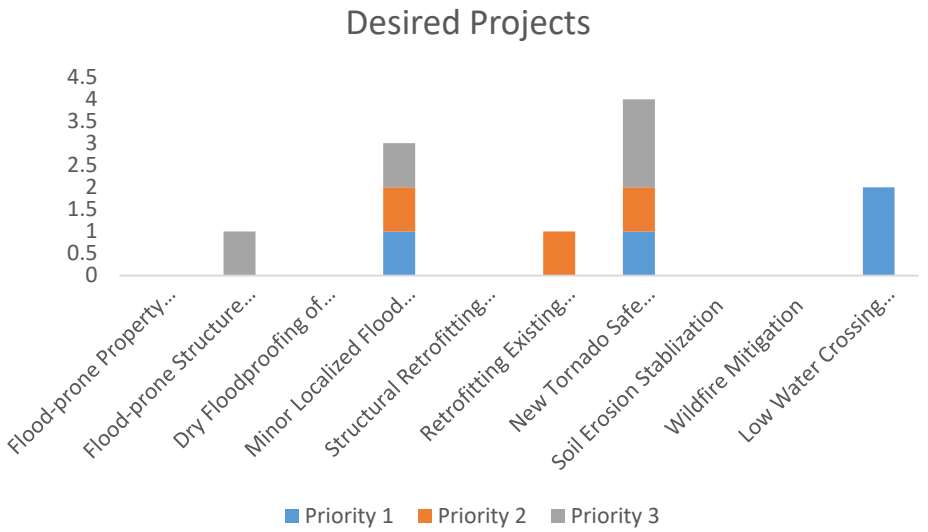
City Profile: Sparta (5 participants)







Primary Concerns

- Extreme temperature
  - T-storm
- Winter weather
  - Tornado

Perceived Magnitude

- Winter weather
- Tornado

Desired Projects

1. New Tornado Safe Room Construction
2. Low Water Crossing Replacement

2. Minor Localized Flood Reduction Projects

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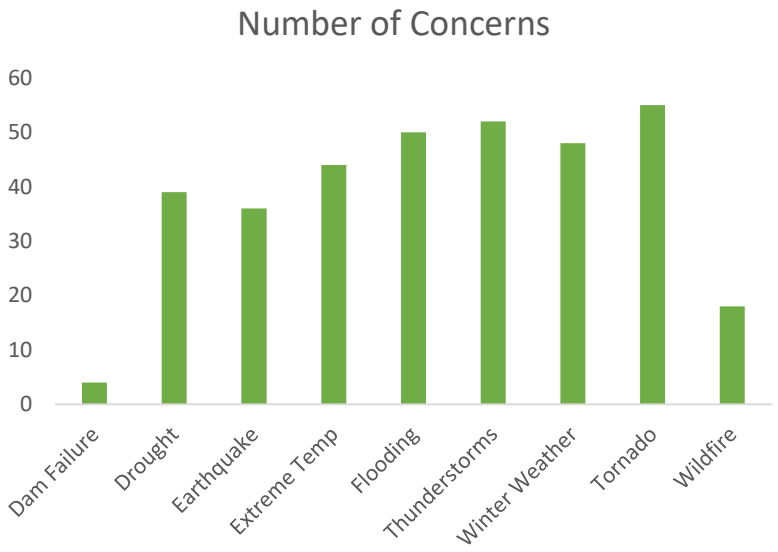
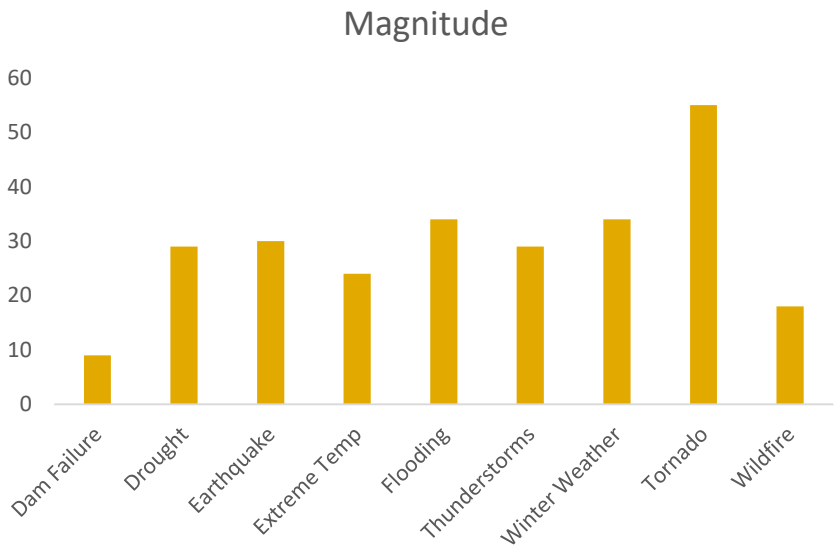
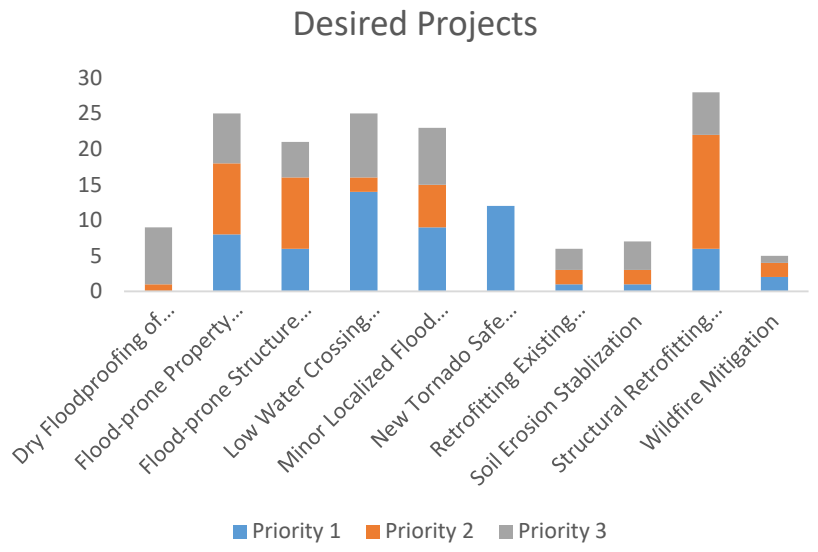
COUNCIL OF GOVERNMENTS

City Profile: Unincorporated (59 participants)







Primary Concerns

1. Tornado
2. T-storm
3. Flooding

Perceived Magnitude

1. Tornado
2. Flooding/Winter weather
3. Earthquake

Desired Projects

1. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
2. Low Water Crossing Replacement
3. Flood-prone Property Acquisition & Structure Demolition/Relocation

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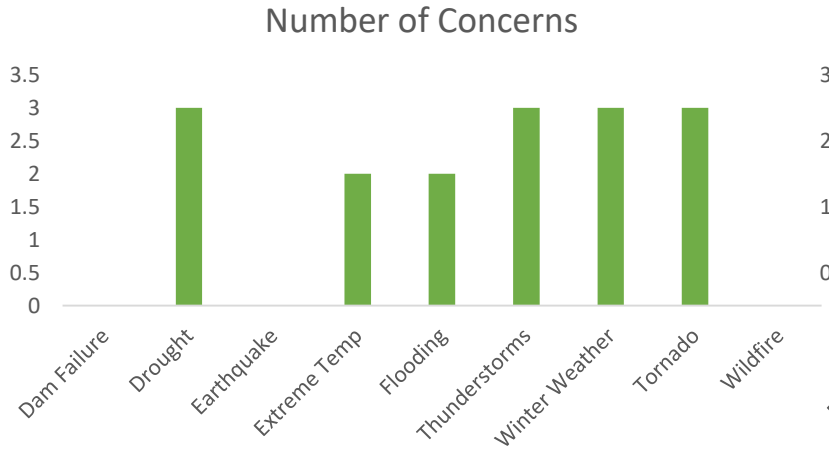
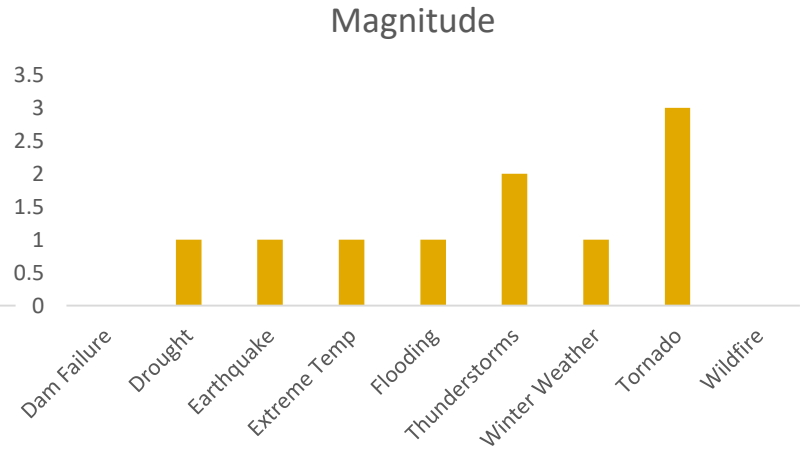
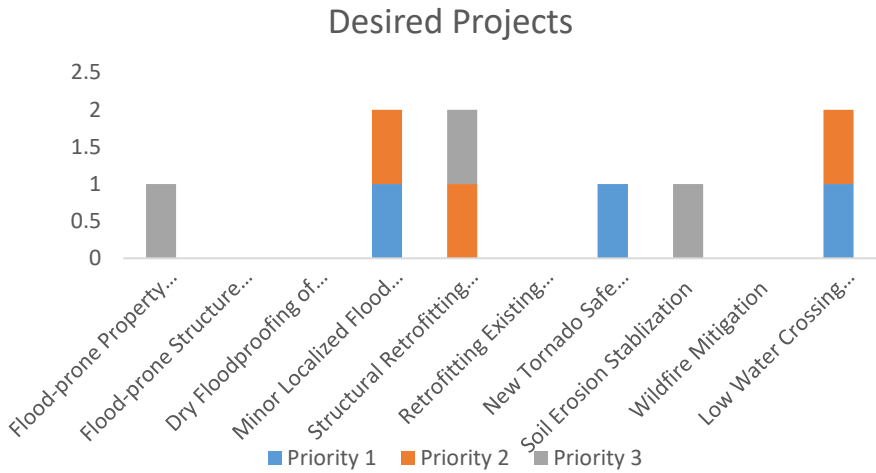
District Profile: Billings R-IV (3 participants)







Primary Concerns

- Drought
- T-storm
- Winter weather
- Tornado

Perceived Magnitude

1. Tornado
2. T-storm

Desired Projects

1. Minor Localized Flood Reduction Projects
2. Low Water Crossing Replacement
3. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms

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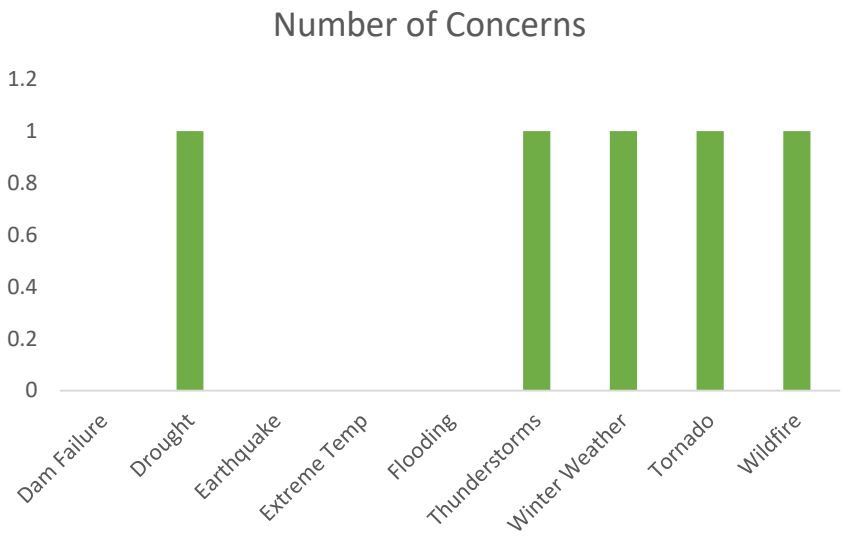
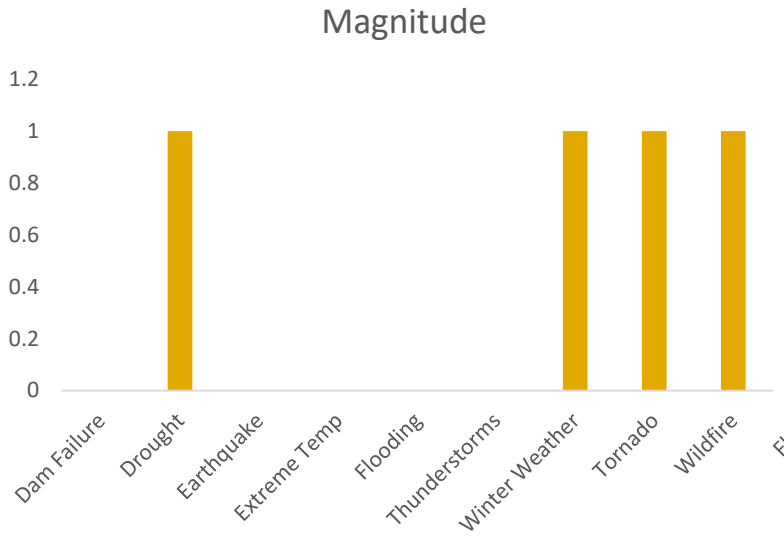
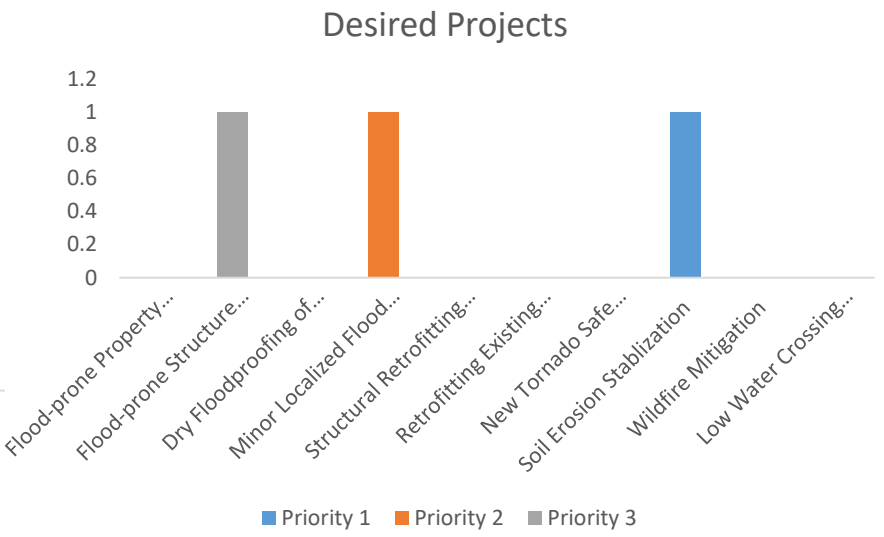
District Profile: Chadwick R-I (1 participant)







Primary Concerns

- Drought
- T-storm
- Winter weather
- Tornado
- Wildfire

Perceived Magnitude

- Drought
- Winter weather
- Tornado
- Wildfire

Desired Projects

1. Soil Erosion Stabilization
2. Minor Localized Flood Reduction Projects
3. Flood-prone Structure Elevation

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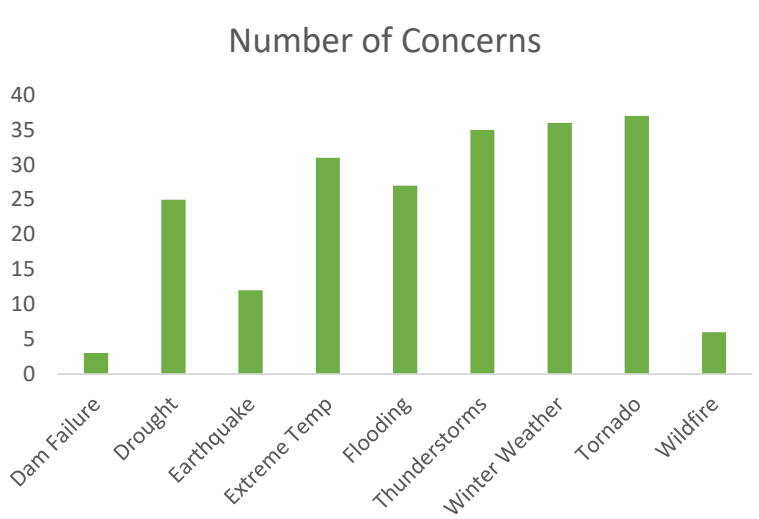
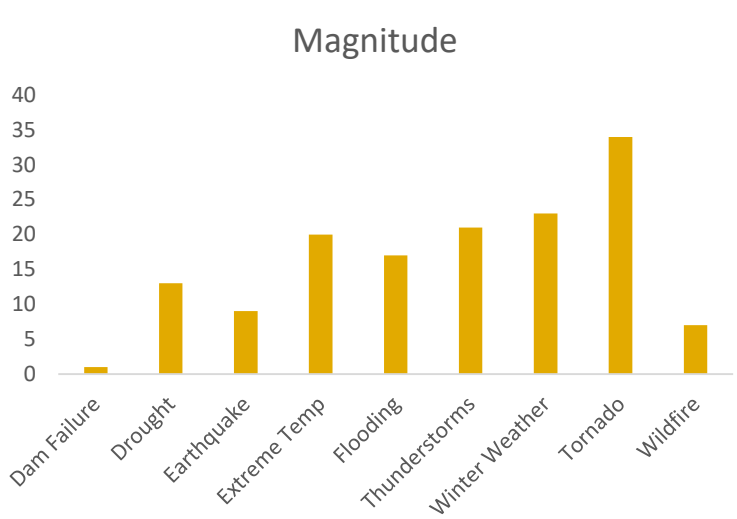
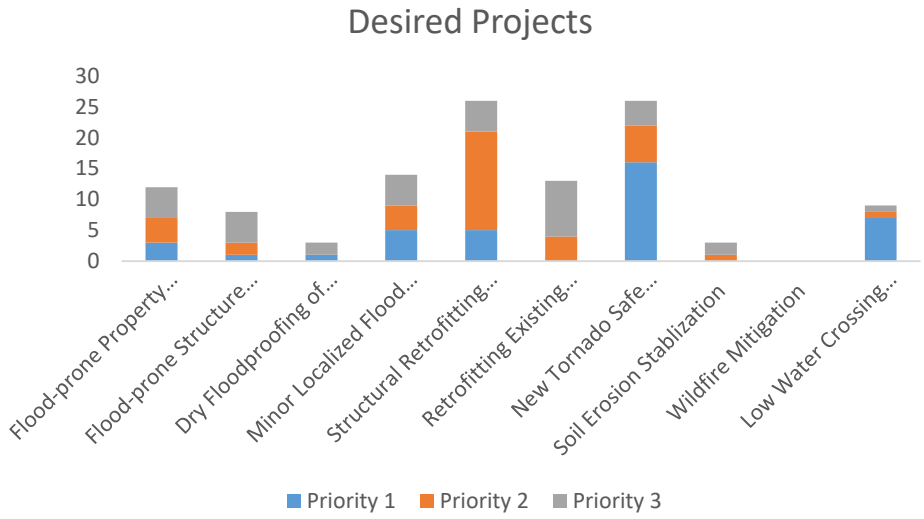
District Profile: Clever R-V (38 participants)







Primary Concerns

1. Tornado
2. Winter weather
3. T-storm

Perceived Magnitude

1. Tornado
2. Winter weather
3. T-storms

Desired Projects

1. New Tornado Safe Room Construction
2. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
3. Minor Localized Flood Reduction Projects

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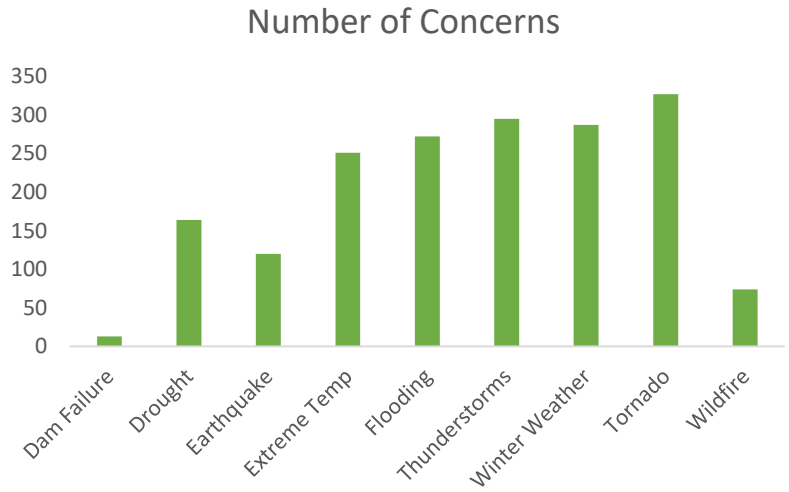
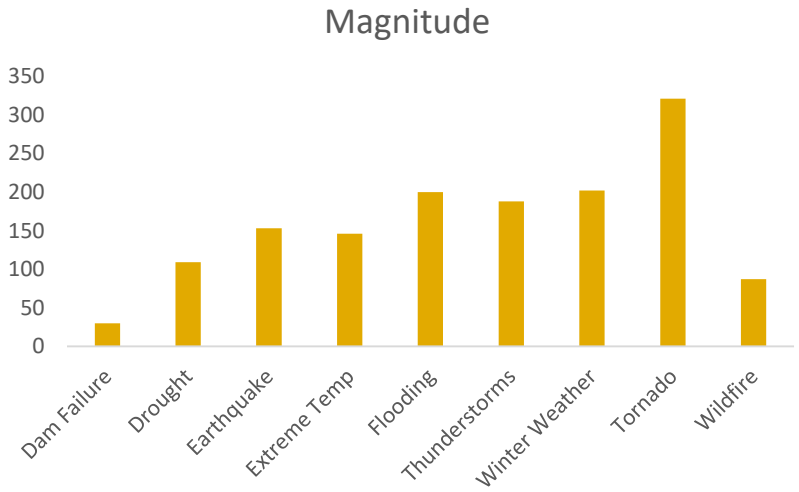
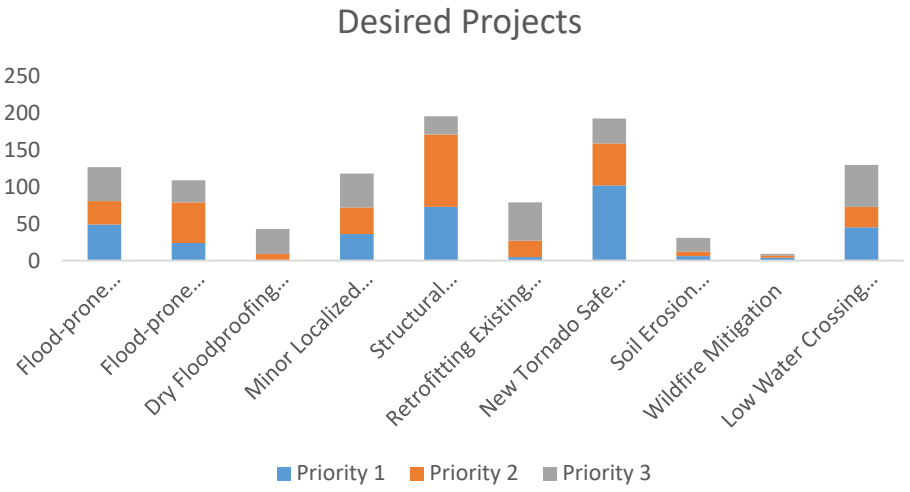
COUNCIL OF GOVERNMENTS

District Profile: Nixa Public Schools (345 participants)







Perceived Magnitude

1. Tornado
2. Winter weather
3. Flooding

Primary Concerns

1. Tornado
2. T-storm
3. Winter weather

Desired Projects

1. New Tornado Safe Room Construction
2. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
3. Flood-prone Property Acquisition & Structure Demolition/Relocation

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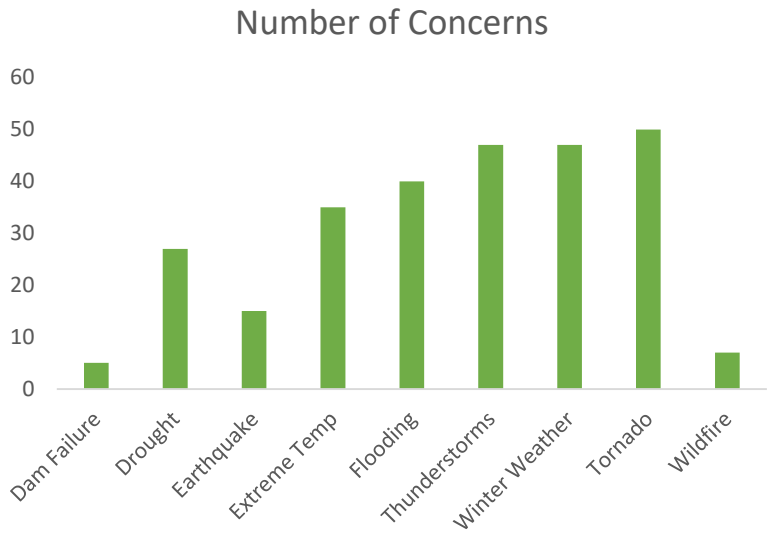
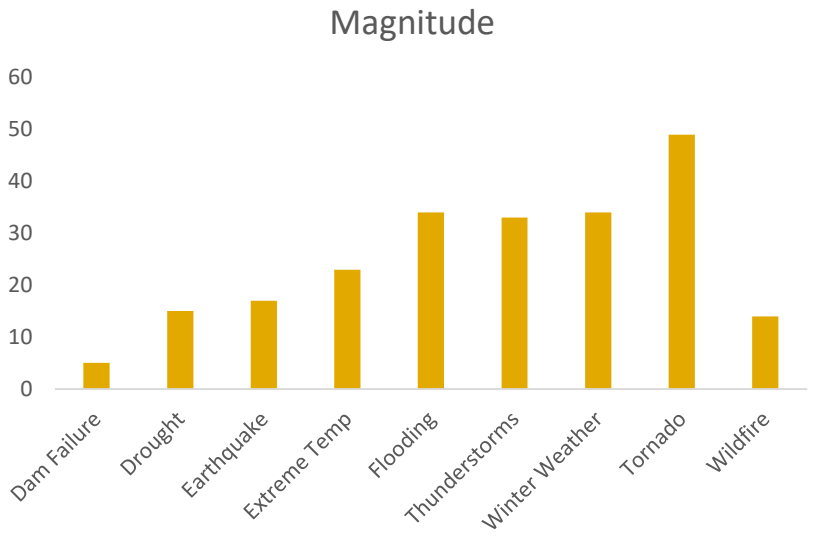
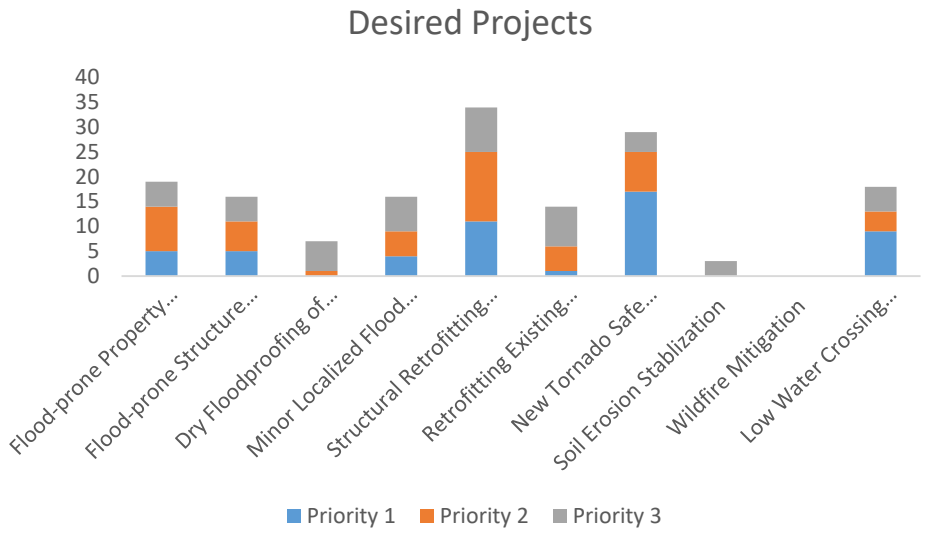
District Profile: Ozark R-VI (52 participants)







Primary Concerns

1. Tornado
2. T-storm/winter weather
3. Flooding

Perceived Magnitude

1. Tornado
2. Flooding/Winter weather
3. T-storm

Desired Projects

1. New Tornado Safe Room Construction
2. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms
3. Flood-prone Property Acquisition & Structure Demolition/Relocation

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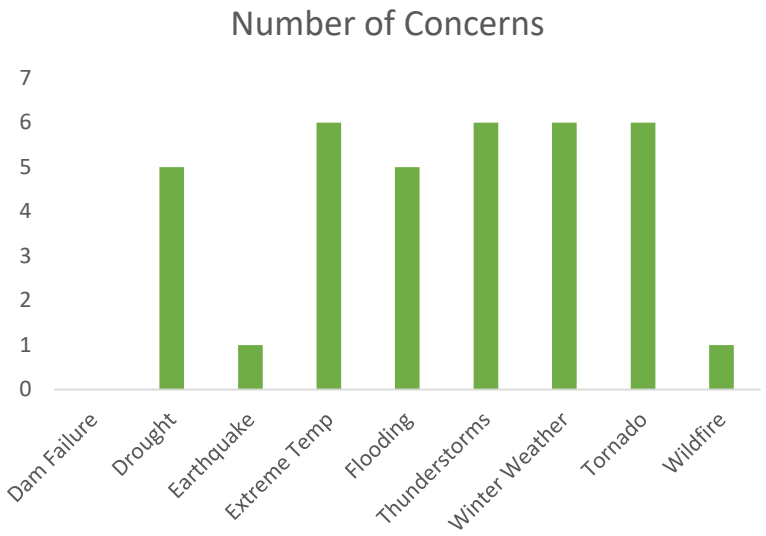
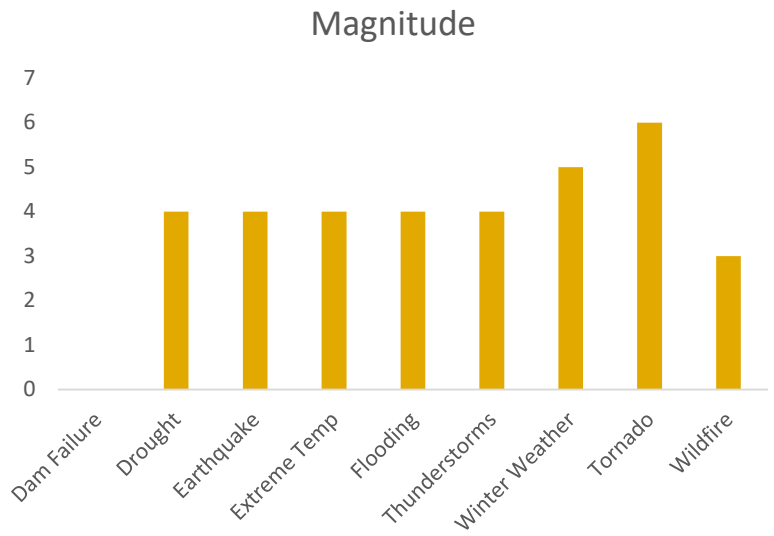
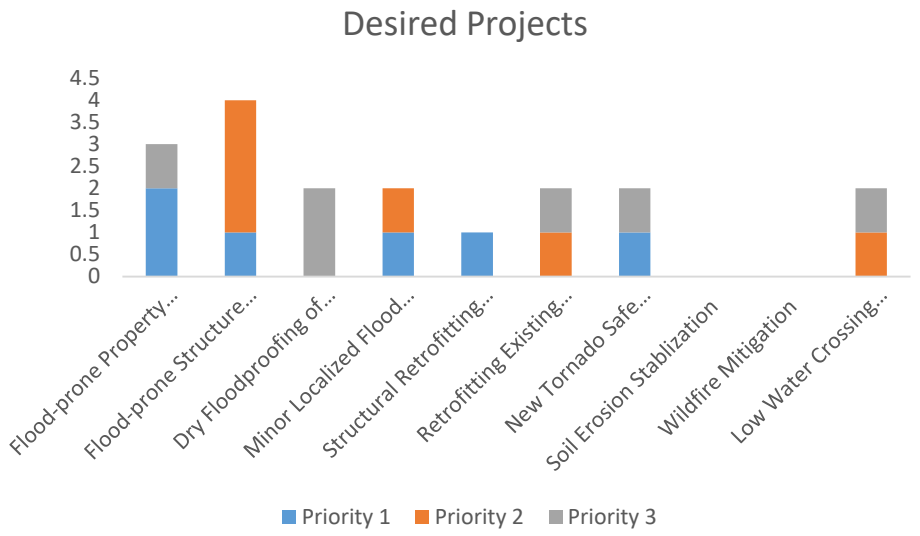
District Profile: Sparta R-III (6 participants)







Primary Concerns

1. Extreme temp/ T-storm/Winter weather/Tornado
2. Flooding/Drought

Perceived Magnitude

1. Tornado
2. Winter weather

Desired Projects

1. Flood-prone Structure Elevation
2. Flood-prone Property Acquisition & Structure Demolition/Relocation
3. Minor Localized Flood Reduction Projects

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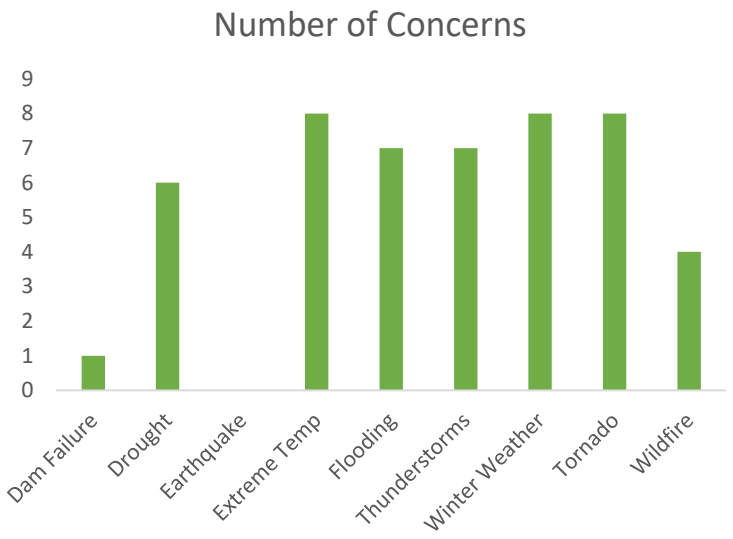
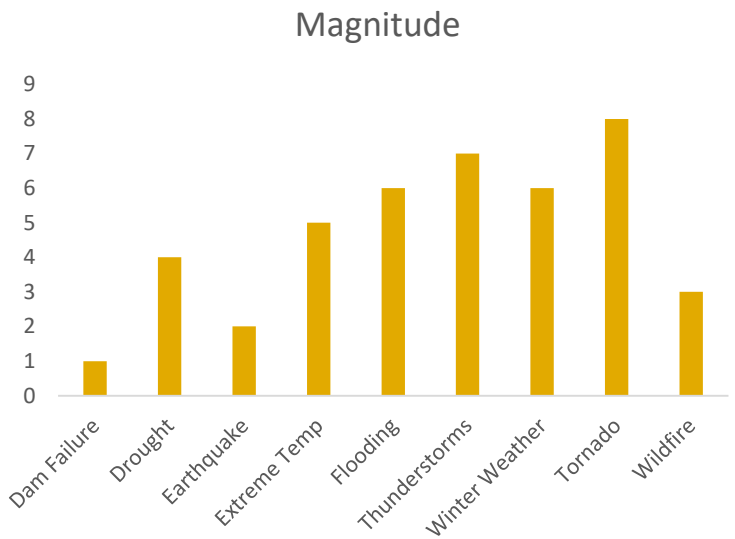
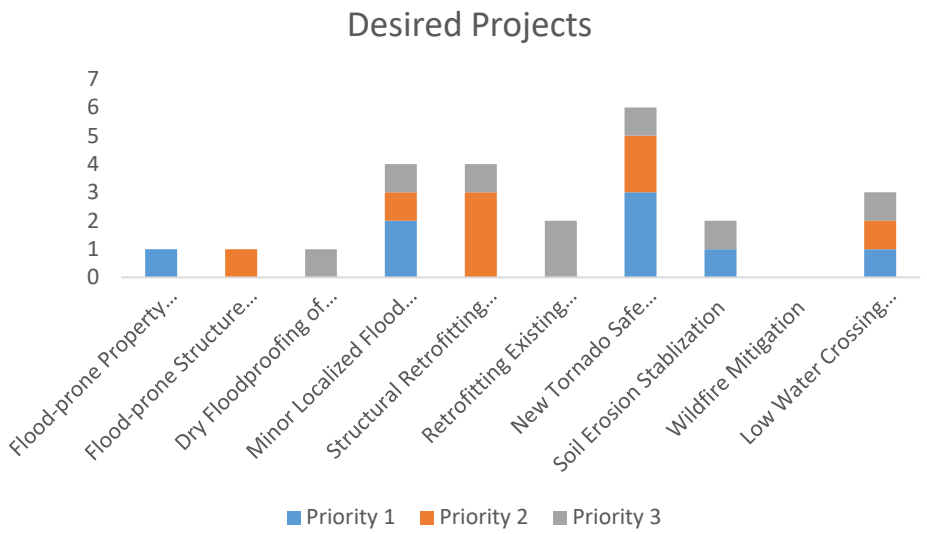
District Profile: Spokane R-VII (8 participants)







Primary Concerns

- Extreme Temp
- Winter Weather
- Tornado

Perceived Magnitude

1. Tornado
2. T-storms
3. Flooding/Winter weather

Desired Projects

1. New Tornado Safe Room Construction
2. Minor Localized Flood Reduction Projects
3. Structural Retrofitting of Existing Buildings to add Tornado Safe Rooms

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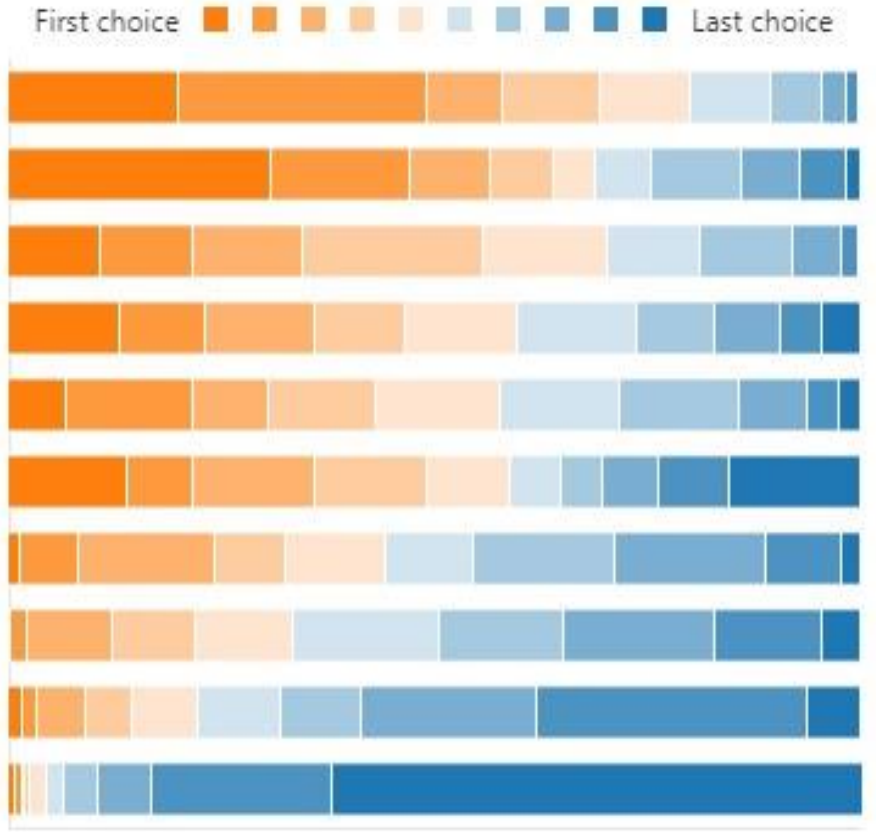
Special Districts

Catastrophic or Critical impact	Dam Failure	Drought	Earthquake	Extreme Temp	Flooding	Thunderstorm	Winter Weather	Tornado	Wildfire
Billings Fire Protection District; Billings Special Road District;	0	1	1	1	1	**2**	1	**2**	0
Billings Special Road District;	0	0	1	1	1	0	0	**2**	0
Chadwick Fire District;	0	**1**	0	0	0	0	**1**	**1**	**1**
Christian County Ambulance District;	4	12	9	13	17	19	20	**24**	9
Christian County Ambulance District; Billings Fire Protection District; Billings Special Road District;	0	0	1	1	0	1	1	**2**	0
Christian County Ambulance District; Billings Fire Protection District; Billings Special Road District; Clever Fire Protection District;	0	**1**	0	**1**	**1**	**1**	**1**	**1**	0
Christian County Ambulance District; Clever Fire Protection District;	1	3	5	6	6	4	6	**8**	4
Christian County Ambulance District; Clever Fire Protection District; Nixa Fire Protection District;	1	1	1	1	1	1	1	1	1
Christian County Ambulance District; Highlandville Fire Protection District;	1	1	1	1	2	**3**	2	**3**	2
Christian County Ambulance District; Nixa Fire Protection District;	11	43	55	64	82	79	82	**127**	32
Christian County Ambulance District; Nixa Fire Protection District ;Ozark Fire Protection District;	0	0	0	0	0	0	0	**1**	0
Christian County Ambulance District; Nixa Fire Protection District; Ozark Special Road District;	0	1	0	1	**2**	0	1	**2**	0
Christian County Ambulance District;Ozark Fire Protection District;	1	4	3	7	10	10	9	**13**	3
Christian County Ambulance District; Ozark Fire Protection District; Ozark Special Road District;	1	5	8	7	8	10	11	**16**	3
Christian County Ambulance District; South Sparta Special Road District;	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**	0
Clever Fire Protection District;	0	9	2	11	12	15	16	**24**	3
Highlandville Fire Protection District;	0	**2**	1	**2**	**2**	1	1	**2**	1
Nixa Fire Protection District;	13	50	84	69	96	92	100	**167**	43
Ozark Fire Protection District;	3	8	7	6	9	7	9	**12**	7
Ozark Fire Protection District;Ozark Special Road District;	0	1	3	3	6	6	6	**9**	3
Ozark Special Road District;	1	1	1	1	**2**	1	1	**2**	1
South Sparta Special Road District;	0	**2**	**2**	**2**	**2**	**2**	**2**	**2**	1

Survey Results

Countywide project desires

Rank	Options
1	Structural Retrofitting of Existi...
2	New Tornado Safe Room Cons...
3	Minor Localized Flood Reducti...
4	Flood-prone Property Acquisit...
5	Flood-prone Structure Elevation
6	Low Water Crossing Replacem...
7	Retrofitting Existing Buildings ...
8	Dry Floodproofing of Historica...
9	Soil Erosion Stablization
10	Wildfire Mitigation



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Mitigation Strategies

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

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Future Meetings

Meeting 3: December 11, 11 a.m.	Meeting 4: February 5, 2020, 11 a.m.	Meeting 5: April 1, 2020, 11 a.m.
• Review Goals, Objectives, & Mitigation Strategies • Review STAPLEE	• STAPLEE Scoring of Mitigation Strategies • Questions	• Final Wrap-Up • Plan Maintenance

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Draft Plan Submitted to SEMA: October 1, 2020
Final Plan Approval By: January 1, 2021

Thank you for your time!

Any questions?

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www.smcog.org