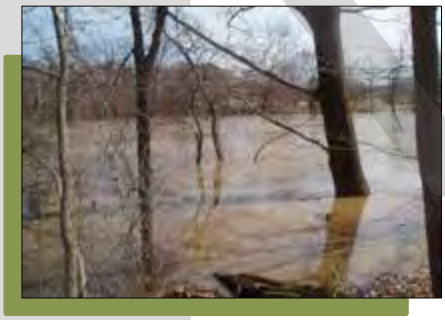

Dent County Multi-Jurisdiction Natural Hazard Mitigation Plan

Meramec Regional Planning Commission ● June 2018

4 Industrial Drive,
St. James, MO 65559

Phone: (573) 265-2993

Fax: (573) 265-3550

CONTRIBUTORS

Dent County Hazard Mitigation Planning Committee

The individuals invited to participate in the Dent County hazard mitigation planning committee are as follows:

Jurisdictional Representatives

Name	Title	Department	Jurisdiction/Agency/Organization
Darrell Skiles	Presiding Commissioner	County	Dent County
Gary Larson	Associate Commissioner	County	Dent County
Dennis Purcell	Associate Commissioner	County	Dent County
Angie Curley	County Clerk	County	Dent County
Bob Wells	Sherriff	Sherriff's Dept.	Dent County
Brad Nash	EMD	Emergency Management	Dent County
Dent Co. Road Dept.	Supervisor	Road Dept.	Dent County
Jim Kotchedoff	Public Administrator	County	Dent County
Kendra Mobray	Admin.	Health Dept.	Dent County Health Dept.
Jack Ficker	Fire Chief	Fire District	Jadwin
Donald L. Good	Fire Chief	Fire District	Lenox
Fire Chief	Fire Chief	Fire District.	Montauk
Brad Nash	Fire Chief	Fire District	Salem
Brad Nash	Mayor	City Admin.	Salem
Mary D. Happel	City Clerk	City Admin.	Salem
Ray Walden	City Administrator	City Admin.	Salem
Gary Glenn	Street Supt.	Public Works	Salem
Keith Steelman	Chief of Police	Police Dept.	Salem
Jack Emory	Water & Sewage Supt.	Public Works	Salem
Bryon Johns	Electric Supt.	Public Works	Salem
John McColloch	Superintendent	School District	Salem R-80
Victoria Brooker	Superintendent	School District	Dent-Phelps R-III
Kevin Prugh	Superintendent	School District	Green Forest R-II
Dr. Jeff Dodson	Superintendent	School District	North Wood R-IV
Deron Gibbs	Superintendent	School District	Oak Hill R-I

*Sign in sheets from planning meetings are included in Appendix B.

The individuals invited to represent stakeholders on the Dent County hazard mitigation planning committee are as follows:

Stakeholder Representatives

Name	Title	Agency/Organization
Administrator	Administrator	Seville Care Center
Administrator	Administrator	Salem Care Center
Administrator	Administrator	Salem Residential Care
Administrator	Administrator	Salem Mem. Dist. Hospital
Intercounty Electric Co-Op	Intercounty Electric Co-Op	Intercounty Electric Co-Op

Name	Title	Agency/Organization
Supervisor	Maintenance Supervisor	MoDOT
Kath Mayne	Disaster Program Manager	American Red Cross
Genifer Cape	Community Relations Rep.	Crawford Electric Co-Op Inc.
James W. Remillard	Captain	MSHP
Karen McHugh	Floodplain Manager	SEMA
Matt Shively	District Engineer	USACE
Ken Sessa	Regional Environmental Officer	FEMA Region VII
Josh Hundley	Biologist	USFWS
Resource Science Division	Resource Science Division	MDC
J.R. Flores	State Conservationist	USDA, NRCS
Fidelity Communications	Fidelity Communications	Fidelity Communications
Century Link	Century Link	Century Link
The Salem News	The Salem News	The Salem News

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EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Dent County and participating cities and school districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses to the county and its communities and schools resulting from hazard events. This is the first hazard mitigation plan for Dent Co. The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 and to achieve eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The county Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following 7 jurisdictions that participated in the planning process:

- Dent County
- City of Salem
- Salem R-80 School District
- Oak Hill R-I School District
- Dent-Phelps R-III School District
- North Wood R-IV School District
- Green Forest R-II School District

Dent County and the jurisdictions listed above have developed a multi-jurisdictional Hazard Mitigation This current planning effort serves as the first plan for the county and its jurisdictions (hereafter referred to as the 2018 Hazard Mitigation Plan).

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representative from Dent County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Dent County and analyzed the vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate them. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/ lightening/high winds and tornadoes are among the hazards that historically have had a significant impact.

Based upon the risk assessment, the MCP reviewed goals for reducing risk from hazards. The goals are listed below:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

To meet the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. The MPC developed an implementation plan for each action, which identifies priority level, responsible agency, timeline, cost estimate, potential funding sources and progress to date.

PREREQUISITES

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools districts. The documentation of adoptions is included in Appendix D.

The following jurisdictions participated in the development of this plan and have adopted the multi-jurisdictional plan.

- Dent County
- City of Salem
- Salem R-80 School District
- Oak Hill R-I School District
- Dent-Phelps R-III School District
- North Wood R-IV School District
- Green Forest R-II School District

Model Resolution

RESOLUTION NO. _____

A RESOLUTION TO ADOPT THE DENT COUNTY MULTI-JURISDICTION NATURAL HAZARDS MITIGATION PLAN

WHEREAS, (Government/District) recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 emphasizing the need for pre-disaster mitigation of potential hazards and made available hazard mitigation grants to state and local governments; and

WHEREAS, an adopted Multi-Jurisdiction Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre-and post-disaster mitigation grant programs; and

WHEREAS, (Government/District) fully participated in the FEMA prescribed mitigation planning process to prepare this Mitigation Plan; and

WHEREAS, the Missouri State Emergency Management Agency and Federal Emergency Management Agency officials have reviewed the Dent County Multi-Jurisdictional Natural Hazards Mitigation Plan and approved it contingent upon this official adoption of the participating governing body; and

WHEREAS, (Government/District) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Dent County Multi-Jurisdiction Natural Hazards Mitigation Plan; and

WHEREAS, adoption by the governing body of (Government/District) demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Mitigation Plan; and

WHEREAS, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan;

NOW, THEREFORE BE IT RESOLVED, that (Government/District) adopts the Dent County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan and will submit this Adoption Resolution to the Missouri Emergency Management Agency and the Federal Emergency Management Agency officials to enable the plan's final approval.

_____ _____

Certifying Official Date

_____ _____

Witness Date

1 Introduction and Planning Process

1.1 Purpose

Dent County and six other jurisdictions prepared this local hazard mitigation plan to guide hazard mitigation planning for the purpose of better protecting the people and property of the county from the effects of natural hazard events. Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set and appropriate strategies to lessen impacts are determined, prioritized and implemented.

The mission of the Dent County Hazard Mitigation Plan is to substantially and permanently reduce the county's vulnerability to natural hazards. This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources for the next five years. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss prevention and identifying activities to guide the community towards the development of a safer, more sustainable community.

This plan was also developed to make Dent County and participating cities and school districts eligible for certain federal disaster assistance as required by the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Those programs include the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program and Flood Mitigation Assistance Program. The plan has been prepared in accordance with the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and developed and organized within the rules and regulations established under 44 CFR 201.6 published in the *Federal Register* on February 26, 2002 and finalized in October 31, 2007. Those jurisdictions within Dent County that do not adopt the 2018 plan will not be eligible for funding through these grant programs.

1.2 Background and Scope

The 2018 Dent County Hazard Mitigation Plan is the first plan developed for Dent County and its jurisdictions. The document will be valid for five years from approval by FEMA. It is a multi-jurisdictional plan that covers the participating jurisdictions within the county's borders, all of whom adopted the plan, including the following:

- Dent County
- City of Salem
- Salem R-80 School District
- Oak Hill R-I School District
- Dent-Phelps R-III School District
- North Wood R-IV School District
- Green Forest R-II School District

The information and guidance in this plan document will be used to help guide and coordinate mitigation activities and decisions for local jurisdictions and organizations. Proactive mitigation planning will help reduce the cost of disaster response and recover to local communities and residents by protecting critical infrastructure, reducing liability exposure and minimizing overall community impacts and disruptions. Dent County has been affected by natural disasters in the past and participating jurisdictions and organizations are committed to reducing the impacts of future incidents and becoming eligible for hazard mitigation-related funding opportunities.

1.3 Plan Organization

The plan contains a mitigation action listing, a discussion of the purpose and methodology used to develop the plan, a profile on Dent County, as well as the hazard identification and vulnerability assessment of natural hazards. In addition, the plan offers a discussion of the community's current capability to implement the goals, objectives and strategies identified through the planning process.

The plan is organized as follows:

- Executive Summary
- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

To assist in the explanation of the above identified contents, there are several appendices included which provide more detail on specific subjects. This plan is intended to improve the ability of Dent County and the jurisdictions within to handle disasters and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

Table 1.1 Summary of 2017 Revisions to Plan

Chapter	Summary of Revisions
Chapter 1 Introduction and Planning Process	Updated with 2017 information and reformatted to follow the 4-4-17 model outline. Provided information on how the planning process followed the *Local Mitigation Planning Guidance (March 2013),* the *Local Mitigation Plan Review Guide (October 1, 2011),* and *Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013).* Added information on RiskMAP
Chapter 2 Planning Area Profile and Capabilities	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Chapter 3 Risk Assessment	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Chapter 4 Mitigation Strategy	Updated with 2017 data and reformatted to follow the 4-4-17 model outline, including substituting action item worksheets for the narrative used in the previous plan to provide required information for each action item.
Chapter 5 Plan Implementation and Maintenance	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Appendices	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.

*2017 data encompasses the most recent available data.

1.4 Planning Process

44 CFR Requirement 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

The Dent County Hazard Mitigation Planning Committee first organized in 2017 when the Missouri State Emergency Management Agency (SEMA) provided grant funds and contracted with the Meramec Regional Planning Commission (MRPC) to develop a hazard mitigation plan for the county. MRPC is a council of local governments in south central Missouri serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties.

MRPC's role in developing and updating the Dent County Hazard Mitigation plan included assisting in the formation of the mitigation planning committee (MPC) and facilitating the planning meetings; soliciting public input; and producing the draft and final plan for review by the MPC, SEMA and FEMA. Staff carried out the research and documentation necessary for the planning process. In addition, MRPC compiled and presented the data for the plan, helped the MPC with the prioritization process and insured that the final document met the DMA requirements established by federal regulations and the most current planning guidance.

In March 2017, SEMA secured a grant to develop the Dent County Multi-Hazard Mitigation Plan and contracted with MRPC to facilitate the planning process for the plan development. MRPC staff has followed the most current planning guidance provided by FEMA for the purpose of insuring that the plan meets all of the requirements of the Disaster Mitigation Act as established by federal regulations.

The Dent County Multi-Hazard Mitigation Plan was developed as the result of a collaborative effort among Dent County, the City of Salem, Salem R-80 School District, Oak Hill R-I School District, Dent-Phelps R-III School District, North Wood R-IV School District, Green Forest R-II School District public agencies, non-profit organizations, the private sector as well as regional, state and federal agencies. MRPC contacted and asked for volunteers to serve on the planning committee from the county and local city governments, school districts, the county health department, local businesses and utility companies. The mailing list is included in **Appendix B: Planning Process**. This cross-section of local representatives was chosen for their experience and expertise in emergency planning and community planning in Dent County. Staff worked with the Dent County MPC to collect and analyze information on hazards and disasters that have impacted the county as well as document mitigation activities that have occurred during the past five years.

Due to time and duty constraints, not all the jurisdictions that were invited to participate in the MPC were able to attend meetings. However, all of the jurisdictions provided information to develop the document, reviewed the plan and provided input. Interviews were conducted with stakeholders from the community and several planning meetings were conducted during the plan development.

The 2018 planning process began with a meeting held in conjunction with the Dent County Commission meeting on May 15, 2017. MRPC staff provided an in depth overview of the hazard mitigation planning purpose, including requirements and grant programs. The second meeting was held on June 12, 2017. The MPC briefly reviewed hazard mitigation planning, and focused

the majority of time on the development of action items for the next five years; A full description of the prioritization process is included in Chapter 4. The third meeting was held on September 18, 2017. MRPC staff presented draft chapters of the HMP so jurisdictional representatives and stakeholders to get a feel for the plan content and format.

During the meetings, staff met with County Associate Commissioners who provided a comprehensive list of projects to be included in the plan. Staff incorporated these action items into the planning materials reviewed and prioritized by the MPC in June.

The final list of prioritized action items were mailed to all jurisdictions and entities that had been invited to participate on the MPC. Recipients were asked to review and provide feedback if they had concerns about how any of the projects were ranked. The draft plan was made available online and MPC members were notified on where to find the document and asked to review and provide feedback.

All planning committee members were provided drafts of sections of the plan as they became available. Members of the planning committee reviewed the draft chapters and provided valuable input to MRPC staff. Additionally, through public committee meetings, press releases and draft plan posting on MRPC's website, ample opportunity was provided for public participation. Jurisdictions in surrounding counties were also notified of where to view the revised plan and encouraged to provide input. Any comments, questions and discussions resulting from these activities were given strong consideration in the development of this plan.

Dent County further assisted in the planning process by issuing public notice of the planning meetings as well as scheduling meeting times at the City of Salem Auditorium and Council Chambers. County officials attended and participated in meetings.

The MPC contributed to the planning process by:

- Attending and participating in meetings;
- Collecting data for the plan;
- Making decisions on plan content;
- Reviewing drafts of the plan document;
- Developing a list of needs:
- Prioritizing needs and potential mitigation projects; and
- Assisting with public participation and plan adoption

The MPC did not formally meet on a regular basis as recommended in the plan. However, mitigation has become a regular topic of discussion among the majority of jurisdictions included in the plan. Hazard mitigation projects have been encouraged to be incorporated into other planning projects.

Table 1.2 provides information on who actively participated in the planning process and who they represented:

Table 1.2 Jurisdictional Representatives Dent County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Agency/ Organization	Direct Participation	Indirect Participation
Darrell Skiles	Presiding Commissioner	County	Dent Co.	X	
Gary Larson	Assoc. Commissioner	County	Dent Co.	X	
Dennis Purcell	Assoc. Commissioner	County	Dent Co.	X	
Bob Wells	Sheriff	Sheriff's Office	Dent Co.	X	
Leonard Pabin	Sergeant	Sheriff's Office	Dent Co.	X	
Kendra Mobray	Administrator	Health Dept.	Dent Co.	X	
Brad Nash	Mayor	City Admin.	Salem	X	
Ray Walden	City Administrator	City Admin.	Salem	X	
Allen Kimrey	EMD	Emergency Management	Salem	X	
Bryon Johns	Electric Superintendent	Public Works	Salem	X	
Victoria Brooker	Superintendent	School District	Dent-Phelps R-III	X	
Kevin Creighton	Principal	School District	Dent-Phelps R-III	X	
Kevin Prugh	Superintendent	School District	Green Forest R-II	X	
Wanda Tatom	Principal	School District	Green Forest R-II	X	
Paul Dodson	Superintendent	School District	North Wood R-IV	X	
Deron Gibbs	Superintendent	School District	Oak Hill R-I	X	
Doug Dunn	Superintendent	School District	Oak Hill R-I	X	
John McColloch	Superintendent	School District	Salem R-80	X	
Phillip Karr	Athletic Director	School District	Salem R-80	X	
Deborah Hobson	Ambulance Director/Emergency Preparedness Coord.	Hospital	Salem Memorial District Hospital	X	
Don Good	Fire Chief	Fire Dept.	Lenox Fire Dept.	X	
David Borg	Treasurer	Fire Dept.	Montauk Fire Dept.	X	
Sherry Lea	Director	-	Healthy Dent County	X	
Andrew Sheeley	Reporter	-	The Salem News	X	
Stan Podorski	General Manager	-	KSMO Radio	X	
Tony	Developer	-	Intercounty Electric	X	

Name	Title	Department	Jurisdiction/Agency/ Organization	Direct Participation	Indirect Participation
Floyd					
James Goodman	Social Services Director	-	Seville Care Center	X	

1.5 Multi-Jurisdictional Participation

44 CFR Requirement **§201.6(a)(3)**: Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Dent County invited incorporated cities, school districts, utility companies, medical facilities, nursing facilities, county health department, and not-for-profits to participate in the hazard mitigation planning process. Letters and/or emails were sent to each of the following:

- Dent County
- City of Salem
- Salem R-80 School District
- Oak Hill R-I School District
- Dent-Phelps R-III School District
- North Wood R-IV School District
- Green Forest R-II School District
- Salem Memorial District Hospital
- Dent Co. Health Dept.
- Intercounty Electric Co-Op, Inc
- Crawford Electric Co-Op, Inc
- American Red Cross
- Seville Care Center
- Salem Care Center
- Salem Residential Care
- Missouri Dept. of Conservation
- MoDOT
- Missouri State Highway Patrol
- MO, SEMA
- FEMA Region VII
- USFWS
- USACE
- Fidelity Communications
- Century Link
- USDA, NRCS
- The Salem News

A copy of the mailing list and invitation letters are included in **Appendix B: Planning Process**.

The Disaster Mitigation Act requires that each jurisdiction must participate in the planning process and formally adopt the plan. There were a number of criteria established for participation. In order to be considered participating in the planning process, jurisdictions needed to do at least one of the following as well as adopt the plan:

- Providing a representative to serve on the planning committee;
- Participating in at least one or more meetings of the planning committee;
- Providing data for plan development through surveys and/or interviews;
- Identify goals and mitigation actions for the plan;
- Prioritize mitigation actions/projects for the plan;
- Review and comment on the draft plan document;
- Informing the public, local officials and other interested parties about the planning process and providing opportunities for them to comment on the plan;
- Provide in-kind match documentation; and
- Formally adopt the plan prior to submittal of the final draft to SEMA and FEMA for final approval.

Not all jurisdictions were able to attend the MPC meetings. Most communities and school districts in Dent County are small and understaffed. It was not always feasible for representatives to travel to the meetings. However, all jurisdictions met at least one of the participation criteria. The jurisdictions that participated in the process, as well as their level of participation in the process are shown in Table 1.3. Documentation of meetings, including sign-in sheets are included in Appendix B: Planning Process.

Table 1.3 Jurisdictional Participation in the Planning Process

Jurisdiction	Meeting #1	Meeting #2	Interviews	Data Collection Questionnaire/Call	Update/Develop/ Prioritize Mitigation Actions	Review/ Comment on Plan
Dent Co.	X	X		X	X	X
Salem	X	X	X	X	x	X
Salem R-80	X	X		X	X	X
Oak Hill R-I	X			X	X	X
Dent-Phelps R-III	X	X		X	X	X
North Wood R-IV	X			X	X	X
Green Forest R-II	X	X		X	X	X

1.6 The Planning Steps

Dent County and MRPC worked together to develop the plan and based the planning process in FEMA's *Local Mitigation Planning Guidance (March 2013),* the *Local Mitigation Plan Review Guide (October 1, 2011),* and *Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013).* The planning process has included organizing the county's resources, assessing the risks to the county, developing the mitigation plan and implementing the plan and monitoring the progress of plan implementation.

The planning committee based their activities on the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. By following the 10-step planning process, the plan met funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System and Flood Mitigation Assistance Program.

Table 1.4 Dent County Planning Process

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)
Step 1: Organize	Task 1: Determine the Planning Area and Resources Task 2: Build the Planning Team 44 CFR 201.6(c)(1)
Step 2: Involve the public	Task 3: Create an Outreach Strategy 44 CFR 201.6(b)(2) & (3)
Step 3: Coordinate	Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)
Step 4: Assess the hazard	Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)
Step 5: Assess the problem	

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)
Step 6: Set goals	Task 6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(iii)
Step 7: Review possible activities	
Step 8: Draft an action plan	
Step 9: Adopt the plan	Task 8: Review and Adopt the Plan
Step 10: Implement, evaluate, revise	Task 7: Keep the Plan Current Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)

Step 1: Organize the Planning Team (Handbook Tasks 1 & 2)

The planning area was determined by the boundaries of Dent County. MRPC staff provided general information on the hazard mitigation plan review process at regular MRPC board meetings – providing both written and oral reports on the review process, schedules for the various plans; which ones had been funded; described match requirements; and asked mayors and commissioners to think about who should be included on the planning committees for each respective county.

The planning team was selected by contacting the leadership of each jurisdiction, explaining the process, and asking them to send appropriate representation to the planning meetings. In addition they were asked to provide input on who they wanted to include on the planning committee. Stakeholders such as electric cooperatives and sewer districts were also contacted and invited. In addition, it was suggested that representatives of some of the local critical facilities be included on the planning committee, such as medical clinics and nursing homes. All meetings were also publicized to allow additional interested parties to attend and participate. Dent County along with the City of Salem offered to host the meetings in conjunction with the regular commission meetings and three meeting dates were selected – May 15, June 12, and September 18, 2017.

At the first meeting on May 15, 2017, MRPC staff made introductions and provided an overview of the hazard mitigation planning purpose, grant programs linked to an approved plan, participation requirements and public involvement, data collection questionnaires, overview of hazards, critical facilities, and additional steps in the planning process. Staff wrapped up the meeting by explaining the process that would be used to prioritize the action items at the next meeting – using both the STAPLEE method and analyzing the cost benefit.

The second meeting was held on June 12, 2017. The MPC reviewed hazard mitigation planning and discussed action items for the next five years. Staff documented recommendations from jurisdictional representatives and developed a matrix of action items with the STAPLEE and cost benefit scores. This matrix was emailed to the MPC with a request for feedback. All suggestions for changes were incorporated into the plan. Furthermore, integration of action items with local planning initiatives was discussed. The group also reviewed the list of critical facilities in the plan and provided feedback on any changes or additions to that list.

The third meeting was held on September 18, 2017. MRPC staff presented completed chapters of the HMP for jurisdictional representatives and stakeholders to get a feel for the plan content and format. Additionality, the meeting served as an opportunity for representatives and stakeholders to review, comment, and offer edits on the completed chapters.

The fourth meeting was held on May 21, 2018. MRPC staff presented completed chapters of the HMP for jurisdictional representatives and stakeholders. Additionally, the meeting served as an opportunity for edits/review of all draft chapters. Lastly, remaining stages in the planning process were discussed along with public comment opportunities.

Table 1.5 Schedule of MPC Meetings outlines the dates that meetings were held and topics covered.
Documentation of the planning process can be found in **Appendix B: Planning Process**.

Table 1.5 Schedule of MPC Meetings

Meeting	Topics	Date
Planning Meeting #1	Overview of hazard mitigation planning purpose and Dent County plan; grant programs linked to approved plan; participation requirements and public involvement; data collection questionnaires; discussion of hazards; critical facilities	May 15, 2017
Planning Meeting #2	Overview of hazard mitigation planning and Dent Co. HMP; discussion of action items for the next 5 years; prioritization of action items; road and bridge projects; integration of other data, reports, studies, and plans	June 12, 2017
Planning Meeting #3	Overview of Dent Co. HMP and the planning process; review of draft chapters; discussion regarding edits; remaining stages in the planning process; reminder of incorporating HMP in local planning initiatives and documents	September 18, 2017
Planning Meeting #4	Review of draft chapters; discussion regarding edits; remaining stages in the planning process; public comment/review period	May 21, 2018

Step 2: Plan for Public Involvement (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

The MPC followed the same process for public involvement and input as suggested by SEMA and FEMA. All MPC meetings were held at the City of Salem Auditorium or Council Chambers

and were held in conjunction with the weekly commission meeting. Public notices were placed at the courthouse and press releases were done prior to the meeting to make the public aware. Meetings were also posted on the MRPC webpage. The public was notified each time the plan or sections of the plan was presented for review and discussion. MPC members and public officials within the county as well as in surrounding counties were contacted, directed to the MRPC website (www.meramecregion.org) where a copy of the draft plan could be viewed or downloaded. The document was made available on the website on 5/23/2018. Hard copies of the final draft were placed at the Dent County Courthouse and city hall buildings for Dent Co., and Salem. A hard copy of the draft could be obtained directly from MRPC by request. Members of the local media, both radio, newspaper and online were invited to attend planning meetings. Information was shared by these media outlets with the public on the planning process and where to find draft copies of the plan. Copies of public notices and press release are included in **Appendix A: Planning Process**.

No comments were received from the public.

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Every effort was made to encourage input from stakeholders whose goals and interests interface with hazard mitigation in Dent County including:

- Neighboring communities
- Local and regional agencies involved in hazard mitigation activities
- Agencies with the authority to regulate development
- Businesses
- Academia
- Other private and non-profit interests

Stakeholders involved in the hazard mitigation planning process included Dent County Health Dept., The Salem News, Healthy Dent Co., Salem Memorial District Hospital, KSMO Radio, Lenox Fire Dept., Montauk Fire Dept., Dent Co. Fire Dept., Intercounty Electric, Dent Co. Sheriff's Office, and Seville Care Center. No federal stakeholders were involved during the planning process.

Jurisdictional representatives on the MPC were asked to share and solicit information from within and outside of their jurisdictions. A broad spectrum of entities other than the jurisdictions named in the plan, were invited to participate in the planning process.

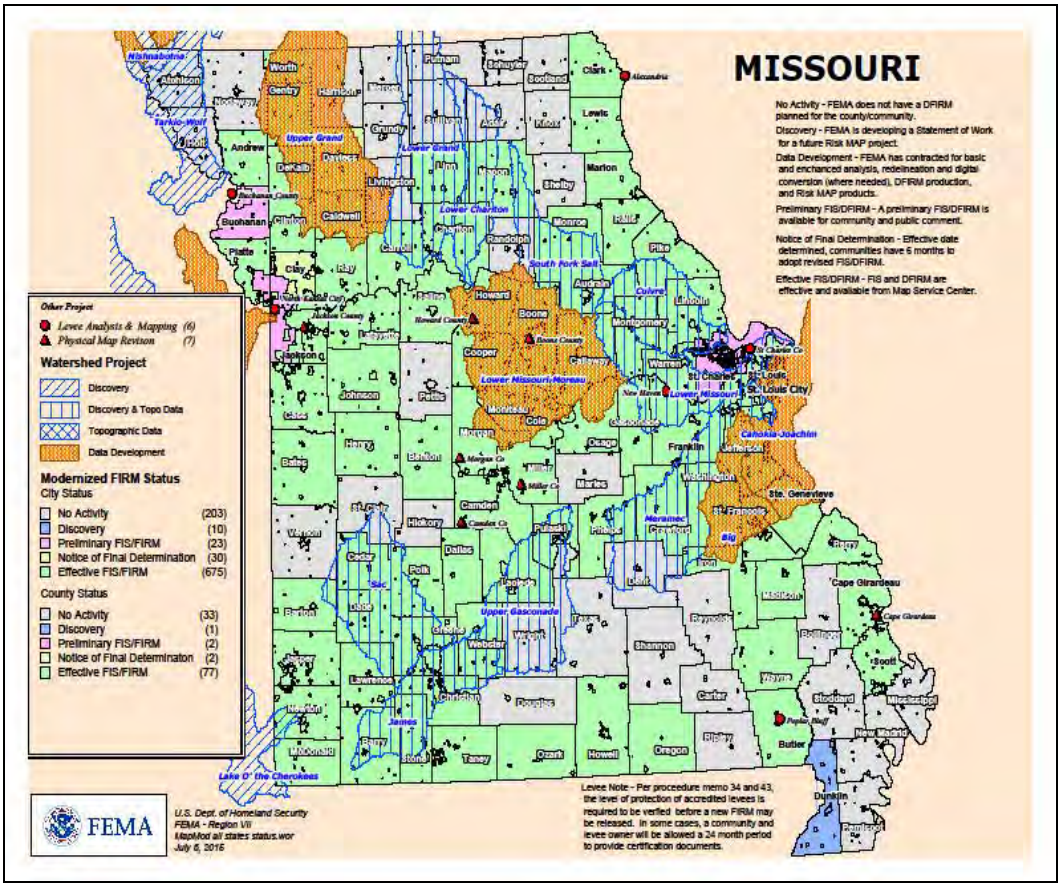
The questionnaire provided to every jurisdiction asked how mitigation actions were being incorporated into other planning documents. Since this is the first hazard mitigation plan for the county, mitigation actions have not been incorporated into local planning documents. However, it was found that the County Road and Bridge Department does a good job of incorporating mitigation projects into their regular maintenance program. Those projects have been incorporated into the plan document. Hazard mitigation goals and action items have also be incorporated, where applicable, in the Community Economic Development Strategy (CEDS).

Coordination with FEMA Risk MAP Project

Dent County is currently in the Discovery and Topo Data phase of the Risk MAP project. Once completed, Risk MAP will provide mitigation planning support in a variety of ways including helping in the assessment of risks and identifying action items to reduce vulnerability. In addition, this project will provide tools to improve the understanding of risk by local officials and the general public. Dent County's FIRM Status is No Activity.

Figure 1.1 illustrates the current status of Missouri counties in regards to RiskMap projects.

Figure 1.1. Map of RiskMAP projects



Integration of Other Data, Reports, Studies and Plans

The MPC researched available plans, studies, reports and technical information during development of the plan. The intent was to identify existing data and information, shared objectives and past and ongoing activities that would add to the planning document. The goal was to identify the existing capabilities and planning mechanisms to implement the mitigation strategy. Dent County is a rural area with the largest community's population at approximately 4,976. Not all of the participating communities have planning or zoning, subdivision regulations or other mechanisms for controlling the development of land. Some of the jurisdictions do have ordinances and planning documents. Following is a list of the documents that were reviewed:

- Local planning and zoning ordinances
- County EOP
- Crisis Plans (school districts)
- Comprehensive plans
- Economic development plans
- Capital improvement plans
- Regional Transportation Plan
- Floodplain management ordinances and flood Insurance Risk Maps (FIRMs)

In addition to information available from local jurisdictions, a number of data sources, reports, studies and plans were used in updating the plan. Every attempt was made to gather the best available data to develop the vulnerability assessment and identify assets in the county. The Missouri State Hazard Mitigation Plan (2013) was reviewed and referenced throughout the document. Other data sources included dam information from the Missouri Department of Natural Resources and National Inventory of Dams (NID); fire reports from state agencies; Wildland/Urban Interface and Intermix data from the SILVIS Lab – Department of Forest Ecology and Management – University of Wisconsin; the Community Economic Development Strategy (CEDS); capital improvement plans from the participating jurisdictions; historic weather data and damage estimates from the National Oceanic and Atmospheric Administration; the critical facilities inventory conducted by MRPC; and road and bridge department plans/budgets.

All documents were reviewed so that the MPC would have a broad foundation of data upon which to base the planning area's risk assessment. Information from these documents and data sources are incorporated into the plan as indicated throughout the document.

Step 4: Assess the Hazard: Identify and Profile Hazards (Handbook Task 5)

The MPC reviewed the hazards that affected Dent County at the first planning meeting on May 15, 2017 including discussions of any hazard events that occurred during the last twenty years and all of the hazards included in the Missouri Hazard Mitigation plan. A variety of sources were used to identify and profile hazards. These included U.S. Census data, GIS data, HAZUS, the Missouri Spatial Data Information Service (MSDIS), statewide datasets compiled by state and federal agencies, existing plans and reports, personal interviews with MPC members and the questionnaire completed by each jurisdiction. Every effort was made to use the most current and best data available. Additional information on the risk assessment and the conclusions drawn from the available data can be found in Chapter 3.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Assets for each jurisdiction were identified based on responses to the data collection questionnaire distributed to all jurisdictions, interviews with MPC members and the critical

facilities inventory conducted by MRPC. Additional sources included U.S. census, GIS data, MSDIS and HAZUS.

Losses were calculated using HAZUS data and the most recent U.S. census data available. Values reflected in the plan are on structures only and do not include land values.

Jurisdictions provided information on their regulatory, personnel, fiscal and technical abilities by completing the data collection questionnaire. The vulnerability assessment was completed using estimates from the 2013 State plan. For more information on planning area profiles and capabilities, please see Chapter 2.

Step 6: Set Goals (Handbook Task 6)

Goals were developed at the second planning meeting on June 12, 2017. Those goals are as follows:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

Step 7: Review Possible Mitigation Actions and Activities

Mitigation strategy and specific action items were discussed at the first and second MPC meetings. At the second MPC meeting the group developed and prioritized action items. It was emphasized that any mitigation actions in the plan that were not likely to be accomplished, due to cost factors or that did not address the risks identified in the risk assessment, should be removed from the list.

Each jurisdiction and stakeholder group was asked to provide information about mitigation activities that were needed. Meeting facilitators offered to share ideas for mitigation projects from the FEMA publication *Mitigation Ideas: As Resource for Reducing Risk to Natural Hazards (January 2013)* to help stimulate ideas and discussion.

Staff received proposed road and bridge mitigation projects that need to be addressed from the County Associate Commissioners on May 15, 2017.

As RiskMAP is still in the discovery phase in Dent County, no projects have been identified through that process at this time.

In order to prioritize action items, the MPC was asked to use the STAPLEE method as well as assign a cost benefit to each activity. This allowed the group to consider a broad range of issues in order to decide which actions should be considered high, moderate or low priority. The prioritization process used by the MPC is explained as follows:

STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does your jurisdiction have the legal authority to implement the action?
- **Economic:** is the action cost-beneficial? Is there funding available: Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

Each question was scored based on a 0 to 3 point value system:

3 = Definitely YES
2 = Maybe YES
1 = Probably NO
0 = Definitely NO

For the Benefit/Cost Review portion of the prioritization process, these two aspects were scored as follows:

Benefit – two (2) points were added for each of the following avoided damages (8 points maximum = highest benefit)

- Injuries and/or casualties
- Property damages
- Loss-of-function/displacement impacts
- Emergency management costs/community costs

Cost – points were subtracted according to the following cost scale (-5 points maximum = highest cost)

- (-1) = Minimal – little cost to the jurisdiction involved
- (-3) = Moderate – definite cost involved but could likely be worked into operating budget

- (-5) = Significant – cost above and beyond most operating budgets; would require extra appropriations to finance or to meet matching funds for a grant

Note: For the Benefit/Cost Review, the benefit and cost of actions which used the word "encourage" were evaluated as if the action or strategy being encouraged was actually to be carried out.

Total Score – The scores for the STAPLEE Review and Benefit/Cost Review were added to determine a Total Score for each action.
Priority Scale – To achieve an understanding of how a Total Score might be translated into a Priority Rating, a sample matrix was filled out for the possible range of ratings an action might receive on both the STAPLEE and Benefit/Cost Review. The possible ratings tested ranged between:

- A hypothetical action with "Half probably NO and half maybe YES" answers on STAPLEE (i.e. poor STAPLEE score) and Low Benefit/High Cost: Total Score = 7
- A hypothetical action with "All definitely YES" on STAPLEE and High Benefit/Little Cost: Total Score = 28

An inspection of the possible scores within this range led to the development of the following Priority Scale based on the Total Score in the STAPLEE- Benefit/Cost Review process:

20 – 28 points = High Priority
14-19 points = Medium Priority
13 points and below = Low Priority

The benefit portion of the prioritization process helped the MPC focus on long-term mitigation solutions that demonstrated the future cost savings that could be realized by completing mitigation projects that safeguard lives and protect property.

Step 8: Draft an Action Plan

The MPC reviewed the final list of action items at the June 12, 2017 meeting and completed the prioritization process. The final list was then mailed out to all jurisdictions and members of the MPC for review and approval as everyone was not able to attend the meeting. Staff was directed by the MPC to take the finalized list after allowing time for comments, remove all action items that scored a 13 or below, and drafts an action plan.

Step 9: Adopt the Plan (Handbook Task 8)

When the first draft of the plan was completed, staff posted the document on the MRPC website and provided a hard copy to the county courthouse. All MPC members, jurisdictions and surrounding jurisdictions were notified on where to find a copy of the plan to review. If requested, additional hard copies of the plan document were provided. After allowing time for comments, a letter was mailed out to all jurisdictions asking them to formally adopt the plan and providing a sample adoption resolution. A deadline was provided in order to insure receipt of adoption resolutions prior to submitting a final draft to FEMA for approval.

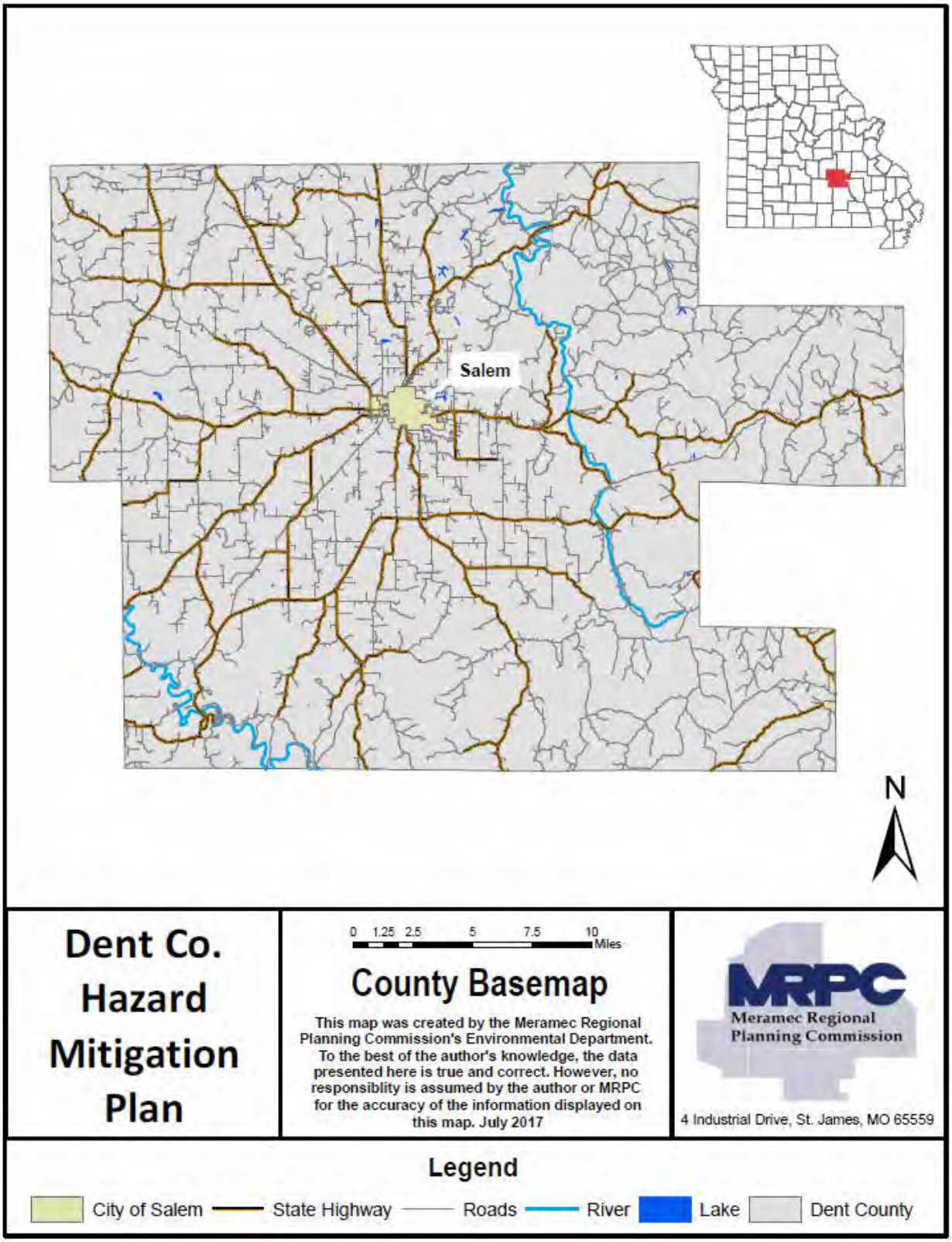
Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

At all planning meetings (May 15, 2017, June 12, 2017, September 18, 2017, and May 21, 2018) MRPC staff advised the MPC and participating jurisdictions of the importance of continuing to meet periodically to discuss implementation of the plan as well as monitoring and maintaining the plan into the future. Chapter 5 provides details on Dent County's strategy for implementation, evaluation and revising the plan.

2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 Dent County Planning Area Profile

Figure 2.1. Map of Dent County



Dent County has a population of approximately 15,578 according to the most recent census data[1]. **Table 2.1** illustrates the percentage population growth since 2000 as compared to the statewide and national population growth. The median household income and percentage growth since 1999, as compared to statewide and national figures can be found in **Table 2.2.** Furthermore**,** median house value percentage growth for Dent County, Missouri, and the United States is provided in **Table 2.3**

Table 2.1. Percent Population Growth for County, State, and Nation 2000 - 2016

	Total Population		Change Over Period	
Demographic Region	**2000**	**2016**	**Change**	**Percent**
Dent County	14,927	15,578	651	4.3
Missouri	5,595,211	6,059,651	464,440	8.3
United States	281,421,906	318,558,162	37,136,256	13.2

Source: U.S. Census Bureau, Census 2000 Summary File 1; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

Table 2.2. Median Household Income and Percentage Growth for County, State, and Nation 2000 - 2016

	Median Household Income (USD)		Change Over Period	
Demographic Region	**2000**	**2016**	**Change**	**Percent**
United States	$41,994	$55,322	$13,328	31.7
Missouri	$37,934	$49,593	$11,659	30.7
Dent County	$27,193	$38,020	$10,827	39.8

Source: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

Table 2.3. Median House Value Percentage Growth for County, State, and Nation 2000 - 2016

	Median House Value (USD)		Change Over Period	
Demographic Region	**2000**	**2016**	**Change**	**Percent**
United States	$119,600	$184,700	$65,100	54.4
Missouri	$89,900	$141,200	$51,300	57.1
Dent County	$61,000	$100,300	$39,300	64.4

Source: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

2.1.2 Geography, Geology and Topography

Dent County has a total land area of 755 square miles. Approximately 60 percent of the land cover in the county is deciduous forest intermixed with 30 percent of grassland. Less than one percent of the land cover within the county is cropland. The area has karst terrain, which is characterized by springs, caves, losing streams, and sinkholes. Additionally the county is comprised of 1.7 square miles of total water area. Incorporated jurisdictions within the county include the City of Salem.

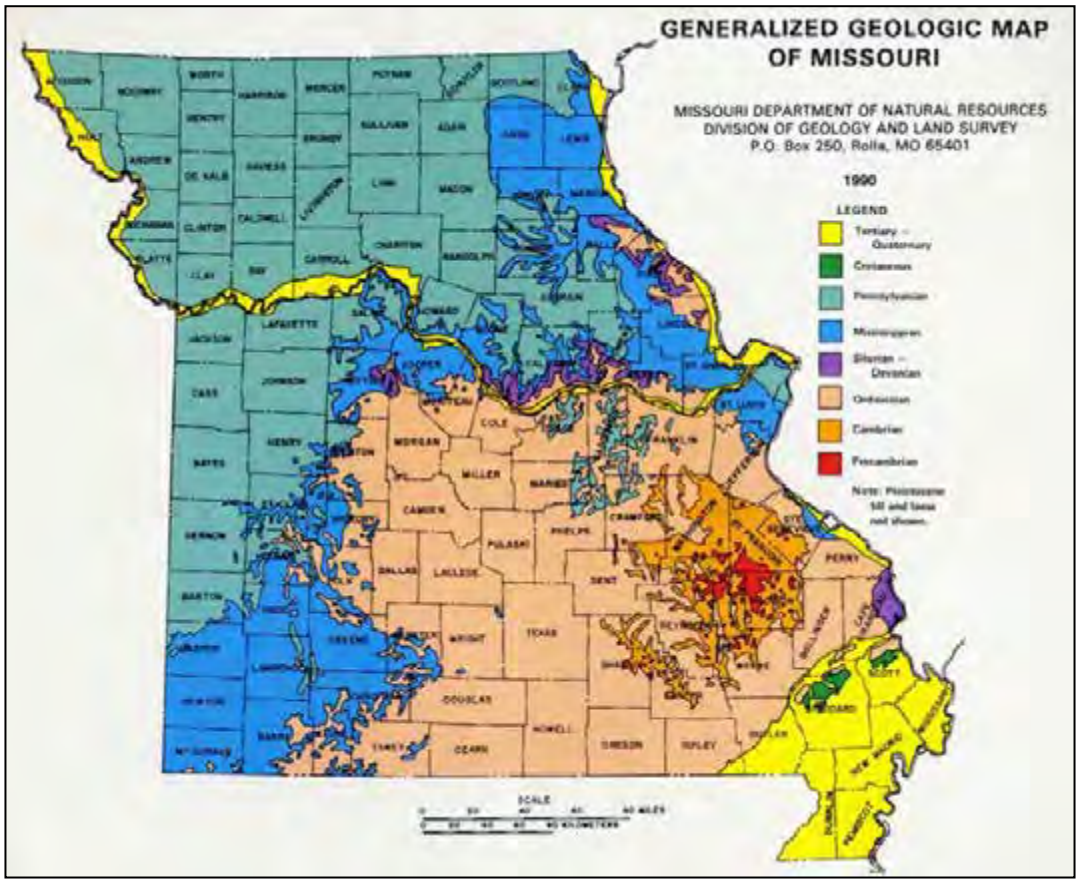
[1] U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

The county seat, Salem, is located in southeast central Missouri, approximately 75 miles southeast of the state capital of Jefferson City, approximately 100 miles northeast of Springfield, Mo. and approximately 98 miles southwest of St. Louis, Mo. The county is bordered on the north by Phelps and Crawford Counties. On the east side the county is bordered by Iron and Reynolds Counties. To the south the county is bordered by Shannon County. Texas County shares a border with Phelps to the west.

Located within the Ozark Mountains, Dent County specifically resides within the Salem Plateau and the interior Ozark Highlands. The county is located in the largest outcrop area of Ordovician-age rocks in the United States. This rock is 505 to 441 million years old and made up primarily of carbonates and thin shales with three distinctive sandstone layers: the Gunter at the base of the column, the red and white Roubidoux which is often used as a building stone and the St. Peter glass sand. This stone is the result of a time period when Missouri was covered by a shallow sea and the stone frequently produces aquatic fossils from that time period. Portions of this formation contain rock that dissolves and fractures over time from rainwater, thus resulting in the karst features found throughout the Ozarks.

The plateau is centered around the City of Salem with a gently rolling topography. To the east of Salem, the terrain becomes more rugged, with steep, sloping hills. The Current River Watershed area is characterized by very rough terrain and extremely steep, sloping valleys. The maximum relief is about 500 feet, with the high point on a ridge south of Salem, and the low points near the north and south borders of the county.

Figure 2.2. Generalized Geologic Map of Missouri



Dent County is comprised of four HUC8 watersheds which include the Lower Gasconade, Upper Black, Meramec, and Current. Seven miles northeast of the town of Salem in Southeastern Missouri, a spring-fed brook called the Watery Fork merges with a larger wet-weather branch and becomes the source of the Meramec River. For many millions of years the Meramec has been carving its twisting, sometimes-tortuous 240-mile course into the solid rock of the Ozark Plateau, scouring its way through a deep, slowly widening valley, bordered by limestone bluffs and steep hills. It is joined along the way by innumerable springs, creeks, and four large tributaries, which transform the Meramec into a 100-yard to 200-yard wide floodplain stream at its confluence with the Mississippi River eighteen miles below St. Louis.

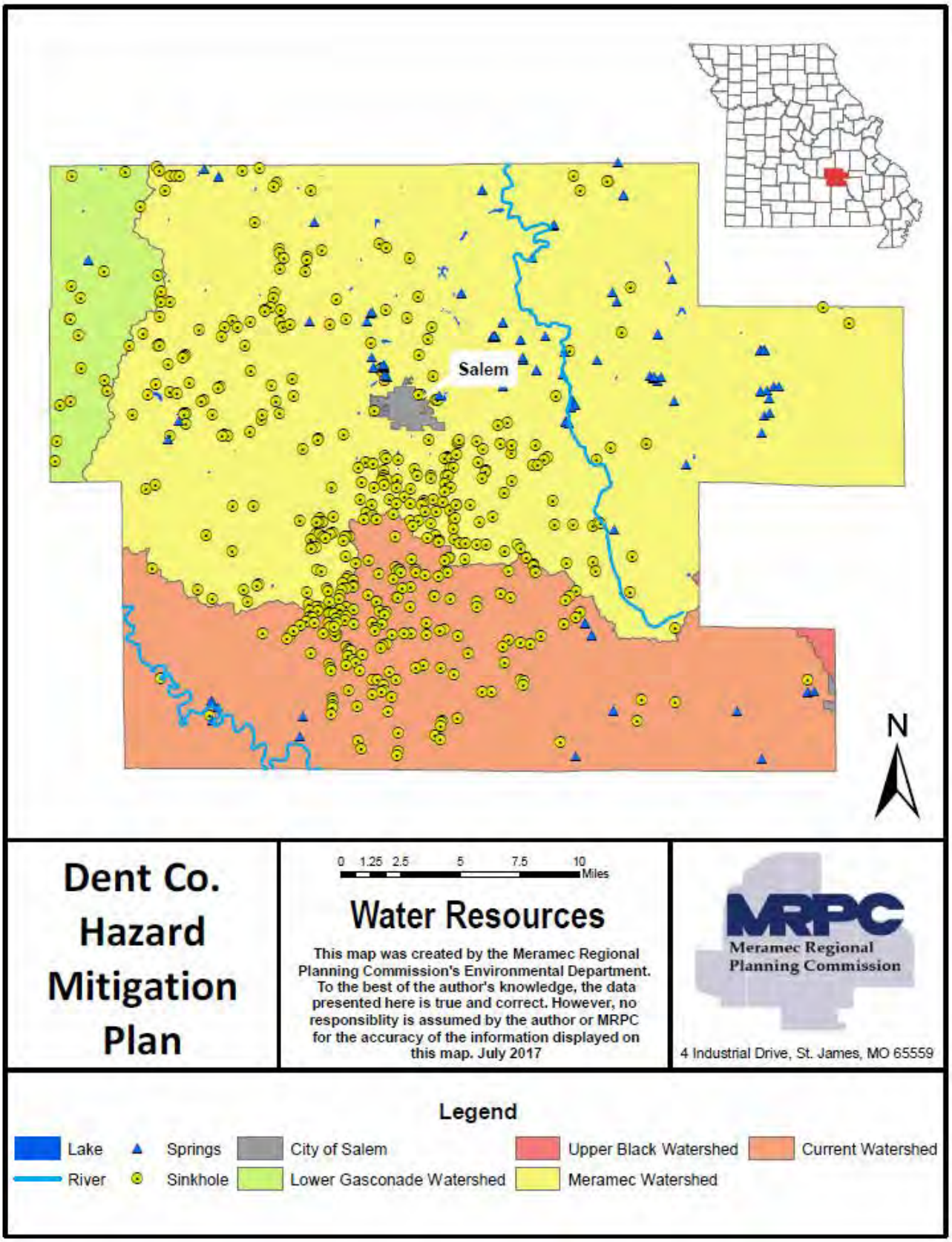
The Current River is the most spring-fed of all of the Ozark Rivers. The watershed drains approximately 2,621 square miles in 9 Missouri counties and 2 Arkansas counties. The Current River is formed by the emergence of Pigeon Creek and the Montauk Spring complex near Montauk, Missouri. The river flows south towards the Black River in Arkansas.

During the last 100 years, stream channels in the Ozarks have become wider and shallower and deep-water fish habitat has been lost. Historical data indicate that channel disturbances have resulted most directly from clearing of vegetation along stream channels, which decreases bank strength. Historical and stratigraphic data show that after 1830, Ozarks streams responded to land-use changes by depositing more gravel and less muddy sediment, compared to pre-settlement conditions. Because less muddy sediment is being deposited on flood plains, many stream banks now lack cohesive sediments, and, therefore, no longer support steep banks. Land use statistics indicate that the present trend in the rural Ozarks is toward increased populations of cattle and increased grazing density; this trend has the potential to continue the historical stream-channel disturbance by increasing storm-water runoff and sediment supply.

Dent County has several soil types. The northwestern part of the county is associated with Nixa-Clarksville-Lebanon-Hobson soils, which are gently sloping to moderately steep, somewhat excessively drained to moderately well drained soils that have a fragipan, a cherty subsoil, or both. Towards the eastern and southern part of the county soils part of the Clarksville-Coulstone association are located. This association is considered steep, somewhat excessively drain, and cherty. Lastly, soil associated with Huzzah Creek and Sinking Creek are categorized as Clarksville-Coulstone which is steep, somewhat excessively drained and well drained soils that have a cherty surface layer and a cherty or clayey subsoil[2].

[2] Soil Survey, Dent County, Missouri, USDA, SCS, USFS, March 1971

Figure 2.3. Dent County Watershed/Water Resources



2.1.3 Climate

Snowfall typically occurs November to March and averages about 8 to 12 inches in the Meramec Region. It is unusual for snow to stay on the ground for more than a week or two before it melts. Winter precipitation usually is in the form of rain, snow or both. Conditions sometimes borderline between rain and snow, and in these situations freezing drizzle or freezing rain occurs. Spring, summer and early fall precipitation comes largely in the form of showers or thunderstorms. Thunderstorms are most frequent from April to July. Measurable precipitation occurs on the average of less than 100 days per year. About half of these will be days with thunderstorms. The average annual precipitation is 47.21 inches. Most of the precipitation is absorbed by the soil and plants; however, a portion of the precipitation forms runoff and is returned to streams and other bodies of water.

Because of its inland location, Missouri and Dent County are subject to frequent changes in temperature. The average annual temperature is 57.35°F. The average annual high temperature is 68.7°F with the average annual low at 46°F. The average high and low in January is 44°F and 23°F, respectively. In August the average high and low are 90°F and 66°F, respectively.

While winters are cold and summers are hot, prolonged periods of very hot weather are unusual. Occasional periods of mild, above freezing temperatures are noted almost every winter. Conversely, during the peak of the summer season occasional periods of dry, cool weather break up stretches of hot, humid weather. In the summer, temperatures rise to 90°F or higher on average 55 to 60 days. In winter, there is an average of about 100 days with temperatures below 32 degrees. Temperatures below 0°F are infrequent with only about three days per year reaching this low temperature. The first frost occurs in mid-October, and the last frost occurs about mid-April[3].

2.1.4 Population/Demographics

Table 2.4 provides population/demographic data for Dent County between 2000 and 2016 by jurisdiction. The unincorporated area of Dent County was determined by subtracting the populations of the incorporated areas from the overall county population.

Table 2.4. Dent County Population 2000-2016 by Jurisdiction

Jurisdiction	2000 Population	2016 Population	2000-2016 # Change	2000-2016 % Change
Unincorporated Dent County	10,073	10,604	531	5.3
Salem	4,854	4,974	120	2.5

Source: U.S. Census Bureau, Census 2000 Summary File 1; U.S. Bureau of the Census, 2012-2016 5-Year American Community Survey;

Table 2.5 provides information in regards to the percent of individuals under the age of 5, and over 65 for the county, State, and Nation. In addition, average household size is illustrated in **Table 2.6** including figures for Dent County, Missouri, and the U.S. In 2016 there were an estimated 5,889

[3] Decker, W.L., 2017, Climate of Missouri, Missouri Climate Center, College of Agriculture, Food, and Natural Resources

households within the county[4].

Table 2.5. Percent of Individuals Under the Age of 5, and Over 65 for County, State, and Nation (2016)

Location	% Under Age of 5	% Over Age of 65
Dent County	5.9	20.1
Missouri	6.2	15.3
United States	6.2	14.5

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Table 2.6. 2016 Average Household Size for County, State, and Nation

Location	Average Household Size
Dent County	2.61
Missouri	2.48
United States	2.64

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Social Vulnerability Index (SoVI ®)

The University of South Carolina developed the Social Vulnerability Index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to natural disasters. The index synthesizes 30 socioeconomic variables which are primarily derived from the United States Census Bureau. **Table 2.7** depicts the Social Vulnerability Index for Dent County along with its national percentile.

Table 2.7. Social Vulnerability Index (SoVI ®)

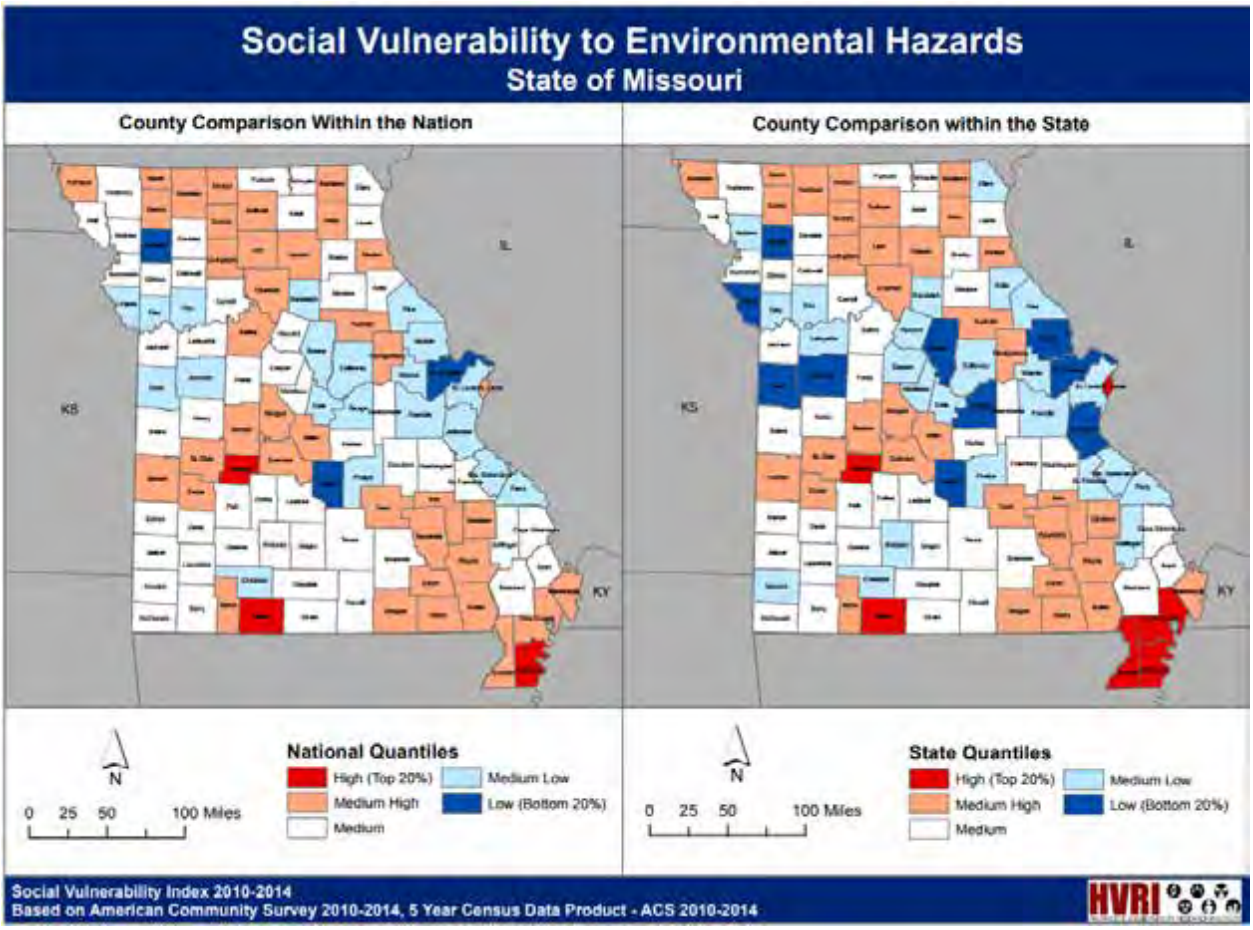
State	County	SoVI Score (06 - 10)	National Percentile (06 - 10)
Missouri	Dent County	(+)1.950000048	80.4%

Source: http://artsandsciences.sc.edu/geog/hvri/sovi-data

The analysis of 30 socioeconomic variables includes the standardization of data, and reduction of variables into a condensed set of statistically optimized components; positive component loadings (+) are linked with amplified vulnerability, and negative component loadings (-) are linked with diminished vulnerability. Scores are represented as a numeric value, but have no inherent mathematical properties. To simplify the metrics of the SoVI ® Score, a negative number illustrates a county's resiliency to hazard events, and a positive number illustrates a decrease in resiliency[5]. Dent County's SoVI ® Score illustrates a decreased resiliency to cope with natural disasters. Additionally, Dent County is included in the top 20 percent of counties most vulnerable to environmental hazards in the nation. **Figure 2.4** depicts Missouri's SoVI ® to environmental hazards between 2010 and 2014. Furthermore, **Figure 2.5** depicts the Nation's SoVI ® to environmental hazards between 2010 and 2014.

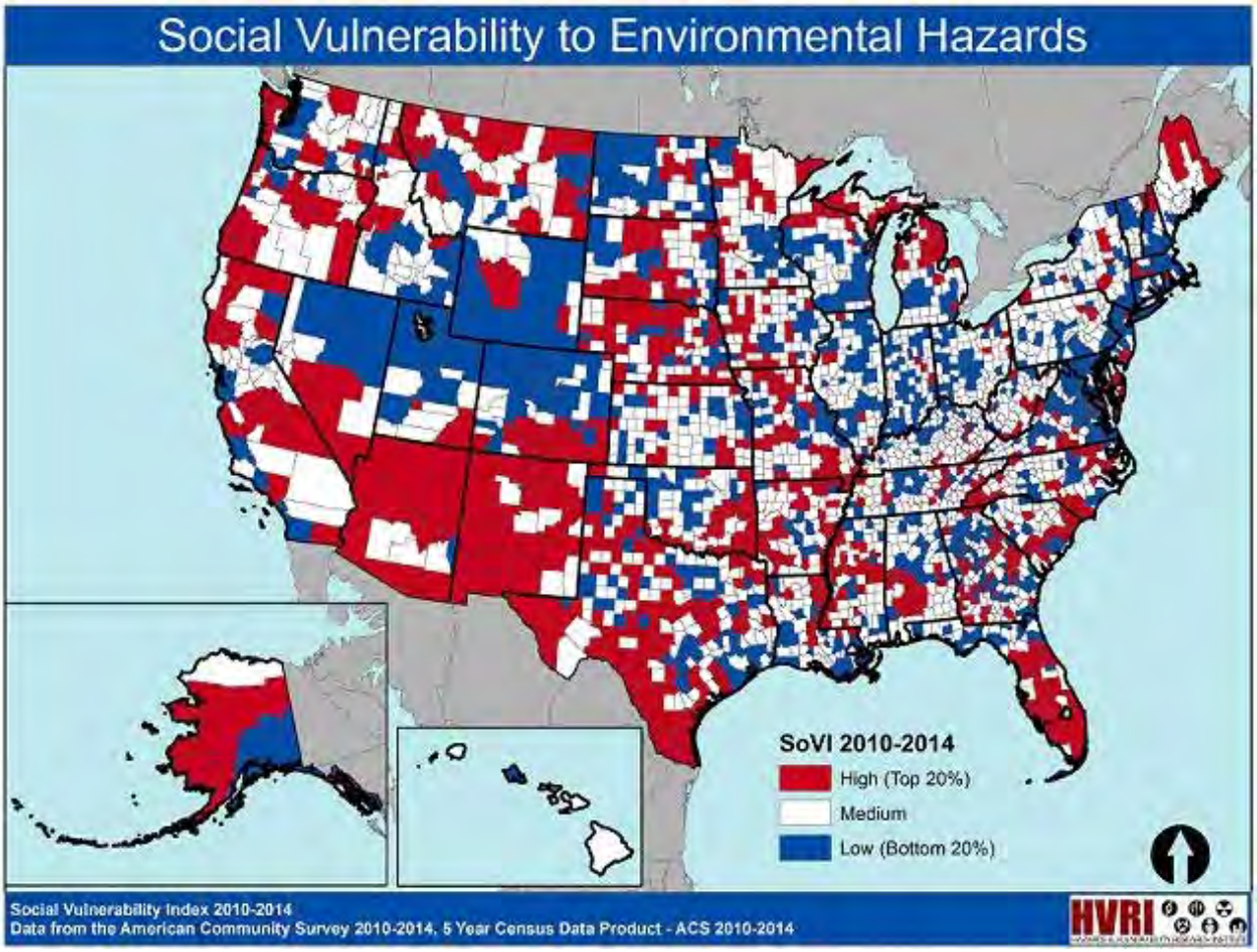
[4] U.S. Census Bureau, 2012-2016 5-Year American Community Survey
[5] http://webra.cas.sc.edu/hvri/products/sovifaq.aspx

Figure 2.4. 2010 – 2014 Missouri Social Vulnerability to Environmental Hazards (SoVI ®)



Source: http://artsandsciences.sc.edu/geog/hvri/sites/sc.edu.geog.hvri/files/attachments/MO_1014.pdf

Figure 2.5. 2010 – 2014 U.S. Social Vulnerability to Environmental Hazards (SoVI ®)



Source: http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-0

Table 2.8 provides additional demographic and economic indicators for Dent County.

Table 2.8. 2016 Unemployment, Poverty, Education, and Language Percentage Demographics, Dent County, Missouri

Jurisdiction	% in Labor Force	% of Population Unemployed	% of Families Below the Poverty Level	High School Diploma ONLY, ages 25+ (%)	Bachelor's degree or higher, ages 25+ (%)	% of population (language spoken at home other than English
Dent County	52.2	8.1	15.6	39.5	12.6	2.1
Salem	48.9	7.8	24.1	35.9	8.8	0.8

Source: U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year American Community Survey

2.1.5 History

It is uncertain whether remains of mounds, earthworks, pottery and other artifacts found in Dent County were left by the pre-historic people known as Mound Builders or by earlier races of Native Americans. It is known, however, that the Native Americans who roamed the region attributed these artifacts to people who have lived long before their time.

Early records indicate that the Native Americans made little trouble for the early settlers in the area. As late as 1838, Native Americans were passing through the county on the White River Trail. The Trail became one of the branches of the Trail of Tears, which many Cherokees were forced to travel along to Oklahoma.

Henry Rowe Schoolcraft was one of the earliest visitors to Dent County. In 1818, Schoolcraft and Levi Pettibone left the Potosi area and ended up at the Current River before returning home. It wasn't until around 1829, that the first settlers came to the area. The first white settler was George Cole, who cultivated a farm on the Meramec. The site later became the location of the Nelson Mill.

Land in the county could be purchased for five cents or less an acre. William Thornton, Daniel Troutman and Daniel W. Wooliver were among the 1829 settlers, followed by William Blackwell, Elisha Nelson, Jerry Potts, Ephraim Bressie, Robert Leonard, Abner Wingfield, Lewis Dent, Wilson Craddock, Thomas Higginbotham, Jack Berry, Silas Hamby, Smith Wofford, Turkill McNeill, Dr. John Hyer, Samuel Hyer and David Lenox.

The Missouri Assembly created Dent County on February 10, 1851, reducing the size of neighboring Crawford and Shannon Counties. The county was named after Lewis Dent, who served as the first representative. The first officers in the county included G.D Breckenridge, Samuel Hyer, Jr., and Jotham Clark. Joseph Millsap and David Henderson were the sheriff and clerk, respectively.

A log courthouse, built in 1851-52, was Dent County's first, located on the Wingfield farm northeast of Salem. In 1852-53 a courthouse was built south of the present courthouse. The courthouse was used as a military headquarters until 1864. In October of that year, while federal troops were away from the area, two Dent County citizens – Simeon Richardson and James Jamison – burned the courthouse and jail. Because of the fire, the court was forced to meet in a store belonging to Judge W.P. Williams. The next courthouse built in 1864, also fell victim to fire in May 1866. The beautiful Victorian courthouse which is listed in the National Registry of Historic Places was built in 1870.

It was not until 1853 that the present site of the county seat was designated in Salem. Previously the court meetings were held either at the home of Mr. Bressie or Mr. Wingfield near what later became Salem on Spring Creek. Salem was established in 1853, and a brick courthouse erected shortly thereafter. Perhaps when the founders named the town, they had in mind the ancient biblical city of Salem in Cannan, later identified with Jerusalem. In 1860, the first mayor of Salem was elected. A year later, the Civil War came and city governments were suspended. It is likely the governments regain function starting in 1870.

Salem grew to a population of between 600 and 800 people by the opening of the Civil War. After the close of the war, Salem recuperated slowly. The construction of the railway and the opening of the mines during 1872 caused a booming growth. By the time of the panic of 1873, the population had reached approximately 1,100[6,7].

[6] Meramec Regional Planning Commission, Comprehensive Economic Development Strategy, 2013 Revision

[7] S. Charles, Edited by S. Tubbs. History of Dent County, Missouri. Accessed September 2017.

2.1.6 Occupations

Table 2.9 provides occupation statistics for the incorporated jurisdictions and incorporated county.

Table 2.9. Occupation Statistics, Dent County, Missouri

Place	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Dent County	1,524	1,394	1,157	796	1,091
Salem	369	506	375	187	369

Source: U.S. Census, 2012-2016 American Community Survey, 5-year Estimates.

2.1.7 Agriculture

Due to the rural nature of the area, agriculture and timber are significant factors in the local economy. In 2016, agriculture, forestry, and related industries contributed $512.5 million in sales within the county. According to the 2007 Census of Agriculture, the number of farms in the county was 651 encompassing 176,601 total acres. In addition, the average farm was 271 acres. According to the 2012 Census of Agriculture, Dent County had risen to 673 farms encompassing 188,060 acres, with an average farm size of 279 acres. Furthermore, there are only approximately 35 farms with 1,000 or more acres in the county. Due to the rugged nature of the region, row crop farming is for the most part limited to the river valleys. In 2012, 17.1 percent of the land in farms was categorized as cropland with hay, haylage, grass silage, and green chop being the top crop in the county. Moreover, 14,018 cattle and calves were raised. The average agricultural products sold per farm were $25,779[8].

The Ozarks region of Missouri is the focal point of several converging ranges of plant associations. Eastern hardwoods, southern pines and western prairies and the wildlife each supports, all reach the outward limits of their range in this area. As a result, various types of forest lands and animal habitats co-exist within a limited area. Several sawmills operate in the area and the large amount of National Forest Lands in the region also contribute to the importance of timber production and logging to the local economy.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

FEMA's Hazard Mitigation Assistance (HMA) grant program provides funding for mitigation activities which have the potential to reduce disaster losses and protect life and property from future disaster damages[9]. Dent County has not previously received HMA grants[10].

[8] 2012 Census of Agriculture, Missouri Farm Commodity Sales, USDA, National Agriculture Statistics Service
[9] https://www.fema.gov/media-library/assets/documents/103279
[10] https:/www.fema.gov/openfema-dataset-hazard-mitigation-grants-v1

2.2 Jurisdictional Profiles and Mitigation Capabilities

This section will include individual profiles for each participating jurisdiction. It will also include a discussion of previous mitigation initiatives in the planning area. There will be a summary table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities. The unincorporated county is profiled first, followed by the incorporated communities, the special districts, and the public school districts.

2.2.1 Unincorporated Dent County

Overview

The jurisdiction of Dent County includes all unincorporated areas within the county boundaries. Dent County is governed by a three-member County Commission. The Commission is composed of a presiding commissioner, representing all of the county's population who is elected for a four-year term. Two associate commissioners representing roughly half the county's population each, are elected for four-year terms. The commission meets on Mondays and Thursdays of each week. Other elected county officials include the County Clerk, Prosecuting Attorney, Sheriff, Circuit Court Clerk, Recorder of Deeds, Collector of Revenue, Assessor, Treasurer, County Surveyor, Coroner, and Public Administrator.

Technical and Fiscal Resources

The county government has the authority to administer county structures, infrastructure, and finances. Third class counties do not have the authority to enforce building regulations. Dent County has staff resources emergency management and transportation. The county has a 9-1-1 central dispatch center located at the Dent County Sheriff's Office. Additionally, there are no outdoor warning sires in the county.

Fiscal tools or resources that the county could potentially use to help fund mitigation activities include Community Development Block Grants, capital improvements project funding, levy taxes for specific purposes, incur debt through general obligation bonds, and incur debt through special tax bonds.

Existing Plans and Policies

The county has a County Emergency Operations Plan, an in progress Hazard Mitigation Plan, Land-Use Plan, Regional Transportation Plan (MRPC), and a Regional Comprehensive Economic Development Strategy (MRPC). Dent County does not participate in the National Flood Insurance Program.

Other Mitigation Activities

The Office of Emergency Management, local fire departments, Sheriff's Department and the Dent County Health Department have conducted public education campaigns to raise awareness and increase preparedness among the county's population. Those programs have included flood recovery awareness, fire safety, storm preparedness, heat wave preparedness, and general press releases/social media outreach regarding hazards, preparedness, and mitigation.

Table 2.10. Demographic and Structure Risk Parameters For Unincorporated Dent County

Jurisdiction	With a disability	Non-English Speaking Populations	People Below Poverty Level	% Population Under 5 Yrs.	% Population 65 Yrs. and Over	% of Residences Built Prior to 1939	% of Mobile Homes
Unincorporated Dent County	2,398	0	1,935	5.9	20.1	10.8	17.1

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.11. Unincorporated Dent County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
City Emergency Operations Plan	n/a
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	n/a
County Mitigation Plan	In progress
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Yes – Regional
Land-use Plan	Yes – 5/11/1998
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	n/a
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
Hazard Awareness Program	No
National Flood Insurance Program	No
NFIP Community Rating System (CRS) Participating Community	n/a
National Weather Service (NWS) Storm Ready	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	n/a

Capabilities	Status Including Date of Document or Policy
ISO Fire Rating	9
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	n/a
Hazard Analysis/Risk Assessment (County)	No
Evacuation Route Map	Yes
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	n/a
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Director	Yes
NFIP Floodplain Administrator	n/a
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	No
Sanitation Department	n/a
Transportation Department	Yes
Economic Development Department	No
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	No

Capabilities	Status Including Date of Document or Policy
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	n/a
Ability to withhold spending in hazard prone areas	n/a

Source: Data Collection Questionnaire, 2017

2.2.2 City of Salem

Overview

Salem is located in the central portion of Dent County. The community was established in 1860. State highways 72, 68, 19, and 32 intersect the City of Salem. According to the 2016 U.S. Census, the community has a population of 4,974. Salem is incorporated as a fourth class city (1881) with a four member board of aldermen and a mayor. The city employs a City Clerk, City Attorney, City Administrator, City Collector, Chief of Police, Building Inspector/Building Code Official, NFIP Floodplain Administrator, and Emergency Management Coordinator.

Technical and Fiscal Resources

Ambulance service is provided by the Salem Memorial District Hospital in Salem. There is also a Volunteer Fire Department within the community. The Sherriff's Department houses and operates the 9-1-1 system located in Salem. The city operates seven warning sirens which is controlled by the Salem Police Department, Dent County EMD, City EMD, or other authorized officials. The city is in the process of implementing an AMI system for city utilities which will include some notification abilities.

Fiscal tools or resources that the city could potentially use to help fund mitigation activities include Community Development Block Grants, capital improvements project funding, ability to levy taxes for specific purposes, fees for water, sewer, gas or electric services, incur debt through general obligation bonds with voter approval, incur debt through special tax bonds with voter approval, and withhold spending in hazard prone areas.

Existing Plans and Policies

Salem currently participates in the National Flood Insurance Program, joined in August 1979. The city has a Comprehensive Plan, Capital Improvement Plan, City Emergency Operations Plan, Debris Management Plan, Transportation Plan, Land-Use Plan, Critical Facilities Plan, Regional Transportation Plan (MRPC), Regional, and Comprehensive Economic Development Strategy (MRPC). The city is in the process of developing an Economic Development Plan part of Growth in the Rural Ozarks (GRO).

Table 2.12. Demographic and Structure Risk Parameters For Salem

Jurisdiction	With a disability	Non-English Speaking Populations	People Below Poverty Level	% Population Under 5 Yrs.	% Population 65 Yrs. and Over	% of Residences Built Prior to 1939	% of Mobile Homes
Salem	1,425	0	1,491	6.1	23.5	12.8	7.1

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.13. City of Salem Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 2013
Builder's Plan	No
Capital Improvement Plan	Yes, part of 2017-2018 budget
City Emergency Operations Plan	Yes, 2016
County Emergency Operations Plan	Yes, 2016
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	No
County Mitigation Plan	First plan in process
Debris Management Plan	Yes, 2016
Economic Development Plan	In process
Transportation Plan	Yes, 2017
Land-use Plan	Yes, 1987
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes, 2015
Policies/Ordinance	
Zoning Ordinance	Yes, 1987 with subsequent updates
Building Code	Yes, IBC 2012 with exceptions
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes, 1986
Tree Trimming Ordinance	Yes, 2000
Nuisance Ordinance	Yes, 1992
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	Yes, 1986
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
Hazard Awareness Program	Yes
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No

Capabilities	Status Including Date of Document or Policy
ISO Fire Rating	5
Economic Development Program	Yes
Land Use Program	Yes
Public Education/Awareness	Yes
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes
Tree Trimming Program	Yes
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes, Police and Utilities
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	No
Evacuation Route Map	Yes, 2016
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Vacant
Development Planner	Vacant
Public Works Official	Vacant
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes, City Engineer (vacant)
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	Yes
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	Included above
Housing Department	Yes, Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes with voter approval
Fees for water, sewer, gas, or electric services	Yes

Capabilities	Status Including Date of Document or Policy
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Currently no, but could with voter approval
Ability to incur debt through special tax bonds	Currently no, but could with voter approval
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Yes

Source: Data Collection Questionnaire, 2017

Table 2.14 summarizes the mitigation capabilities of Dent County and its jurisdictions.

Table 2.14. Mitigation Capabilities Summary Table

CAPABILITIES	Unincorporated Dent County	Salem
Planning Capabilities		
Comprehensive Plan	No	Yes, 2013
Builder's Plan	No	No
Capital Improvement Plan	No	Yes, part of 2017-2018 budget
City Emergency Operations Plan	n/a	Yes, 2016
County Emergency Operations Plan	Yes	Yes, 2016
Local Recovery Plan	No	No
County Recovery Plan	No	No
City Mitigation Plan	n/a	No
County Mitigation Plan	In progress	First plan in process
Debris Management Plan	No	Yes, 2016
Economic Development Plan	CEDS	In process
Transportation Plan	Yes – Regional	Yes, 2017
Land-use Plan	Yes – 5/11/1998	Yes, 1987
Flood Mitigation Assistance (FMA) Plan	No	No
Watershed Plan	No	No
Firewise or other fire mitigation plan	No	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No	Yes, 2015
Policies/Ordinance		
Zoning Ordinance	No	Yes, 1987 with subsequent updates
Building Code	No	Yes, IBC 2012 with exceptions
Floodplain Ordinance	No	Yes
Subdivision Ordinance	n/a	Yes, 1986
Tree Trimming Ordinance	No	Yes, 2000
Nuisance Ordinance	No	Yes, 1992

CAPABILITIES	Unincorporated Dent County	Salem
Storm Water Ordinance	No	No
Drainage Ordinance	No	No
Site Plan Review Requirements	No	Yes, 1986
Historic Preservation Ordinance	No	No
Landscape Ordinance	No	No
Program		
Zoning/Land Use Restrictions	No	Yes
Codes Building Site/Design	No	Yes
Hazard Awareness Program	No	Yes
National Flood Insurance Program	No	Yes
NFIP Community Rating System (CRS) Participating Community	n/a	No
National Weather Service (NWS) Storm Ready	No	No
Firewise Community Certification	No	No
Building Code Effectiveness Grading (BCEGs)	n/a	No
ISO Fire Rating	9	5
Economic Development Program	No	Yes
Land Use Program	No	Yes
Public Education/Awareness	No	Yes
Property Acquisition	No	No
Planning/Zoning Boards	No	Yes
Stream Maintenance Program	No	Yes
Tree Trimming Program	No	Yes
Engineering Studies for Streams (Local/County/Regional)	No	No
Mutual Aid Agreements	Yes	Yes, Police and Utilities
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)	n/a	No

CAPABILITIES	Unincorporated Dent County	Salem
Hazard Analysis/Risk Assessment (County)	No	No
Evacuation Route Map	Yes	Yes, 2016
Critical Facilities Inventory	No	No
Vulnerable Population Inventory	No	No
Land Use Map	No	Yes
Staff/Department		
Building Code Official	n/a	Yes
Building Inspector	No	Yes
Mapping Specialist (GIS)	No	No
Engineer	No	Vacant
Development Planner	No	Vacant
Public Works Official	No	Vacant
Emergency Management Director	Yes	Yes
NFIP Floodplain Administrator	n/a	Yes, City Engineer (vacant)
Bomb and/or Arson Squad	No	No
Emergency Response Team	No	No
Hazardous Materials Expert	No	Yes
Local Emergency Planning Committee	MREPC	Yes
County Emergency Management Commission	No	Yes
Sanitation Department	n/a	No
Transportation Department	Yes	No
Economic Development Department	No	Included above
Housing Department	Phelps Co. PHA	Yes, Phelps Co. PHA
Regional Planning Agencies	MRPC	MRPC
Historic Preservation	No	No
Non-Governmental Organizations (NGOs)		
American Red Cross	Yes	Yes

CAPABILITIES	Unincorporated Dent County	Salem
Salvation Army	Yes	Yes
Veterans Groups	Yes	Yes
Environmental Organization	No	No
Homeowner Associations	Yes	No
Neighborhood Associations	No	No
Chamber of Commerce	Yes	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes	Yes
Financial Resources		
Ability to apply for Community Development Block Grants	Yes	Yes
Ability to fund projects through Capital Improvements funding	Yes	Yes
Authority to levy taxes for a specific purpose	Yes	Yes with voter approval
Fees for water, sewer, gas, or electric services	No	Yes
Impact fees for new development	No	No
Ability to incur debt through general obligation bonds	Yes	Currently no, but could with voter approval
Ability to incur debt through special tax bonds	Yes	Currently no, but could with voter approval
Ability to incur debt through private activities	n/a	No
Ability to withhold spending in hazard prone areas	n/a	Yes

Source: Data Collection Questionnaires, 2017

2.2.3 Public School District Profiles and Mitigation Capabilities

The following school districts are participating jurisdictions in this plan: Salem R-80 School District, Oak Hill R-I School District, Green Forest R-II School District, Dent-Phelps R-III School District, and North Wood R-IV School District. As public institutions responsible for the care and education of the county's children, these school districts share an interest with Dent County in public safety and hazard mitigation planning. **Figure 2.6** provides the boundaries of the school districts participating in this planning process.

Technical and Fiscal Resources

Salem R-80, Green Forest R-II, Dent-Phelps R-III, and North Wood R-IV have NOAA all hazard radios on site to provide early warning of hazard events. In addition, each school district has fire alarms and intercom systems capable of providing specific instructions in the event of an emergency. Salem R-80 utilizes AlertNow for mass notifications. Green Forest R-II utilizes an emergency alert system through their phone system.

Green Forest R-II employs a grant writer.

Existing Plans and Policies

All school districts have an emergency management plan and weapons policy.

Other Mitigation Activities

All schools participating in the plan conduct regular fire, earthquake and tornado drills and on a quarterly basis or semi-annual basis. All districts practice lock-down security training at least once a year. None of the schools have a designated safe area for tornados in accordance with FEMA Standards.

New Construction

Oak Hill R-I anticipates a new building project in May of 2017. North Wood R-IV also anticipates possible construction within the next 5 years.

Table 2.15. School District Buildings and Enrollment Data, 2017

District Name	Building Name	Enrolment
Salem R-80		
	Salem Sr. High	588
	Salem Middle School	225
	Salem Upper Elem.	344
	Wm. H. Lynch Elem.	296
Oak Hill R-I		
	Oak Hill Elem.	131
Green Forest R-II		
	Green Forest Elem.	196

Dent-Phelps R-III		
	Dent-Phelps Elem.	250
North Wood R-IV		
	North Wood Elem.	231

Source: https://ogi.oa.mo.gov/DESE/schoolSearch/index.html

Figure 2.6. Dent County School Districts

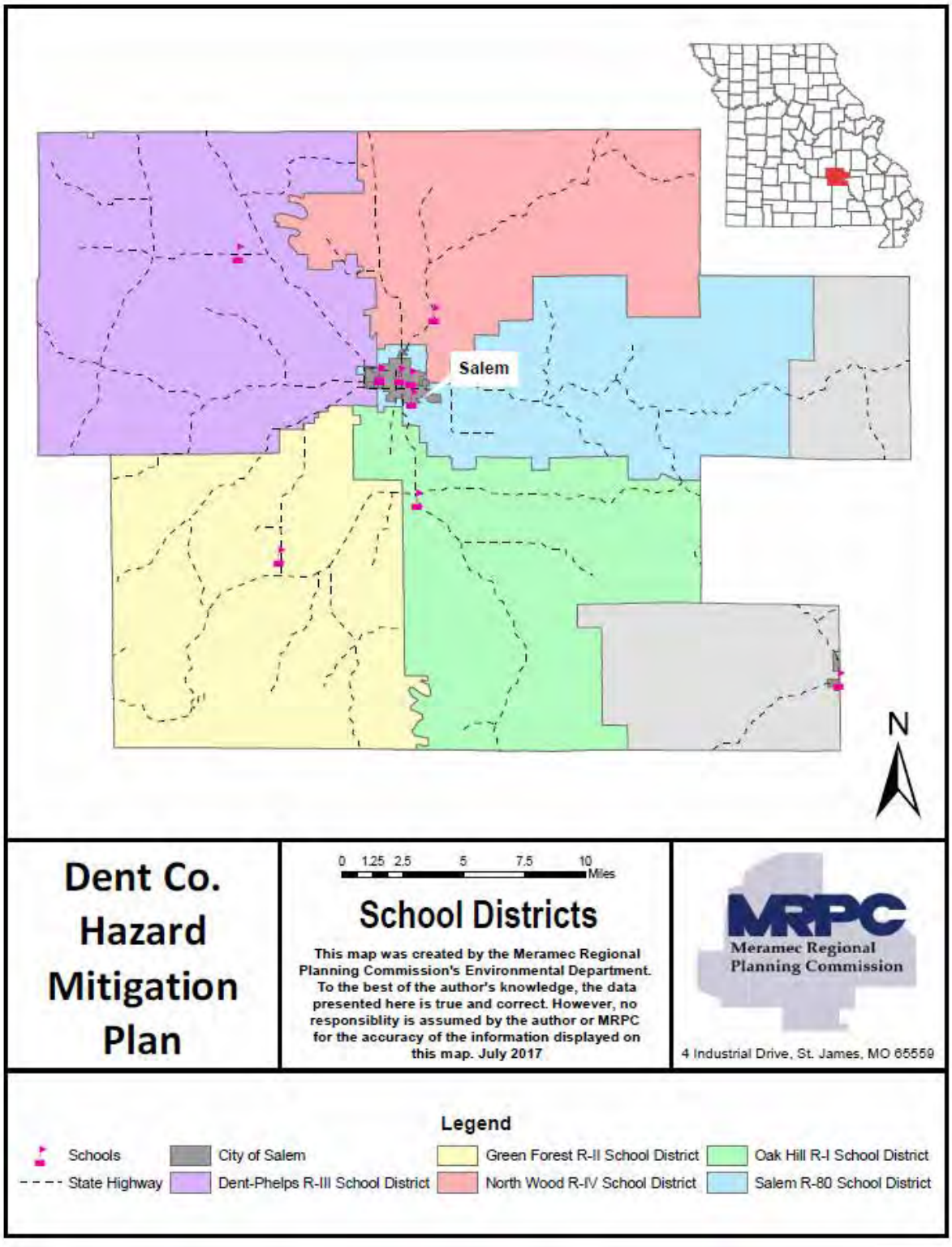


Table 2.16. Summary of Mitigation Capabilities for School Districts

Capability	Salem R-80	Oak Hill R-I	Green Forest R-II	Dent-Phelps R-III	North Wood R-IV
Planning Elements					
Master Plan/Date	10/2014	No	2016	Nov. 15, 2015	No
Capital Improvement	No	10/17	No	No	No
School Emergency Plan/Date	05/2016	Yes	Yes	Yes	Yes
Weapons Policy/Date	10/2016	Yes	Yes	2016	Yes
Personnel Resources					
Full-Time Building Official (Principal)	Yes	Yes	Yes	Yes	Yes
Emergency Manager	Yes	No	Yes	No	Yes
Grant Writer		No	Yes	No	No
Public Information Officer	Yes	No	Yes	No	Yes
Financial Resources					
Capital Improvements Project Funding	Yes	Yes	Yes	Yes	Yes
Local Funds	Yes	Yes	Yes	Yes	No
General Obligation	Yes	No	Yes	No	No
Special Tax Bonds	No	No	Yes	No	No
Private Activities/Donations	Yes	No	Yes	Yes	Yes
State and Federal Funds/Grants	Yes	No	Yes	Yes	Yes
Other					
Public Education Programs	N/A	No	No	No	No
Privately or Self-Insured?	Private	-	No	Dec. 31, 2016	Yes
Fire Evacuation Training	Multiple times a year	Yes	Yes	Yes	4x/year
Tornado Sheltering Exercises	Multiple times a year	Yes	Yes	Yes	3x/year
Public Address/Emergency Alert System	PA system, icom radio, AlertNow for mass communication	Intercom and Bells	Though phone system	PA all call system	Intercom system
NOAA Weather Radios	Yes	No	Yes	Yes, but no signal	Yes
Lock-Down Security Training	Multiple times a year	Yes	Yes	Yes	3x/year
Mitigation Programs	No	No	Yes	Yes	
Tornado Shelter/Safe-room	N/A	No	No	No	No
Campus Police	Salem PD	No	No	No	No

Source: Data Collection Questionnaires, 2017

2.2.4 Critical Facilities

The table below (**Table 2.17**) provides information for critical facilities in the planning area. Specific information includes a Hazus ID if applicable, jurisdiction, building name/owner, and address. Facilities addressed include emergency, fire department, law enforcement, medical, and schools. Furthermore, **(Table 2.18)** provides information in regards to colleges/universities located in the planning area.

Table 2.17. Dent County Critical Facilities by Type and Jurisdiction

HazusID	Jurisdiction	Building Name	Address	City	State	Zip
Emergency Facilities						
	Dent Co.	Salem Memorial Hospital Ambulance	35629 Hwy 72	Salem	MO	65560
	Salem	EOC	#2 S. Main St.	Salem	MO	65560
Fire Department Facilities						
	Dent Co.	Jadwin Vol. Fire Dept.	8861 Hwy K	Jadwin	MO	65501
	Dent Co.	Lenox Rural Fire Dept.	18231 Hwy C.	Lenox	MO	65541
	Dent Co.	Dent County Fire Prot. Dist.	#2 S. Main St.	Salem	MO	65560
	Dent Co.	Montauk Rural Fire Dist.	2742 Hwy 119	Salem	MO	65560
Law Enforcement Facilities						
	Salem	Salem Police Dept.	500 N Jackson St.	Salem	MO	65560
	Dent Co.	Dent Co. Sheriff's Dept.	112 E. 5th St., Suite 7	Salem	MO	65560
Medical Facilities						
	Dent Co.	Salem Memorial District Hospital	35629 Hwy. 72	Salem	Mo	65560
	Dent Co.	Dent County Health Center	601 S. MacArthur	Salem	Mo	65560
HazusID	**Jurisdiction**	**Building Name**	**Address**	**City**	**State**	**Zip**
School Districts						
	Salem R-80	Salem R-80 School District	1409 W. Rolla Road	Salem	MO	65560
	Oak Hill R-I	Oak Hill R-I School District	6200 Hwy 19 S.	Salem	MO	65560
	Green Forest R-II	Green Forest R-II School District	6111 Hwy F	Salem	MO	65560
	Dent-Phelps R-III	Dent-Phelps R-III School District	27870 Hwy C	Salem	MO	65560
	North Wood R-IV	North Wood R-IV School District	3734 N Hwy 19	Salem	MO	65560

Source: Meramec Region Community Data Mining for Hazard Mitigation Planning (2014)

Southwest Baptist University is located in Bolivar, MO. The university operates a satellite campus within Dent County. The campus and location are shown in **Table 2.18**.

Table 2.18. Dent County Colleges/Universities

College/University	Location	Description
Southwest Baptist University-Salem Campus	501 S Grant St, Salem, MO 65560	Afternoon and evening classes. 9 undergraduate majors available.

3 RISK ASSESSMENT

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

The goal of the risk assessment is to estimate the potential loss in the planning area, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities and school/special districts in the planning area to better understand their potential risk to the identified hazards. It will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and provides a factual basis for elimination of hazards from further consideration;
- **Section 3.2 Assets at Risk** provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 3.3 Future Land Use and Development** discusses areas of planned future development
- **Section 3.4 Hazard Profiles and Vulnerability Analysis** provides more detailed information about the hazards impacting the planning area. For each hazard, there are three sections: 1) Hazard Profile provides a general description and discusses the threat to the planning area, the geographic location at risk, potential severity/magnitude/extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk; 2) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and 3) Problem Statement briefly summarizes the problem and develops possible solutions.

3.1 Hazard Identification

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The primary phase in the development of a hazard mitigation plan is to identify specific hazards which may impact the planning area. To initiate this process, the Hazard Mitigation Planning Committee (HMPC) reviewed a list of natural hazards provided by the Federal Emergency Management Agency (FEMA). From that list, the HMPC selected pertinent natural hazards of concern that have the potential to impact Dent County. These selected natural hazards are further profiled and analyzed in this plan.

3.1.1 Review of Existing Mitigation Plans

Within the State of Missouri, local hazard mitigation plans customarily include only natural hazards, as only natural hazards are required by federal regulations. Nevertheless, there is an opportunity to include man made or technical hazards within the plan. However, it was decided that only natural hazards were appropriate for the purpose of this plan. Based on past history and future probability, the Hazard Mitigation Planning Committee (HMPC) determined that the following potential hazards would be included in the Dent County Hazard Mitigation Plan:

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Fires (Urban/Structural and Wild)
- Flooding
- Land Subsidence/Sinkholes
- Thunderstorm/High Winds/Lightning/Hail
- Tornado
- Severe Winter Weather

Hazards not occurring in the planning area, or considered insignificant were eliminated from this plan. **Table 3.1** outlines the hazards eliminated from the plan and the reasons for doing so. Additionally, some hazards were combined in the Dent County Plan to match the hazards listed in the Missouri State Hazard Mitigation Plan.

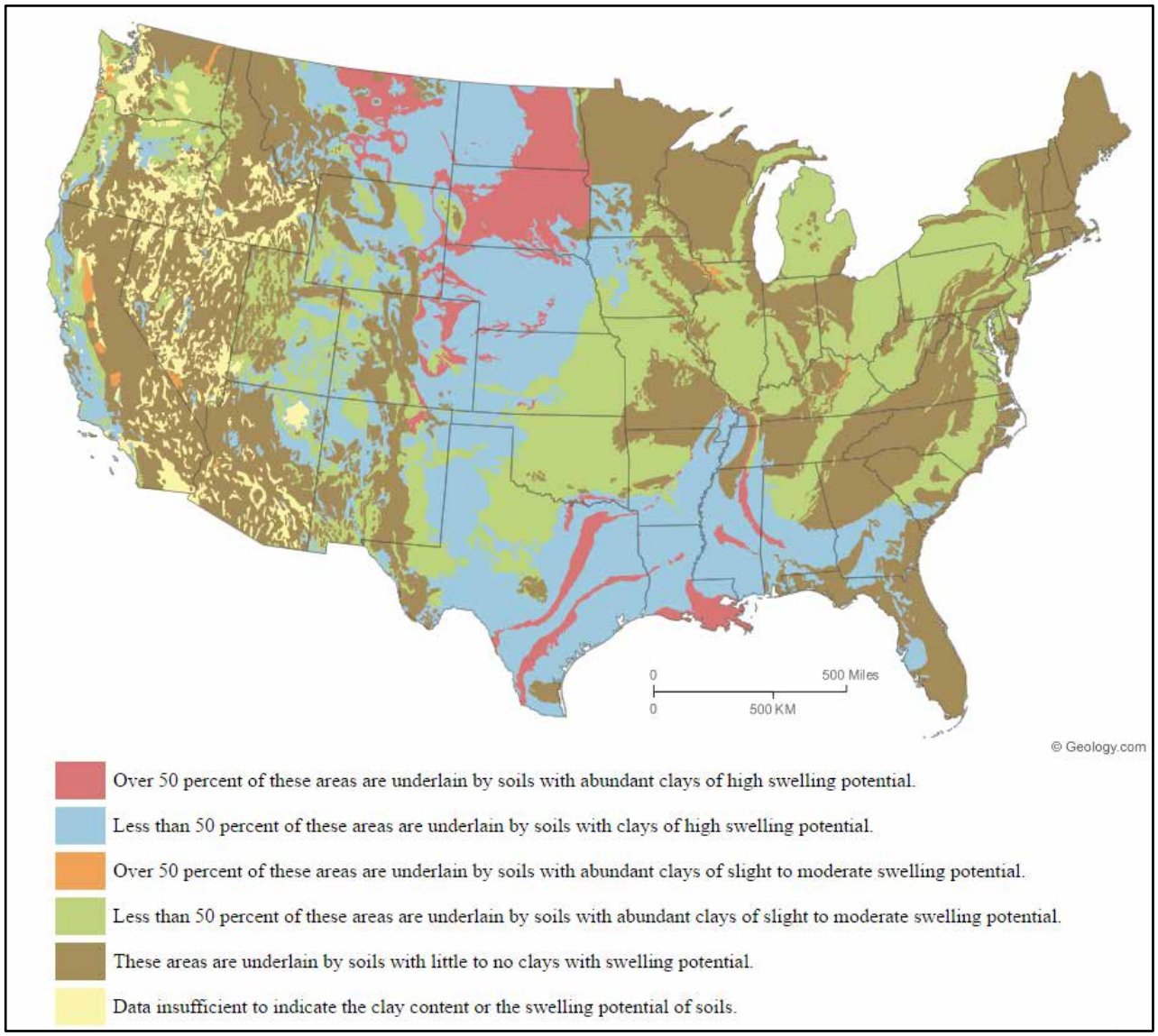
Table 3.1. Table 3.1 Hazards Not Profiled in the Plan

Hazard	Reason for Omission
Avalanche	No mountains in the planning area.
Coastal Erosion	Planning area is located in the Midwest, not on any coast.
Coastal Storm	Planning area is located in the Midwest, not on any coast.

Hazard	Reason for Omission
Debris Flow	There are no mountainous areas in the planning area where this type of event occurs.
Expansive Soils	No expansive soils exist within the planning area. According to the USGS National Geologic Map Database[1], the planning area is underlain by soils with little to no clays with swelling potential (**Figure 3.1**).
Hurricane	Planning area is located in the Midwest, not on any coast.
Levee Failure	According to the US Army Corps of Engineers' National Levee Database [2], and local officials, there are no levees located in the planning area. However, low-head agricultural levees could be present. Unfortunately, no data could be found indicating damages in the event of failure.
Volcano	There are no volcanic areas in the county.

[1] http://ngmdb.usgs.gov/Prodesc/proddesc_10014.htm
[2] http://nld.usace.army.mil/egis/f?p=471:1:0::NO

Figure 3.1. Swelling clays map of the conterminous United States



Source: http://ngmdb.usgs.gov/Prodesc/proddesc_10014.htm

3.1.2 Review Disaster Declaration History

In order to assess risk, it was logical to review the disaster declaration history for the State of Missouri and specifically for Dent County. Federal and State disaster declarations are granted when the severity and magnitude of a hazard event surpasses the ability of local government to respond and recover. Disaster assistance is initiated when the local government's response and recovery capabilities have been exhausted. In this type of situation, the state may declare a disaster and provide resources from the state level. If the disaster is so great that state resources are also overwhelmed, a federal disaster may be declared in order to allow for federal assistance.

There are three agencies through which a federal disaster declaration can be issued – FEMA, the U.S. Department of Agriculture (USDA) and/or the Small Business Administration. A federally declared disaster generally includes long-term federal recovery programs. The type of declaration is determined by the type of damage sustained during a disaster and what types of institutions or industries are affected.

A declaration issued by USDA indicates that the affected area has suffered at least a 30 percent loss in one or more crops or livestock industries. This type of declaration provides those farmers affected with access to low-interest loans and other programs to assist with disaster recovery and mitigation.

Missouri has been especially hard hit by natural disasters in the recent past. The state has had 68 federally declared disasters since 1953. Of those, 38 have occurred between 2000 and 2016. All of these disasters have been weather related – severe wind and rain storms, tornadoes, flooding, hail, ice storms and winter storms. **Table 3.2** lists the federal disaster declarations for Dent County from 1990 through 2017.

Table 3.2. FEMA Disaster Declarations that included Dent County, Missouri, 1990-2017

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-1006	Missouri Flooding, Severe Storm, Tornadoes	Incident Period: November 13, 1993 – November 19, 1993 Declaration Date: December 01, 1993	IA, PA
DR-1412	Missouri Severe Storms and Tornadoes	Incident Period: April 24, 2002 – June 10, 2002 Declaration Date: May 06, 2002	PA
DR-1463	Missouri Severe Storms, Tornadoes, & Flooding	Incident Period: May 04, 2003 – May 30, 2003 Declaration Date: May 06, 2003	IA, PA
EM-3232	Missouri Hurricane Katrina Evacuation	Incident Period: August 29, 2005 – October 01, 2005 Declaration Date: September 10, 2005	PA

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
EM-3267	Missouri Severe Storms	Incident Period: July 19, 2006 – July 21, 2006 Declaration Date: July 21, 2006	PA
EM-3281	Missouri Severe Winter Storms	Incident Period: December 08, 2007 – December 15, 2007 Declaration Date: December 12, 2007	-
DR-1676	Missouri Severe Winter Storms & Flooding	Incident Period: January 12, 2007 – January 22, 2007 Declaration Date: January 15, 2007	PA
DR-1809	Missouri Severe Storms, Flooding, & a Tornado	Incident Period: September 11, 2008 – September 24, 2008 Declaration Date: November 13, 2008	PA
DR-1749	Missouri Severe Storms and Flooding	Incident Period: March 17, 2008 – May 09, 2008 Declaration Date: March 19, 2008	PA
DR-1847	Missouri Severe Storms, Tornadoes, and Flooding	Incident Period: May 08, 2009 – May 16, 2009 Declaration Date: June 19, 2009	IA, PA
EM-3303	Missouri Severe Winter Storm	Incident Period: January 26, 2009 – January 28, 2009 Declaration Date: January 30, 2009	-
EM-3317	Missouri Severe Winter Storm	Incident Period: January 31, 2011 – February 05, 2011 Declaration Date: February 03, 2011	-
EM-3374	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: December 22, 2015 – January 09, 2016 Declaration Date: January 02, 2016	-
DR-4317	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: April 28, 2017 – May 11, 2017 Declaration Date: June 02, 2017	IA, PA

Source: Federal Emergency Management Agency: http://www.fema.gov/disasters

3.1.3 Research Additional Sources

List the additional sources of data on locations and past impacts of hazards in the planning area:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Previously approved planning area Hazard Mitigation Plan (12/1/2011)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI);
- Pipeline and Hazardous Materials Safety Administration
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Various articles and publications available on the internet (sources are cited in the body of the Plan)

Remarkably, the only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCEI documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the

NCEI may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Those using information from NCEI should be cautious as the NWS does not guarantee the accuracy or validity of the information.

The NCEI damage amounts are estimates received from a variety of sources, including those listed above in the Data Sources section. For damage amounts, the NWS makes a best guess using all available data at the time of the publication. Property and crop damage figures should be considered as a broad estimate. Damages reported are in dollar values as they existed at the time of the storm event. They do not represent current dollar values.

The database currently contains data from January 1950 to March 2014, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

1. Tornado: From 1950 through 1954, only tornado events were recorded.
2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

Injuries and deaths caused by a storm event are reported on an area-wide basis. When reviewing a table resulting from an NCEI search by county, the death or injury listed in connection with that county search did not necessarily occur in that county.

3.1.4 Hazards Identified

Table 3.3 lists the hazards that significantly impact each jurisdiction within the planning area and were chosen for further analysis in alphabetical order. However, not all hazards impact every jurisdiction such as dam failure. “X” indicates the jurisdiction is impacted by the hazard, and a "-" indicates the hazard is not applicable to that jurisdiction. As Dent County is predominately rural, limited variations occur across the county. However, jurisdictions with a high percentage of housing comprised of mobile homes, for example, could be more at risk to damages from a tornado. Error! Reference source not found. depicts a summary of natural hazard profiles and severity ratings by participating jurisdictions.

Table 3.3. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Urban/Structural and wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Thunderstorms/High Winds/ Lightning/Hail	Tornado	Severe Winter Weather
Dent County	x	x	x	x	x	x	x	x	x	x
Salem	x	x	x	x	x	x	x	x	x	x
School Districts										
Dent-Phelps R-III	x	x	x	x	x	x	x	x	x	x
Green Forest R-II	x	x	x	x	x	x	x	x	x	x
North Wood R-IV	x	x	x	x	x	x	x	x	x	x
Oak Hill R-I	x	x	x	x	x	x	x	x	x	x
Salem R-80	x	x	x	x	x	x	x	x	x	x

Table 3.4. Natural Hazard Probability (P) and Vulnerability (V) Ratings by Participating Jurisdiction

		Dent County	Salem	Dent-Phelps R-III	Green Forest R-II	North Wood R-IV	Oak Hill R-I	Salem R-80
Dam Failure	P	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	V	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Drought	P	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
	V	L	L	L	L	L	L	L
Earthquake	P	1%	1%	1%	1%	1%	1%	1%
	V	L	L	L	L	L	L	L
Extreme Heat	P	100%	100%	100%	100%	100%	100%	100%
	V	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Fires (Urban/Structural and *Wild)	P	100%	100%	100%	100%	100%	100%	100%
	V	M	M	M	M	M	M	M
*Flood/Flash Flood	P	100%	100%	100%	100%	100%	100%	100%
	V	M	M	M	M	M	M	M
Land Subsidence/Sinkholes	P	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	V	H	H	H	H	H	H	H
Thunderstorm: *Heavy Rain/High Winds/Lightning/Hail	P	25%	25%	25%	25%	25%	25%	25%
	V	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Tornado	P	40%	40%	40%	40%	40%	40%	40%
	V	M	M	M	M	M	M	M
Severe Winter Weather/Snow/Ice/Severe Cold	P	100%	100%	100%	100%	100%	100%	100%
	V	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Vulnerability Rating Key: L = Low, L-M = Low-Medium, M = Medium, M-H = Medium-High, H = High, NDA = No Data Avail.								
*Indicates hazard utilized for probability.								

3.1.5 Multi-Jurisdictional Risk Assessment

For this multi-jurisdictional hazard mitigation plan, each hazard is profiled in which the risks are assessed on a planning area wide basis. Some hazards, such as dam failure, vary in risk across the county. If variations exist within the planning area, discussion is included in each profile. Dent County is uniform across the county in terms of climate, topography, and building construction characteristics. Weather-related hazards will impact the entire county in much the same fashion, as do topographical/geological related hazards such as earthquake. Sinkholes are widespread in the county, but more localized in their effects. The focal area of urbanization includes the City of Salem. Urbanized areas have more assets at a greater density, and therefore have greater vulnerability to weather-related hazards. Rural areas include agricultural assets (livestock/crops) that are also vulnerable to damages. Differences among jurisdictions for each hazard will be discussed in greater detail in the vulnerability section of each hazard.

3.2 Assets at Risk

This section assesses the planning area's population, structures, critical facilities, infrastructure, and other important assets that may be at risk to hazards.

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2016 Census Bureau data. Building counts values are based on parcel data provided by the Missouri Spatial Data Information Service which can be found at the following website, http://msdis.missouri.edu. Building values and exposure values were unable to be calculated due to incompatibility/technical issues with HAZUS MH 4.0.

Table 3.5. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2016 Population	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Salem	4,974	3,851	-	-	-
Unincorporated Dent County	10,604	20,541	-	-	-
Total	15,578	24,392	-	-	1,382,572,000

Sources: U.S. Census Bureau, 2012-2016 5-Year American Community Survey; 2013 Missouri State Hazard Mitigation Plan MO_2014_Missouri_Structures_Project_gdb;

Table 3.6. Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Industrial Counts	Agricultural Counts	Other	Total
Salem	2,088	275	9	44	1,435	3,851
Unincorporated Dent County	4,646	118	94	9,466	6,217	20,541
Total	6,734	393	103	9,510	7,652	24,392

Source: MO_2014_Missouri_Structures_Project_gdb.

Table 3.7 below, provides additional information for school districts, including the number of buildings, building values (building exposure) and contents value (contents exposure). These numbers will represent the total enrollment and building count for the public school districts regardless of the county in which they are located.

Table 3.7. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrollment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Dent-Phelps R-III	250	5	$8,694,735	$948,000	$9,642,735
Green Forest R-II	196	1	4,729,628	$730,819	$5,460,447
North Wood R-IV	231	5	$4,814,806	$882,150	$5,696,956
Oak Hill R-I	131	2	$4,000,000	$1,000,000	$5,000,000
Salem R-80	1,453	32	$42,698,711	$6,414,922	$49,113,633

Source: https://ogi.oa.mo.gov/DESE/schoolSearch/index.html; 2017 Data Collection Questionnaire

3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, essential, high potential loss, and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

- Critical Facility: Those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- Essential Facility: Those facilities that if damaged, would have devastating impacts on disaster response and/or recovery.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community.
- Transportation and lifeline facilities: Those facilities and infrastructure critical to transportation, communications, and necessary utilities.

Table 3.8 includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area. The list was compiled from the 2017 Data Collection Questionnaire.

Table 3.8. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

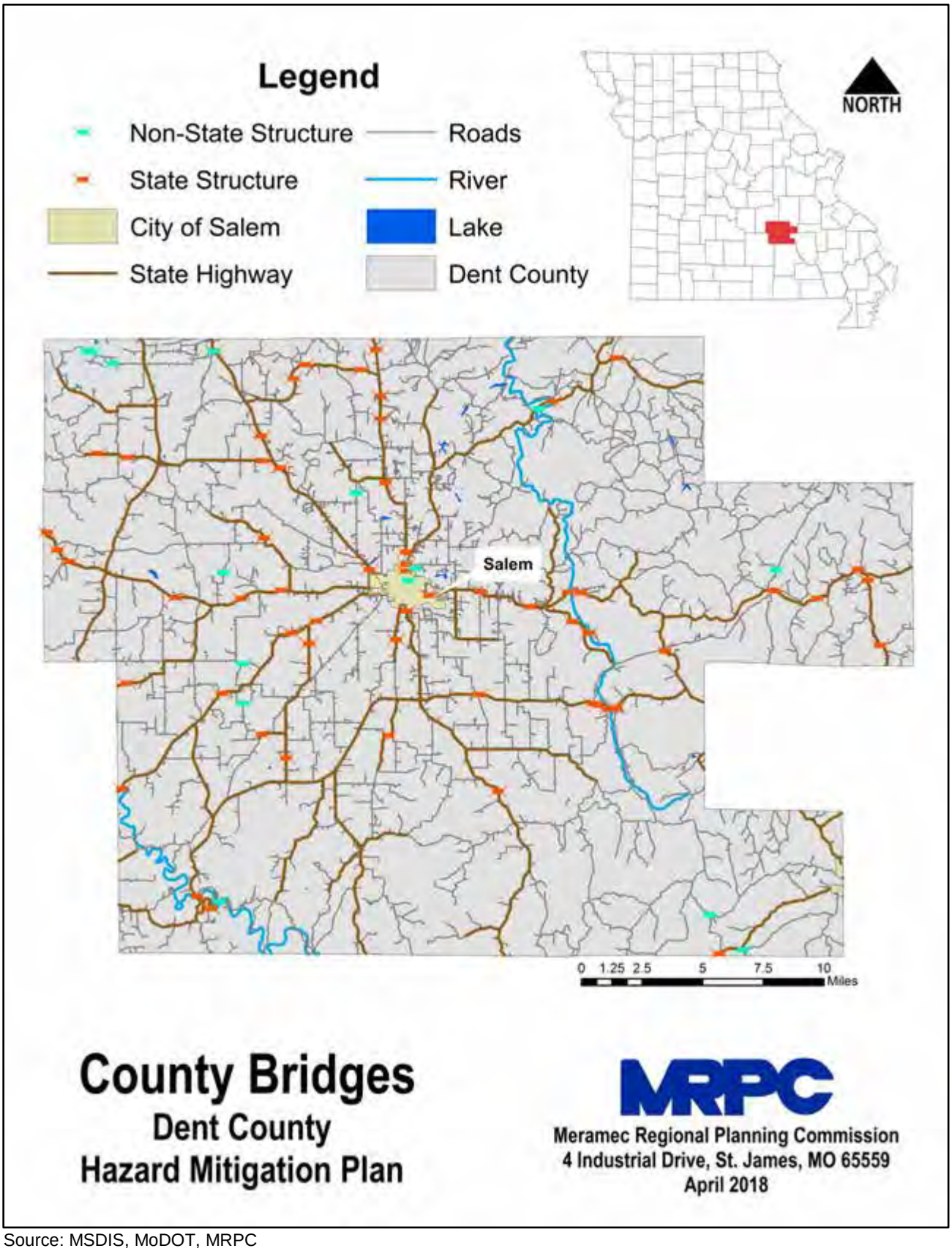
	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	State & Non-State Structures (Bridge)	Hospital/Health Care	Military	Pipeline/Pump Station	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Unincorporated Dent County	0	0	0	8	-	1	4	2	1	1	73	2	0	1	3	1	1	0	0	4	0	4	0	106
Salem	1	0	5	1	0	2	1	10	2	0	2	3	0	0	2	2	1	0	5	5	0	30	1	73
Totals	1	0	5	9	0	3	5	12	3	1	75	5	0	1	5	3	2	0	5	9	0	34	1	179

Source: 2017 Data Collection Questionnaires

According to the National Bridge Inventory there are a total of 74 bridges in Dent County[3]. **Figure 3.2** shows the locations of State regulated bridges and non-State bridges in the planning area along with scour critical bridges. Scour critical refers to one of the database elements in the National Bridge Inventory. This element is quantified using a "scour index", which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered "scour critical", or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition. Nonetheless, there are no scour critical structures within the county.

[3] http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm

Figure 3.2. Dent County Bridges



Source: MSDIS, MoDOT, MRPC

3.2.3 Other Assets

Assessing the vulnerability of the planning area to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons.

- These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters.
- Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

Threatened and Endangered Species: **Table 3.9** depicts Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.9. Threatened and Endangered Species in Dent County

Common Name	Scientific Name	Status
Amphibians		
Ozark Hellbender	*Cryptobranchus alleganiensis bishopi*	Endangered (F) (S)
Bird		
Red-cockaded Woodpecker	*Picoides borealis*	Endangered (F)
Northern Harrier	*Circus hudsonius*	Endangered (S)
Flowering Plants		
Mead's Milkweed	*Asclepias meadii*	Threatened (F)
Virginia Sneezeweed	*Helenium virginicum*	Threatened (F) Endangered (S)
Insect		
Hine's Emerald Dragonfly	*Somatochlora hineana*	Endangered (F) (S)
Mammal		
Gray bat	*Myotis grisescens*	Endangered (F) (S)
Indiana bat	*Myotis sodalis*	Endangered (F) (S)
Northern long-eared bat	*Myotis septentrionalis*	Threatened (F) Endangered (S)

Note: S = State, F = Federal
Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html;
MDC Missouri Natural Heritage Program Search

Natural Resources: The Missouri Department of Conservation (MDC) provides a database of lands owned, leased, or managed for public use. **Table 3.10** provides the names and locations of parks and conservation areas in Dent County.

Table 3.10. Conservation Areas in Dent County

Area Name	Address	City
Brown (Gerhild and Graham) CA	From Salem at the junction of Highway 72/Route H, take Route H west 3.50 miles, then Route DD north 3 miles.	Salem
Cedar Grove CA	To the larger tract(720 acres) : From Jadwin, take Route K south 3 miles to the area To the smaller tract(160 acres) :From Salem, take Highway 19 south 16 miles, then Route WW west 1 mile to the area.	Jadwin
Clement (R F) Mem Forest and WA	From Salem take Highway 72 north, then a left on Route C west 5 miles, then right on Route O north 2 miles, and a left on Route OO west 3.50 miles.	Salem
Hyer Woods CA	From Salem, take Highway 72 north 13 miles, then left on County Road 2070 west, then an immediate right (north) on Old Highway 72 across the bridge of the Hyer Branch, then left on County Road 2060 left and the area is on the left.	Salem
Indian Trail CA	From Salem, take Highway 19 northeast 12 miles to the area.	Salem
Lenox Towersite	From Lenox, take Route C south 1 mile.	Lenox
Montauk Fish Hatchery	Montauk Fish Hatchery/Trout Park is inside Montauk State Park, southeast of Licking. From Highway 137, take Route VV east 10 miles to Highway 119, then turn right, and watch for signs to the area.	Licking
Montauk Towersite	From Salem, Take Highway 32 west out of town 11 miles , turn left on Highway 19 south 3 miles, then turn west on County Road 6020 to the tower site.	Salem
Shawnee Mac Lakes CA	From Salem, take 10th Street, which becomes County Road 4110, east 2 miles to the area.	Salem

Short Bend Access	From Salem, take Highway 19 northeast about 9 miles.	Salem
White River Trace CA	From Highway 72 in Salem, take Route H west approximately 9 miles to Dent County Road 253. Headquarters is approximately 1.30 miles south on Dent County Road 253.	Salem

Source: http://mdc4.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s

Table 3.11 provides information pertaining to community owned/operated parks within Dent County.

Table 3.11. Community Owned Parks in Dent County

Park Name	Address	City
Main Park	Rolla Road	Salem
Roadside Park	-	Salem
Picnic Area	Center Street	Salem
Tiger Trail	-	Salem

Source: Google Search

Historic Resources: The National Register of Historic Places is the official list of registered cultural resources worthy of preservation. It was authorized under the National Historic Preservation Act of 1966 as part of a national program. The purpose of the program is to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering, and culture. **Table 3.12** provides information in regards to properties on the National Register of Historic Places in Dent County.

Table 3.12. Dent County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Dam and Spillway in the Hatchery Area at Montauk State Park	Salem vicinity off MO 119	Salem	2/26/85
Dent County Courthouse	Main and 4th St.	Salem	2/23/72
Lower Parker School	E bank of Current R. at Parker Hollow	Salem	5/31/91
Montauk State Park Open Shelter	Salem vicinity off MO 119	Salem	2/28/8
Nichols Farm District	W of CR V, N of Current River	Cedar Grove	12/27/89
Nova Scotia Ironworks Historic District	Mark Twain National Forest	Salem	8/25/03
Old Mill at Montauk State Park	Off MO 119	Salem	6/27/85
Young W.A. House	CR 513	Salem	3/30/89

Source: Missouri Department of Natural Resources – Missouri National Register Listings by County
http://dnr.mo.gov/shpo/mnrlist.htm

Economic Resources: **Table 3.13** provides major non-government employers in the planning area. There are approximately 397 employer establishments within the county, employing on average 9 individuals each[4].

Table 3.13. Major Non-Government Employers in Dent County

Employer Name	Product or Service	Employees
Community Care Center, Inc.	Nursing Home	100-249
Doe Run Co	Mining and Metal Production	100-249
Royal Oak Enterprises Inc.	Charcoal Manufacturer	100-249
Salem Memorial District Hospital	Hospital	100-249
Salem R-80 School District	School	100-249
U.S. Foods	Food Distributer	400
Wal-Mart	Retail	225

Source: https://missourieconomy.org/Employers/default.aspx

Agriculture plays an important role in Dent County. However, the Agribusiness Employment Location Quotient for the county is lower than 1.0; meaning that there is a relatively low share of agribusiness employment to its share of total national employment[5]. In addition, there were 343 individuals working in the agriculture industry, comprising 5.7% of the total workforce in 2016[6]. Furthermore, the market value of products sold in 2012 was $17.3 million; 89% from livestock sales and 11% from crop sales.

3.3 Future Land Use and Development

Table 3.14 provides population growth statistics for Dent County.

Table 3.14. Dent County Population Growth, 2000-2016

Jurisdiction	Total Population 2000	Total population 2016	2000-2016 # Change	2000-2016 % Change
Unincorporated Dent County	10,073	10,604	531	5.3
Salem	4,854	4,974	120	2.5

Source: U.S. Bureau of the Census, 2012-2016 5 Year American Community Survey; Census 2000 Summary File 1

Typically population growth or decline is generally accompanied by an increase or decrease in the number of housing units. **Table 3.15** provides the change in numbers of housing units in the planning area from 2000-2016.

[4] https://www.census.gov/quickfacts/fact/table/dentcountymissouri/HSG650216
[5] http://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf;
[6] https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_S2405&prodType=table

Table 3.15. Change in Housing Units, 2000-2016

Jurisdiction	Housing Units 2000	Housing Units 2016	2000-2016 # Change	2000-2016 % change
Unincorporated Dent County	4,626	4,820	194	4.2
Salem	2,368	2,422	54	2.2

Source: U.S. Census Bureau, 2012-2016 5 Year American Community Survey; U.S. Bureau of the Census, Census 2000 Summary File 1

Jurisdictions reported anticipated future developments within the next 5 years (2018-2023). Dent County anticipates a new County Jail on East 5th Street. The City of Salem anticipates a sewer plant upgrade, water and sewer extensions, AMI meter system for city utilities, and Family Trash is relocating to Salem Industrial Park.

North Wood R-IV reported possible developments within the next 5 years. Oak Hill R-I initiated a new building project in May 2017. Dent-Phelps R-III, Green Forest R-II, and Salem R-80 did not report future developments within the next 5 years.

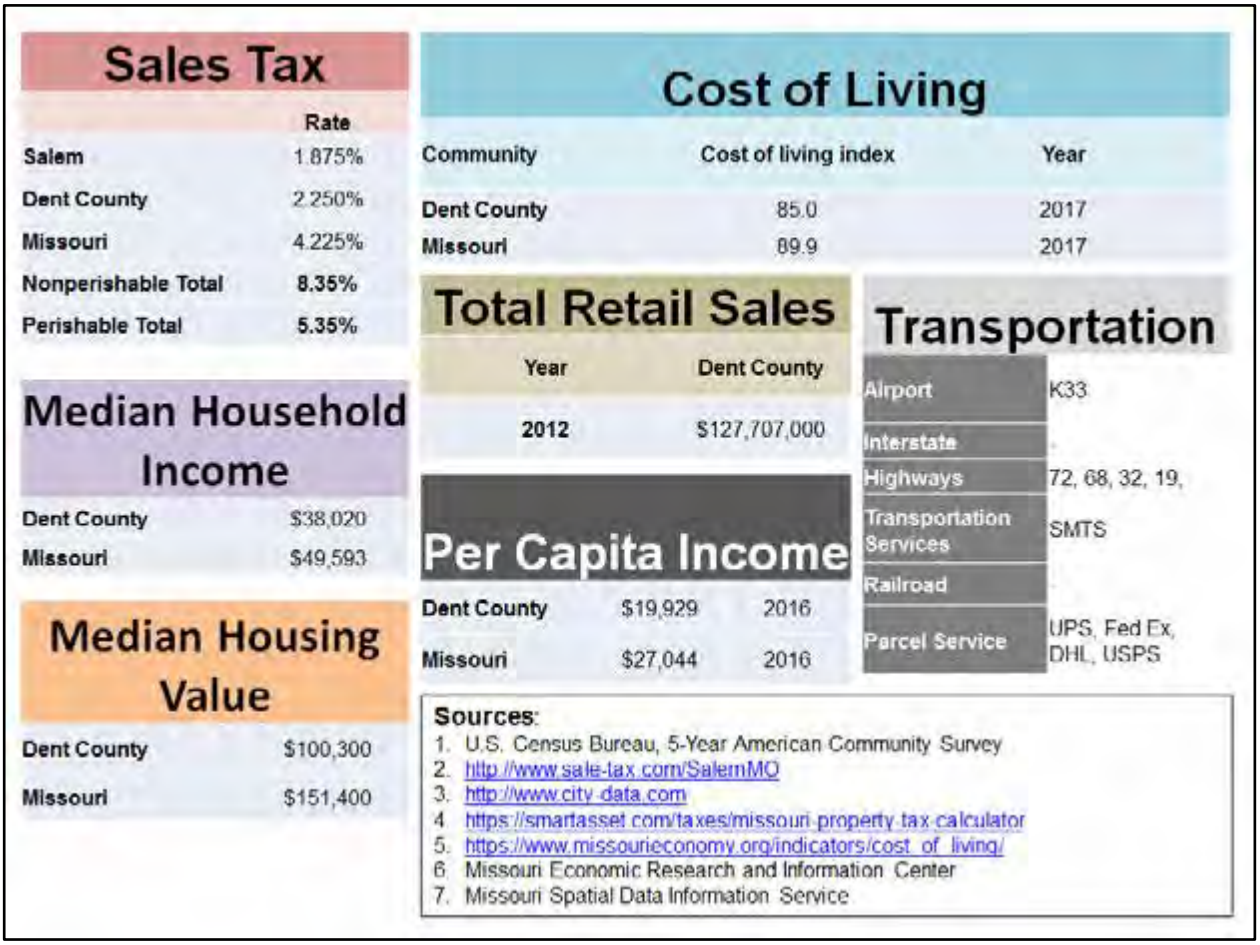
New development can impact a jurisdiction's vulnerability to natural hazards. As the number of buildings, critical facilities, and assets increase, vulnerability increases as well. For example, real estate development can increase storm water runoff, which often increases localized flooding. However, some development such as infrastructure improvements can help reduce vulnerability risks. Unfortunately, quantitative data is not available to further examine each jurisdictions new development and its correlation to natural hazard vulnerabilities.

Socioeconomic Profile

The University of Missouri Extension developed a Social and Economic Profile for Dent County. Population trend data suggests that Dent County will increase by 116 individuals within the next 2 to 12 years[7]. Furthermore, business incentives are available in the County including MissouriWorks, a program for qualified job creators which enables the retention of withholding tax or tax credits that can be transferrable, refundable and/or saleable; BUILD, a financial incentive for the location or expansion of large business projects; sales tax exemptions exist for qualified manufacturers; and. industrial infrastructure grants are available up to $2 million or $20,000 per job created[8]. **Figure 3.3** displays socioeconomic data for Dent County compared to the State of Missouri.

[7] UM Extension Social and Economic Profile http://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=websas.cntypage.sas&county=29065
[8] https://ded.mo.gov/programs/business/missouri-works

Figure 3.3. Dent County Socioeconomic Profile



3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard that has been determined to be a potential risk to Dent County is profiled individually in this section of the plan document. The profile will consist of a general hazard description, location, severity/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could impact risk. At the end of each hazard profile will be a vulnerability assessment, followed by a summary problem statement.

Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…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.

Each hazard identified in Section **3.1.4** will be profiled individually in this section in alphabetical order. The level of information presented in the profiles will vary by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include information categorized as follows:

Hazard Description: This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.

Geographic Location: This section describes the geographic location of the hazard in the planning area. Where available, use maps to indicate the specific locations of the planning area that are vulnerable to the subject hazard. For some hazards, the entire planning area is at risk.

Severity/Magnitude/Extent: This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

Previous Occurrences: This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

The discussion on the probability of future occurrence should also consider changing future conditions, including the effects of long-term changes in weather patterns and climate on the identified hazards. NOAA has a new tool that can provide useful information for this purpose.

- NOAA Climate Explorer, http://toolkit.climate.gov/climate-explorer2/

Vulnerability Assessments

Requirement §201.6(c)(2)(ii) :[The risk assessment shall include 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.

Requirement §201.6(c)(2)(ii)(A) :The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B) :[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments will be based on the best available county-level data, which is in the Missouri Hazard Mitigation Plan (2013). The county-level assessments in the State Plan were based on the following sources:

- Statewide GIS data sets compiled by state and federal agencies; and
- FEMA's HAZUS-MH loss estimation software.

The vulnerability assessments in the Dent County plan will also be based on:

- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans and reports;
- Personal interviews with planning committee members and other stakeholders; and
- Other sources as cited.

Within the Vulnerability Assessment, the following sub-headings will be addressed:

Vulnerability Overview: This section will include a brief review of the vulnerability of each hazard.

Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

Future Development: This section will include information on anticipated future development in the county, and how that would impact hazard risk in the planning area.

Previous and Future Development: This section will include information on how changes in development have impacted the community's vulnerability to this hazard. Describe how any changes in development that occurred in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability. Describe any anticipated future development in the county, and how that would impact hazard risk in the planning area.

Problem Statements

Each hazard analysis must conclude with a brief summary of the problems created by the hazard in the planning area, and possible ways to resolve those problems. Additionally, variations in risk between geographic areas will be included.

3.4.1 Dam Failure

Some specific sources for this hazard are:

- Missouri Department of Natural Resources, Dam and Reservoir Safety, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm
- Stanford University's National Performance of Dams Program; http://npdp.stanford.edu/index.html
- National Inventory of Dams, http://geo.usace.army.mil/
- MO DNR Dam & Reservoir Safety Program;
- National Resources Conservation Service http://www.nrcs.usda.gov
- DamSafetyAction.org, http://www.damsafetyaction.org/MO/
- Missouri Spatial Data Information Service, http://msdis.missouri.edu

Hazard Profile

Hazard Description

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following:

1. Overtopping - inadequate spillway design, debris blockage of spillways or settlement of the dam crest.
2. Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.
3. Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.
4. Structural Failure: caused by an earthquake, slope instability or faulty construction.

Information regarding dam classification systems under both the Missouri Department of Natural Resources (MDNR) and the National Inventory of Dams (NID), which differ, are provided in **Table 3.16** and **Table 3.17**, respectively.

Table 3.16. MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	Contains 10 or more permanent dwellings or any public building
Class II	Contains 1 to 9 permanent dwellings or 1 or more campgrounds with permanent water, sewer, and electrical services or 1 or more industrial buildings
Class III	Everything else

Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules_reg_94.pdf

Table 3.17. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	A dam located in an area where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low volume roads that meet the requirements for low hazard dams.
Significant Hazard	A dam located in an area where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet certain requirements, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.
High Hazard	A dam located in an area where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described for significant hazard dams.

Source: National Inventory of Dams

Geographic Location

Dams in Planning Area

According to the Department of Natural Resources there are 36 dams within Dent County; including Class 1 (5), Class 2 (8), Class 3 (23) (**Table 3.18**). In addition, the state regulates 4 of the 36 dams. The NID recognizes 35 dams in the planning area; including high (13), significant (3), and low (19) NID hazard class dams. None of the dams are owned or operated by the United States Army Corps of Engineers (USACE). County dams are privately or commercially owned. **Table 3.19** provides the names, locations, and other pertinent information for all NID High Hazard Dams in the planning area.

Table 3.18. Dent County Dams Hazard Risk

Name of Dam	DNR Hazard Class	NID Hazard Class
ALLISON & HAAS LAKE DAM	3	Low
ARROWHEAD LAKE UPPER DAM	3	Low
ARROWHEAD LAKES LOWER DAM	1	High
BASS DAM	2	High
BISHOP DAM	2	High
BUBBLING SPRINGS DAM	2	High
CLARK LAKE DAM	2	High
DEEKEN DAM	3	Low
ECHO LAKE DAM #2	3	Low
GREEN DAM	3	Low
HART DEVELOPMENT LAKE DAM SECT 10	2	High

HART DEVELOPMENT LAKE DAM-SECT 15	3	Low
HONEY LAKE DAM	3	Low
HOWES MILL FISH HATCHERY	3	Low
HUZZAH HATCHERIES, INC DAM	3	Low
IMPERIAL PRODUCTS DAM	3	Significant
INDIAN TRAIL FISH HATCHERY LAKE DAM	2	High
LAKE JOY DAM	3	Significant
LAKE TURNER DAM	1	High
LAKE WILLIAMS DAM	3	Significant
LAKE ZISKE DAM	1	High
LITTLE SCOTIA POND	3	-
LOSS LAKE DAM	2	High
MASTERS DAM	1	High
METZGER DAM	3	Low
MITCHELL DAM	1	High
MONONAME 18	3	Low
MUND DAM	3	Low
PUTMAN DAM	3	Low
RYDER LAKE DAM	3	Low
SCOTIA POND DAM	3	Low
STREET LAKE DAM	3	Low
TEALWOOD DAM	3	Low
TIEFENTHALER LAKE DAM	2	High
WARNER LAKE DAM	3	Low
WOOD BROTHERS DAM	3	Low

Source: Missouri Department of Natural Resources, Water Resources Program

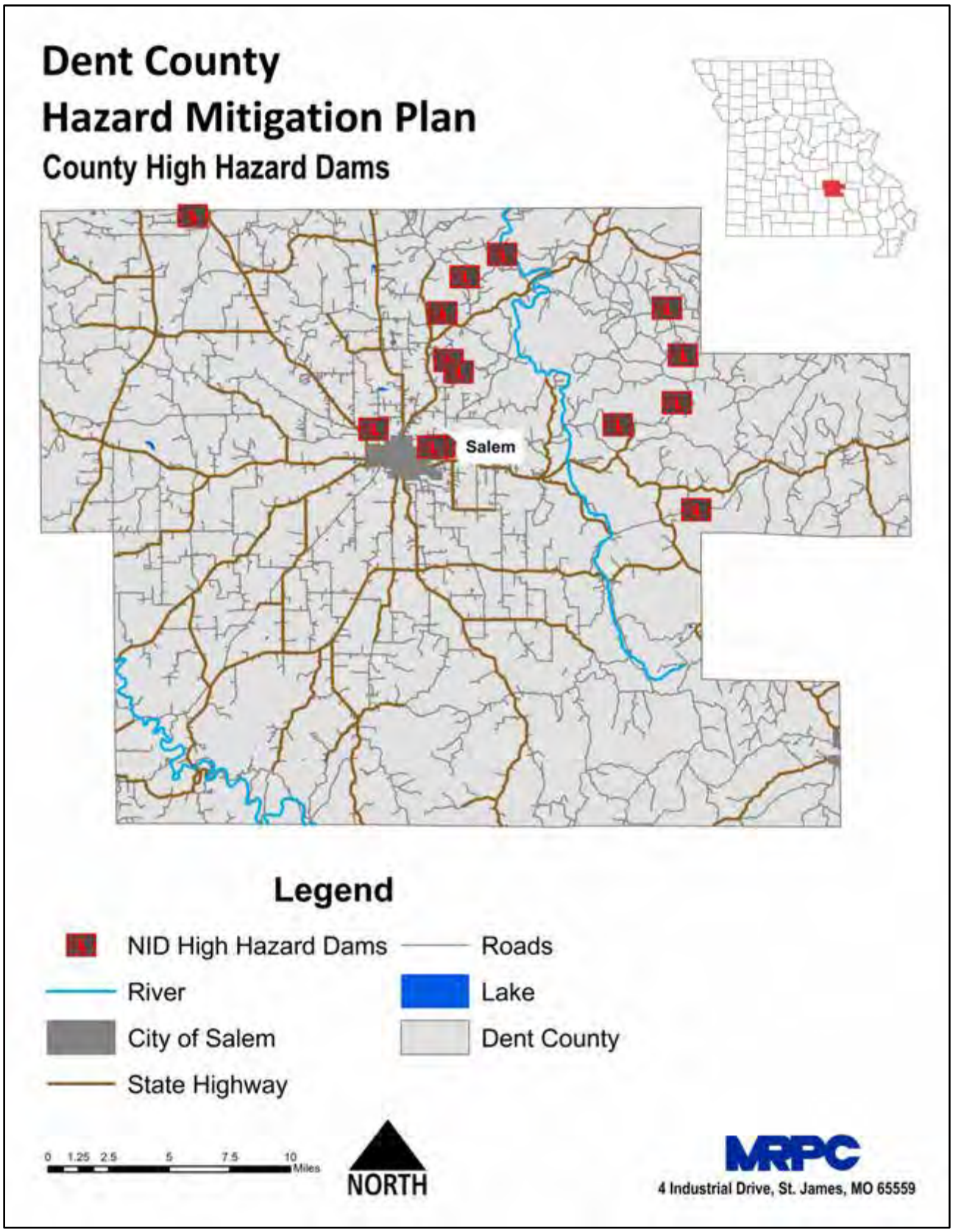
Table 3.19. NID High Hazard Class Dams in the Dent County Planning Area

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
ARROWHEAD LAKES LOWER DAM	MO30267	High	27	84	TR MERAMEC RIVER	COOK STATION	13
BASS DAM	MO30070	High	20	118	TR SPRING CREEK	SALEM	1
BISHOP DAM	MO31049	High	25	201	STONE HILL BRANCH	WESCO	28
BUBBLING SPRINGS DAM	MO30008	High	23	185	PETERS BRANCH	LAKE SPRING	0
CLARK LAKE DAM	MO30269	High	25	67	TR-HUTCHINS CREEK	WESCO	20
HART DEVELOPMENT LAKE DAM SECT 10	MO30264	High	30	835	LOST CREEK	COOK STATION	5
INDIAN TRAIL FISH HATCHERY LAKE DAM	MO30054	High	30	241	CROOKED CREEK	SLIGO	6
LAKE TURNER DAM	MO30266	High	32	274	TR SPRING CREEK	SALEM	1
LAKE ZISKE DAM	MO30071	High	24	372	TRIBUTARY TO SPRING CREEK	SALEM	2
LOSS LAKE DAM	MO30262	High	65	2,200	LOST CREEK	COOK STATION	8
MASTERS DAM	MO30065	High	33	565	LOST CREEK	WESCO	3
MITCHELL DAM	MO30268	High	31	481	TR MERAMEC RIVER	COOK STATION	12
TIEFENTHALER LAKE DAM	MO31322	High	39	546	HAMILTON HOLLOW CROOKED CREEK	SALEM	0

Sources: National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12.

Figure 3.3 depicts locations of NID high hazard dams located in the planning area. If a dam failure were to occur in Dent County, depending upon dam and location, the severity would range between negligible to life threatening. Road infrastructure, residential structures, commercial buildings, and public buildings are all vulnerable to losses. There no areas of assembly in dam inundation zones within the county. Two dam inundation maps were available from the Missouri Department of Natural Resources. These State regulated dams include Loss Lake Dam and Tiefenthaler Lake Dam (**Figure 3.4** and **Figure 3.5**). No other dam inundation maps were available for the remaining NID High Hazard Dams in the county.

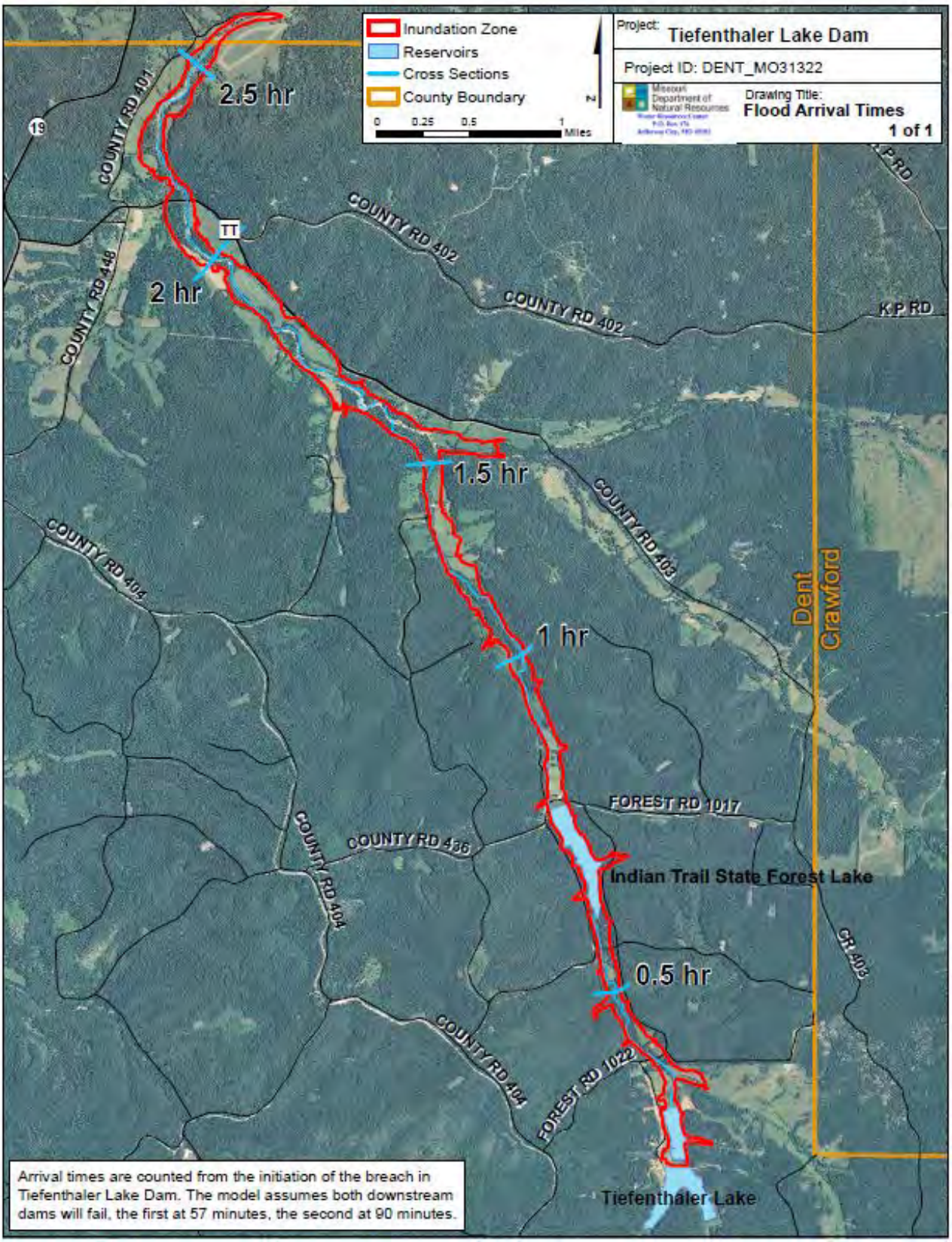
Figure 3.3. NID High Hazard Dam Locations in Dent County



Source: MSDIS, MRPC

Figure 3.4. Loss Lake Dam Inundation Zone

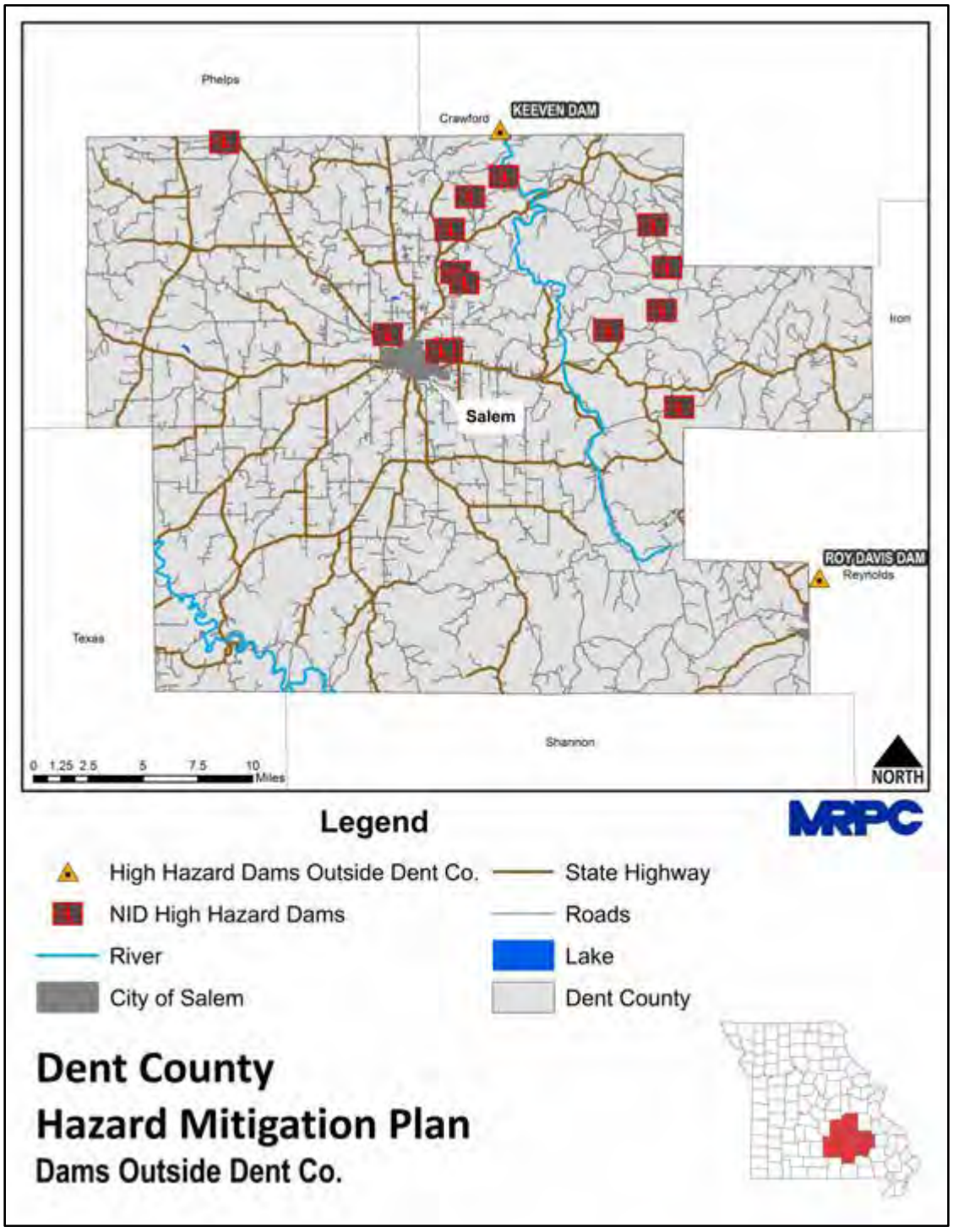
Figure 3.5. Tiefenthaler Lake Dam Inundation Zone



Upstream Dams Outside the Planning Area

Figure 3.6 depicts dams outside of Dent County. Two High Hazard dams (1 regulated) are located within a 1 mile buffer of the county. According to the Missouri Department of Natural Resources, Missouri Geological Survey, Water Resources Center, there are no high hazard dams that would flow into Dent County from surrounding counties during a failure event.

Figure 3.6. Upstream Dams Outside Dent County



Source: MSDIS, MRPC

Severity/Magnitude/Extent

The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Worst case scenario would be a catastrophic failure at any of the high hazard class dams designated in **Table 3.19**.

Previous Occurrences

According to Stanford University's National Performance of Dams Program and the Missouri State Emergency Management Agency, there were 69 recorded dam incidents in Missouri between 1917 and 2008. Fourteen were considered failures[9,10]. Fortunately, only one drowning has been associated with a dam failure in the state. The problem of unsafe dams in Missouri was underscored by dam failures at Lawrenceton in 1968, Washington County in 1975, Fredricktown in 1977, and a near failure in Franklin County in 1979. A severe rainstorm and flash flooding in October 1998 compromised about a dozen small, unregulated dams in the Kansas City area. But perhaps the most spectacular and widely publicized dam failure in recent years was the failure of the Taum Sauk Hydroelectric Power Plant Reservoir atop Profitt Mountain in Reynolds County, MO.

In the early morning hours of December 14, 2005, a combination of human and mechanical error in the pump station resulted in the reservoir being overfilled. The manmade dam around the reservoir failed and dumped over a billion gallons of water down the side of Profitt Mountain, into and through Johnson's Shut-Ins State Park and into the East Fork of the Black River. The massive wall of water scoured a channel down the side of the mountain that was over 6000 feet wide and 7,000 feet long that carried a mix of trees, rebar, concrete, boulders and sand downhill and into the park[11]. The deluge destroyed Johnson's Shut-Ins State Park facilities, including the campground, and deposited sediment, boulders and debris into the park. The flood of debris diverted the East Fork of the Black River into an older channel and turned the river chocolate brown. Fortunately the breach occurred in mid-winter. Five people were injured when the park superintendent's home was swept away by the flood, but all were rescued and eventually recovered. Had it been summer, and the campground filled with park visitors, the death toll could have been very high[12]. This catastrophe has focused the public's attention on the dangers of dam failures and the need to adequately monitor dams to protect the vulnerable.

Despite the significance of the immediate damage done by the Taum Sauk Reservoir dam failure, the incident also highlights the long-term environmental and economic impacts of an event of this magnitude. Four years later, the toll of the flooding and sediment on aquatic life in the park and Black River is still being investigated. Even after the removal of thousands of dump truck loads of debris and mud, the river is still being affected by several feet of sediment left in the park. The local economy, heavily reliant upon the tourism from the park and Black River, has also been hit hard[13].

Overall, many of Missouri's smaller dams are becoming a greater hazard as they continue to age and

[9] http://npdp.stanford.edu/dam_incidents

[10] 2013 Missouri State Hazard Mitigation Plan

[11] United States Geological Survey. Damage Evaluation of the Taum Sauk Reservoir Failure using LiDAR. http://mcgsc.usgs.gov/publications/t_sauk_failure.pdf

[12] The Alert. Spring 2006. After the Deluge…What's Ahead for Taum Sauk? By Dan Sherburne.

[13] The Alert. Spring 2006. After the Deluge…What's Ahead for Taum Sauk? By Dan Sherburne.

deteriorate. While hundreds of them need to be rehabilitated, lack of available funding and often questions of ownership loom as obstacles difficult to overcome[14].

Event Description

According to Stanford University's National Performance of Dams Program, no dam incidents have been recorded for Dent County[15].

Probability of Future Occurrence

Since it is unknown which dams, if any might fail at any given time, determining the probability of future occurrence is not possible[16]. In addition, dam failure within the county has not occurred according to available data. **Table 3.4** depicts dam failure probability as no data available (NDA).

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for the vulnerability analysis of dam failure for Dent County. There are however data limitations regarding dams unregulated by the State of Missouri due to height requirements. These limitations hinder vulnerability analysis; nonetheless, failure potential still exists. **Table 3.20** provides vulnerability analysis data for the failure of State-regulated dams in Missouri.

Table 3.20. Vulnerability Analysis for Failure of State-regulated Dams in Missouri

County	Class 1	Class 2	Class 3	Total	Estimated # of Buildings Vulnerable	Average Exposure Value per Structure ($)	Estimated Total Potential Building Exposure ($)	Estimated Total Population Exposure	Estimated Building Losses ($)
Dent	0	2	2	4	10	78,112	1,527,519	3	763,759

Source: 2013 Missouri State Hazard Mitigation Plan

For the vulnerability analysis of State regulated dams, the State developed the following assumptions for overview.

- Class 1 dams, the number of structures in the inundation area was estimated to be 10 buildings since this is the minimum threshold for a dam being considered a class 1 dam.
- Class 2 dams, the number of structures in the inundation area was estimated to be 5

[14] United States Geological Survey Fact Sheet 131-02. October 2002
[15] http://www.npdp.standord.edu/dam_incidents
[16] 2013 Missouri State Hazard Mitigation Plan

buildings. This is the mid-range of buildings in the inundation area for a dam to be considered a class 2 dam.
- Class 3 dams, the number of structures in the inundation area was estimated to be 0 buildings since class 3 dams do not have any structures within their inundation area.

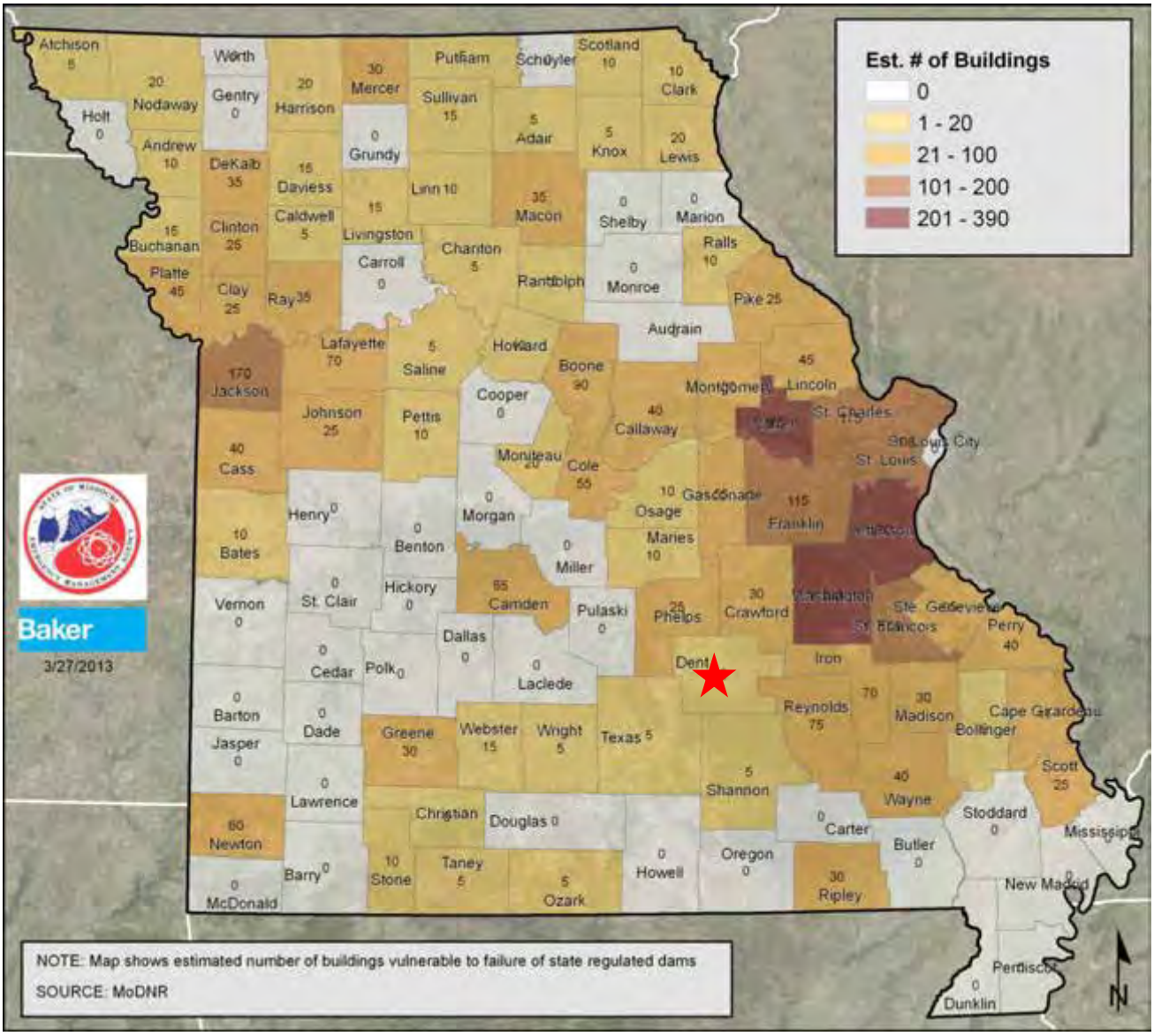
According to the 2013 Missouri State Hazard Mitigation Plan, there is an estimated 10 buildings vulnerable to failure of State-regulated dams (**Figure 3.7**). Furthermore, the state quantified potential loss estimates in terms of property damages. To execute the analysis, the following assumptions were utilized.

- Average values for residential structures were obtained for each county from HAZUS-MH MR4. Residential structures were chosen as the most prevalent structure-type downstream of dams. Although certainly other building types are present, the numbers and values are not known.
- The estimated structure loss was estimated to be at 50 percent of the value of the structure. Actual losses will vary based on the depth of inundation.
- For population exposure, United States Census blockers were intersected with available State regulated dam inundation areas to identify the vulnerable population for each county[17].

Figure 3.8 and **Figure 3.9** depict the total estimated building losses and population exposure by county, respectively. The estimated building losses from failure of State-regulated dams are $1 – $2 million. The estimated population exposure to failure of State-regulated dams ranges between 1 and 130.

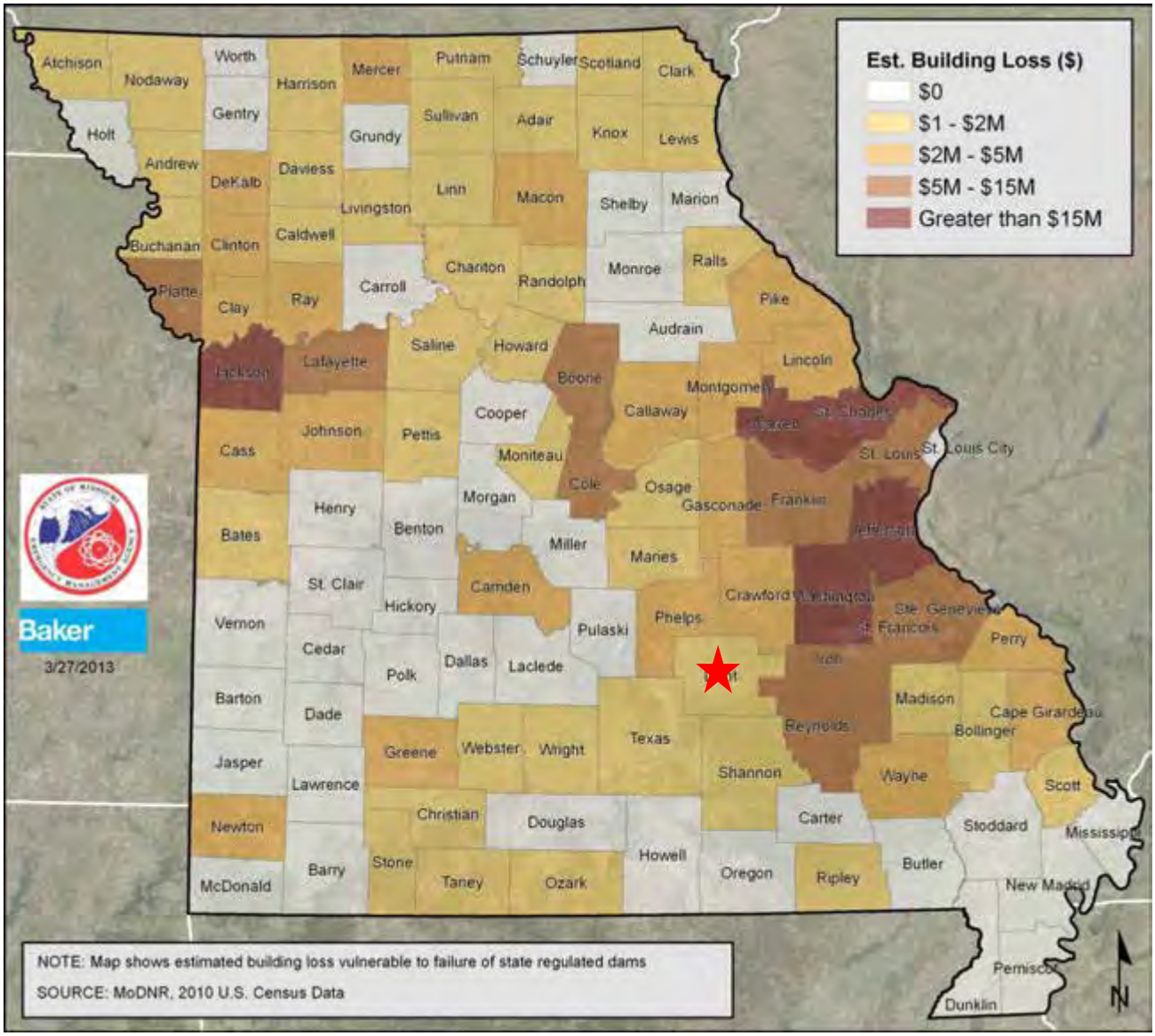
[17] 2013 Missouri State Hazard Mitigation Plan

Figure 3.7. Estimated Number of Buildings Vulnerable to Failure of State-regulated Dams



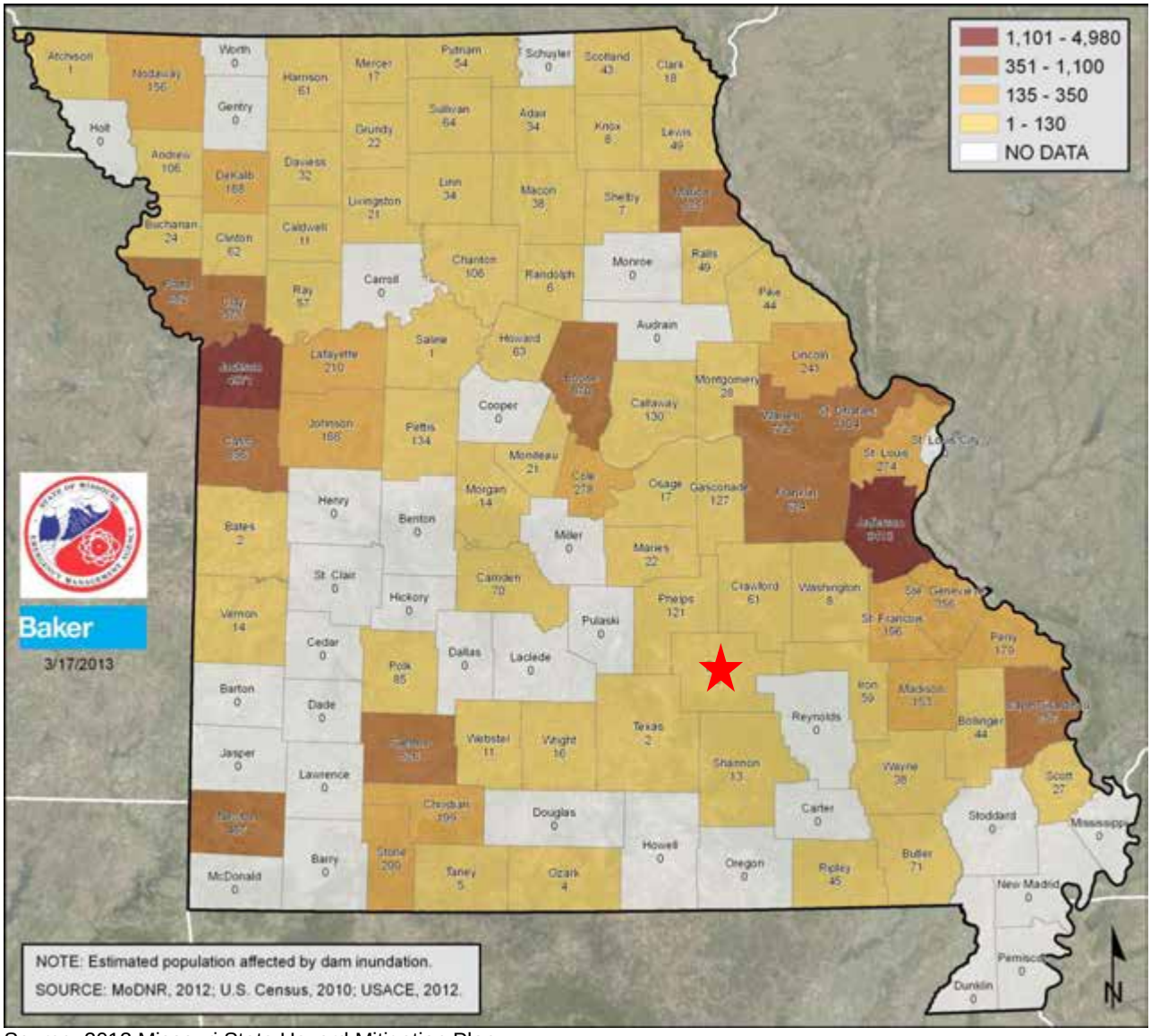
Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.8. Estimated Building Losses from Failure of State-regulated Dams



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.9. Estimated Population Exposure to Failure of State-regulated Dams



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

The most obvious worst case dam failure scenario would occur at any High Hazard/Class 1 dam. During a failure event, serious loss to road infrastructure, commercial and residential structures, and human life is likely. However, the majority of dams in Dent County are rural in nature.

Impact of Future Development

Future development within the county that has potential to be influenced by dam failure includes any areas downstream of a dam within the 100 Year Floodplain.

Hazard Summary by Jurisdiction

Variations in vulnerability across the planning area depend upon multiple variables. Nonetheless, Dent County school districts and special districts do not have assets located in dam breach inundation areas.

Problem Statement

In summary, the hazard risk for dam failure in Dent County ranges between high and low, dependent upon the dam. If a dam does fail, the expected impacts could vary from negligible to critical, and could potentially affect road infrastructure, residential structures, commercial buildings, public structures, and human life. It is recommended to encourage land use management practices to decrease the potential for damage from a dam collapse; including the discouragement of development in areas with the potential for sustaining damage from a dam failure. Installation of education programs to inform the public of dam safety measures and preparedness activities would be beneficial. In addition, the availability of training programs to encourage land owners how to properly inspect their dams, and develop emergency action plans would be advantageous.

3.4.2 Drought

Some specific sources for this hazard are:

- Maps of effects of drought, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; http://www.drought.unl.edu/.
- Historical drought impacts, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; at http://droughtreporter.unl.edu/ .
- Recorded low precipitation, NOAA Regional Climate Center, (http://www.hprcc.unl.edu).
- Water shortages, Missouri's Drought Response Plan, Missouri Department of Natural Resources, http://dnr.mo.gov/pubs/WR69.pdf
- Populations served by groundwater by county, USGS-NWIS, http://maps.waterdata.usgs.gov/mapper/index.html
- Census of Agriculture, http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Missouri/and http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- Natural Resources Defense Council, http://www.nrdc.org/globalWarming/watersustainability/

Hazard Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the 2013 Missouri State Hazard Mitigation Plan, which are as follows.

- Meteorological drought is defined in terms of the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

- Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.

- Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

- Socioeconomic drought refers to when physical water shortage begins to affect people[18].

Geographic Location

All areas and jurisdictions in Dent County are susceptible to drought, but particularly cities where thousands of residents are served by the same source of water. These cities use deep hard rock wells that are 1,100 to 1,800 feet deep and can experience drought when recharge of these wells is low. The number of individuals within the county served by groundwater is 8,069[19]. However, rural residences with individual wells will likely be affected as well. Approximately 38.9% of the land in the county is utilized for agricultural purposes. Furthermore, livestock sales comprise 89% of the market of agricultural products sold in Dent County. A drought would directly impact livestock production and the agriculture economy in Dent County[20].

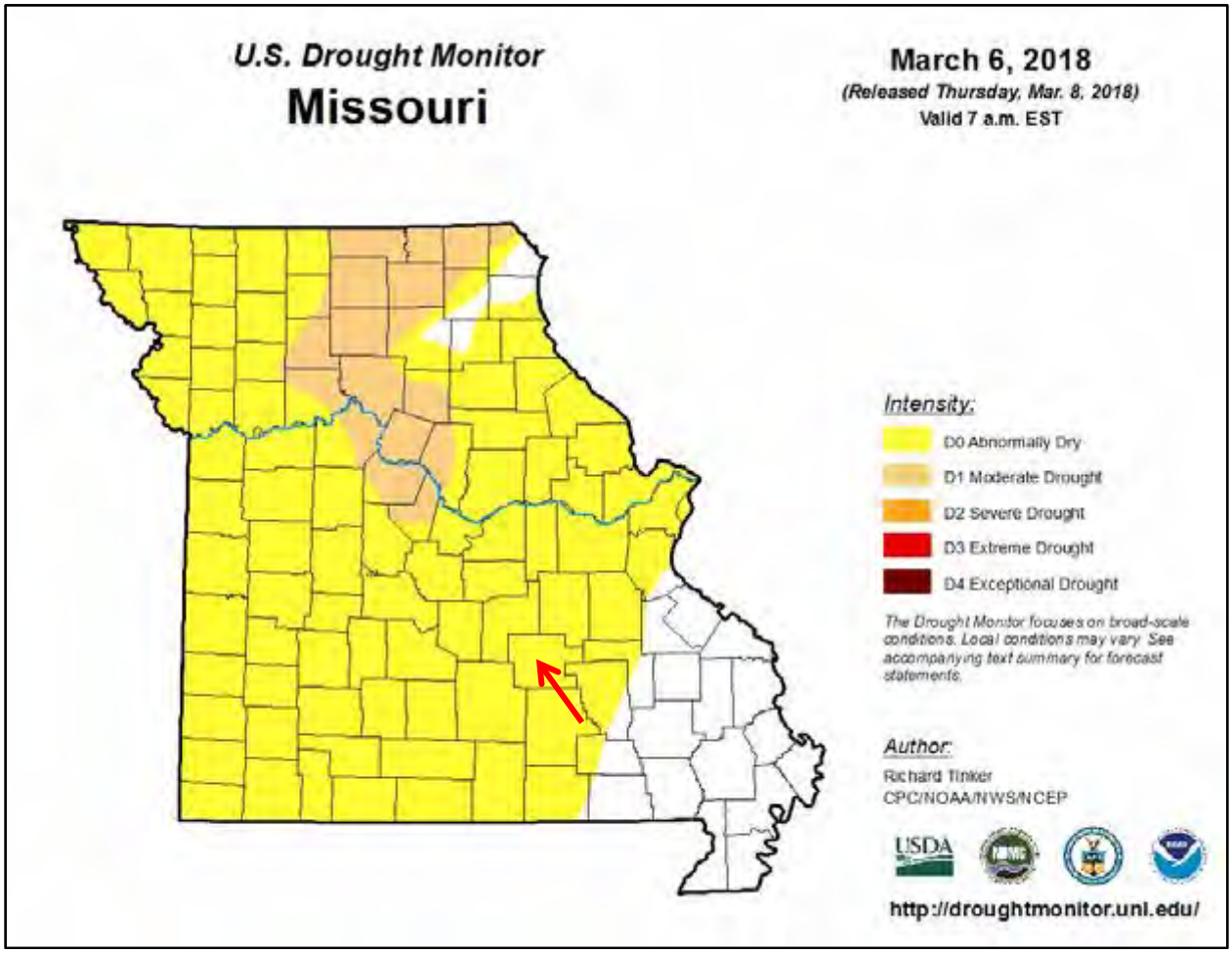
Severity/Magnitude/Extent

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential severity of drought as follows. Drought can create economic impacts on agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn place both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Finally, while drought is rarely a direct cause of death, the associated heat, dust and stress can all contribute to increased mortality[21].

Figure 3.10 depicts a U.S. Drought Monitor map of Missouri on March 6, 2018. This map illustrates the planning area, which could be in drought at any given moment in time. A red arrow indicates the location of the planning area (Dent County).

[18] http://www.drought.unl.edu/ http://droughtreporter.unl.edu/
[19] 2013 Missouri State Hazard Mitigation Plan
[20] http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/cp29161.pdf
[21] Ibid

Figure 3.10. U.S. Drought Monitor Map of Missouri on March 6, 2018



Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?MO

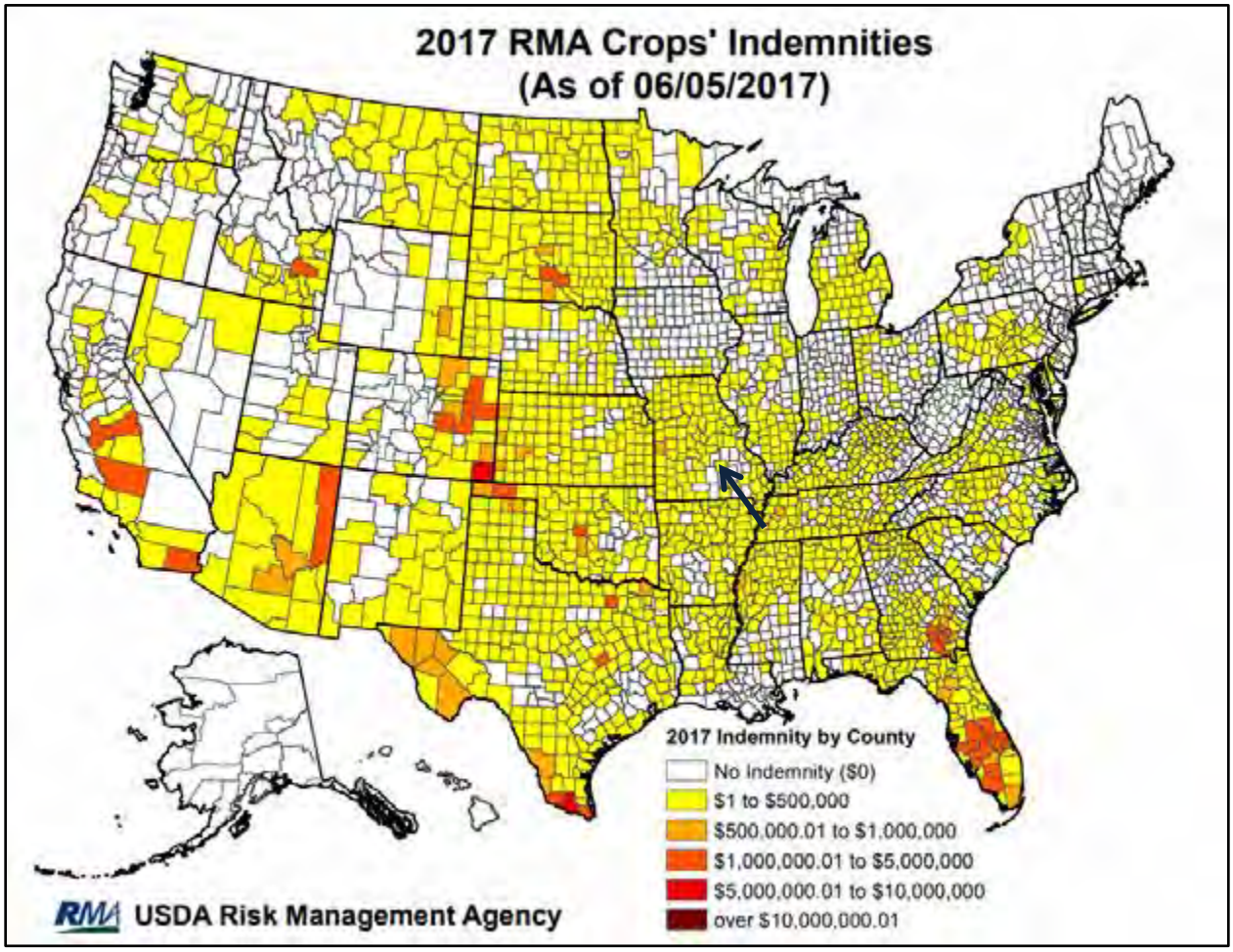
Table 3.21 details crop losses between 1998 and 2012 for Dent County. Additionally, **Figure 3.11** illustrates RMA crop indemnities for 2017 across the United States. Dent County fell in the range of $1 to $500,000 for crop indemnities.

Table 3.21. Dent County Crop Losses 1998 – 2012 (USDA Risk Management Agency)

Total Crop Insurance Paid for Drought Damage 1998-2012	Crop Claims Ratio Rating	Annualized Crop Insurance Claims/Drought Damage	Crop Exposure (2007 Census of Agriculture)	Annual Crop Claims Ration	Crop Loss Ratio Rating
$1,949	1	$130	$1,270,000	0.01%	1

Source: 2013 Missouri State Hazard Mitigation Plan, USDA Risk Management Agency and USDA crop exposure

Figure 3.11. 2017 RMA Crop Indemnities for the United States



Source: http://www.rma.usda.gov/data/indemnity/
*Black arrow indicates Dent County

According to the USDA's Risk Management Agency, there has been 1 crop insurance payment due to drought since 1998. **Table 3.22** illustrates the year, number of payments, and total amount of crop insurance payments.

Table 3.22. Dent County Crop Indemnity Payments (1998-2017)

Year	Number of Payments	Total
2017	1	$903

Source: http://www.rma.usda.gov/data/cause.html

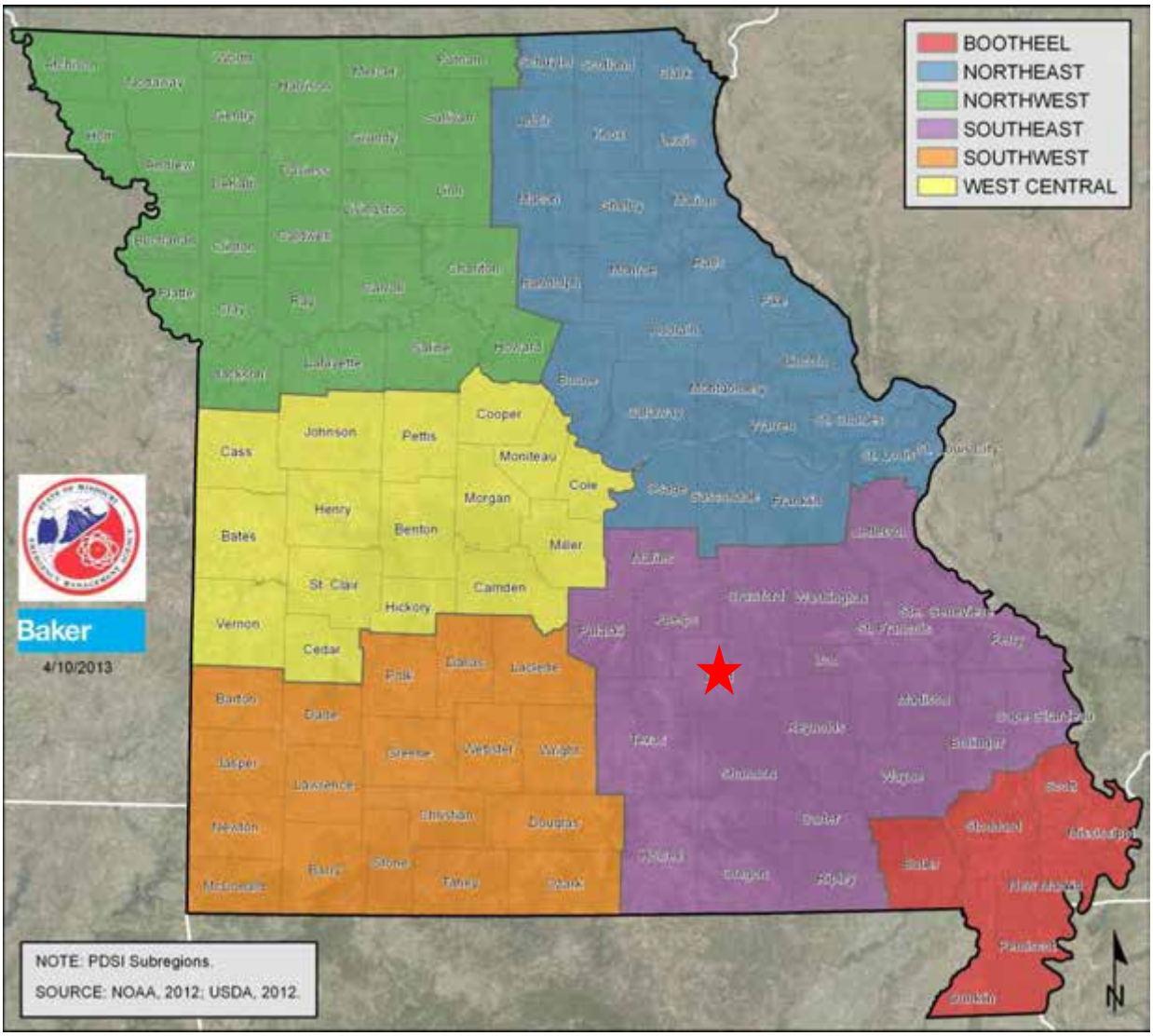
The Palmer Drought Indices measure dryness based on recent precipitation and temperature. The indices are based on a "supply-and-demand model" of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates, and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a "0" as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers.

Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

Figure 3.12 illustrates the Palmer Drought Severity Index sub-regions of Missouri. Dent County is categorized under the Southeast sub-region.

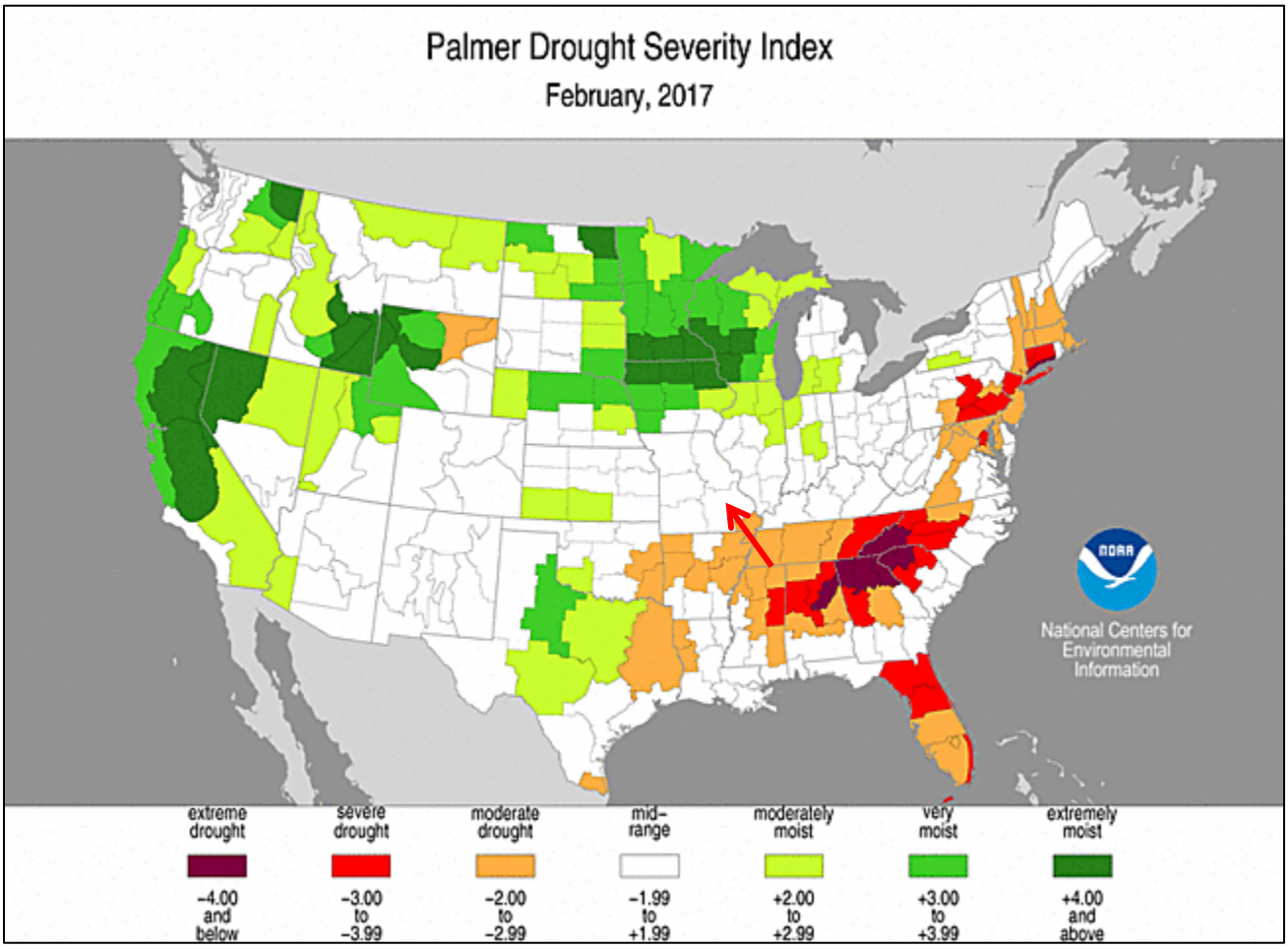
Figure 3.12. Palmer Drought Severity Index: Missouri Sub-regions



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

Figure 3.13 is an example of the Palmer Modified Drought Index for the United States on February, 2017.

Figure 3.13. Palmer Modified Drought Index National Map February, 2017



Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/; *Red arrow indicates Dent County

Data was collected from the Missouri Department of Natural Resources (2017 Census of Missouri Public Water Systems) to determine water source by jurisdiction. Dent County and the City of Salem utilize well water as their sole source of water (**Table 3.23**). Communities that exclusively depend upon ground water could experience hardship in the event of a long term drought.

Table 3.23. 2017 Water Source by Jurisdiction

Jurisdiction	% of source that is groundwater
Dent County	100
Salem	100

Source: Missouri Dept. of Natural Resources, 2017 Census of Missouri Public Water Systems

Previous Occurrences

Table 3.24 offers Palmer Drought Severity Index data for Dent County between 2010 and 2017. This information exemplifies drought conditions on a monthly basis for Missouri's Southeast sub-region within the United States.

Table 3.24. Palmer Drought Severity Index for Dent County, MO (2010 – 2017)

	Year							
Month	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Jan.	Extremely moist	Mid-range	Mid-range	Mid-range	Moderately moist	Mid-range	Very moist	Mid-range
Feb.	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Very moist	Mid-range
March	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist	Mid-range
April	Mid-range	Very moist	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist
May	Mid-range	Very moist	Moderate drought	Mid-range	Mid-range	Mid-range	Moderately moist	Very moist
June	Mid-range	Mid-range	Moderate drought	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist
July	Mid-range	Mid-range	Severe drought	Mid-range	Mid-range	Moderately moist	Moderately moist	Moderately moist
Aug.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Very moist	Very moist	Moderately moist
Sept.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Moderately moist	Very moist	Mid-range
Oct.	Mid-range	Mid-range	Moderate drought	Moderately moist	Mid-range	Mid-range	Very moist	Mid-range
Nov.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Very moist	Very moist	Moderate drought
Dec.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Extremely moist	Moderately moist	Severe drought

Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201001-201511

Probability of Future Occurrence

To calculate the probability of future occurrence of drought in Dent County, historical climate data was analyzed. There were 32 months of recorded drought (**Table 3.25**) over a 20 year span (January, 1998 to December, 2017). The number of months in drought (32) was divided by the total number of months (240) and multiplied by 100 for the annual average percentage probability of drought (**Table 3.26**). Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increase change of drought.

Table 3.25. Palmer Drought Severity Index for Dent County, MO (1998 – 2017)

	Year											
Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
1998												
1999										x	x	x
2000	x	x	x	x	x	x	x	x	x	x	x	x
2001	x		x	x	x							
2002												
2003												
2004												
2005						x						
2006												
2007										x	x	
2008												
2009												
2010												
2011												
2012					x	x	x	x	x	x	x	x
2013												
2014												
2015												
2016												
2017											x	x

Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/zin/199409-201511
*x indicates drought

Table 3.26. Annual Average Percentage Probability of Drought in Dent County, MO

Location	Annual Avg. % P of Drought
Dent County	13.3%

Source: NOAA National Centers for Environmental Information, Historical Palmer Drought Indices
*P = probability; see page 3.24 for definition.

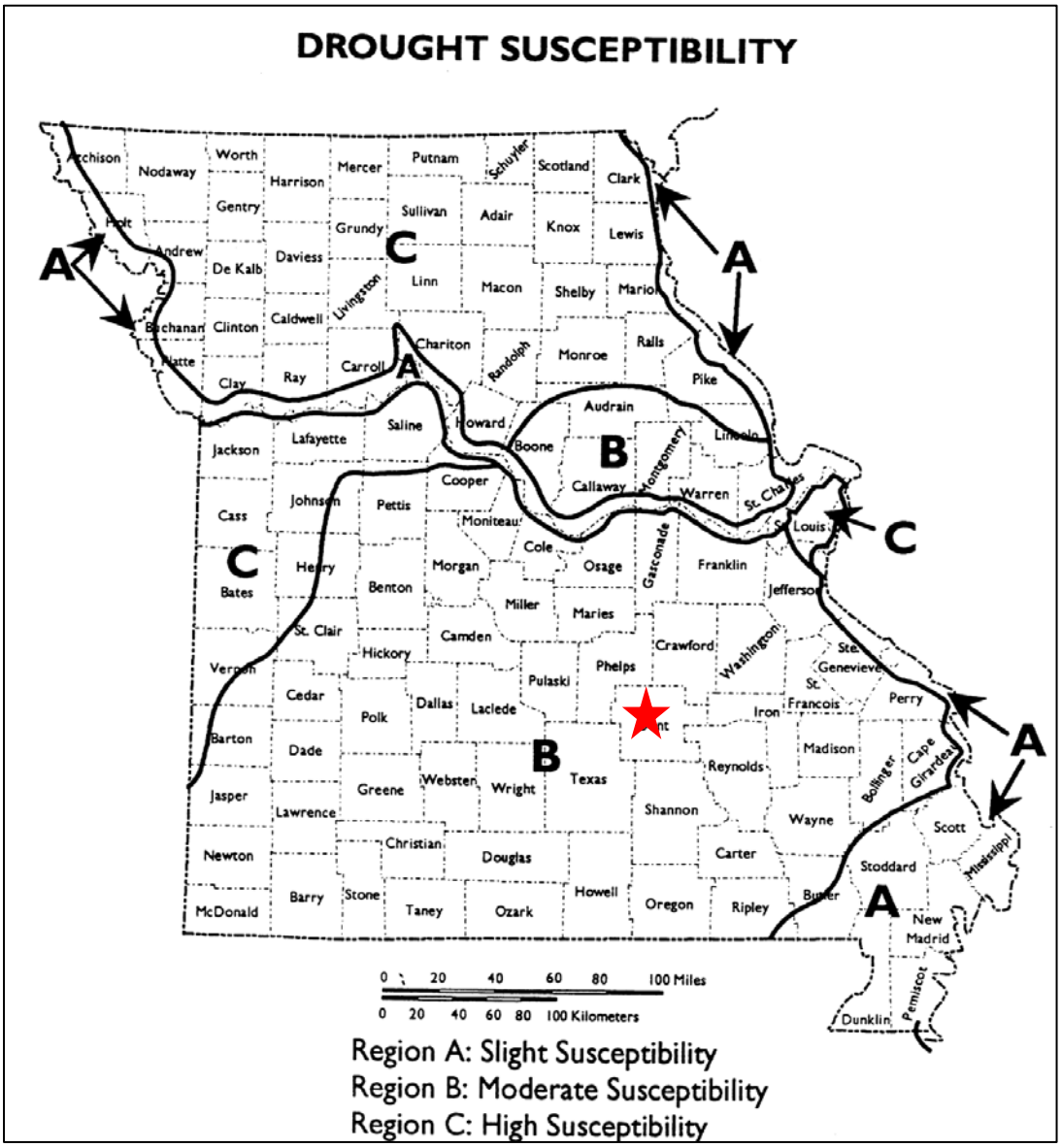
Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for the drought vulnerability analysis. **Table 3.27** depicts the ranges for drought vulnerability factor ratings created by SEMA. The array ranges between 1 (low) and 5 (high). The factors considered include crop loss ratio rating and annualized crop claims paid. These two factors were utilized as agricultural losses data is readily available; thus making them the best factors to determine drought vulnerability throughout the State. Dent County is determined as having a low vulnerability to crop loss (**Table 3.28**) as a result of a drought. Additionally, SEMA has divided the State into 3 regions in regards to drought susceptibility (**Figure 3.14**). Dent County is included in Region B (Moderate Susceptibility). Region B is described as having groundwater sources that are suitable in meeting domestic and municipal water needs, but due to required well depths, irrigation wells are very expensive. Also, the topography is commonly unsuitable for row-crop irrigation[22].

[22] 2013 Missouri State Hazard Mitigation Plan

Figure 3.14. Drought Susceptibility in Missouri



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

Table 3.27. Ranges for Drought Vulnerability Factor Ratings

Factors Considered	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Crop Loss Ratio Rating	0 – 2%	2 – 4%	4 – 6%	6 – 8%	>8%
Annualized Claims Paid	<$500,000	$500,000-$1.5 M	$1.5M-$2.5 M	$2.5 M-$3.5 M	>$3.5 M

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.28. Vulnerability of Dent County to Drought

County	Total Crop Insurance Paid for Drought Damage 1998 - 2012	Crop Claims Ratio Rating	Annualized Crop Insurance Claims/Drought Damage	Crop Exposure (2007 Census of Agriculture)	Annual Crop Claims Ratio	Crop Loss Ratio Rating
Dent	$1,949	1	$130	$1,270,000	0.01%	1

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

Drought is not limited to a hazard that affects just agriculture, but can extend to encompass the nation's whole economy. Its impact can adversely affect a small town's water supply, the corner grocery store, commodity markets, or tourism. Additionally, extreme droughts have the ability to damage roads, water mains, and building foundations. On average, drought costs the U.S. economy about $7 billion to $9 billion a year, according to the National Drought Mitigation Center. Moreover, drought prone regions are also prone to increased fire hazards[23].

Impact of Future Development

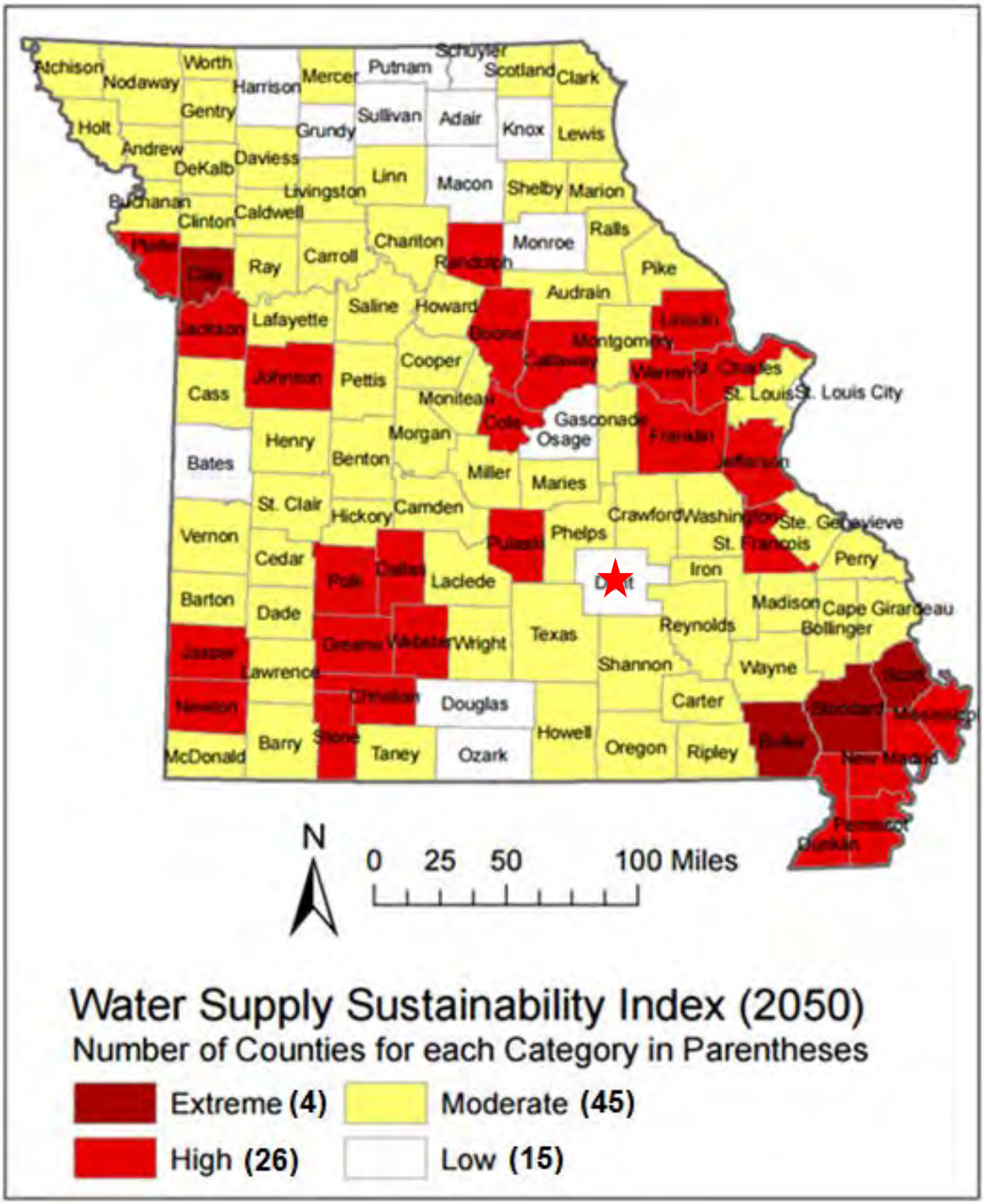
Impacts of drought on future development within Dent County would be negligible. Population trend analysis from the University of Missouri Extension suggests that Dent County will increase by approximately 116 individuals within the next 2 to 12 years[24]. Moreover, with an increasing population, water use and demand would be expected to increase as well; potentially straining the water supply systems. Salem anticipates new water infrastructure within the next 5 years. However, long term drought could expose vulnerabilities during construction/upgrades of water distribution and sewer infrastructures. Furthermore, any agriculture related development in terms of crop or livestock production would also be at risk.

Impact of Climate Change

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree. Dent County is predicted to experience low water shortages as a result of global warming (**Figure 3.15**) by the year 2050.

[23] 2015 Boone County Hazard Mitigation Plan
[24] UM Extension Social and Economic Profile http://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=websas.cntypage.sas&county=29055

Figure 3.15. Water Supply Sustainability Index (2050) with Climate Change Impacts



Source: Natural Resources Defense Council (NRDC), Climate Change, Water, and Risk
*Red star indicates Dent County

Hazard Summary by Jurisdiction

The variations between jurisdictions are non-existent to minimal. Dent County and Salem utilize ground/well water as their water source. In Salem, drought conditions would be the same as those experienced in rural areas, but the magnitude would be different with only lawns and local gardens impacted. Long term drought, spanning months at a time, could negatively impact the amount of potable drinking water available.

Problem Statement

In summary, drought within Dent County is considered low risk. Climate change predictions also suggest low risks by the year 2050. Dent County has a strong agricultural economy. Drought would impact commodities, specifically livestock and crops. Potential impacts to local economies and infrastructures are foreseeable in the event of a long term drought.

The county and Salem should develop water monitoring plans as an early warning system. Each sector should inventory and review their groundwater operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged to the public. The county and Salem should continually look for and fund water system improvements, new systems, and new wells.

3.4.3 Earthquakes

Some specific sources for this hazard are:

- U.S. Seismic Hazard Map, United States Geological Survey, http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014_lg.jpg;
- 6.5 Richter Magnitude Earthquake Scenario, New Madrid Fault Zone map, http://www.igsb.uiowa.edu/Browse/quakes/quakes.htm;
- Probability of magnitude 5.0 or greater within 100 Years, United States Geological Survey, https://geohazards.usgs.gov/eqprob/2009/index.php

Hazard Profile

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one side of the fault slips, generating compressive and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

The closest fault to Dent County is the New Madrid Seismic Zone (NMSZ). The NMSZ is the most active seismic area in the United States east of the Rocky Mountains. Unfortunately, the faults in the NMSZ are poorly understood due to concealment by alluvium deposits. Moreover, the NMSZ is estimated to be 30 years overdue for a 6.3 magnitude earthquake[25].

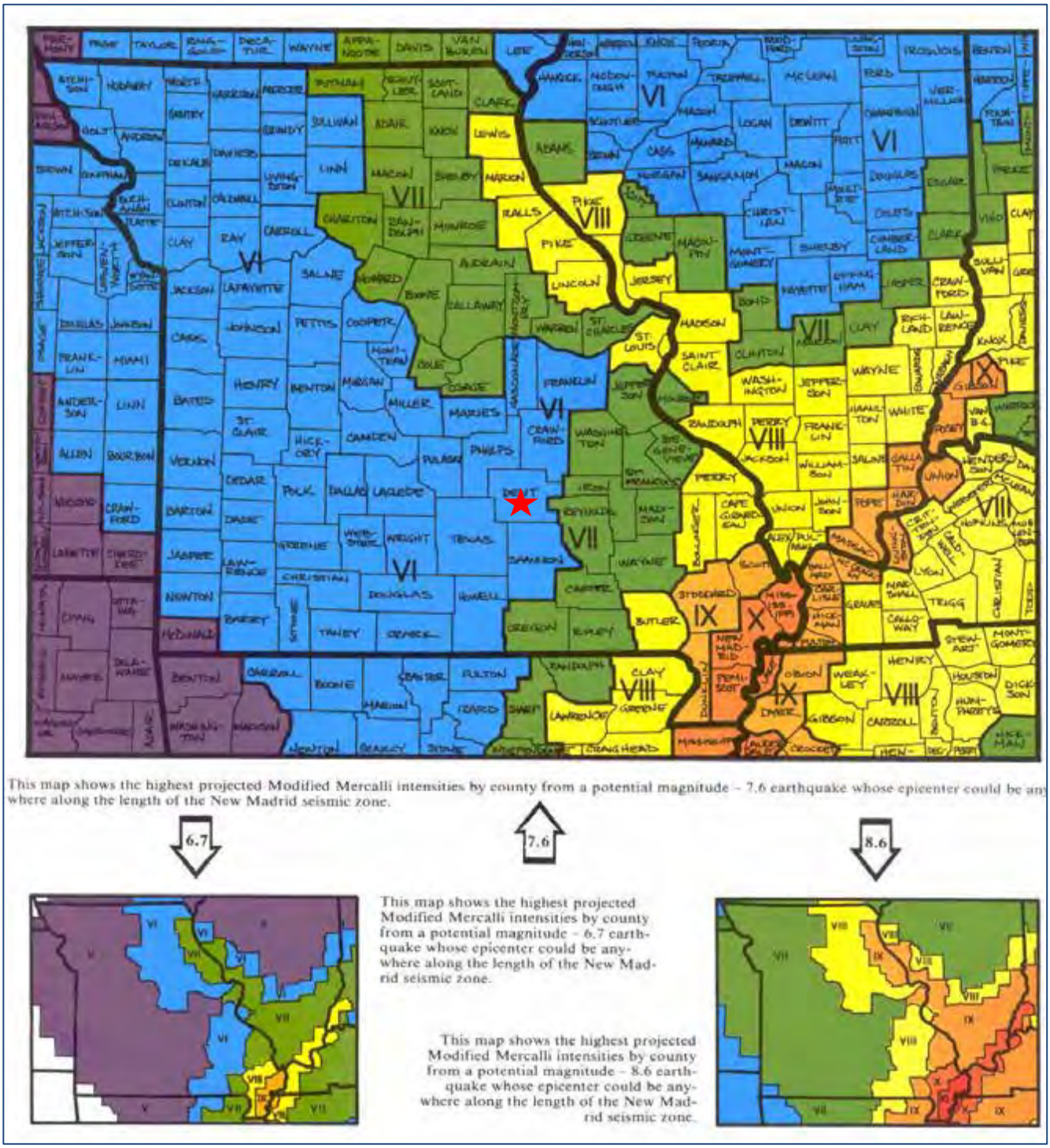
Geographic Location

There are eight earthquake source zones in the Central United States, one of which is located within the state of Missouri—the New Madrid Fault. Other seismic zones, because of their close proximity, also affect Missourians. These are the Wabash Valley Fault, Illinois Basin, and the Nemaha Uplift. The most active zone is the New Madrid Fault, which runs from Northern Arkansas through Southeast Missouri and Western Tennessee and Kentucky to the Illinois side of the Ohio River Valley.

Figure 3.16 depicts impact zones for a magnitude 7.6 earthquake along the New Madrid Fault along with associated Modified Mercalli Intensities. Dent County is indicated by a red star. Furthermore, the Modified Mercalli Intensities for potential 6.7 and 8.6 magnitude earthquakes are illustrated. In the event of a 6.7 magnitude earthquake, Dent County would experience a Modified Mercalli Intensity of V (**Figure 3.17**). This intensity is categorized as being almost felt by everyone. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some cases. Small objects move or are turned over. Liquids might spill out of open containers. Additionally, in the occurrence of 7.6 and 8.6 magnitude earthquakes; the county would experience Modified Mercalli Intensities of VI and VII respectively. Earthquake intensities will not vary across the planning area, which is the case for most Missouri counties**. Figure 3.17** and **Table 3.29** further define Richter Scale intensities.

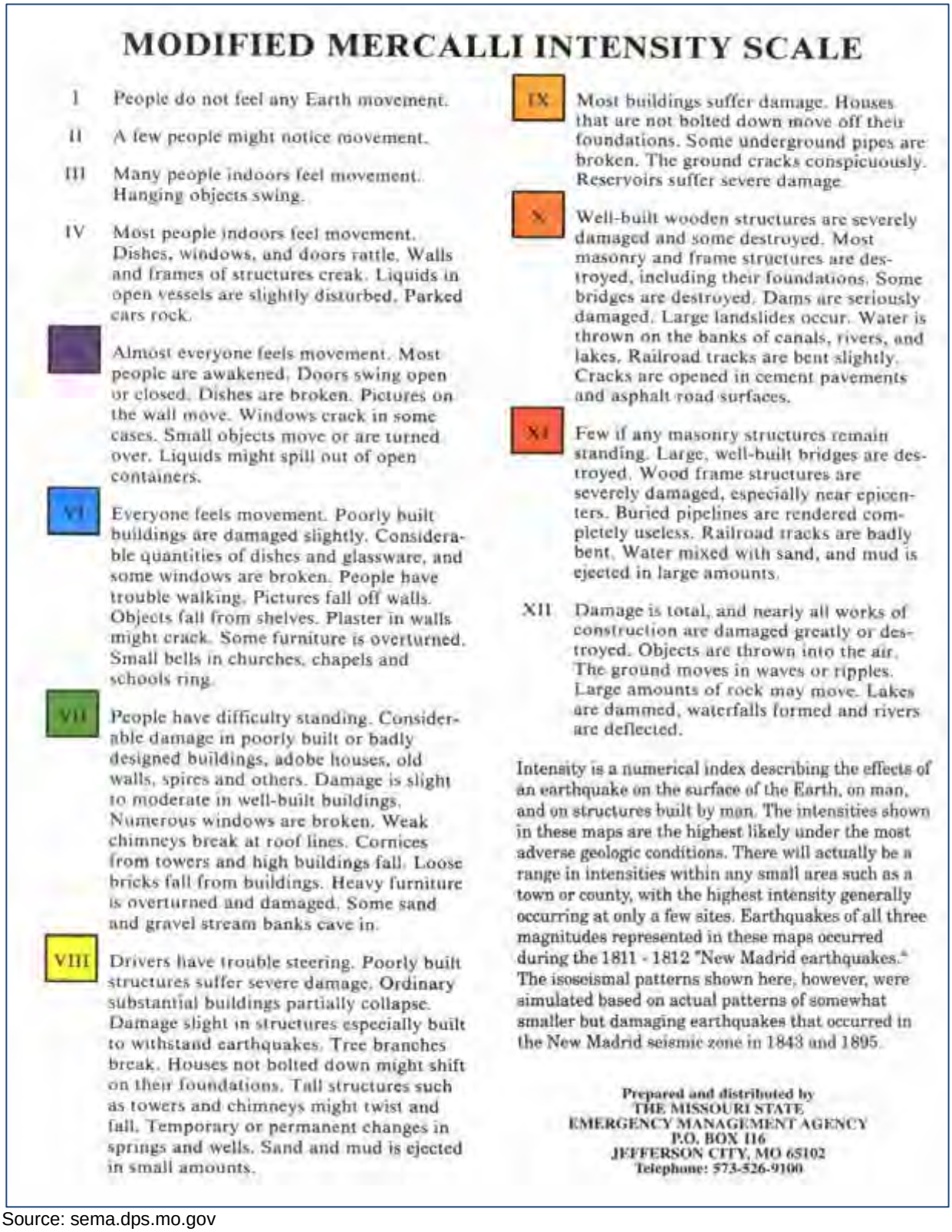
[25] Missouri Department of Natural Resources, Facts about the New Madrid Seismic Zone

Figure 3.16. Impact Zones for Earthquake Along the New Madrid Fault



Source: sema.dps.mo.gov; *Red star indicates Dent County

Figure 3.17. Projected Earthquake Intensities



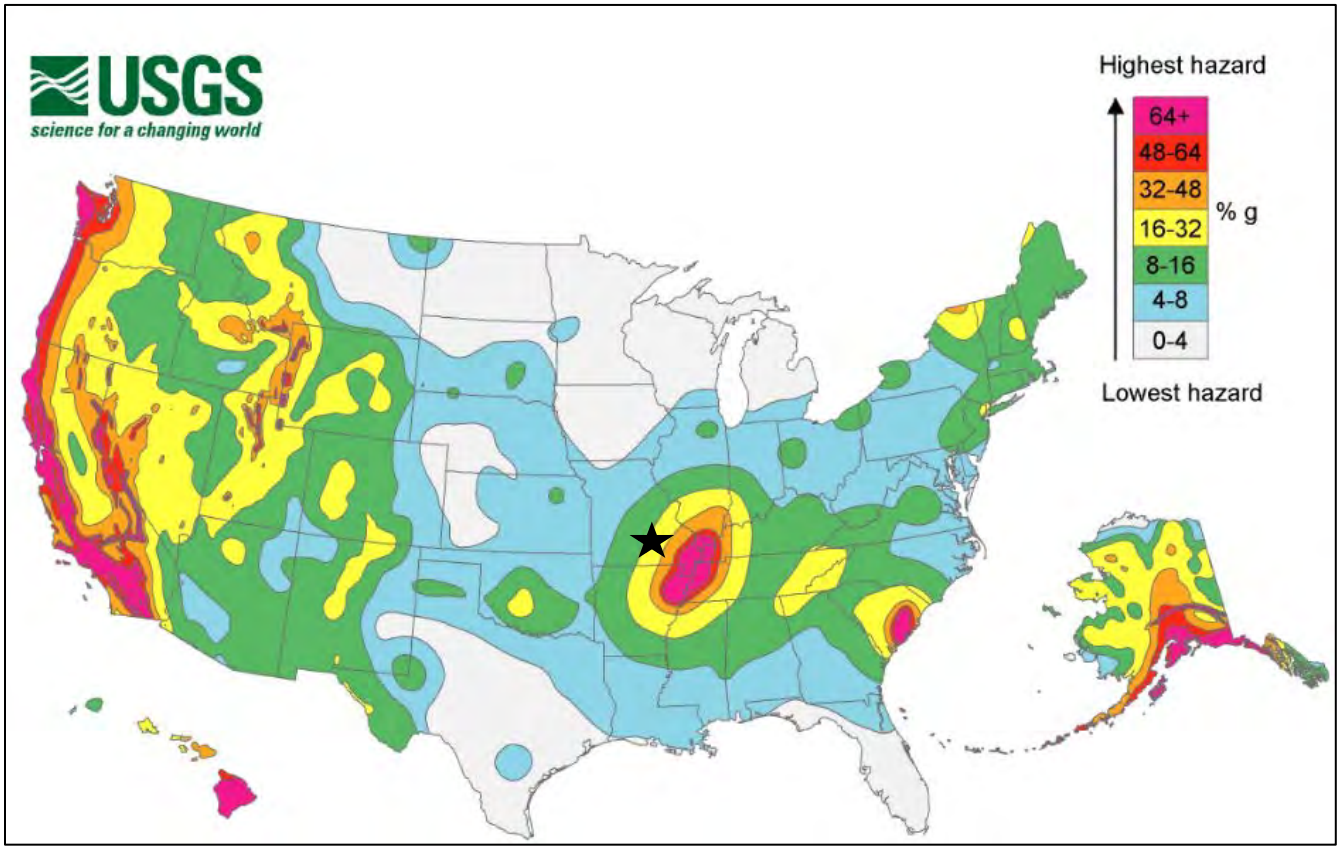
Source: sema.dps.mo.gov

Table 3.29. Richter Scale of Earthquake Magnitude

Magnitude Level	Category	Effects	Earthquake per Year
Less than 1.0 to 2.9	Micro	Generally not felt by people, though recorded on local instruments	More than 100,000
3.0-3.9	Minor	Felt by many people; no damage	12,000-100,000
4.0-4.9	Light	Felt by all; minor breakage of objects	2,000-12,000
5.0-5.9	Moderate	Some damage to weak structures	200-2,000
6.0-6.9	Strong	Moderate damage in populated areas	20-200
7.0-7.9	Major	Serious damage over large areas; loss of life	3-20
8.0 and higher	Great	Severe destruction and loss of life over large areas	Fewer than 3

Figure 3.18 illustrates the seismicity in the United States. A black star indicates the location of Dent County. The seismic hazard map displays earthquake peak ground acceleration (PGA) that has a 2% chance of being exceeded in 50 years; which has a value between 16-32% g.

Figure 3.18. United States Seismic Hazard Map



Source: USGS, http://earthquake.usgs.gov; *Black star indicates Dent County

Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined a follows.

Richter Magnitude Scale

The Richter Magnitude Scale was developed in 1935 as a device to compare the size of earthquakes. The magnitude of an earthquake is measured using a logarithm of the maximum extent of waves recorded by seismographs. Adjustments are made to reflect the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. Each whole number increase in magnitude represents a tenfold increase in measured amplitude; an estimate of energy. For example, comparing a 5.3 and a 6.3 earthquake shows that a 6.3 earthquake is ten times bigger than a magnitude 5.3 earthquake on a seismogram, but is 31.622 times stronger (energy release)[26].

Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 and is composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale does not have a mathematical basis, but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

Previous Occurrences

Most of Missouri's earthquake activity has been concentrated in the southeast corner of the state, which lies within the New Madrid seismic zone. The written record of earthquakes in Missouri prior to the nineteenth century is virtually nonexistent; however, there is geologic evidence that the New Madrid seismic zone has had a long history of activity. The first written account of an earthquake in the region was by a French missionary on a voyage down the Mississippi River. He reported feeling a distinct tremor on Christmas Day 1699 while camped in the area of what is now Memphis, TN.

Whatever the seismic history of the region may have been before the first Europeans arrived, after Dec. 16, 1811, there could be no doubt about the area's potential to generate severe earthquakes. On that date, shortly after 2 a.m., the first tremor of the most violent series of earthquakes in the United States history struck southeast Missouri. In the small town of New Madrid, about 290 kilometers south of St. Louis, residents were aroused from their sleep by the rocking of their cabins, the cracking of timbers, the clatter of breaking dishes and tumbling furniture, the rattling of falling chimneys, and the crashing of falling trees. A terrifying roaring noise was created as the earthquake waves swept across the ground. Large fissures suddenly opened and swallowed large quantities of river and marsh water. As the fissures closed again, great volumes of mud and sand were ejected along with the water.

The earthquake generated great waves on the Mississippi River that overwhelmed many boats and washed others high upon the shore. The waves broke off thousands of trees and carried them into the river. High river banks caved in, sand bars gave way, and entire islands disappeared. The

[26] Measuring the Size of an Earthquake, http://earthquake.usgs.gov/learn/topics/measure.php

violence of the earthquake was manifested by great topographic changes that affected an area of 78,000 to 130,000 square kilometers.

On Jan. 23, 1812, a second major shock, seemingly more violent than the first, occurred. A third great earthquake, perhaps the most severe of the series, struck on Feb. 7, 1812.

The three main shocks probably reached intensity XII, the maximum on the Modified Mercalli scale, although it is difficult to assign intensities, due to the scarcity of settlements at the time. Aftershocks continued to be felt for several years after the initial tremor. Later evidence indicates that the epicenter of the first earthquake (Dec. 16, 1811) was probably in northeast Arkansas. Based on historical accounts, the epicenter of the Feb. 7, 1812, shocks was probably close to the town of New Madrid.

Although the death toll from the 1811-12 series of earthquakes has never been tabulated, the loss of life was very slight. It is likely that if at the time of the earthquakes the New Madrid area had been as heavily populated as at present, thousands of persons would have perished. The main shocks were felt over an area covering at least 5,180,000 square kilometers. Chimneys were knocked down in Cincinnati, Ohio, and bricks were reported to have fallen from chimneys in Georgia and South Carolina. The first shock was felt distinctly in Washington, D.C., 700 miles away, and people there were frightened badly. Other points that reported feeling this earthquake included New Orleans, 804 kilometers away; Detroit, 965 kilometers away; and Boston, 1,769 kilometers away.

The New Madrid seismic zone has experienced numerous earthquakes since the 1811-12 series, and at least 35 shocks of intensity V or greater have been recorded in Missouri since 1811. Numerous earthquakes originating outside of the state's boundaries have also affected Missouri. Five of the strongest earthquakes that have affected Missouri since the 1811-12 series are described below.

On Jan. 4, 1843, a severe earthquake in the New Madrid area cracked chimneys and walls at Memphis, Tennessee. One building reportedly collapsed. The earth sank at some places near New Madrid; there was an unverified report that two hunters were drowned during the formation of a lake. The total felt area included at least 1,036,000 square kilometers.

The Oct. 31, 1895, earthquake near Charleston, MO probably ranks second in intensity to the 1811-12 series. Every building in the commercial area of Charleston was damaged. Cairo, Illinois, and Memphis, Tennessee, also suffered significant damage. Four acres of ground sank near Charleston and a lake was formed. The shock was felt over all or portions of 23 states and at some places in Canada.

A moderate earthquake on April 9, 1917, in the Ste. Genevieve/St. Mary’s area was reportedly felt over a 518,000 square kilometer area from Kansas to Ohio and Wisconsin to Mississippi. In the epicentral area people ran into the street, windows were broken, and plaster cracked. A second shock of lesser intensity was felt in the southern part of the area.

The small railroad town of Rodney, MO experienced a strong earthquake on Aug. 19, 1934. At nearby Charleston, windows were broken, chimneys were overthrown or damaged, and articles were knocked from shelves. Similar effects were observed at Cairo Mounds and Mound City, IL, and at Wickliff, KY. The area of destructive intensity included more than 596 square kilometers.

The Nov. 9, 1968, earthquake centered in southern Illinois was the strongest in the central United States since 1895. The magnitude 5.5 shock caused moderate damage to chimneys and walls at

Hermann, St. Charles, St. Louis, and Sikeston, Missouri. The felt areas include all or portions of 23 states[i].

Several area residents observed a small seismic occurrence during the early morning hours of July 8, 2003 in Crawford County. According to information from the USGS, a micro-earthquake happened about 20 miles northeast of Rolla and measured 2.9 on the Richter scale. The earthquake originated at a depth of about 3.1 miles beneath the earth's surface. In southern parts of Missouri, earthquakes of this magnitude happen frequently, but are an unusual event in Dent County.

Small earthquakes continue to occur frequently in Missouri. Averages of 200 earthquakes are detected every year in the New Madrid Seismic Zone alone. Most are detectable only with sensitive instruments, but on an average of every 18 months, southeast Missouri experiences an earthquake strong enough to crack plaster in buildings[27].

Probability of Future Occurrence

Dent County has reported a total of zero 1998. The county, located in south central Missouri, a good distance from the southeast corner of the state that has the potential for moderate damage should a significant earthquake occur.

In 2002 the University of Memphis estimated a 25% to 40% chance for one occurrence of a 6.0 magnitude earthquake in the next fifty years (by year's end 2052) in the New Madrid Seismic Zone. Ideally, if an occurrence is to happen within the next 50 years, it would occur at the midway point (25 years) year 2027. Given this hypothetical situation, there would be one chance in twenty-five (1/25 .04 or 4%) of an occurrence, and it represents an annualized percentage since the divisor (25) is the number of years; estimating that the earthquake will happen at the end of the 25th year over the intervening period. The 4% number becomes the "object of interest" (objective) and it has an estimated chance of happening.

The University of Memphis has fundamentally estimated this 4% objective has a 25% to 40% chance of occurrence. If we apply these percentages to the annualized figure of 4%, the result is the overall annualized percentages. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0% (4% x 25%). At the 40% level, the likelihood of an earthquake happening in a given year is 1.6% (4% x 40%)[28]. For the purpose of this plan, the 1.0% probability of an earthquake occurring in a given year will be utilized.

Vulnerability

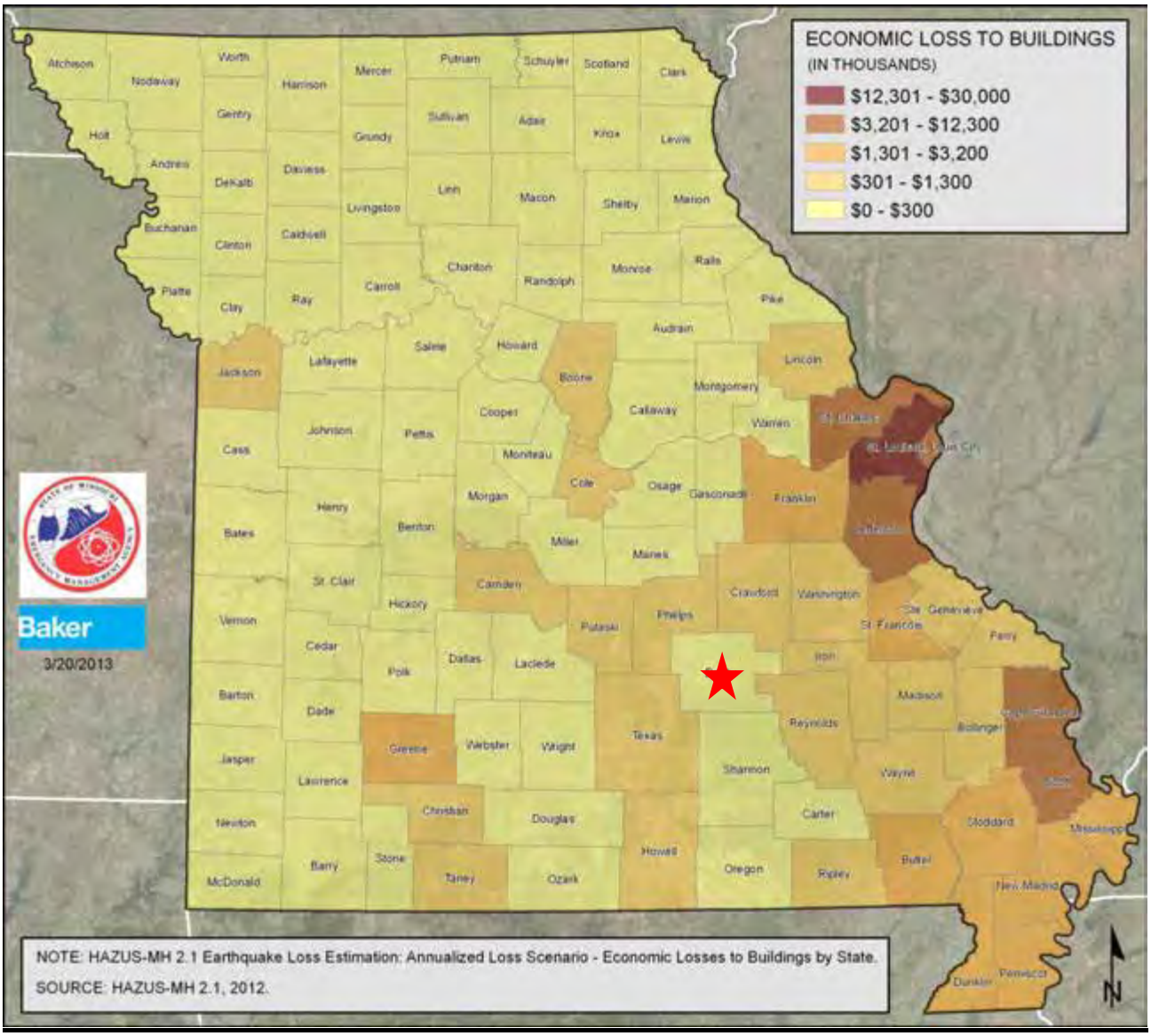
Vulnerability Overview

SEMA utilized Hazus 2.1 to analyze vulnerability and estimate losses to earthquakes. Hazus is a program developed by FEMA which is a nationally applicable standardized methodology that encompasses models for assessing potential losses from earthquakes, floods, and hurricanes. Geographic Information Systems (GIS) is utilized to assess physical, economic, and social impacts of disasters[29]. For the vulnerability analysis, an annualized loss scenario for each county was analyzed. Secondly, statistics from an event with a 2% probability of exceedance in 50 years was analyzed, suggesting outcomes of a worst case scenario.

[27] Missouri State Hazard Mitigation Plan May 2007
[28] SEMA
[29] www.fema.gov/hazus

Annualized loss is the maximum potential annual dollar loss resulting from eight return periods (100, 200, 500, 750, 1,000, 1,500, 2,000, and 2,500 years) averaged on a 'per year' basis[30]. The Hazus earthquake loss estimation is depicted in **Figure 3.19** and **Table 3.30**. Dent County's buildings are suggested to lose between $0 and $300,000 in any one year; thus ranking the county as having the 41st highest expected loss in the state, or low vulnerability. This loss ratio indicates impacts on local economies in the event of an earthquake, and the difficulty for jurisdictions to recover from said event.

Figure 3.19. Hazus Earthquake Loss Estimation: Annualized Loss Scenario –Total Economic Losses to Buildings.



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

[30] 2013 Missouri State Hazard Mitigation Plan

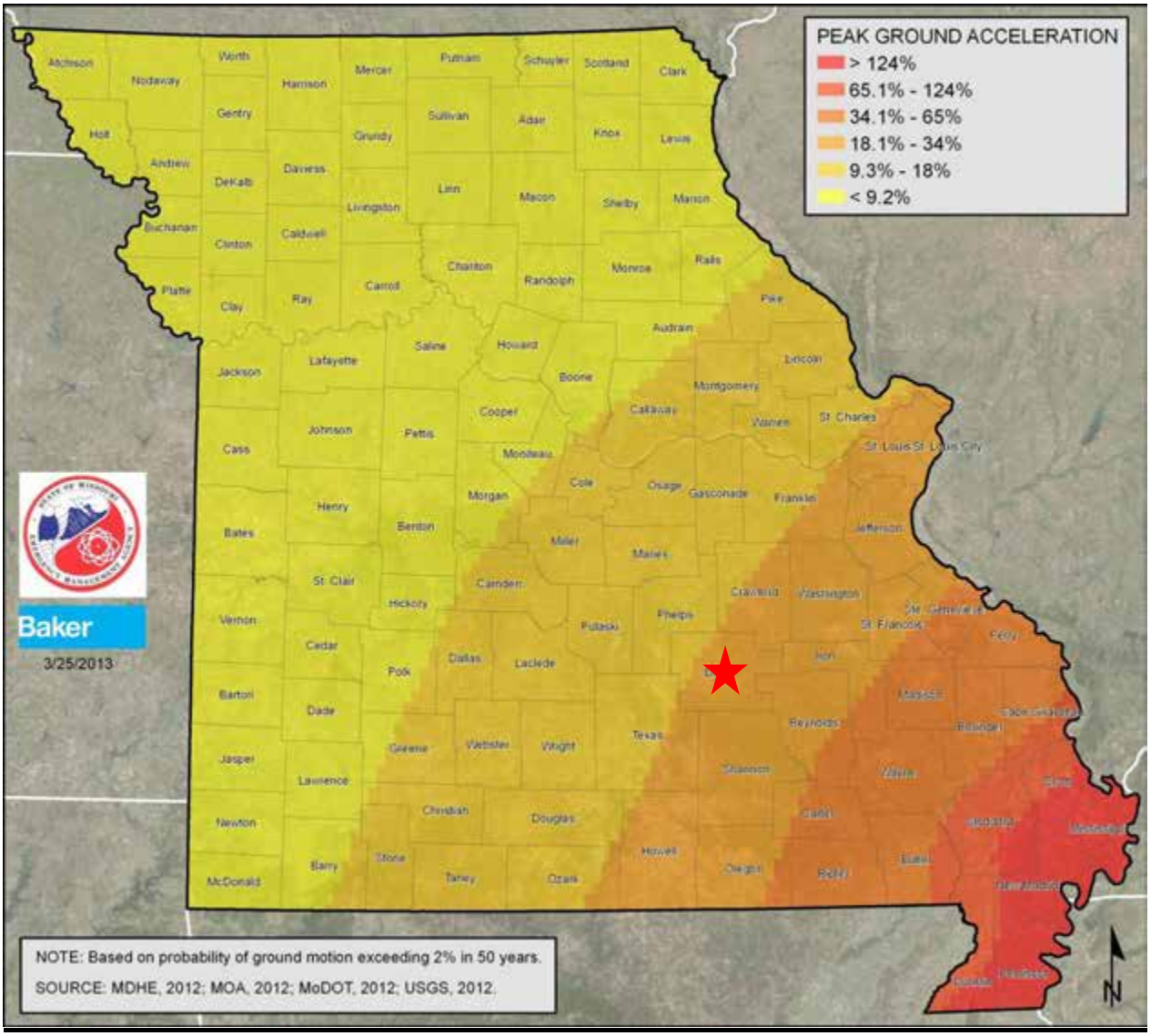
Table 3.30. Hazus Earthquake Loss Estimation: Annualized Loss Scenario

Location	Building Loss Total ($)*	Loss Ratio %**	Income Loss Total ($)*	Total Economic Loss to Buildings ($)*	Loss Ratio Rank
Dent	420	0.01	62	302	41

Source: Hazus 2.1
*All $values are in thousands
**Loss ratio is the sum of structural and nonstructural damage divided by the entire building inventory value within a county

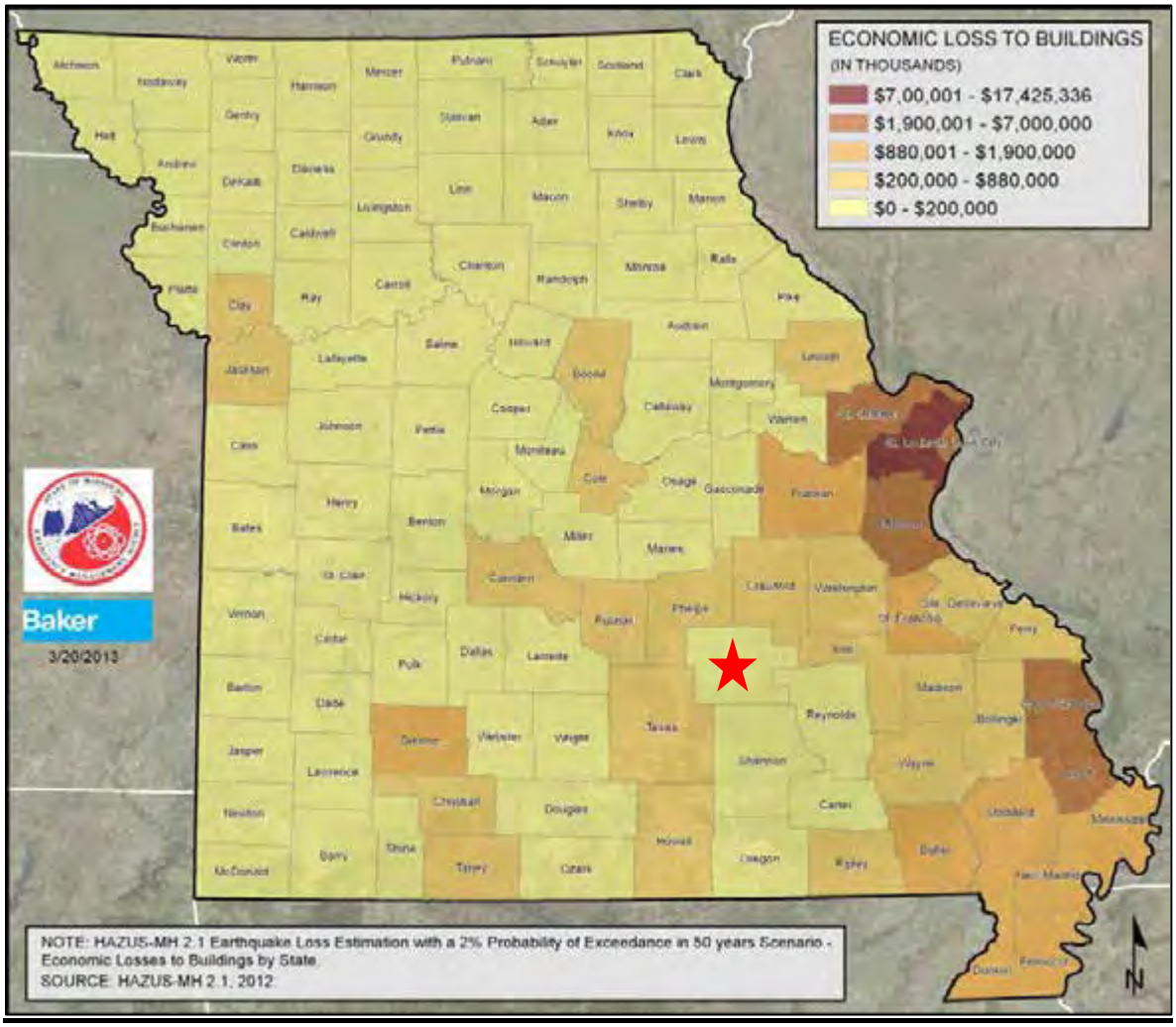
Likewise, SEMA developed a second scenario which incorporated a 2% probability of exceedance in 50 years. This model was to demonstrate a worst case scenario. **Figure 3.20** provides estimates of peak ground acceleration and spectral acceleration (ground shaking potential) at intervals of 0.3 and 1.0 seconds, respectively. These acceleration events have a 2% probability of exceedance in the next 50 years. A 7.7 magnitude earthquake was utilized in this scenario, which is typically utilized for New Madrid fault planning scenarios in Missouri. Dent County is estimated to have peak ground acceleration between 9.3 and 34%. Furthermore, **Figure 3.21** illustrates total economic loss to buildings including content and inventory loss, and wage/income loss in the event of the modeled earthquake. Dent County is anticipated to lose between $0 and $200,000 in a 50 year scenario. Moreover, in the same event the county is estimated to experience between 7.1% and 15% loss (damage) of the total building inventory (**Figure 3.22). Table 3.31** further exemplifies the county's loss ratio.

Figure 3.20. Hazus Earthquake 2% Probability of Exceedance in 50 Years – Ground Shaking Potential



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

Figure 3.21. Hazus Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario – Total Economic Loss to Buildings



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

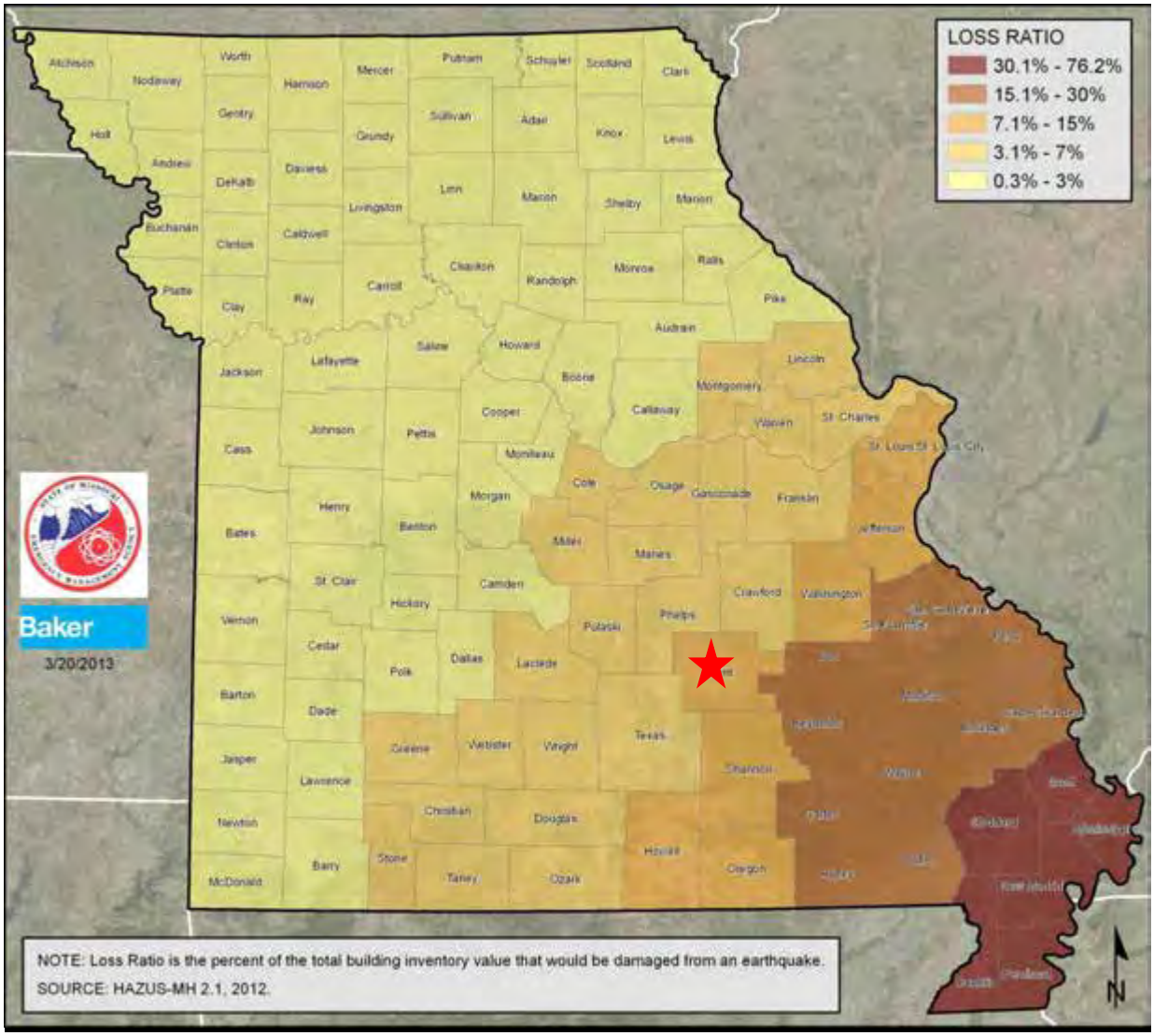
Table 3.31. Hazus-MH Earthquake Loss Estimation: 2% Probability of Exceedance in 50 Years Scenario Results Building Impacts by County, Ranked by Highest Building Losses

County	Structural Damage ($)*	Non-Structural Damage ($)*	Contents Damage and Inventory Loss ($) *	Loss Ratio (%) **	Income Loss ($)*	Total Economic Loss to Buildings ($)*,***	Loss Ratio Rank
Dent	29,514	88,659	30,144	8.55	38,351	186,668	25

Source: 2013 Missouri State Hazard Mitigation Plan, Hazus 2.1

*All $ values are in thousands
**Loss ratio is the sum of structural and nonstructural damage divided by the entire building inventory value within a county
***Total economic loss to buildings includes inventory loss, relocation loss, capital-related loss, wages loss, and rental income loss
****Note: Total loss numbers provide an estimate of total losses and due to rounding, these numbers may differ slightly from the global summary report outputs from HAZUS

Figure 3.22. Hazus Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario – Loss Ratio



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

In terms of social impacts for the same earthquake event, **Table 3.32** defines casualty severity, displaced households, and short-term shelter needs that are utilized in **Table 3.33.** During this scenario, Dent County is estimated to have 60 injuries requiring medical attention without hospitalization, 13 injuries requiring hospitalization, 2 life threatening injuries, and 3 deaths. Moreover, 114 individuals are expected to become displaced from their homes, along with 73 individuals requiring short-term shelter needs.

Table 3.32. Casualty Severity, Displaced Households, and Short-Term Shelter Needs

Casualty Severity Level 1	Injuries will require medical attention but hospitalization is not needed
Casualty Severity Level 2	Injuries will require hospitalization but are not considered life-threatening
Casualty Severity Level 3	Injuries will require hospitalization and can become life threatening if not promptly treated
Casualty Severity Level 4	Victims are killed by the earthquake
Displaced Households	The number of households that are expected to be displaced from their homes due to the earthquake
Short-Term Shelter Needs	The number of displace people that will require accommodations in temporary public shelters

Source: Hazus 2.1

Table 3.33. Social Impact Estimates by County from the 2% Probability of Exceedance in 50 Years Scenario 2 a.m. Time of Occurrence

County	MMI Zone	Level 1	Level 2	Level 3	Level 4	Total	Displaced Households	Short-Term Shelter Needs
Dent	VII	60	13	2	3	78	114	73

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

Economic loss to buildings in the event of an earthquake can be found in the Vulnerability Overview. Infrastructures across the planning area would also be expected to experience losses. Additional losses expected would be environmental and economic.

Impact of Future Development

Future development at risk includes Dent County's proposed County Jail, Salem's sewer plant upgrade, water and sewer extensions, AMI meter system, and development at the Salem Industrial Park. In addition, North Wood R-IV's and Oak Hill R-I's anticipated development would be at risk. Future development will not increase the risk of an earthquake, rather contributing to the overall exposure of damaged property. As new development arises, minimum standards of building codes should be established in all jurisdictions to decrease the potential damage/loss should an earthquake occur.

The Revised Statutes of MO, Section 160.451 require that: The governing body of each school district which can be expected to experience an intensity of ground shaking equivalent to a Modified Mercalli Intensity of VII or above from an earthquake occurring along the New Madrid Fault with a potential magnitude of 7.6 on the Richter Scale shall establish an earthquake emergency procedure system in every school building under its jurisdiction[31].

[31] 2015 Boone County Hazard Mitigation Plan

Hazard Summary by Jurisdiction

Since earthquake intensity is not likely to vary greatly throughout the planning area, the risk will be the same throughout. Dent County is not near the New Madrid Shock Zone, but it will most likely endure mild secondary effects from the earthquake, such as fire, structure damage, utility disruption, environmental impacts, and economic disruptions/losses. However, damages could differ if there are structural variations in the planning area's built environment. For example, if one community has a higher percentage of residences built prior to 1939 than the other participants, that community is likely to experience higher damages. **Table 3.34** depicts the percent of residences built prior to 1939 in Dent County. If a major earthquake should occur, Dent County would likely be deeply impacted by the number of refugees traveling through the area seeking safety and assistance.

Table 3.34. Percent of Dent County Residences Built Prior to 1939

Jurisdiction	% of Residences built prior to 1939
Unincorporated Dent County	9.9%
Salem	12.8%

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5 – Year Estimates

Problem Statement

In the event of a 7.7 magnitude earthquake (worst case scenario), Dent County is estimated to have 60 injuries requiring medical attention without hospitalization, 13 injuries requiring hospitalization, 2 life threatening injuries, and 3 deaths. Moreover, 114 individuals are expected to become displaced from their homes, along with 73 individuals requiring short-term shelter needs. Additionally, the county is expected to encounter $0 to $200,000 in total economic losses to buildings. Moreover, Salem is particularly at risk due to the percent of residences built prior to 1939.

Jurisdictions should encourage purchase of earthquake hazard insurance. As well as establishing structurally sound emergency shelters in several parts of the county. In addition, stringent minimum standards of building codes should be established. Lastly, outreach and education should be utilized more frequently to prepare citizens for the next occurrence.

3.4.4 Extreme Heat

Hazard Profile

Some specific sources for this hazard are:

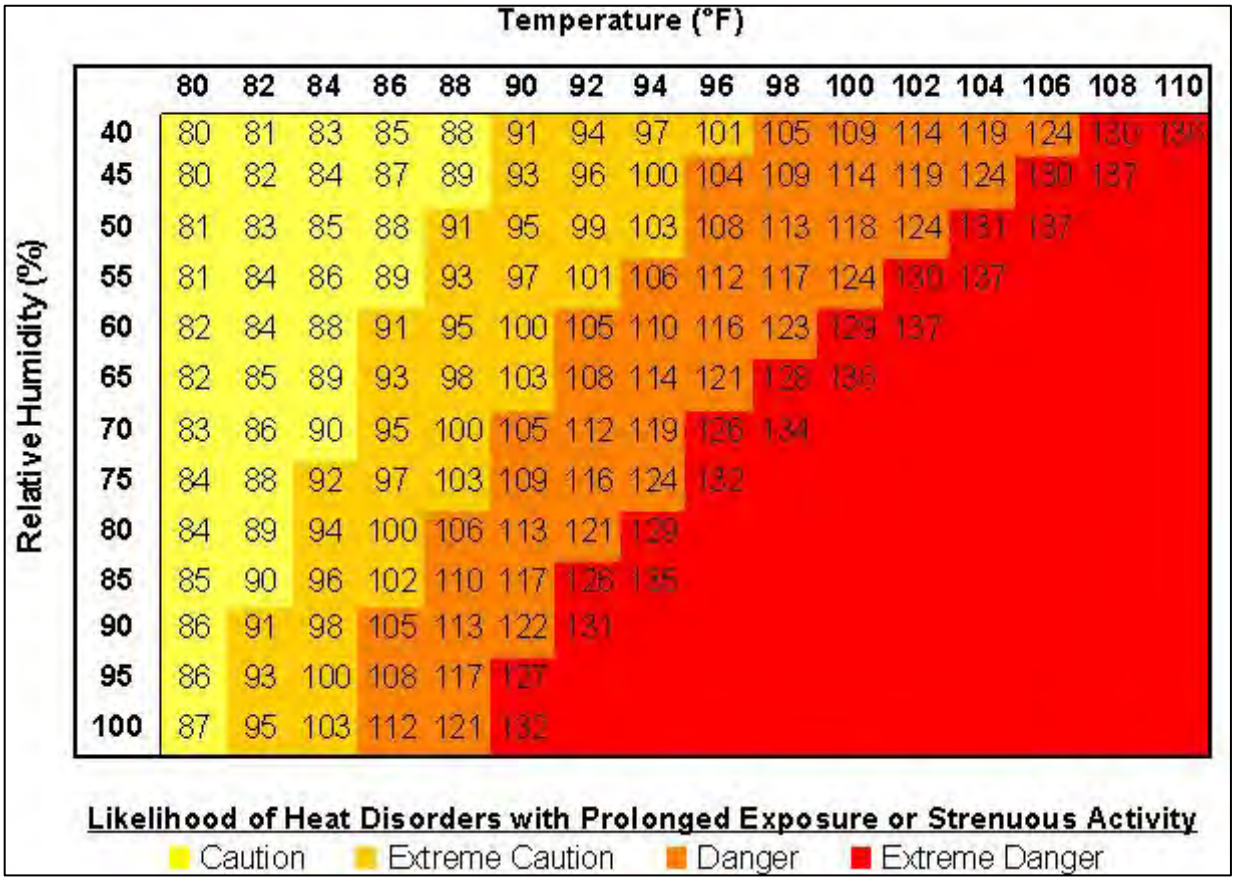
- National Centers for Environmental Information, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/
- Heat Index Chart & typical health impacts from heat, National Weather Service; National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml ;
- Daily temperatures averages and extremes, High Plains Regional Climate Summary, http://www.hprcc.unl.edu/data/historical/index.php?state=ia&action=select_state&submit=Select+State;
- Hyperthermia mortality, Missouri; Missouri Department of Health and Senior Service, http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper1.pdf;
- Hyperthermia mortality by Geographic area, Missouri Department of Health and Senior Services,
- http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2.pdf;

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Winter Storm in **Section 3.4.10.** According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. These high temperatures generally occur from June through September, but are most prevalent in the months of July and August. Regional reports indicate all of Missouri is subject to heat wave during the summer months. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in **Figure 3.23** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

High humidity, a common factor in Missouri, can magnify the effects of extreme heat. While heat-related illness and death can occur from exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. The persistence of a heat wave increases the threat to public health.

Figure 3.23. Heat Index (HI) Chart



Source: National Weather Service (NWS)
Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Geographic Location

Extreme heat is considered to be an area-wide hazard event. In such a case, the chance of variation in temperatures across Dent County is minimal to nonexistent.

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, Dent County did not report losses to insurable crops during a 20-year time period from 1998 to 2017 due to extreme heat. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1979 to 2013, there were approximately 9,000 fatalities in the U.S. attributed to heat. This translates to an annual national average of 264 deaths[32]. Fortunately, there were no recorded heat related deaths in the planning area, according to the Bureau of Environmental Epidemiology[33]. The

[32] https://www3.epa.gov/climatechange/pdfs/print_heat-deaths-2015.pdf
[33] http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2b.pdf

National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.35 lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.35. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

The National Weather Service has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days: (1) when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F); and the night time minimum Heat Index is 80°F or above. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

Previous Occurrences

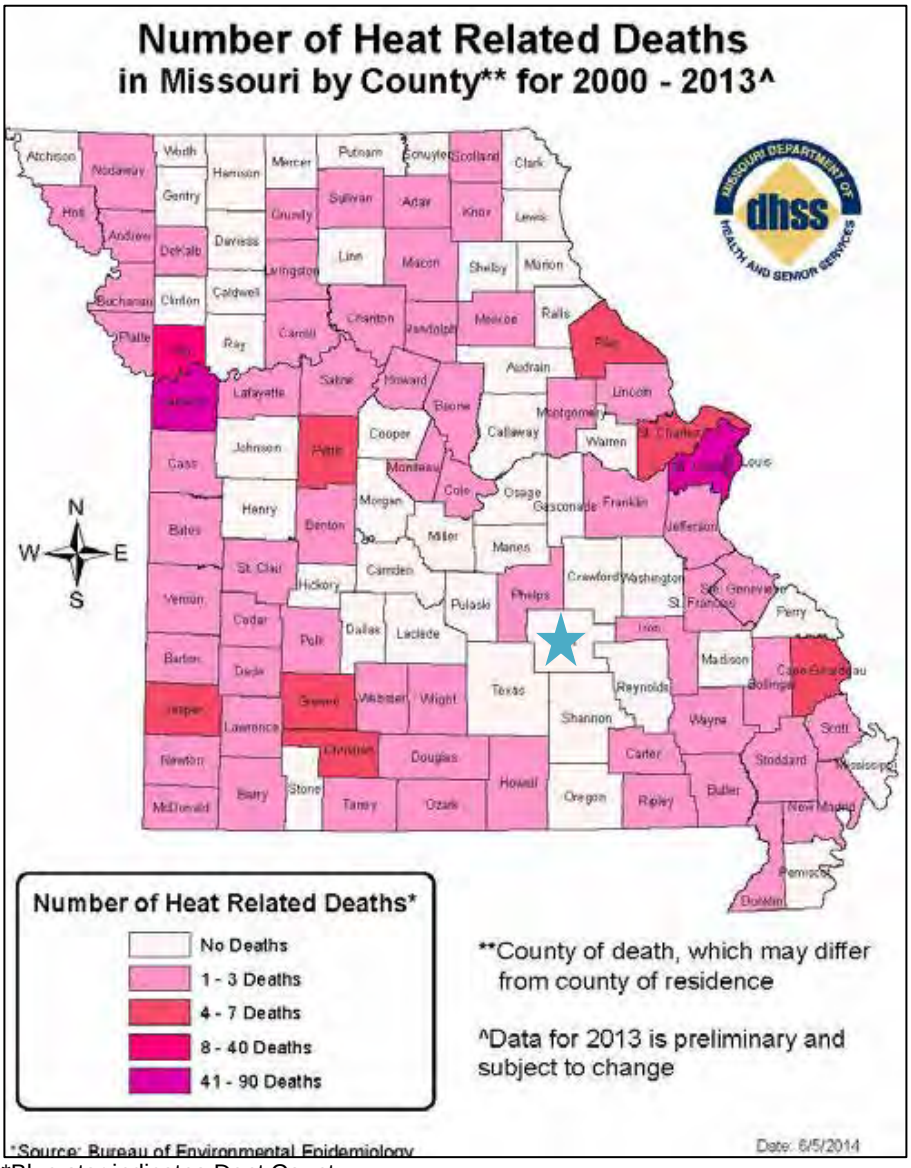
Table 3.36 provides data in relation to record heat events between 1998 and 2017 in Dent County. Maximum heat index values and temperatures are shown for each extreme temperature event. Fortunately, there were zero recorded injuries and fatalities during this time. In addition, **Figure 3.24** illustrates heat related deaths by county in Missouri between 2000 and 2013.

Table 3.36. Dent County Recorded Heat Events 1998 – 2017

Month, Year	# of Event Days	Fatalities	Injuries	Temperature (F°)	Heat Index Values (F°)
7/23/1999	9	0	0	95+	105-115
8/01/1999	18	0	0	95+	100+
8/27/2000	5	0	0	100+	100-110
9/01/2000	4	0	0	100	100+
7/17/2001	15	0	0	90-100	100-110
8/01/2001	9	0	0	-	100-110
6/01/2012	30	0	0	90+	100+
7/01/2012	31	0	0	100	104+
8/01/2012	31	0	0	90+	106
Total	**152**	**0**	**0**	**-**	**-**

Source: http://www.ncdc.noaa.gov/stormevents/

Figure 3.24. Heat Related Deaths in Missouri 2000 - 2013



*Blue star indicates Dent County

Probability of Future Occurrence

Table 3.37 illustrates the annual average percent probability of extreme heat in Dent County. The county's likelihood of enduring an extreme heat event per year is 100% (152 events/20 years x 100 = 7.6). The average number of events per year is 7.6. Extreme heat events can be found in **Table 3.36.**

Table 3.37. Annual Average % Probability of Extreme Heat in Dent County

Location	Annual Avg. % P	Avg. Number of Events
Dent County	100%	7.6

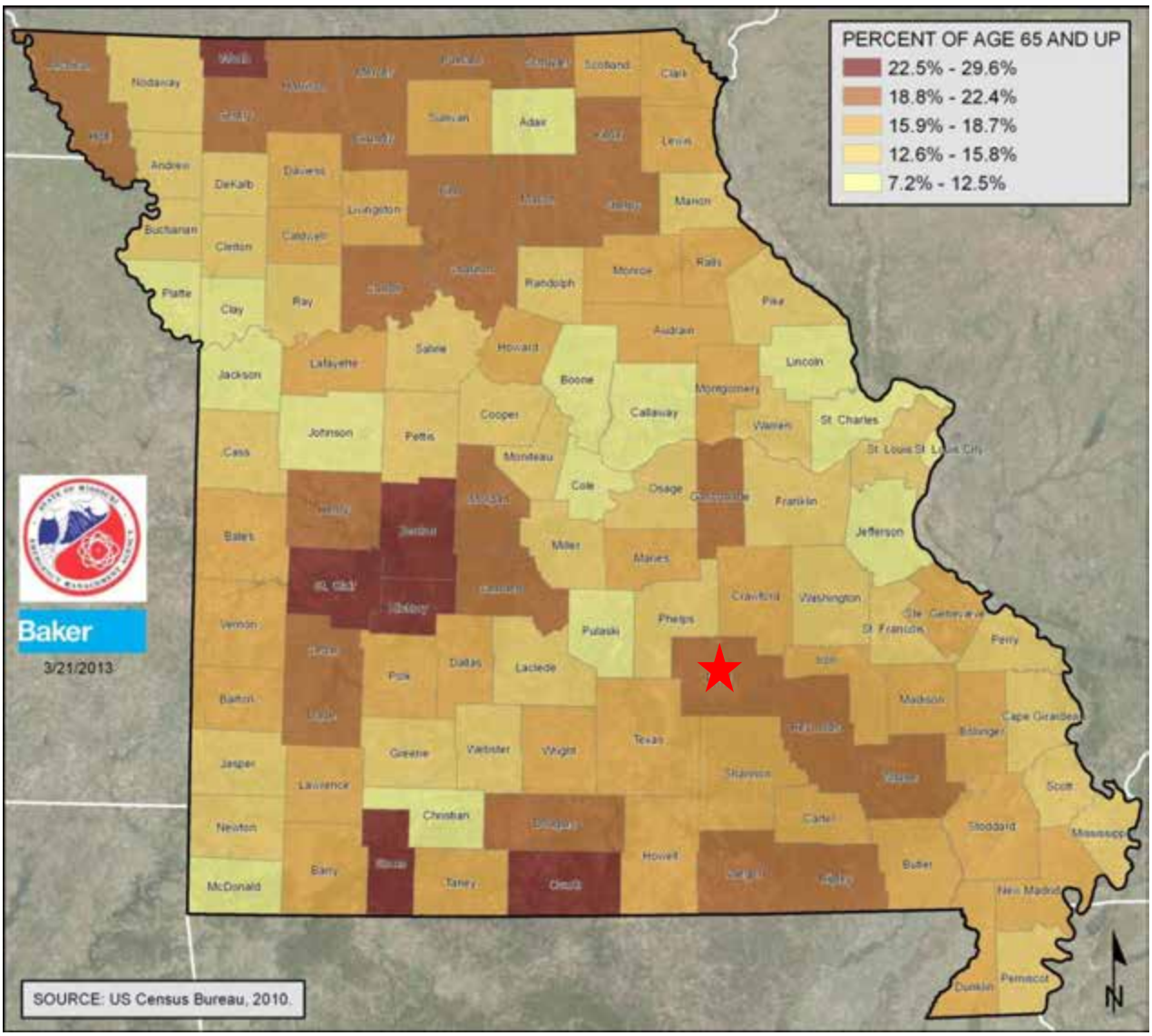
*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

Dent County, along with the rest of the state of Missouri is vulnerable to extreme heat. However, those jurisdictions with higher percentages of individuals below the age of 5, and above the age of 65 tend to be more at risk (**Table 3.38**). **Figure 3.25** depicts the distribution of the elderly population across Missouri. In 2010, 18.8 to 24.4% of the county was comprised of individuals ages 65 and up.

Figure 3.25. Distribution of Elderly Population



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Dent County

Potential Losses to Existing Development

During extreme heat events structural, road, and electrical infrastructure are vulnerable to damages. Depending upon temperatures and duration of extreme heat, losses will vary.

Impact of Future Development

Population trends from 2000 to 2016 for Dent County and Salem indicate that both jurisdictions were growing. Population growth can result in increased age groups that are more susceptible to extreme heat. Additionally, as populations increase, so does the strain on each jurisdiction's electricity and road infrastructure. Salem's anticipated AMI meter system could be susceptible to extreme heat. Local government and the City Emergency Management Director should take extreme heat in consideration while electrical upgrades are underway.

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2012-2016 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.38** below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.38. County Population Under Age 5 and Over Age 65 (2012-2016)

Jurisdiction	% Population Under 5 Years	% Population 65 Years and over
Incorporated Dent County	5.9	20.1
Salem	6.1	23.5

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Due to lack of data, strategic buildings that lack air-conditioning could not be analyzed for this report. Additionally, school policy data in regard to extreme heat were not available.

Problem Statement

In summary, the risks of extreme heat can impact the health/lives of citizens within the county, specifically the young and elderly. Dent County and Salem have a high percentage of individuals 65 and over, making up at least 20 percent of the population.

Many people do not realize how deadly a heat wave can be. Extreme heat is a natural disaster that is not as dramatic as floods or tornadoes. Working with the Dent County Health Department and EMD, local governments should encourage residents to reduce the level of physical activity, wear lightweight clothing, eat fewer protein-rich foods, drink plenty of water, minimize their exposure to the sun, and spend more time in air-conditioned places. People who work outdoors should be educated about the dangers and warning signs of heat disorders. Buildings, ranging from homes (particularly those of the elderly) to factories, should be equipped with properly installed, working air conditioning units, or have fans that can be used to generate adequate ventilation. Charitable organizations and the health department should work together to provide fans to at-risk residents during times of critical heat.

3.4.5 Fires (Urban/Structural and Wild)

The specific sources for this hazard are:

- Missouri Department of Conversation Wildfire Data Search at http://mdc4.mdc.mo.gov/applications/FireReporting/Report.aspx
- Statistics, Missouri Division of Fire Safety;
- National Statistics, US Fire Administration;
- Fire/Rescue Mutual Aid Regions in Missouri;
- Forestry Division of the Missouri Dept. of Conservation;
- National Fire Incident Reporting System (NFIRS), http://www.dfs.dps.mo.gov/programs/resources/fire-incident-reporting-system.asp
- Firewise Missouri, http://www.firewisemissouri.org/wildfire-in-missouri.html
- University of Wisconsin Slivis Lab, http://silvis.forest.wisc.edu/maps/wui_main

Hazard Profile

Hazard Description

The incident types considered for urban/structural fire include all fires in the following categories: 1) general fires, 2) structure fire, 3) fire in mobile property used as a fixed structure, and 4) mobile property (vehicle) fire. The fire incident types for wildfires include: 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation, crop fire.

The Missouri Division of Fire Safety (MDFS) indicates that approximately 80 percent of the fire departments in Missouri are staffed with volunteers. Whether paid or volunteer, these departments are often limited by lack of resources and financial assistance. The impact of a fire to a single-story building in a small community may be as great as that of a larger fire to a multi-story building in a large city.

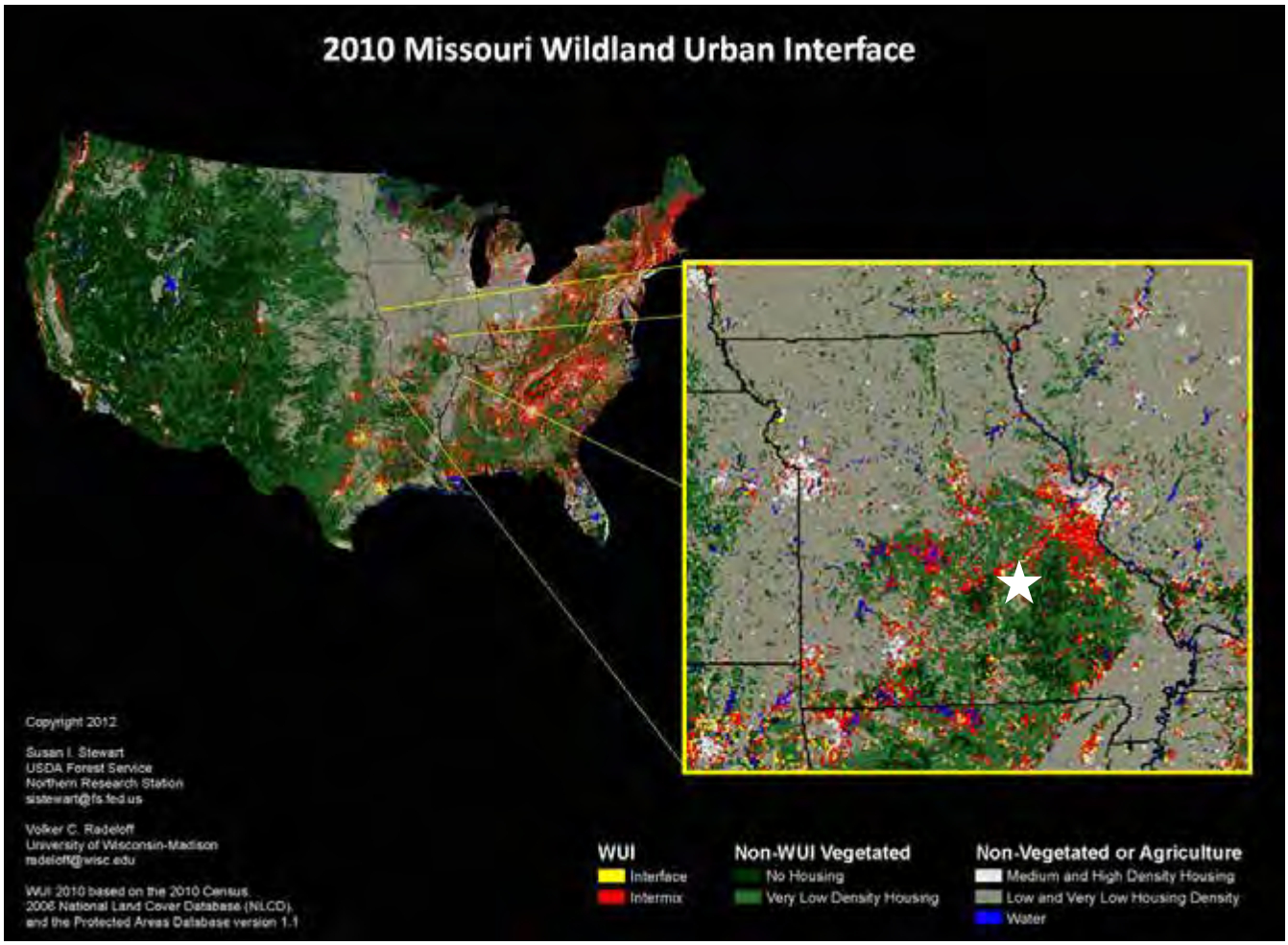
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works closely with volunteer fire departments and federal partners to assist with fire suppression activities. Currently, more than 900 rural fire departments in Missouri have mutual aid agreements with the Forestry Division to obtain assistance in wildfire protection if needed.

Most of Missouri fires occur during the spring season between February and May. The length and severity of both structural and wildland fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents burn their garden spots, brush piles, and other areas in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush. Therefore, spring months are the most dangerous for wildfires. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

Geographic Location

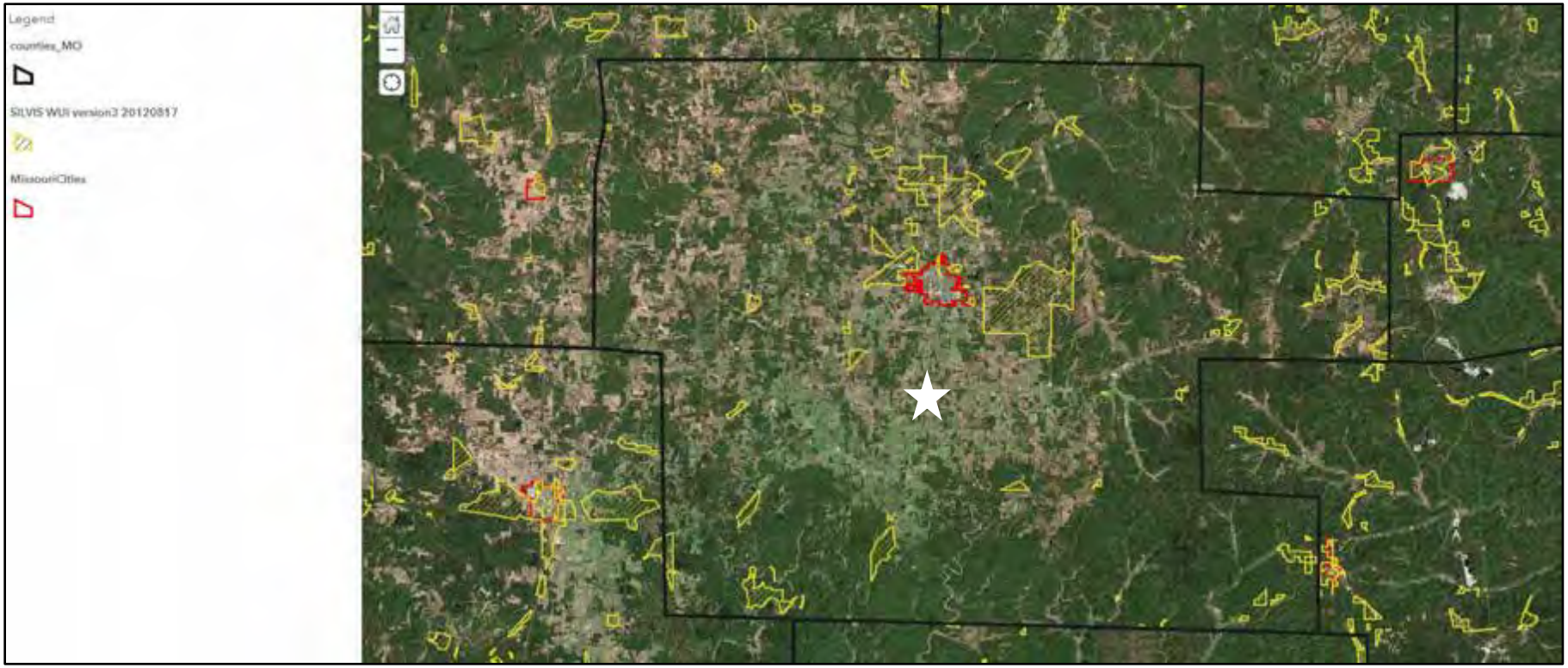
The risk of structural fire does not vary widely across the planning area. However, damages due to wildfires are expected to be higher in communities with more wildland–urban interface (WUI) areas. WUI refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas (**Figure 3.26**). To determine specific WUI areas and variations, data was obtain from ArcGIS, Streets and SILVIS (**Figure 3.27**). According to the WUI area map of Dent County, Salem partially resides in a WUI area.

Figure 3.26. 2010 Missouri Wildland Urban Interface (WUI)



Source: http://silvis.forest.wisc.edu/maps/wui; White star roughly estimates Dent County's location

Figure 3.27. Dent County Wildlife Urban Interface



Source: ArcGIS, Streets; *White star indicates Dent County

Severity/Magnitude/Extent

Structural and urban fires are a daily occurrence throughout the state. Statewide, approximately 100 fatalities occur annually, as well as numerous injuries affecting the lives of the victims, their families, and many others—especially those involved in fire and medical services. Unlike other disasters, structural fires can be caused by human criminal activity: arson. All citizens pay the costs of arson whether through increased insurance rates, higher costs to maintain fire and medical services, or the costs of supporting the criminal justice system.

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

While very unusual, crown fires can and do occur in Missouri native hardwood forests during prolonged periods of drought combined with extreme heat, low relative humidity, and high wind. Tornadoes, high winds, wet snow and ice storms in recent years have placed a large amount of woody material on the forest floor that causes wildfires to burn hotter and longer. These conditions also make it more difficult for fire fighters suppress fires safely.

Often wildfires in Missouri go unnoticed by the general public because the sensational fire behavior that captures the attention of television viewers is rare in the state. Yet, from the standpoint of destroying homes and other property, Missouri wildfires can be quite destructive.

No information in regards to the severity of damages from structural fires is available for Dent County.

Previous Occurrences

Between 2009 and 2012 there was an estimated 66 annual average of urban/structural fires in Dent County. Additionally, the average annual property loss was $883,313. Total deaths and injuries reported totaled 1 and 2, respectively[34].

Between 1998 and 2017, wildfires consumed 11,234.97 acres in Dent County[35]. Between 2004 and 2012 there were 260 wildfires in the county, which consumed 5,077 acres and damaged 5 buildings[36].

Records for school and special districts are not available at this time.

[34] 2013 Missouri State Hazard Mitigation Plan
[35] http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx
[36] 2013 Missouri State Hazard Mitigation Plan

Probability of Future Occurrence

From the data obtained from the Missouri Department of Conservation[37] (**Appendix: E**), 565 wildfire events occurred in Dent County between 1998 and 2017. This information was utilized to determine the annual average percent probabilities of wildfires. Since multiple occurrences are anticipated per year (565 events/20 years), the probability of wildfires per year is 100% with an average of 28.25 events per year (**Table 3.39**). In addition, 5 buildings were considered damaged due to wildfires between 2004 and 2012. The average percent probability of structural damage due to wildfires is 55.5% (5 events/9 years *100) (**Table 3.40**). Lastly, according to the 2013 Missouri State Hazard Mitigation Plan, the probability of structural/urban fires in Dent County per year is 100% with an average of 66 structural fires annually[38] (**Table 3.41**).

Table 3.39. Annual Average Percentage Probability of Wildfires in Dent County

Location	Annual Avg. % P	Avg. Number of Events
Dent County	100%	28.25

*P = probability; see page 3.24 for definition.

Table 3.40. Annual Average Percentage Probability of Structural Damage due to Wildfires in Dent County

Location	Annual Avg. % P
Dent County	55.5%

*P = probability; see page 3.24 for definition.

Table 3.41. Annual Average Percentage Probability of Structural/Urban Fires in Dent County

Location	Annual Avg. % P	Avg. Number of Events
Dent County	100%	66

*P = probability; see page 3.24 for definition.

[37] http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx
[38] 2013 Missouri State Hazard Mitigation Plan

Vulnerability

Vulnerability Overview

Data was collected from the National Fire Incident Reporting System (NFIRS) between 2009 and 2012. The data was analyzed to delineate overall statewide vulnerability for urban/structural fires in Dent County. Unfortunately, only 61 percent of fire departments in the State of Missouri reported occurrences to NFIRS. **Table 3.42** depicts the ranges for urban/structure fire vulnerability ratings. Furthermore, **Table 3.43** illustrates vulnerability analysis utilizing statistical data for urban/structural fires for Dent County between 2009 and 2012[39]. The overall vulnerability rating of urban/structural fires in Dent County is medium-low (2).

Table 3.42. Ranges for Urban/Structure Fire Vulnerability Factor Ratings

Factors Considered	Low (1)	Medium-Low (2)	Medium (3)	Medium-High (4)	High (5)
Housing Density (3 per sq. mile)	<50	50 to 99	100 to 199	200 to 499	>500
Urban Fire Likelihood (# of events/ yrs. Of data)	0 to 49	50 to 99	100 to 299	300 to 499	500+
Building Exposure ($)	<$0.5B	$0.5B to $0.9B	$1B to $1.9B	$2B to $5.9B	>$6B
Annualized Property Loss Ratio Rating (annual Property loss/exposure)	0-.000099	.0001 to .000299	.0003 to .000599	.0006 to .000999	.001+
Death/Injury Rating (2x # of deaths + # of injuries)	0 to 4	5 to 9	10 to 19	20 to 49	50+
Death/Injury/Number of events Rating (Death Injury Rating factor/ # of events)	0 to 0.1	0.1 to 0.2	0.2 to 0.3	0.3 to 0.4	0.4+
Overall Vulnerability Rating (Average of all ratings)	1 to 1.67	1.67 to 2.35	2.36 to 3.03	3.04 to 3.71	3.72 to 4.4

Source: 2013 Missouri State Hazard Mitigation Plan

[39] 2013 Missouri State Hazard Mitigation Plan

Table 3.43. Statistical Data and Factor Ratings for Urban/Structure Fire Vulnerability (2004 to 2008)

County	Housing Units /sq. mi.	Housing Density Rating	Annual # Average	Likelihood Rating	Total Building Exposure ($)	Building Exposure Rating	Average Annual Property Loss ($)	Annual Property Loss Ratio	Property Loss Ratio Rating	Total Deaths/Injuries		Death/Injury Factor	Death/Injury Factor Rating	Death/Injury/# of Fires Factor	Death/Injury/# of Fires Factor Rating	Average of Factors	Overall Vulnerability Rating
Dent	9.7	1	66	2	1,382,572,000	3	883,313	0.000639	4	1	2	4	1	0.06	1	2	2

Source: 2013 Missouri State Hazard Mitigation Plan, US Census, 2010

For wildfires, data was obtained from the Missouri Department of Conservation (MDC). **Table 3.44** depicts the ranges for wildfire vulnerability factor ratings, including the two factors considered; likelihood and annualized acres burned. **Table 3.45** illustrates the statistical data and factor ratings for wildfire vulnerability. The data collected from MDC included wildfire reported between 2004 and 2012. The overall vulnerability of wildfires in Dent County is medium (3).

Table 3.44. Ranges for Wildfire Vulnerability Factor Ratings

Factors Considered	Low (1) Level 1 Range	Medium-low (2) Level 2 Range	Medium (3) Level 3 Range	Medium-high (4) Level 4 Range	High (5) Level 5 Range
Likelihood Rating	<29.56	29.56 to 59.11	59.12 to 88.67	88.68 to 118.23	>118.23
Annualized Acres Burned Rating	<100	100 to 199	200 to 499	500 to 999	>999
Vulnerability (Average of values above)	0.0 to 1.0	1.0 to 2.0	2.0 to 3.0	3.0 to 4.0	4.0 to 5.0

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.45. Statistical Data and Factor Ratings for Wildfire Vulnerability

County	Wildfires 2004 -2012	Average Annual # of Wildfires	Likelihood Rating 1-5	Acres Burned	Average Annual Acres Burned	Average Acres Burned Rating	Total Buildings Damaged	Overall Vulnerability
Dent	260	28.9	1	5,077	564	4	5	3

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

According to the 2013 Missouri State Hazard Mitigation Plan, the average annual property loss due to urban/structure fires was $883,313 (2009 to 2012). Unfortunately, due to lack of data, a monetary value could not be associated with wildfire loss. However the annual average percent probability for structural loss due to wildfires is 55.5%.

Impact of Future Development

Few future developments are anticipated in WUI areas, however due to lack of data, it is difficult to enumerate. Additionally, as previously mentioned, each jurisdiction within the county resides in a WUI area. This increases the risk of fire hazards for future development.

Hazard Summary by Jurisdiction

As long as drought conditions are not seriously inflamed, future wildfires in Dent County should have a negligible adverse impact on the community, as it would affect a small percentage of the population. Nonetheless, homes and businesses located in unincorporated areas are at higher risk from wildfires due to proximity to woodland and distance from fire services. Variations in both structural/urban and wildfires are not able to be determined at this time due to lack of data. However, both fire types are expected to occur on an annual basis across the county.

Problem Statement

Both structural/urban fires and wildfires are expected to occur on an annual basis. To mitigate adverse impacts a comprehensive community awareness and educational campaign on wildfire danger should be designed and implemented. This campaign should include the development of capabilities, systems, and procedures for pre-deploying fire-fighting resources during times of high wildfire hazards; training of local fire departments for wildfire scenarios; encouraging the development and dissemination of maps relating to the fire hazards (WUI areas) to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities; and guidance of emergency services during response.

3.4.6 Flooding (Flash and River)

Some specific sources for this hazard are:

- Watershed map, Environmental Protection Agency, http://cfpub.epa.gov/surf/county.cfm?fips_code=19169
- FEMA Map Service Center, Digital Flood Insurance Rate Maps (DFIRM) for all jurisdictions, if available, msc.fema.gov/portal
- NFIP Community Status Book, http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book
- NFIP claims status, BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html
- Flood Insurance Administration—Repetitive Loss List (this must be requested from the State Floodplain Management agency or FEMA)
- National Centers for Environmental Information, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Hazard Profile

Hazard Description

A flood is partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms “base flood” and “100- year flood” refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Flooding caused by dam failure is discussed in **Section 3.1.** It will not be addressed in this section.

A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP), and can also happen in areas not associated with floodplains.

Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

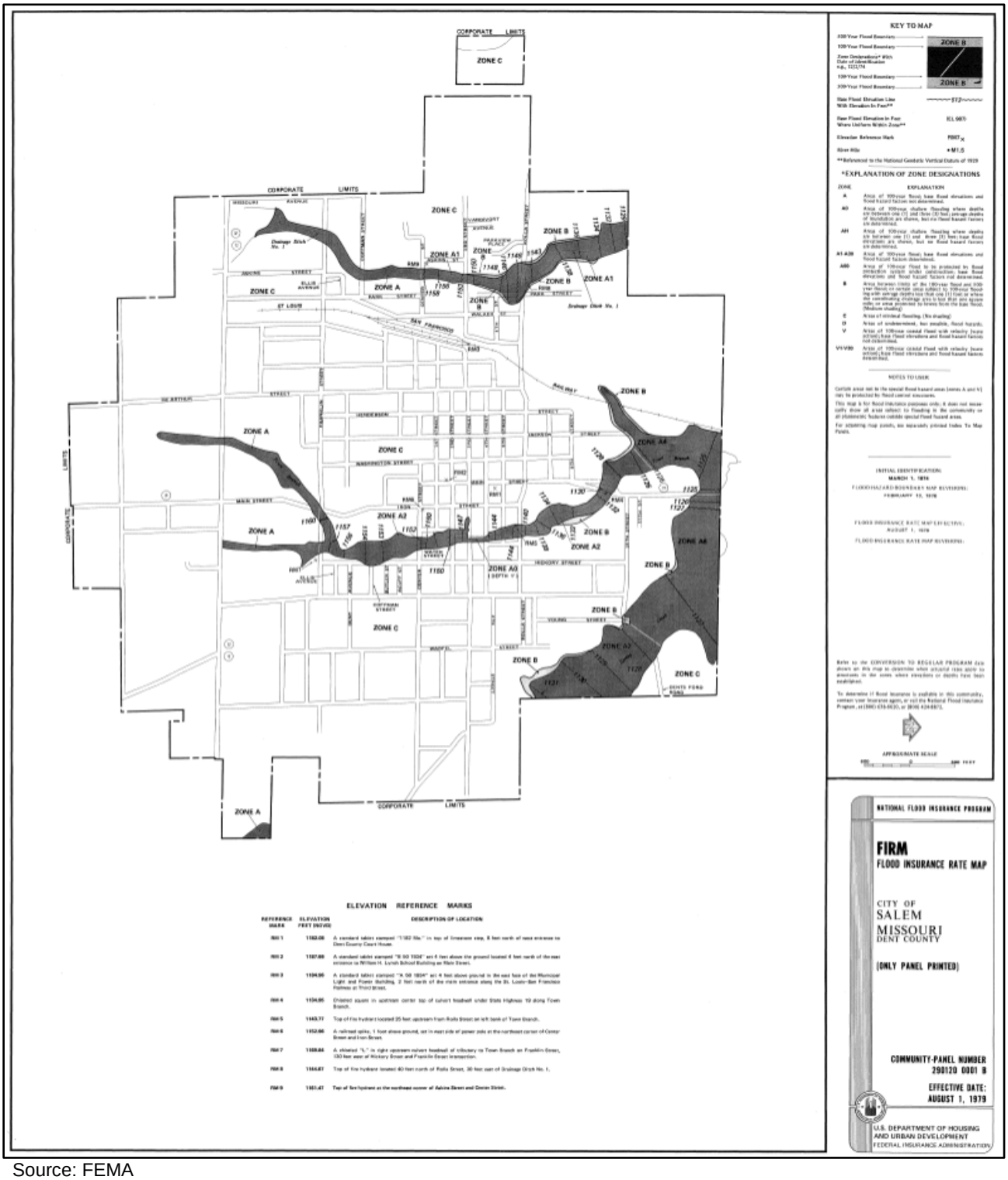
In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems has increased the warning time for flash floods.

Geographic Location

Riverine flooding is most likely to occur in Special Flood Hazard Areas (SFHA). Below is a FIRM for Salem (**Figure 3.28**). Digital data for SFHAs are not available for the City of Salem. **Table 3.46** shows Dent County NCEI flood events by location between 1998 and 2017.

Figure 3.28. Salem, Missouri Special Flood Hazard Areas (SFHAs)



Source: FEMA

Table 3.46. Dent County NCEI Flood Events by Location, 1998-2017

Location	# of Events
Dent (Zone)	9
Hobson	2
Jack	1
Montauk	1
Salem	1
Sligo	9
Stone Hill	2

Source: National Centers for Environmental Information

Flash flooding occurs in SFHAs and locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. After review of NCEI data, Salem is most prone to flash flooding events. **Table 3.47** provides information in regards to flash flood events between 1998 and 2017.

Table 3.47. Dent County NCEI Flash Flood Events by Location, 1998-2017

Location	# of Events
Boss	1
Countywide	4
Gano	1
Hobson	2
Jack	1
Jadwin	1
Max	1
Montauk	5
North Portion (county)	1
Salem	9
Sligo	6
South Portion (county)	1
Stone Hill	3

Source: National Centers for Environmental Information

Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2013 State Hazard Mitigation Plan. Flooding along Missouri‘s major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing communities downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

Flooding presents a danger to life and property, often resulting in injuries, and in some cases, fatalities. Floodwaters themselves can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture as a result of flood activity. Examples are bulk propane tanks. When this happens, evacuation of citizens is necessary.

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology

concerns) may be necessary.

When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Floodwaters can also cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard. Further information regarding scour critical bridges can be found in **Section 3.2.2**.

Between 1998 and 2017, there were zero recorded crop insurance claims in loss due to flooding within Dent County[40].

National Flood Insurance Program (NFIP) Participation

Table 3.48 depicts jurisdictions within the planning area that participate in NFIP. In addition, **Table 3.49** provides the number of policies in force, amount of insurance in force, number of closed losses, and total payments for Salem.

Table 3.48. NFIP Participation in Dent County

Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	E Prc Date
290120	Salem, City of	Y	08/01/79	08/01/79
290118	Dent County	N	01/05/84	01/05/85

Source: NFIP Community Status Book, 5/18/18; BureauNet, http://www.fema.gov/national-flood-insurance-program/national- flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

Table 3.49. NFIP Policy and Claim Statistics as of [01/31/2018]

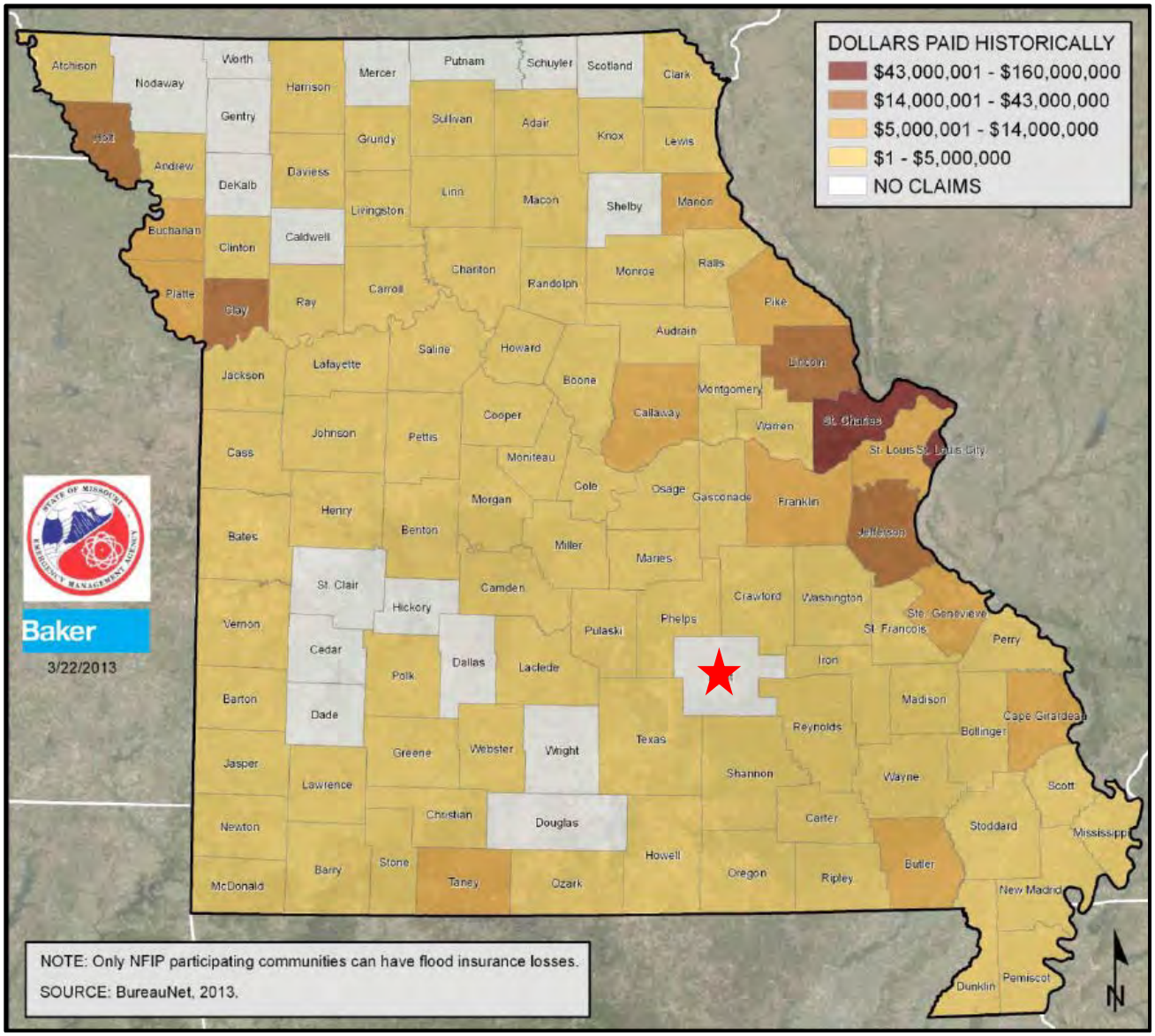
Community Name	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments
Salem, City of	2	0	0	2	.00

Source: NFIP Community Status Book, [05/18/2018]; BureauNet, http://bsa.nfipstat.femxa.gov/reports/reports.html; *Closed Losses are those flood insurance claims that resulted in payment.

The following figures depict the dollars paid historically for flood insurance losses in Missouri by county from 1978 to Jan. 2013 (**Figure 3.29**)**,** and historical flood loss claims in Missouri by county, 1979 to Jan. 2013 (**Figure 3.30**).

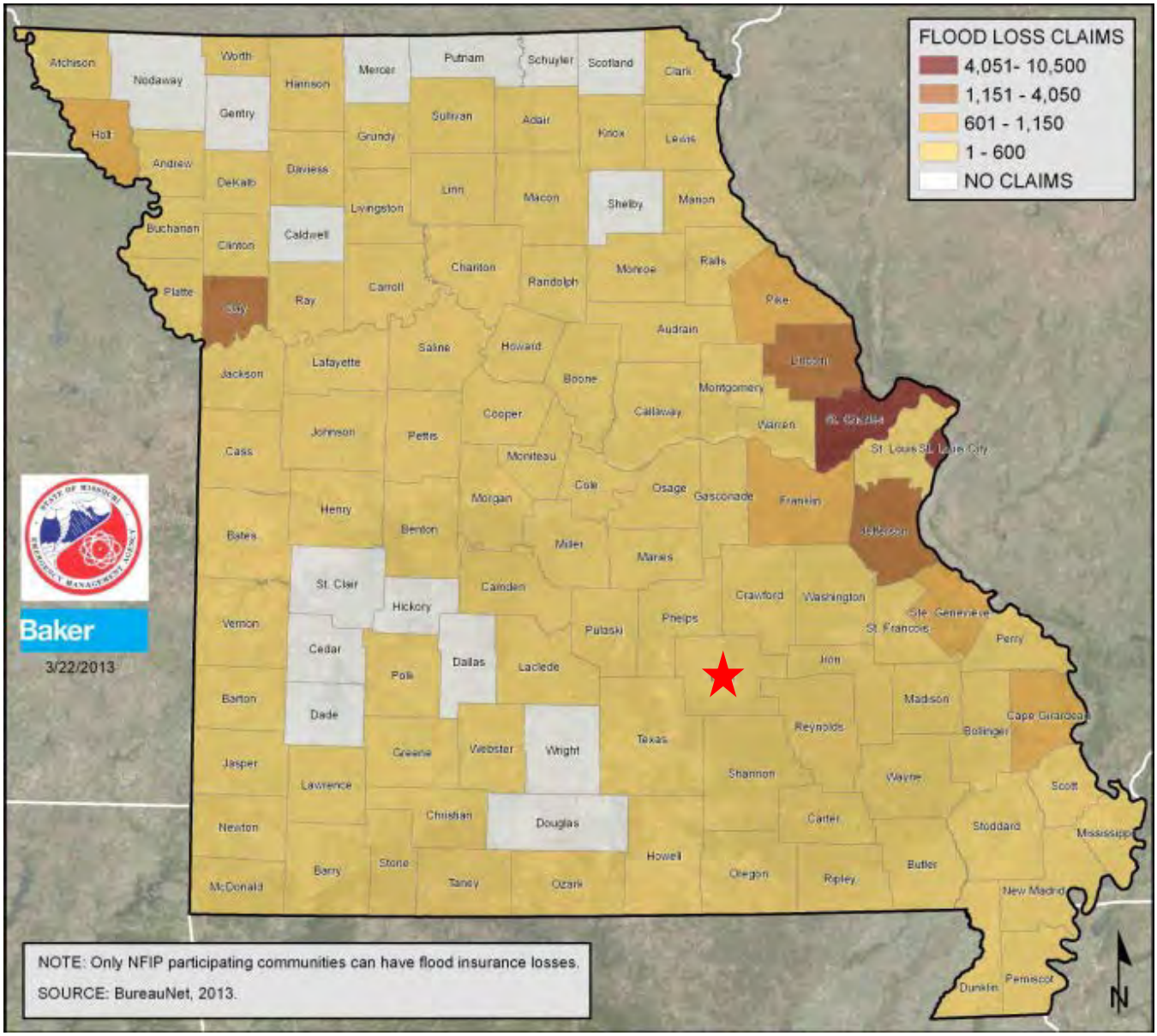
[40] http://www.rma.usda.gov/data/cause.html

Figure 3.29. Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978 to Jan. 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.30. Historical Flood Loss Claims in Missouri by County, 1978 to Jan. 2013

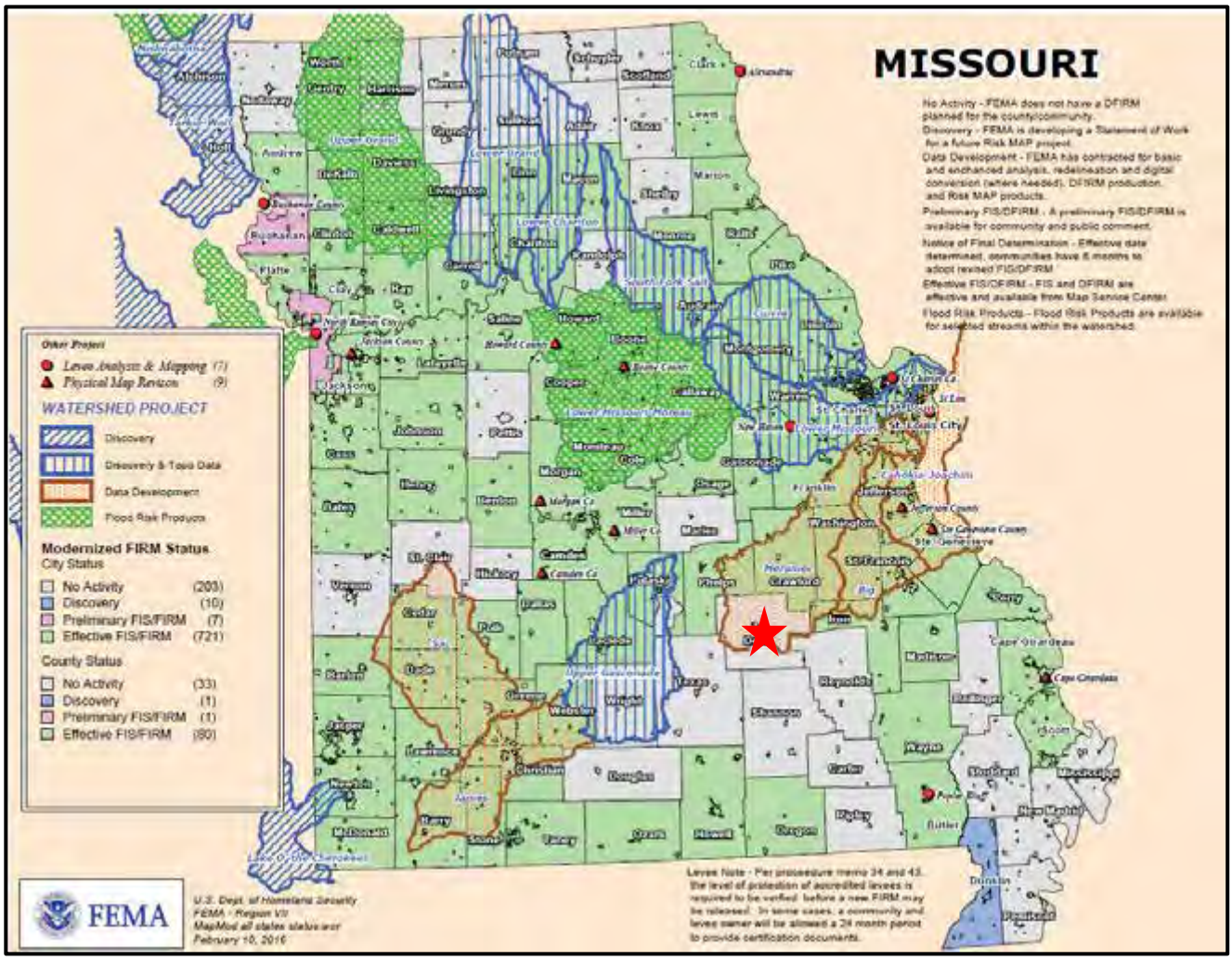


Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

RiskMAP

Risk mapping, assessment, and planning is a FEMA program which provides communities with flood information and tools to enhance their mitigation plan and take action to better protect their citizens. The majority of Dent County is in the data development phase. The Modernized FIRM Status for the county is No Activity. **Figure 3.31** below depicts various watershed projects and FIRM statuses for Missouri.

Figure 3.31. RiskMAP 2015



Source: SEMA, 2016
*Red star indicates Dent County

Repetitive Loss/Severe Repetitive Loss Properties (data requested from SEMA)

Repetitive Loss Properties (RL) are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period.

Severe Repetitive Loss (SRL): A SRL property is defined it as a single family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP; and has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $5,000 and with cumulative

amounts of such claims payments exceeding $20,000; or (2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property

According to FEMA, there are no RL or SRL properties within the county.

Previous Occurrences

Table 3.50 provides information regarding Presidential Flooding Disaster Declarations between 1998 and 2017 for Dent County.

Table 3.50. Dent County Presidential Flooding Disaster Declarations 1998 to 2017

Declaration No.	Date	State	Incident Description
DR-1463	05/04/2003	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
DR-1676	1/12/2007	Missouri	Missouri Severe Winter Storms and Flooding
DR-1809	9/11/2008	Missouri	Missouri Severe Storms, Flooding, and a Tornado
DR-1749	3/17/2008	Missouri	Missouri Severe Storms and Flooding
DR-1847	5/08/2009	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
EM-3374	12/22/15	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding
DR-4317	4/28/17	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding

FEMA, Disaster Declarations for Missouri, Flooding

Data was obtained from the NCEI regarding flash and river flooding over the last 20 years. **Table 3.51** and **Table 3.52** provide this information. Additionally, narratives available for each event are included.

Table 3.51. NCEI Dent County Riverine Flood Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages ($)	Crop Damages ($)
1998	1	0	0	124.00K	0
2002	6	0	0	350.00K	0
2005	2	0	0	0	0
2007	1	1	0	0	0
2008	1	0	0	0	0
2009	2	0	0	0	0
2010	2	0	0	0	0
2011	3	0	0	500.00K	0
2013	2	0	0	0	0
2015	1	0	0	0	0
2016	1	0	0	0	0
2017	3	1	0	10.00K	0
Total	**25**	**1**	**0**	**984.00K**	**0**

Source: NCEI, data accessed [3/16/2018]

Narratives on flood events:

1. **07/26/1998:** A series of thunderstorm complexes over central and south central Missouri produced widespread flooding. Cooperative weather stations reported over 8 inches of rain at Versailles (Morgan County), Rolla (Phelps County, and Salem (Dent County). Flooding caused widespread damage to roads and low water crossings and bridges. The Missouri Governor declared a state of emergency for several counties in central Missouri including Benton, Dent, Maries, Miller, Morgan, Phelps, and Shannon.

2. **01/31/2002:** A prolonged moderate rainfall event occurred over the Ozarks from the early morning to the evening hours of January 31, 2002. One day earlier, heavy rainfall provided nearly one inch of rain over the flooded areas, which made for already wet soil conditions prior to this event.

   A shallow arctic front, which provided the focus for a large scale overrunning precipitation event, was nearly stationary along the Arkansas border during the day. The rainfall began early Thursday morning with an almost continuous influx of steady rainfall from 9 am January 31, to approximately 6 pm that evening. Rainfall rates were generally low and ranged from one half, to three quarters of an inch per hour in the heaviest downpours. However, a general one to two tenths per hour was more consistent with the overall rainfall pattern, with isolated convective activity during the afternoon hours. 24 hour rainfall totals, including Doppler radar estimates in the flooded areas, ranged from one inch, to nearly three inches in Phelps, Pulaski, Texas, Howell and Shannon Counties.

   Numerous low water crossings, streams and county roads were flooded throughout the event. Several of the county roads were closed and did not reopen until Friday morning, February 1, 2002. The hardest hit areas were in Pulaski and Shannon Counties where Cave, Spring, and Creek roadways along the Big Piney River, and Highway H between Highway 16 and 106, were closed for nearly 24 hours.

3. **02/01/2002:** This is the continuation of the flood event of January 31, 2002. Although the rainfall had ended, runoff continued which caused several roads, low water crossings, and small streams to remain flooded through the morning. Runoff from the small streams caused the Big Piney River to rise above flood stage early Friday morning. Also, the Gasconade River, North Fork, Jacks Fork, and Eleven Point Rivers of central and south central Missouri rose significantly during this event.

4. **05/08/2002:** The flash flooding event on the 7th and early 8th, became a major flooding event across all of southern and central Missouri through the early afternoon of May 9th. In addition to the numerous road closures, bridges blocked by debris, evacuations of towns, campgrounds, parks, and moderate river flooding, many communities had their worst flooding in more than 10 years. The American Red Cross set up shelters in Branson and Cassville due to evacuations. Flooded roadways forced several school districts across southwest Missouri to close for a few days. Several areas of west central Missouri also had crop damage.

5. **05/12/2002:** This is the continuation of the flooding that occurred over portions of southern Missouri on May 12th and 13th. Although numerous low water crossings, bridges, and area rivers flooded for the second time in less than a week, this area was more concentrated over portions of southwest Missouri and portions of extreme south central Missouri. One of the more significant factors this time with the flooding is that the area lakes rose to critical levels, especially Bull Shoals and Table Rock Lake, where the water rose to a few feet below the flood pool.

This flooding event prolonged the closure of numerous roads and low water bridges over central and southern Missouri. The additional heavy rain also worsened already existing river flooding over the region. Polk County received over eight inches of rainfall during a 12 hour period which caused most of the southern part of the county to have significant road erosion. Parts of Dent County also reported significant basement flooding and road erosion.

6. **05/17/2002:** This is the continuation of the flooding from May 16th and 17th. Runoff was excessive over south central Missouri and portions of southwest Missouri where local rivers and smaller tributaries continued to rise. The runoff slowly subsided during the early morning hours of May 18th.

   During the first three weeks of May, many areas of the Ozarks and southeast Kansas received between seven and twelve inches of rainfall. Not only did this cause major flooding of roadways, rivers and creeks, this contributed to lake levels rising to near record heights. Bull Shoals Lake rose so high that it caused Highway K to flood for several weeks. It forced seven families that live along Highway K to travel to and from their homes via canoes or rafts. A city park was closed for several weeks on Lake Taneycomo and caused their local fair to be cancelled.

   The significant and widespread flooding that occurred over the region caused the President to declare the following counties in southern Missouri disaster areas; Camden, Cedar, Christian, Dent, Greene, Hickory, Jasper, Laclede, McDonald, Newton, Polk, Stone, Texas, Vernon, Wright, Barry, Barton, Dade, Dallas, Webster, Taney, Douglas, Howell, Oregon, Lawrence and Shannon counties.

7. **08/20/2002:** Runoff continued as four to eight inches of rain that fell earlier causing numerous low water crossings to remain closed through mid-morning of August 20th.

8. **01/05/2005:** Several periods of heavy rain in conjunction with little vegetation over the winter months set the stage for widespread flooding across much of extreme southeast Kansas and southern and central Missouri. In Dent County, numerous roads and low lying areas were inundated and impassable by motorists countywide.

9. **01/13/2005:** A slow moving storm system caused heavy rain to occur across much of southern and central Missouri. This event followed quickly on the heels of a previous flood event that occurred from the 4th through the 6th of January, therefore soils were nearly saturated at the onset of the event. The lack of January vegetation also contributed to increased runoff and flooding. In Dent County, the primary areas that flooded were low water crossings and low lying areas.

10. **04/14/2007:** Numerous thunderstorms produced hail and flash flooding across the Missouri Ozarks.

11. **03/19/2008:** Excessive rainfall developed over southern Missouri during the evening of 17 March. A line of training convection assumed a position roughly along a line from Anderson to Ozark to Licking. This convection expanded with time, eventually covering nearly all of extreme southeast Kansas and the Missouri Ozarks. Moderate to heavy rain continued into the overnight period and did not stop until the morning of 19 March.

12. **09/04/2009:** A low water crossing in Salem flooded.

13. **10/29/2009:** Route TT east of Route 19 was closed due to flooding.

14. **05/20/2010:** A slow moving upper level storm system, moved across the region, acting to transport significant amounts of moisture up and over a stalled frontal boundary laid out across the Ozarks. Isolated embedded thunderstorms produced small hail and locally heavy rainfall. Wide spread flooding and flash flooding occurred as a result of the duration of heavy rainfall in conjunction with isolated heavy rainfall from thunderstorms.

15. **02/24/2011:** Highway TT in northeastern Dent County was closed due to flooding.

16. **04/23/2011:** Highway 119 was closed due to high water and campers were evacuated from Montauk State Park. The low water crossing at Crooked Creek on Highway TT was closed because of flooding.

17. **02/26/2013:** MODOT reported that the low water crossing along Highway TT was flooded.

18. **11/17/2015:** Highway TT was closed approximately one mile east of Highway 19 due to flooding.

19. **05/17/2016:** Highway TT was closed approximately one mile east of Highway 19 due to flooding.

20. **04/05/2017:** Highway TT was closed approximately one mile east of Highway 19 due to flooding. Route TT at Crooked Creek was flooded and impassible. The Missouri State Highway Patrol reported that a man drowned near a low water crossing at County Road 2430 and Dry Fork Creek. The man attempted to drive across a flooded low water crossing but the car was swept away.

Table 3.52. NCEI Dent 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	3	0	0	0	0
2005	4	0	0	0	0
2006	2	0	0	0	0
2008	5	0	0	1.000M	0
2009	2	0	0	0	0
2011	4	0	0	0	0
2013	6	0	0	0	0
2015	4	0	0	0	0
2016	1	0	0	0	0
2017	1	0	0	1.000M	0
Total	**36**	**0**	**0**	**2.000M**	**0**

Source: NCEI, data accessed [3/16/2018]

Narratives on flood events:

1. **3/19/1998:** Heavy rain falling on saturated ground resulted in widespread flooding of low water crossings and creeks in the county. Flooding forced the evacuation of the Montauk State Park campground around 1830 CST 3/19/98. Parts of Route T in the Sligo area and

Route EE.

2. **06/11/1998:** Two inches of rain fell in a one hour period producing flooding of low water crossings and small creeks.

3. **02/07/1999:** An area of 2.5 to 6 inches of rain fell over a portion of southwest and south central Missouri. The heaviest rain fell in eastern Douglas and Texas Counties. Numerous roads were closed due to high water.

4. **08/10/2000:** Highway AB, two miles northwest of Montauk State Park had almost two feet of water flowing over the road.

5. **05/12/2002:** Another in a series of thunderstorm complexes moved across the area producing excessive rainfall on the already saturated soils. Most of the heavy rainfall began across central Missouri Sunday morning May 12th, and then produced another round of torrential rainfall Sunday evening. By Monday morning May 13th, a large area of two inches fell north of Interstate 44, with the heaviest bands of three to six inches from Joplin northeast to Greenfield, Bolivar and Urbana. Another area of excessive rain fell over eastern Texas, northern Shannon, and southern Dent counties where locally three to six inches fell.

6. **05/16/2002:** This was the third major flood event to occur within a 10 day period. Some communities reported over a foot of rain since the beginning of May. This area of excessive rainfall fell over mostly southern Missouri, south of Interstate 44 from the night of May 16, through the morning May 17th. Over an inch of rain fell over a broad area of southern Missouri, with bands of three to six inches from Joplin to Carthage, Powell to Cassville, Ozark to Mansfield, and from Licking to Ankers in northern Shannon County. Even though there were three days of dry weather, runoff was not complete from the previous flooding event, therefore, flash flooding developed quickly.

7. **08/19/2002:** Four inches of rain fell in less than 3 hours over portions of northern Dent County and southern Phelps County. Locally five to seven inches fell near Boss in east central Dent County. Local law enforcement officers reported Highway 32 east of Salem flooded with nearly 12 inches of water flowing over the road at one point. One of the officer's car nearly floated away due to the extremely high water level as he drove down the highway, however, he was able to get out with no injuries. Numerous low water crossings also flooded across the area with several roads closed.

8. **01/05/2005:** Several periods of heavy rain in conjunction with little vegetation over the winter months set the stage for widespread flooding across much of extreme southeast Kansas and southern and central Missouri. In Dent County, numerous roads and low lying areas were inundated and impassable by motorists countywide.

9. **01/13/2005:** A slow moving storm system caused heavy rain to occur across much of southern and central Missouri. This event followed quickly on the heels of a previous flood event that occurred from the 4th through the 6th of January, therefore soils were nearly saturated at the onset of the event. The lack of January vegetation also contributed to increased runoff and flooding. In Dent County, the primary areas that flooded were low water crossings and low lying areas.

10. **04/21/2005**: Heavy thunderstorms caused flash flooding over a section of Highway TT near the community of Sligo.

11. **08/22/2005:** Missouri Department of Transportation observed a section of Highway 32 inundated with flash flooding.

12. **05/10/2006**: Excessive rainfall caused Huzzah Creek to flood over a section of Highway AC.

13. **05/31/2006:** Excessive rainfall caused flash flooding across a low water bridge on Highway P near its intersection with County road 515.

14. **03/18/2008:** Seven to nine inches of rain fell over Dent County. Flooding caused major damage to county roads and bridges. All low areas that typically flood during periods of excessive rainfall were flooded.

15. **03/31/2008**: Saturated antecedent conditions existed prior to this period of excessive rainfall. Some regional locations experienced record rainfall totals from February and March. One to three inches of rain fell across the county causing widespread flash flooding of low water crossings, county roads, and low lying areas near creeks and rivers. Ultimately, all locations that typically flood during periods of excessive rainfall were flooded.

16. **04/10/2008:** One to three inches of rain fell over Dent County. All low areas that typically flood during periods of excessive rainfall were flooded. A section of Highway EE nine miles southeast of Salem was one specific location that flooded.

17. **09/14/2008:** Flash flooding occurred along Pidgeon Creek which caused all campers on Montauk State Park to evacuate.

18. **12/27/2008:** Excessive rain caused several city streets to flood in Salem. Creeks also flooded low areas across the county.

19. **06/03/2009:** A few low water crossings near Craig Industrial Park were flooded due to excessive rainfall.

20. **10/29/2009:** Low water crossings were flooded.

21. **04/23/2011:** The sheriff office reported several low water crossings were flooded. Highway TT was closed due to flooding.

22. **04/25/2011:** Route EE was closed due to flooding. Numerous low water crossings in rural areas were closed due to flooding.

23. **04/18/2013:** Residents were rescued from a trailer surrounded by water along the Meramec River near Highway EE. Water from Spring Creek was over the bridge on County Road 3220.

24. **08/06/2013:** Montauk State Park was evacuated due to high water. The Department of Natural Resources relayed to the NWS that Montauk State Park was flooded from the Current River. All 90 camp sites were evacuated prior to the flooding.

25. **08/07/2013:** Route TT closed in both directions due to flooding in the vicinity of Crooked Creek.

26. **06/19/2015:** State Route TT was closed due to flooding.

27. **07/01/2015:** There was flash flooding in low lying area at Montauk State Park.

28. **08/10/2015:** Route TT was closed in both directions at Crooked Creek due to flooding. Route EE was closed due to flooding of the Meramec River.

29. **09/14/2016:** Water was reported over the road several inches deep on Highway H near Barnitz Prong Creek. The highway was closed for a brief time to traffic due to the high water.

30. **04/29/2017:** Several homes and business sustained flood damage across Dent County. Numerous roads and bridges were severely damaged or washed away across the county. This report will contain the total dollar estimate for flood damage to infrastructure, businesses and homes across Dent County.

Probability of Future Occurrence

From the data obtained from the NCEI [41], there were 25 riverine flood events (**Table 3.52)** over a period of 20 years. This information was utilized to determine the annual average percent probability of riverine flooding (**Table 3.53**). The probability of riverine flooding in Dent County per year is 100% (25 events/20 years x 100) with an average of 1.25 events per year. Furthermore, data was obtained for flash flooding within the county. Dent County endured 36 flash flooding events (**Table 3.51**) over a 20 year period. The probability of flash flooding in Dent County per year is 100% (36 events/20 years x 100) with an average of 1.8 events per year (**Table 3.54**).

Table 3.53. Annual Average % Probability of Riverine Flooding in Dent County

Location	Annual Avg. % P	Avg. Number of Events
Dent County	100%	1.25

*P = probability; see page 3.24 for definition.

Table 3.54. Annual Average % Probability of Flash Flooding in Dent County

Location	Annual Avg. % P	Avg. Number of Events
Dent County	100%	1.8

*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

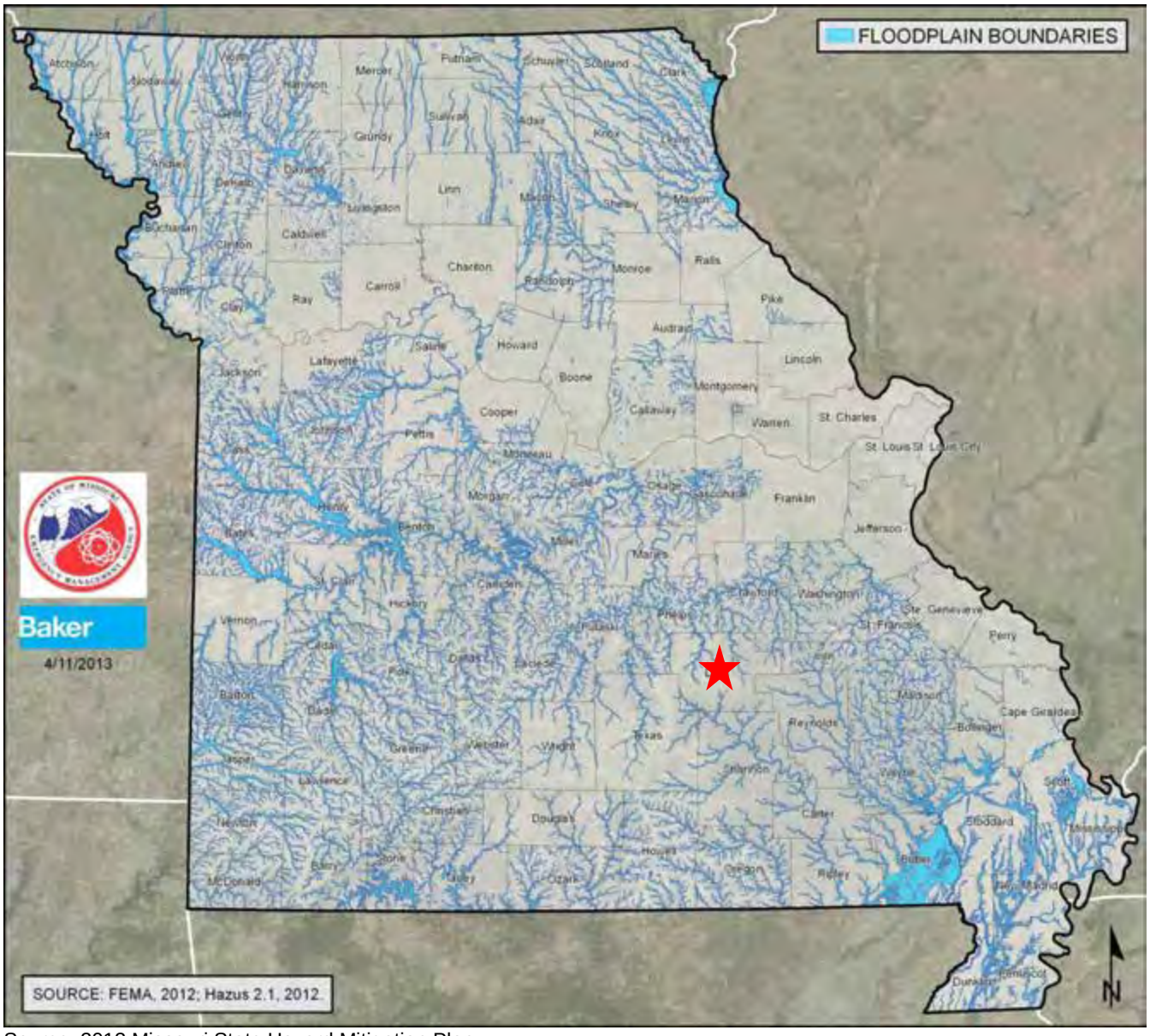
For the vulnerability analysis of riverine and flash flooding for Dent County, data was obtained from the 2013 Missouri State Hazard Mitigation Plan. The 2013 Plan was updated by enhancing the flood vulnerability assessment and loss estimation capabilities of Hazus by leveraging a number of improved local data inputs. This was achieved by integrating DFIRM depth grids for 51 additional counties. Furthermore, the State re-analyzed the previous 29 depth grids used in 2010, to utilize the latest enhancements available in Hazus 2.1; bringing the total number of regions analyzed using DFIRM depth grids to 80 jurisdictions. The subsequent set of improved data inputs included an

[41] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

enhanced building inventory database, which is an improvement over the standard Hazus 2.1 stock data. That data, coupled with the DFIRM depth grids, enabled Level 2 Hazus flood analysis for all 114 counties[42].

Figure 3.32 depicts the 100-year floodplain boundaries for all counties within Missouri. These DFIRM floodplains are comprised of streams based on a <1 sq. mile drainage area.

Figure 3.32. DFIRM and Hazus Countywide Base-Flood Scenarios: Modeled Floodplain Boundaries

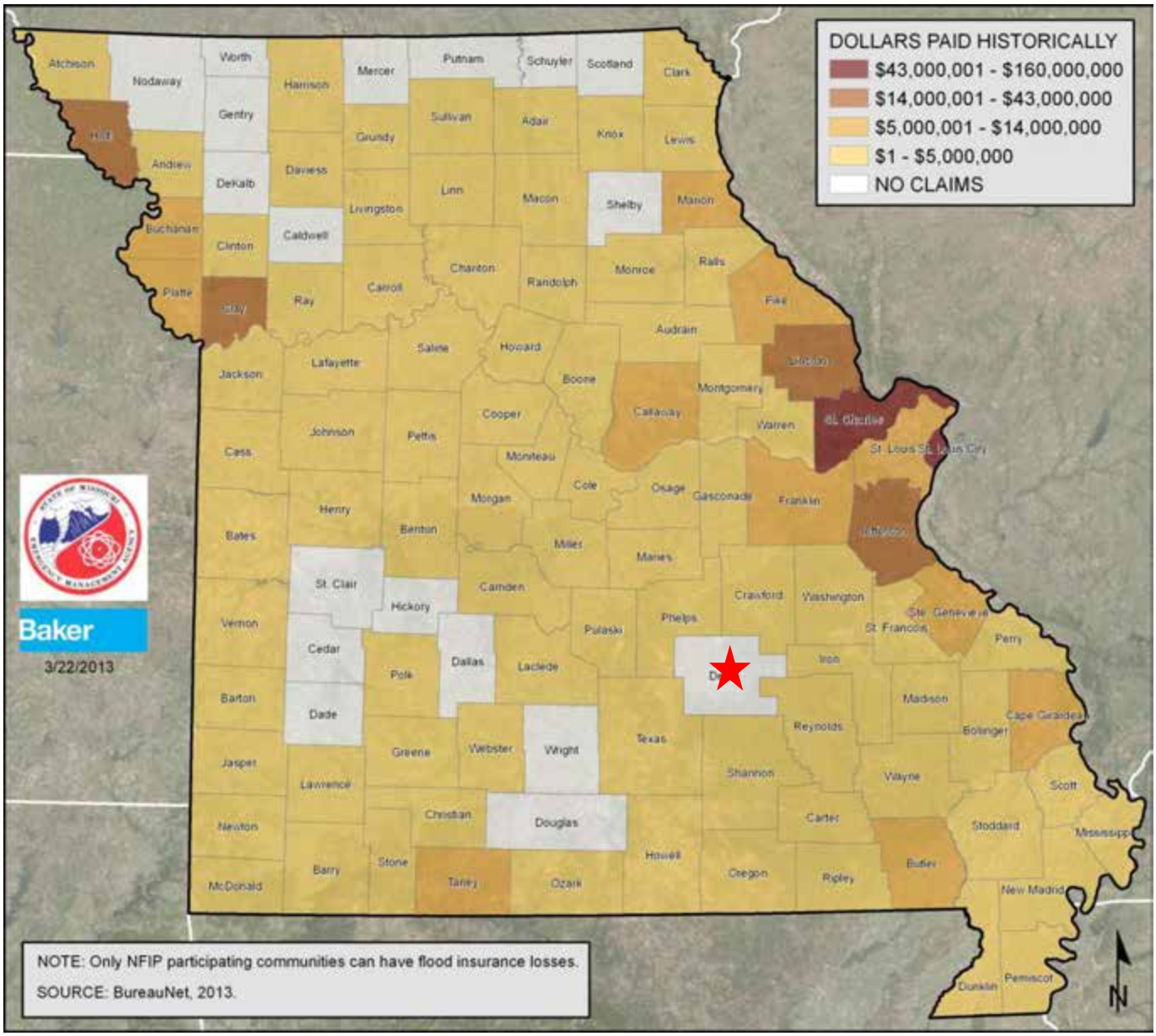


Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

[42] 2013 Missouri State Hazard Mitigation Plan

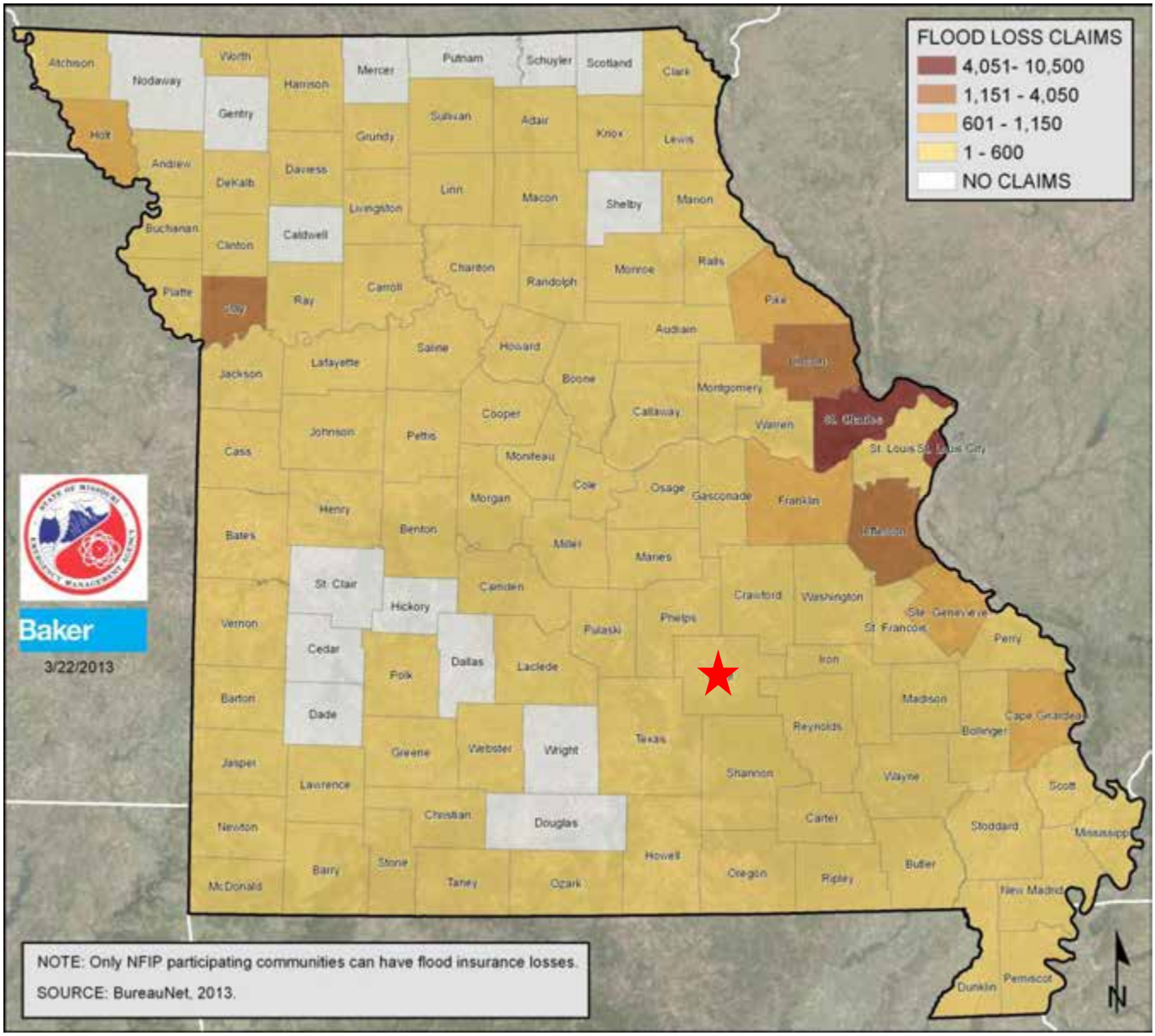
In addition, the state analyzed NFIP flood-loss data to establish areas in Missouri that are most at risk to flooding. **Figure 3.33** illustrates the dollars paid historically for flood insurance losses in Missouri by county from 1978 to 2013. Moreover, **Figure 3.34** depicts flood loss claims in Missouri during the same timeline.

Figure 3.33. Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978 –Jan 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

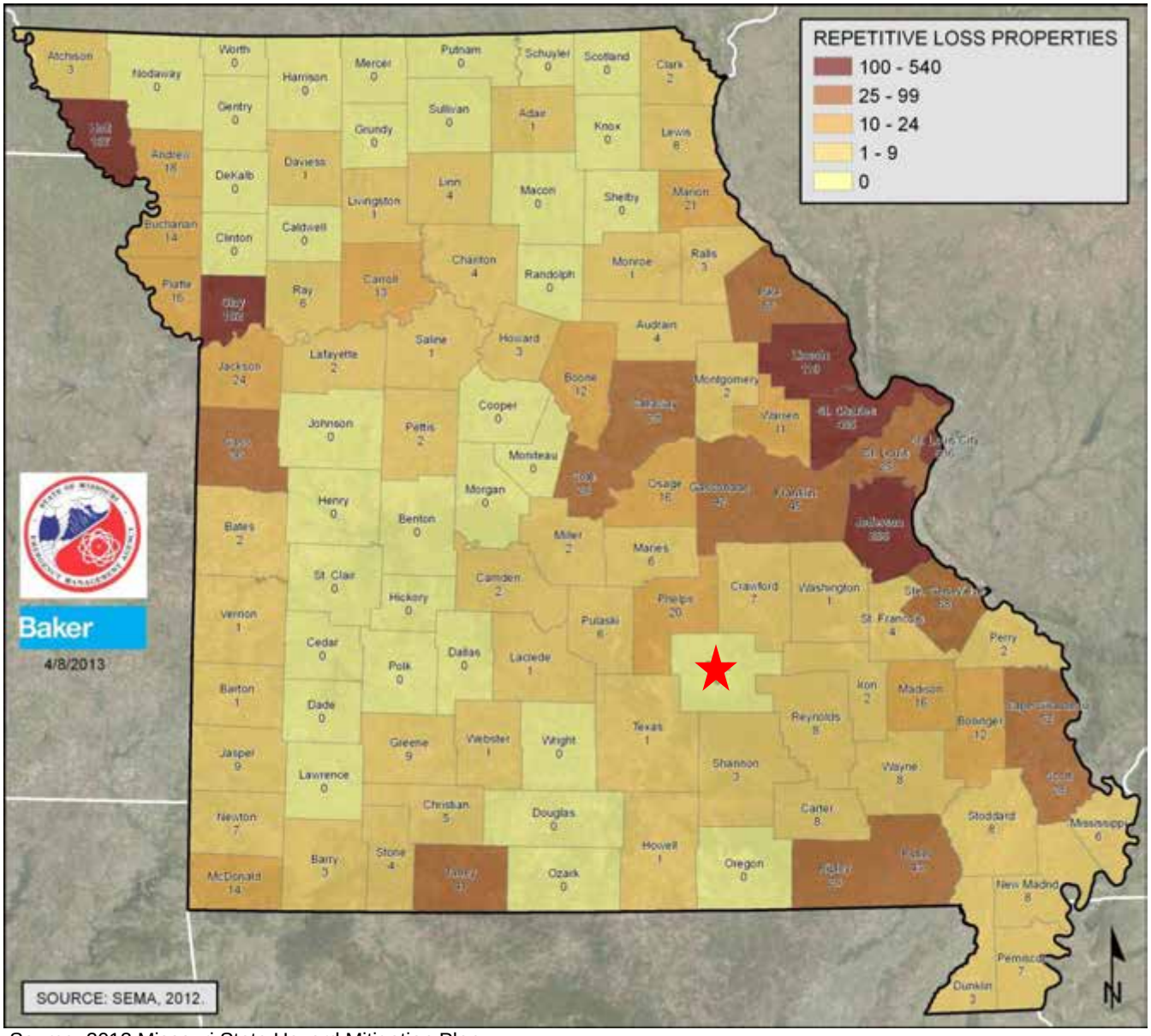
Figure 3.34. Flood Loss Claims in Missouri by County, 1978 – Jan 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.35 illustrates the number of repetitive loss properties in Dent County.

Figure 3.35. Repetitive Flood Loss Properties by County, 1978 - 2009



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

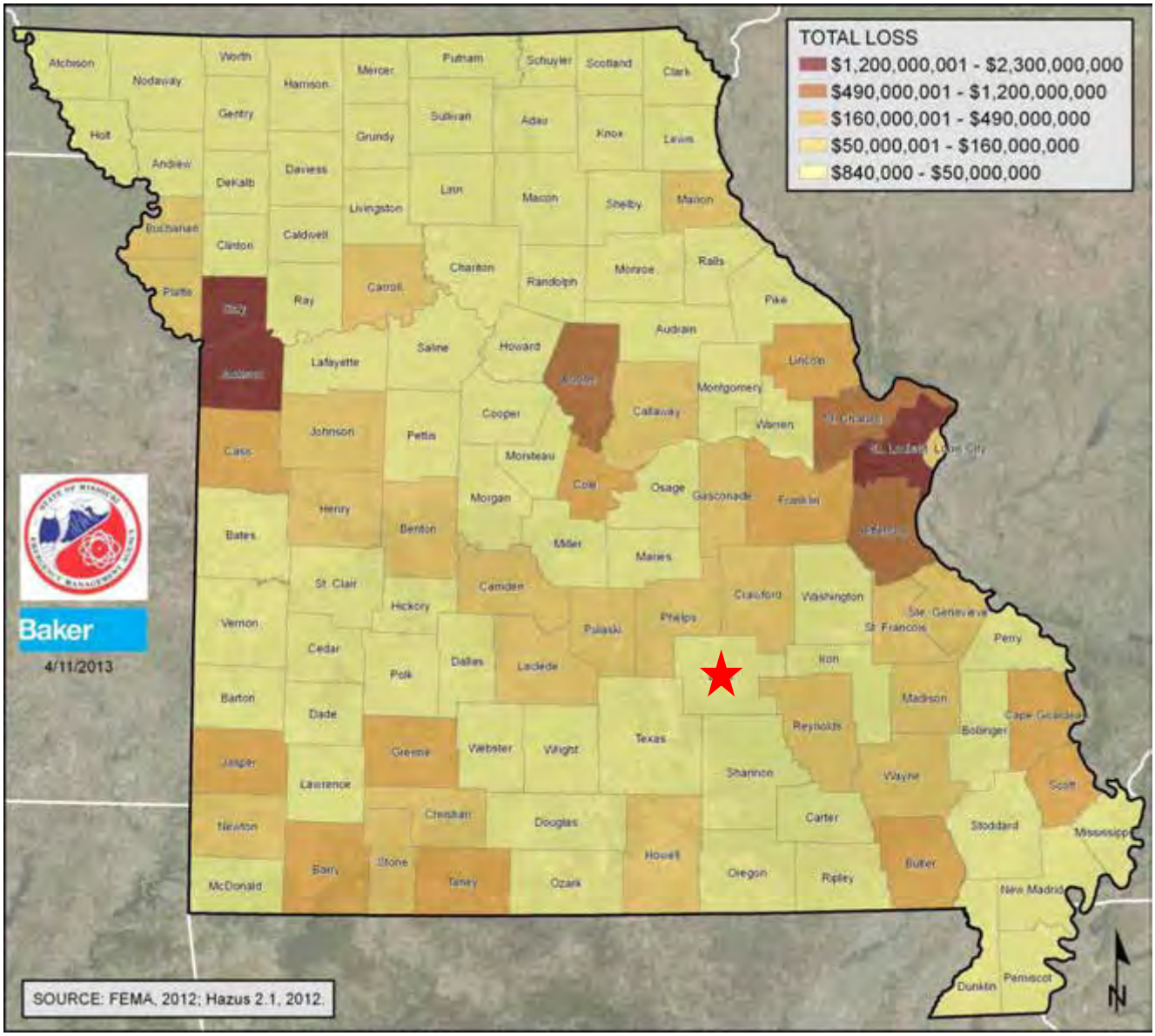
Furthermore, the state analyzed potential loss estimates to flooding. The purpose of the analysis is to determine where flood losses can occur and the degree of severity. These results were generated from DFIRM data and Hazus floodplain data. **Table 3.55** provides information regarding total direct building loss and income loss to Dent County. In addition, **Figure 3.36** and **Figure 3.37** depict Hazus countywide base-flood (100 year) scenarios including building and income loss for total loss and loss ratio respectively.

Table 3.55. Total Direct Building Loss and Income Loss to Dent County

County	Structural Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Loss	Calc. Loss Ratio
Dent	$10,804,076.91	$12,725,547.53	$180,400.08	$23,710,024.52	$62,930.26	$23,772,954.78	3.80

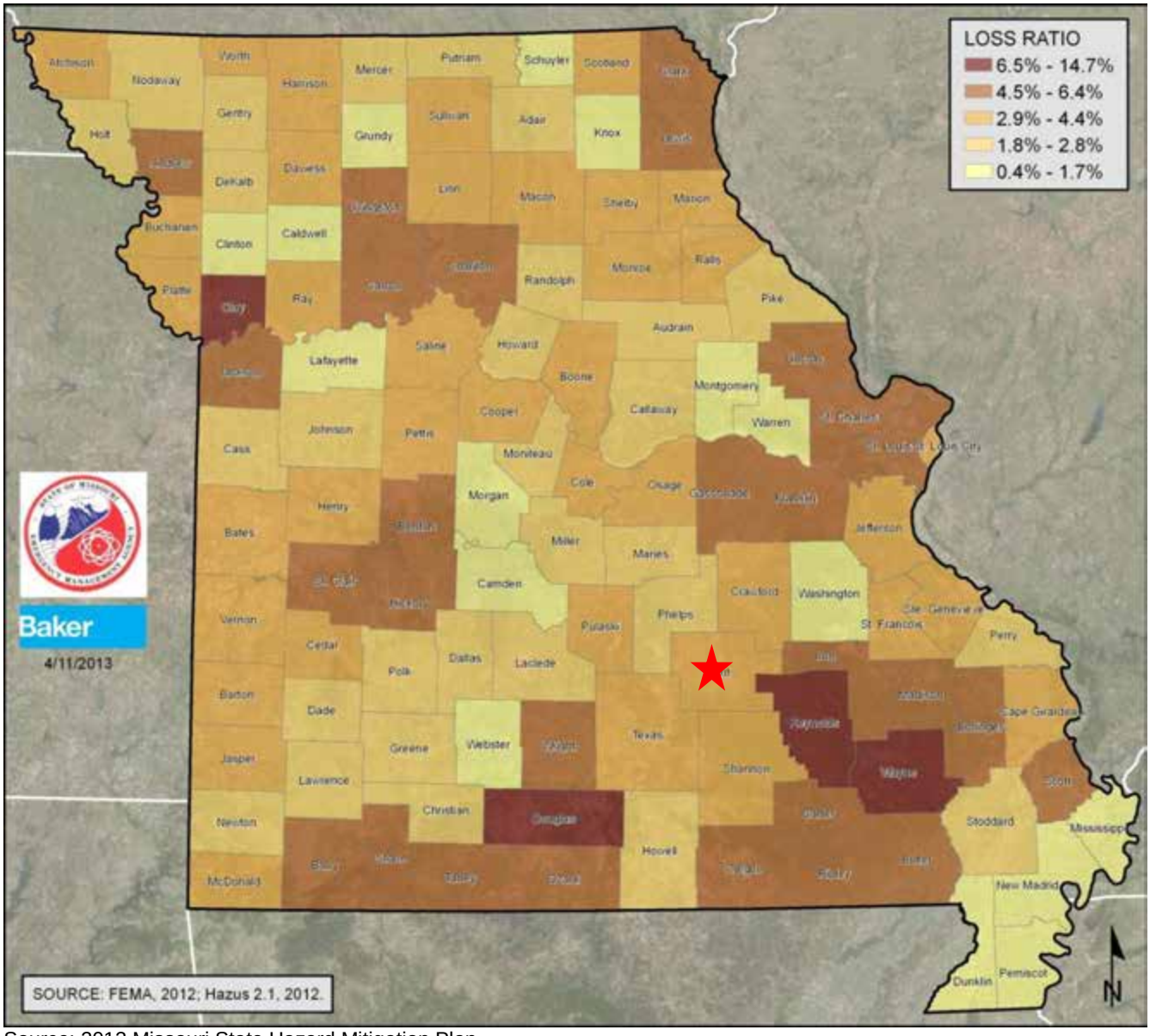
Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.36. Hazus Countywide Base-Flood Scenarios: Building and Income Loss



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.37. Hazus Countywide Base-Flood Scenarios: Building Loss Ratio



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

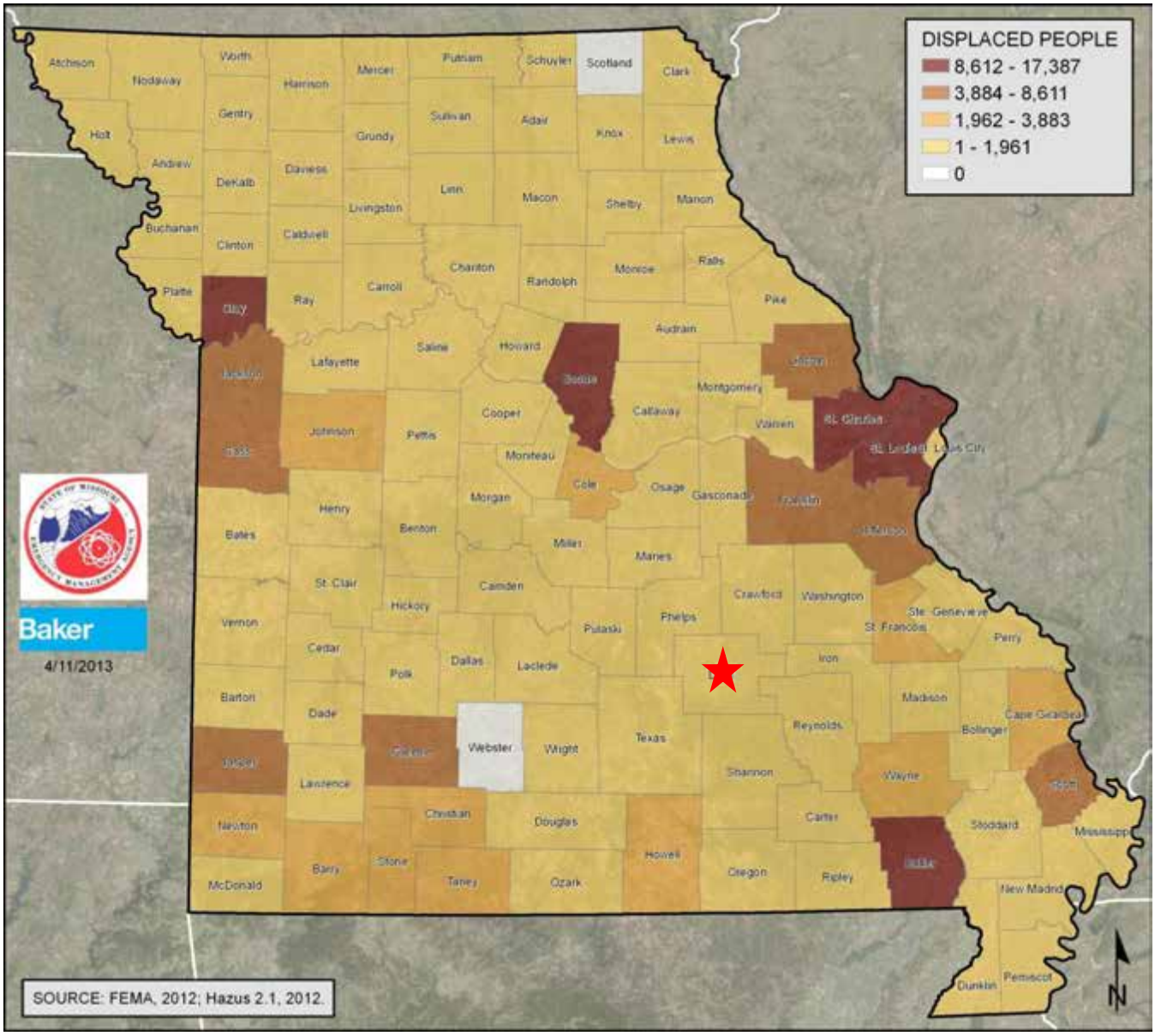
Lastly, the State determined the estimated number of displaced households and need for shelters within Dent County in the event of a 100 year flood. **Table 3.56** and **Figure 3.38** illustrate this information.

Table 3.56. Estimated Displaced households and Shelter Needs for Dent County

County	Displaced Households	Displaced Population Requiring Shelter
Dent	475	104

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.38. Hazus Countywide Base-Flood Scenarios: Displaced People



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Potential Losses to Existing Development

Dent County and Salem both contain a portion of the 100 Year Floodplain. According to the HAZUS model, Dent County has a building loss ratio of 2.9% to 4.4% for countywide base-flood scenarios, which is medium in relation with other counties in the state. Additionally, the county has zero repetitive loss properties. With the annual average probability for flooding at 100% and 100% for flash floods, Dent County's existing development is vulnerable. Especially development located in low-lying areas, near rivers or streams, or where drainage systems are not adequate are all prone to flooding.

Impact of Future Development

Impact of future development is correlated to floodplain management and regulations set forth by the county and jurisdictions[43]. Future development within low-lying areas near rivers and streams, or where interior drainage systems are not adequate to provide drainage during heavy rainfall events should be avoided. Additionally, future development would also increase impervious surface causing additional water run-off and drainage problems during heavy rainfall events.

Hazard Summary by Jurisdiction

Vulnerability to flooding slightly varies across the planning area. The jurisdictions most vulnerable to flooding include Salem and Dent County, including Sligo.

Problem Statement

Local governments should make a strong effort to further improve emergency warning systems to insure that future deaths and injuries do not occur. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list, and actively seek funding to successful complete the projects.

[43] 2015 Boone County Hazard Mitigation Plan

3.4.7 Land Subsidence/Sinkholes

Some specific sources for this hazard are:

- http://www.dnr.mo.gov/geology/geosrv/envgeo/sinkholes.htm http://strangesounds.org/2013/07/us-sinkhole-map-these-maps-show-that-around-40-of-the-u-s-lies-in-areas-prone-to-sinkholes.html
- http://www.businessinsider.com/where-youll-be-swallowed-by-a-sinkhole-2013-3
- http://water.usgs.gov/edu/sinkholes.html
- http://pubs.usgs.gov/fs/2007/3060/

Hazard Profile

Hazard Description

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that naturally can be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. The sudden collapse of the land surface above them can be dramatic and range in size from broad, regional lowering of the land surface to localized collapse. However, the primary causes of most subsidence are human activities: underground mining of coal, groundwater or petroleum withdrawal, and drainage of organic soils. In addition, sinkholes can develop as a result of subsurface void spaces created over time due to the erosion of subsurface limestone (karst).

Land subsidence occurs slowly and continuously over time, as a general rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkhole formation can be aggravated by flooding.

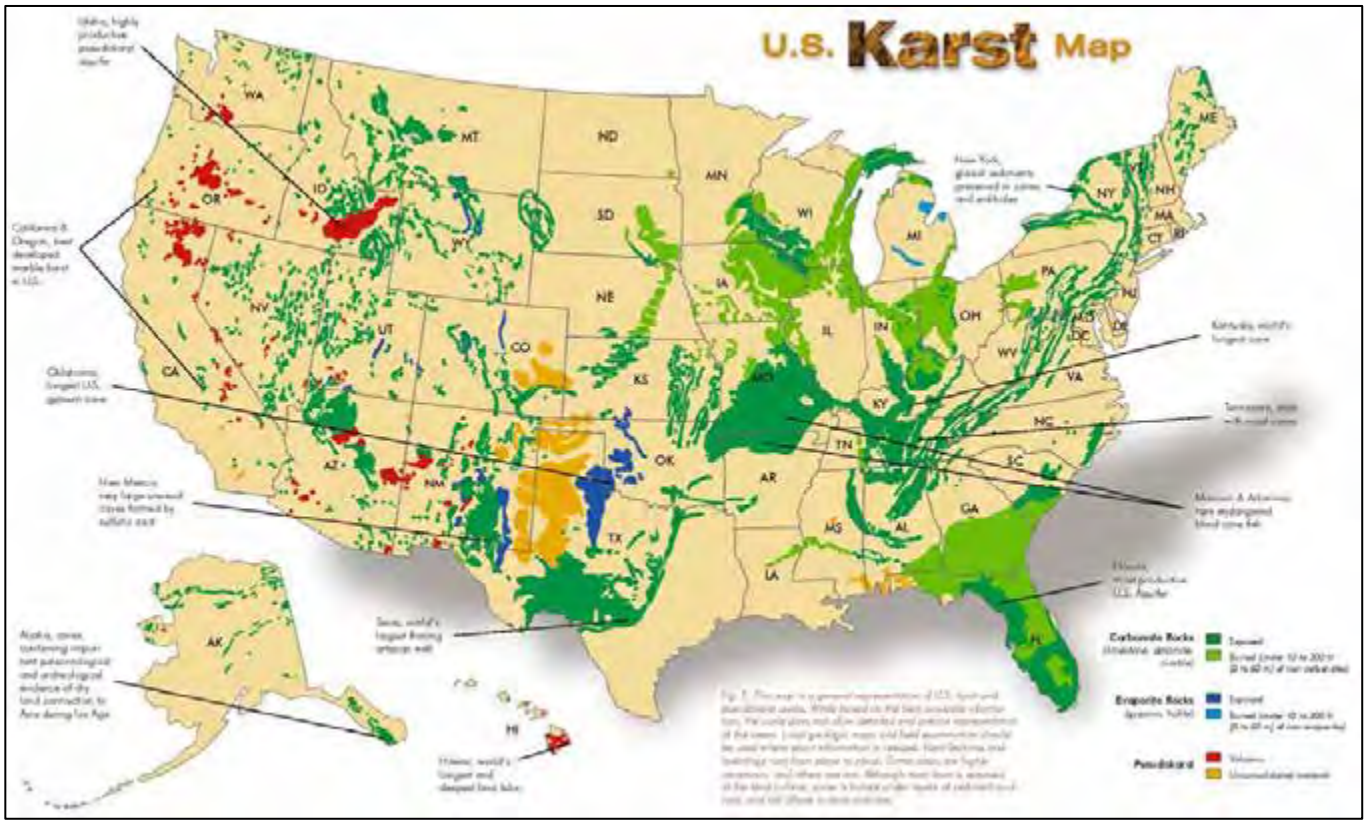
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings into bedrock caves eroding and collapsing into the cave opening. These collapses are called “cover collapses” and geologic information can be applied to predict the general regions where collapse will occur. Sinkholes range in size from several square yards to hundreds of acres and may be quite shallow or hundreds of feet deep.

According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur in Missouri on a fairly frequent basis. Most of Missouri‘s sinkholes occur naturally in the State‘s karst regions (areas with soluble bedrock). They are a common geologic hazard in southern Missouri, but also occur in the central and northeastern parts of the State. Missouri sinkholes have varied from a few feet to hundreds of acres and from less than one to more than 100 feet deep. The largest known sinkhole in Missouri encompasses about 700 acres in western Boone County southeast of where Interstate 70 crosses the Missouri River. Sinkholes can also vary in shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

Geographic Location

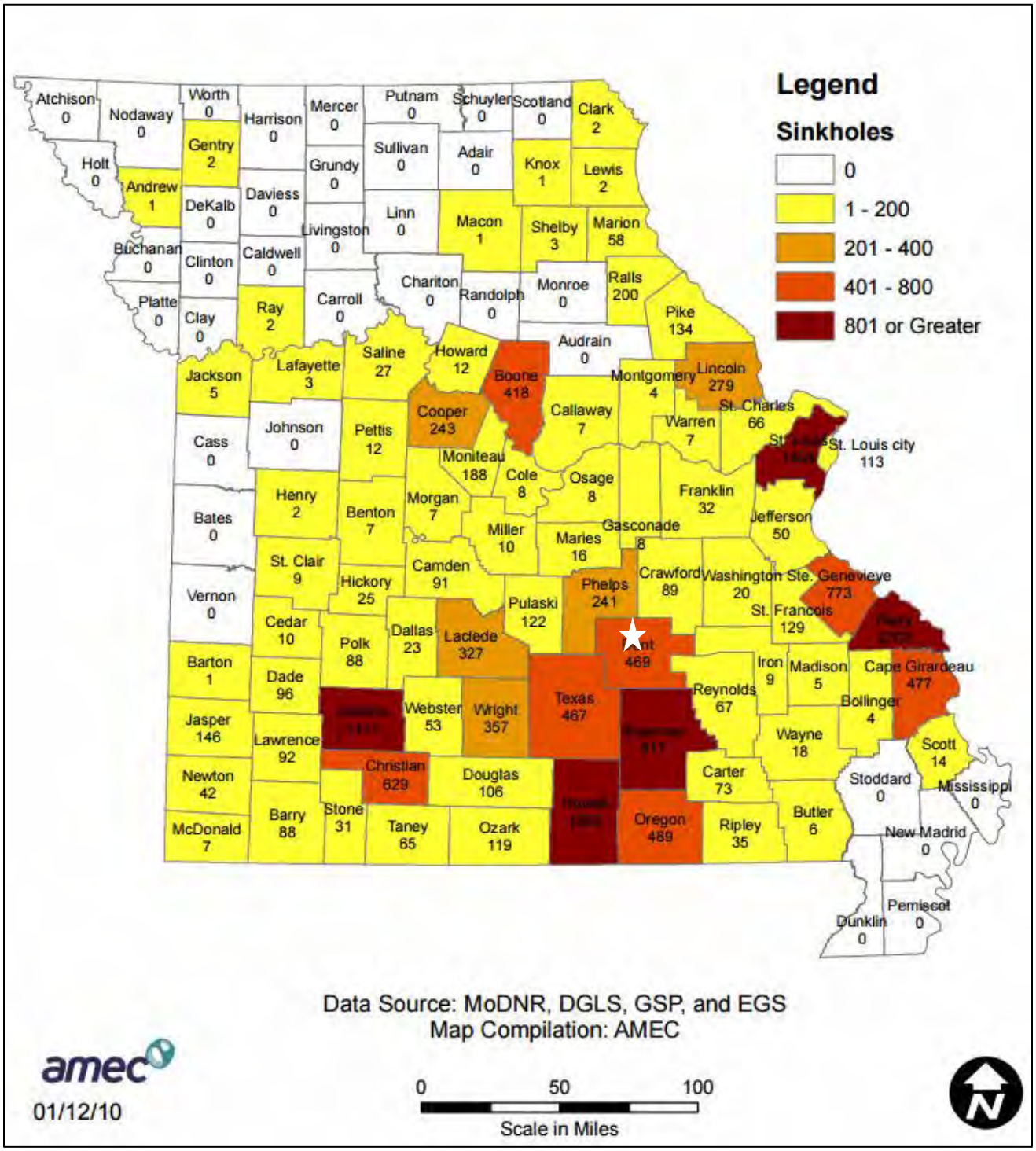
Figure 3.39 depicts karst topography across the United States. Missouri's kart topography is comprised of carbonate rocks such as limestone, dolomite, and marble. Variability in areas prone to sinkholes does not differ greatly across the county. There are approximately 469 sinkholes that have been recorded within Dent County (**Figure 3.40**). According to **Figure 3.41** there are approximately 150 mines in Dent County. According to the Missouri Department of Natural Resources, Dent County primarily produces iron, magnesium dolomite, lead, zinc, copper, and silver. Activities such as mining or drilling are known to be responsible for the formation of sinkholes.

Figure 3.39. U.S. Karst Map



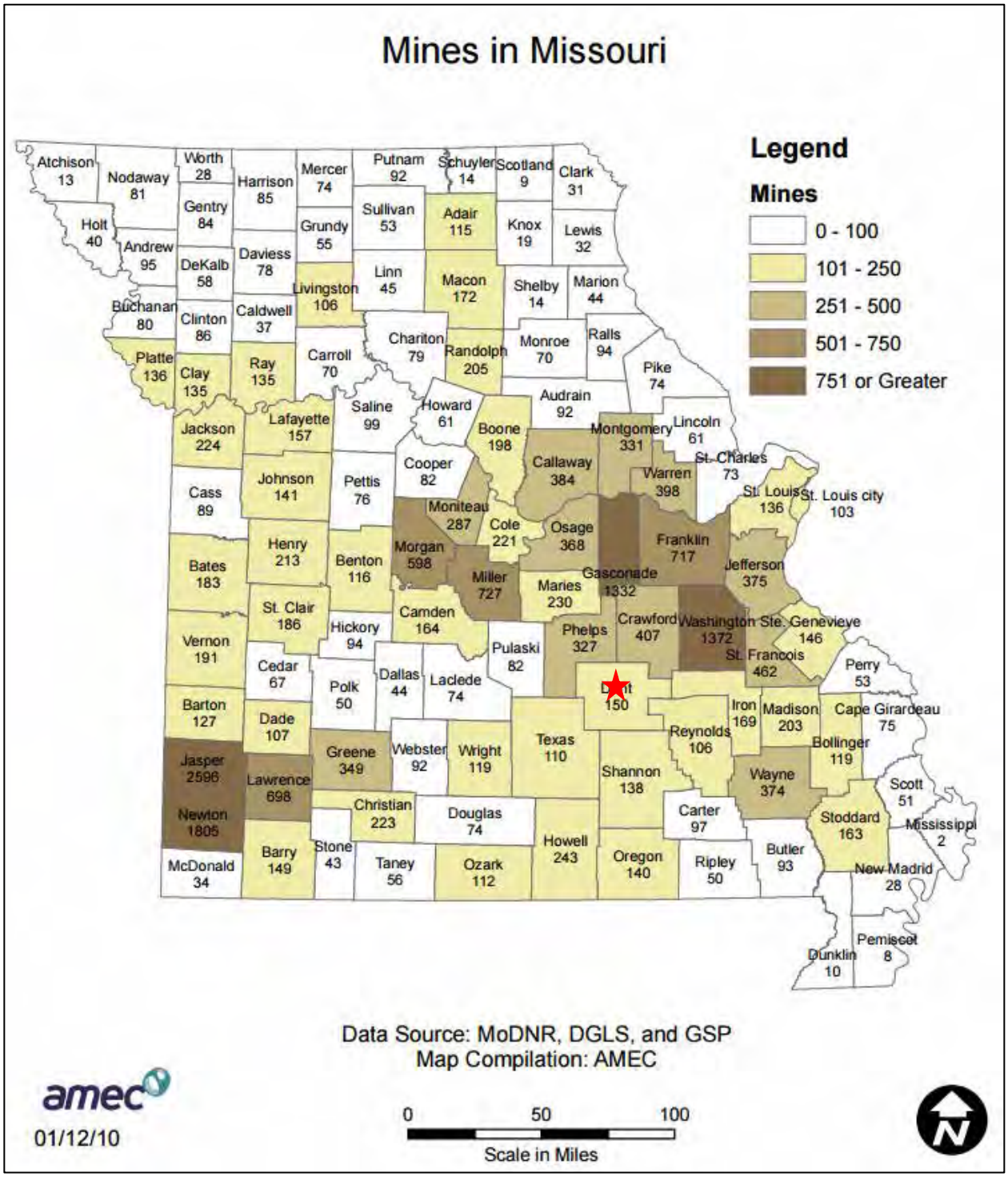
Source: http://www.northeastern.edu/protect/wp-content/uploads/US_KarstMap.jpg

Figure 3.40. Sinkholes in Missouri



Source: http://sema.dps.mo.gov/programs/mitigation_management.php; *White star indicates Dent County

Figure 3.41. Mines in Missouri



Source: https://emgis.oa.mo.gov/dps/mitigation/MO_mines.pdf; *Red star indicates Dent County

Severity/Magnitude/Extent

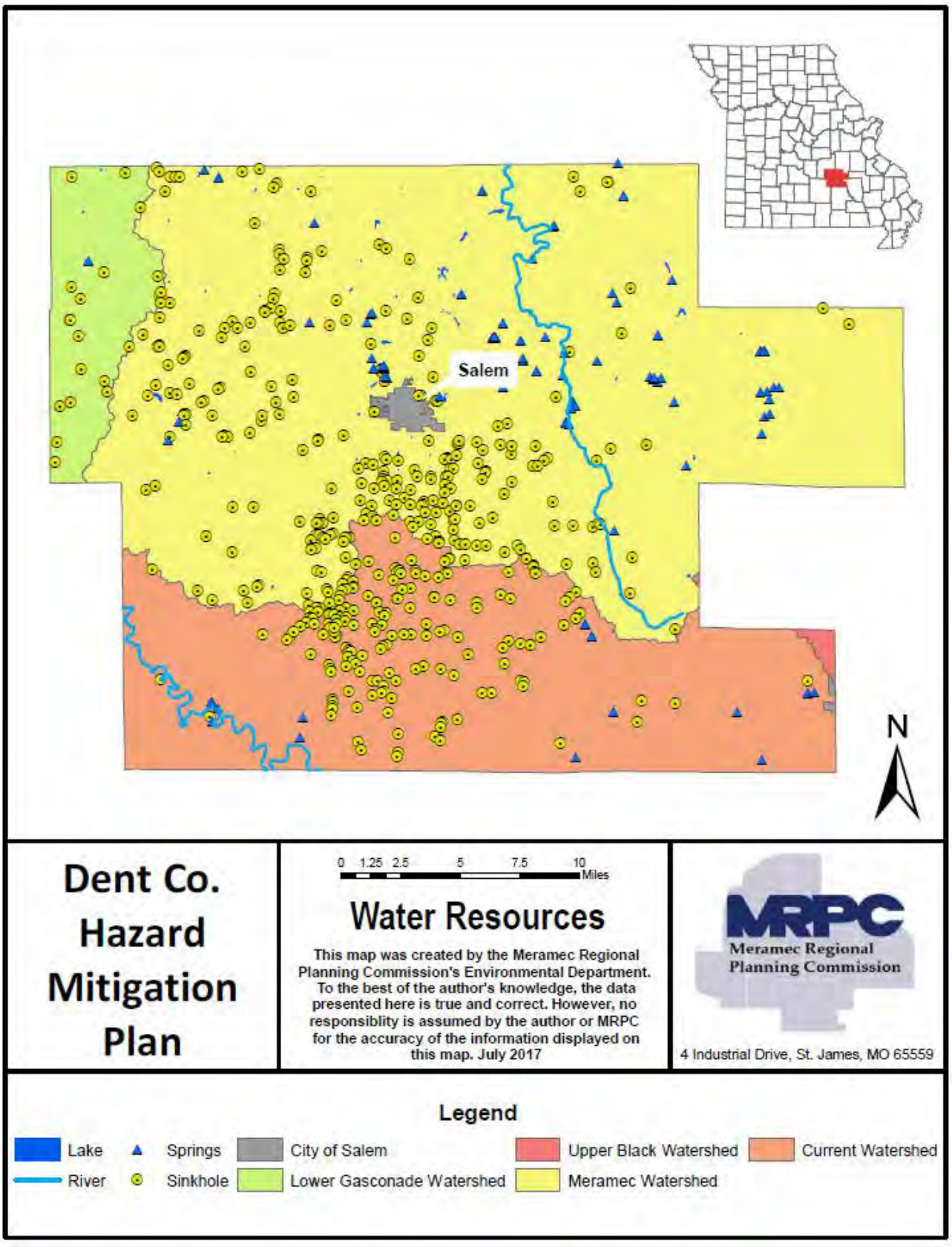
Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

The 2013 State Plan included only seven documented sinkhole "notable events". The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development nor have they caused serious damage.

Previous Occurrences

Although there are numerous sinkholes and sinkhole areas in Dent County there have been no recorded incidents of death. Based on **Figure 3.42**, recorded sinkholes can be found within the City of Salem, with the majority rural in nature residing within unincorporated parts of the county.

Figure 3.42. Dent County Watershed/Water Resources



Probability of Future Occurrence

Due to the lack of data for previous sinkhole events in Dent County, a probability could not be calculated.

Vulnerability

Vulnerability Overview

Unfortunately, no statistics are available for the number of subsurface locations that may potentially collapse in the future, forming a sinkhole. However, areas have been identified that have the greatest vulnerability for future sinkholes which includes Dent County. Other counties vulnerable to sinkhole collapse include Cape Girardeau, Greene, Howell, Laclede, Oregon, Perry, Shannon, St. Louis, and Texas[44].

Potential Losses to Existing Development

The most likely type of damage to occur in conjunction with a sinkhole collapse is property damage related to foundation disturbance. Signs include cracks in interior and exterior walls; doors and windows that no longer sit square or open and close properly; depressions forming in the yard; cracks in the street, sidewalk, foundation or driveway; and turbidity in local well water. All of these can be early indicators that a sinkhole is forming in the vicinity[45]. In the event of a sudden collapse, an open sinkhole can form in a matter of minutes and swallow lawns, automobiles, and homes. This has occurred in some parts of Missouri, particularly in the southwest part of the state, but there have been no dramatic incidents like this in Dent County

Impact of Future Development

Future development over or near abandoned mines and in locations at risk of sinkhole formation will increase the hazard vulnerability. Information regarding regulations limiting construction near sinkholes is very limited. The 2013 Missouri State Hazard Mitigation Plan only lists two counties that limit construction near mines or sinkholes including Greene and Christian Counties.

Hazard Summary by Jurisdiction

Figure 3.42 illustrates 89 sinkholes in Dent County. The jurisdiction most likely to be impacted by sinkholes is unincorporated Dent County.

Problem Statement

Sinkholes and sinkhole areas are well documented by both the US Geological Survey and the Missouri Department of Natural Resources Geologic Resources Section. The risk of sinkhole collapse can be lessened by avoiding the construction of structures in these areas and avoiding those activities that significantly alter the local hydrology, such as drilling and mining. In addition, communities should avoid leaking water and sewer lines through appropriate maintenance and monitoring. Local residents should be educated on the risks associated with sinkholes and advised to avoid placing themselves and their property in danger by building in sinkhole areas. Communities with building codes should include prohibitions on building in known sinkhole areas.

[44] 2013 Missouri State Hazard Mitigation Plan
[45] http://sinkhole.org/commonsigns.php

3.4.8 Thunderstorm/High Winds/Lightning/Hail

Some Specific Sources for this hazard are:

- FEMA 320, Taking Shelter from the Storm, 3rd edition, http://www.weather.gov/media/bis/FEMA_SafeRoom.pdf Lightning Map, National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf
- Death and injury statistics from lightning strikes, National Weather Service.
- Wind Zones in the U.S. map, FEMA, http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm;
- Annual Windstorm Probability (65+knots) map U.S. 1980-1994, NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bigwind.gif
- Hailstorm intensity scale, The Tornado and Storm Research Organization (TORRO), http://www.torro.org.uk/site/hscale.php;
- NCEI data;
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- National Severe Storms Laboratory – hail map, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif

Hazard Profile

Hazard Description

Thunderstorms

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding (**Section 3.4.6**) and tornadoes (**Section 3.4.9**)

High Winds

A severe thunderstorm can produce winds causing as much damage as a weak tornado. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour.

Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and has been known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity that shoots through the air causing vibrations and creating the sound of thunder.

Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow before it hits the earth.

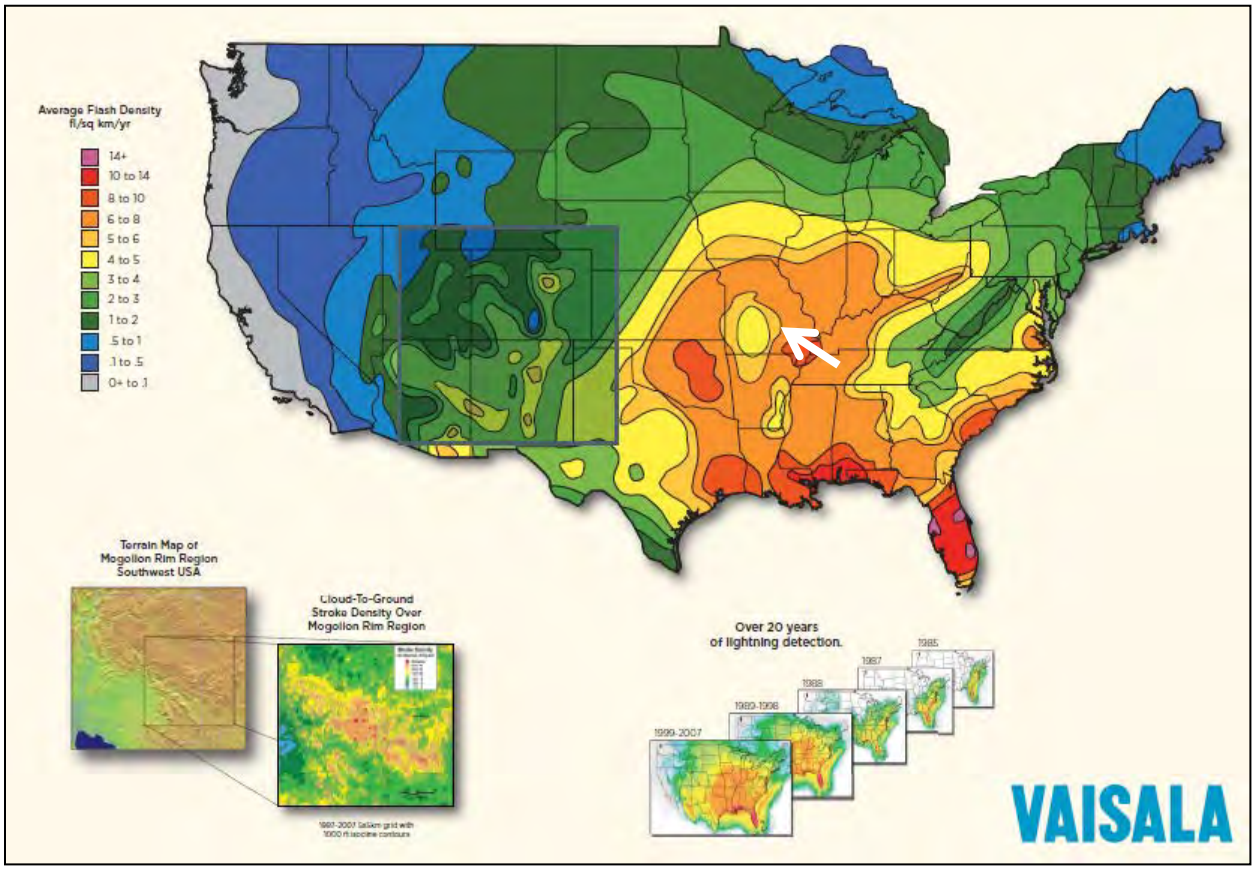
At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone in diameter recorded in the United States was found in Vivian, South Dakota on July 23, 2010. It was eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

Geographic Location

Thunderstorms, high winds, hail, and lightning events are an area-wide hazard that can take place anywhere across the United States. Furthermore, these events do not vary greatly across the planning area; they are more frequently reported in urbanized areas. Additionally, densely developed urban areas are more likely to experience damaging events.

Figure 3.43 depicts the location and frequency of lightning in Missouri. Additionally, the map indicates that the flash density of Dent County ranges between 6 and 8 flashes per square kilometer per year.

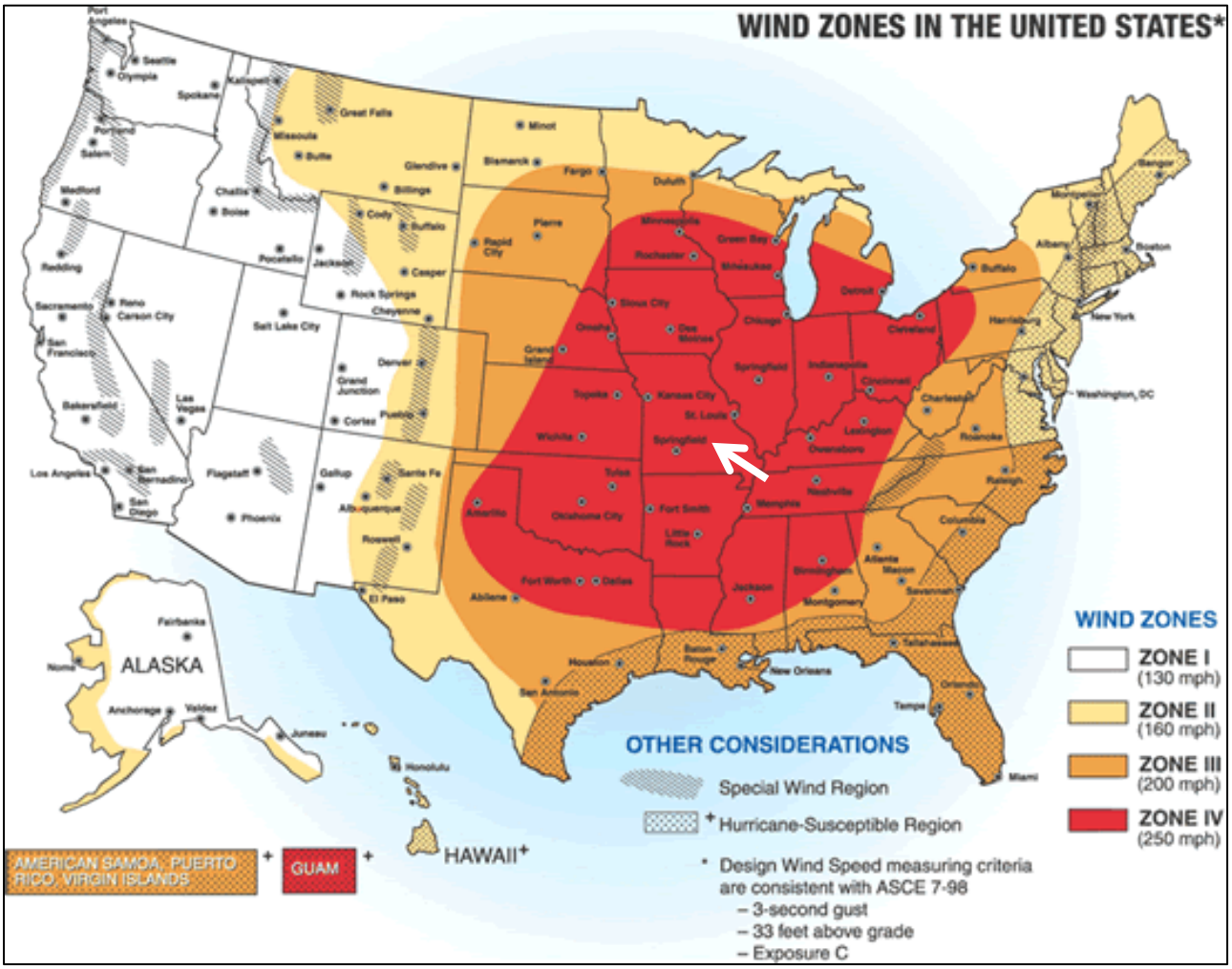
Figure 3.43. Location and Frequency of Lightning in Missouri



Source: National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf.
* Dent County is indicated by a white arrow.

There are four wind zones that are characterized across the United States. These zones range from Zone I to Zone IV. All of Missouri as well as most of the Midwest fall within Zone IV. Within Zone IV, winds can reach up to 250 mph (**Figure 3.44**).

Figure 3.44. Wind Zones in the United States



Source: http://extension.missouri.edu/webster/images/weather/US-WindZones01.gif
*Dent County is indicated by a white arrow.

Severity/Magnitude/Extent

Severe thunderstorm losses are usually attributed to the associated hazards of hail, downburst winds, lightning and heavy rains. Losses due to hail and high wind are typically insured losses that are localized and do not result in presidential disaster declarations. However, in some cases, impacts are severe and widespread and assistance outside state capabilities is necessary. Hail and wind also can have devastating impacts on crops. Severe thunderstorms/heavy rains that lead to flooding are discussed in the flooding hazard profile. Hailstorms cause damage to property, crops, and the environment, and can injure and even kill livestock. In the United States, hail causes more than $1 billion in damage to property and crops each year. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are also commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

In general, assets in the county vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and built structures. Although this hazard results in high annual losses, private property insurance and crop insurance usually cover the majority of losses. Considering insurance coverage as a recovery capability, the overall impact on jurisdictions is reduced.

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.57** below describes typical damage impacts of the various sizes of hail.

Table 3.57. Tornado and Storm Research Organization Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5 - 9	0.2 - 0.4	Pea	No damage
Potentially Damaging	10 - 15	0.4 - 0.6	Mothball	Slight general damage to plants, crops
Significant	16 - 20	0.6 - 0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21 - 30	0.8 - 1.2	Walnut	Severe damage to fruit and crops, damage to glass, plastic structures, paint and wood scored
Severe	31 - 40	1.2 – 1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41 – 50	1.6 – 2.0	Golf ball > pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51 - 60	2.0 - 2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61 – 75	2.4 – 3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76 – 90	3.0 – 3.5	Large orange > soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91 – 100	3.6 – 3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. http://www.torro.org.uk/site/hscale.php

Straight-line winds are defined as any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour, which represent the most common type of severe weather. They are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

Between 1998 and 2017, there were zero recorded crop insurance claims for Thunderstorms, lightning, high wind, and hail in Dent County.

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment.

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Previous Occurrences

Due to the lack of available parameters, heavy rain is utilized in the place of thunderstorms in **Table 3.58**. Moreover, thunderstorm wind and strong was included with high winds. NCEI data was obtained for lightning, and hail events between 1998 and 2017 as well (**Table 3.59**, **Table 3.60**, and **Table 3.61).** However, limitations to the use of NCEI reported lightning events include the fact that only lightning events that result in fatality, injury and/or property and crop damage are in the NCEI.

Table 3.58. NCEI Dent County Heavy Rain Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Rainfall (Inch)
2009	1	0	0	0	4.20
2013	1	0	0	0	4.00
2015	1	0	0	0	5.04
2016	1	0	0	0	4.68
2017	1	0	0	0	-
Total	**5**	**0**	**0**	**0**	**-**

Source: NCEI, data accessed [5/16/18]

Table 3.59. NCEI Dent County High Wind Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Estimated Gust (kts.)
2001	1	0	0	0	43.4
Total	**1**	**0**	**0**	**0**	**43.4**

Source: NCEI, data accessed [5/16/18]

Table 3.60. NCEI Dent County Lightning Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damage
-	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Source: NCEI, data accessed [5/16/18]

Table 3.61. NCEI Dent County Hail Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Hail Size (inch)
1998	3	0	0	1.00K	1.50
1999	2	0	0	0	1.00
2000	3	0	0	0	0.88
2001	1	0	0	0	1.00
2002	4	0	0	10.00K	1.75
2003	3	0	0	0	2.75
2004	1	0	0	0	1.75
2005	1	0	0	0	1.00
2006	3	0	0	0	1.75
2007	1	0	0	0	2.00
2008	3	0	0	0	2.50
2009	4	0	0	0	1.75
2011	3	0	0	10.00K	1.75
2012	1	0	0	0	0.75
2014	1	0	0	0	1.50
2015	1	0	0	0	1.00
2016	2	0	0	0	1.25
2017	3	0	0	0	2.00
Total	**40**	**0**	**0**	**21.00K**	**-**

Source: NCEI, data accessed [5/16/18]

Probability of Future Occurrence

From the data obtained from the NCEI [46], annual average percent probabilities were calculated for heavy rainfall, high winds, lightning, and hail. Heavy rainfall has a 25 percent annual average percent probability of occurrence (5 events/20 years x 100) (**Table 3.62**). Heavy rainfall events can be found in **Table 3.58**.

The annual average percent probability for high winds within the county is 5% (1 event/20 years * 100) (**Table 3.63).** High wind events can be found in **Table 3.59.**

In Dent County, no lightning events (**Table 3.60**) in 20 years were recorded.

Lastly, the annual average percent probability of hail occurrence is 100% (40 events/20 years) with an average of 2 events per year (**Table 3.65**). Hail events can be found in **Table 3.61**.

Table 3.62. Annual Average % Probability of Heavy Rain in Dent County

Location	Annual Avg. % P
Dent County	25%

*P = probability; see page 3.24 for definition.

Table 3.63. Annual Average % Probability of High Winds in Dent County

Location	Annual Avg. % P
Dent County	5%

*P = probability; see page 3.24 for definition.

Table 3.64. Annual Average % Probability of Lightning in Dent County

Location	Annual Avg. % P
Dent County	0%

The probability of lighting damage within the county is very low; however there is still a chance for occurrence.
*P = probability; see page 3.24 for definition.

Table 3.65. Annual Average % Probability of Hail in Dent County

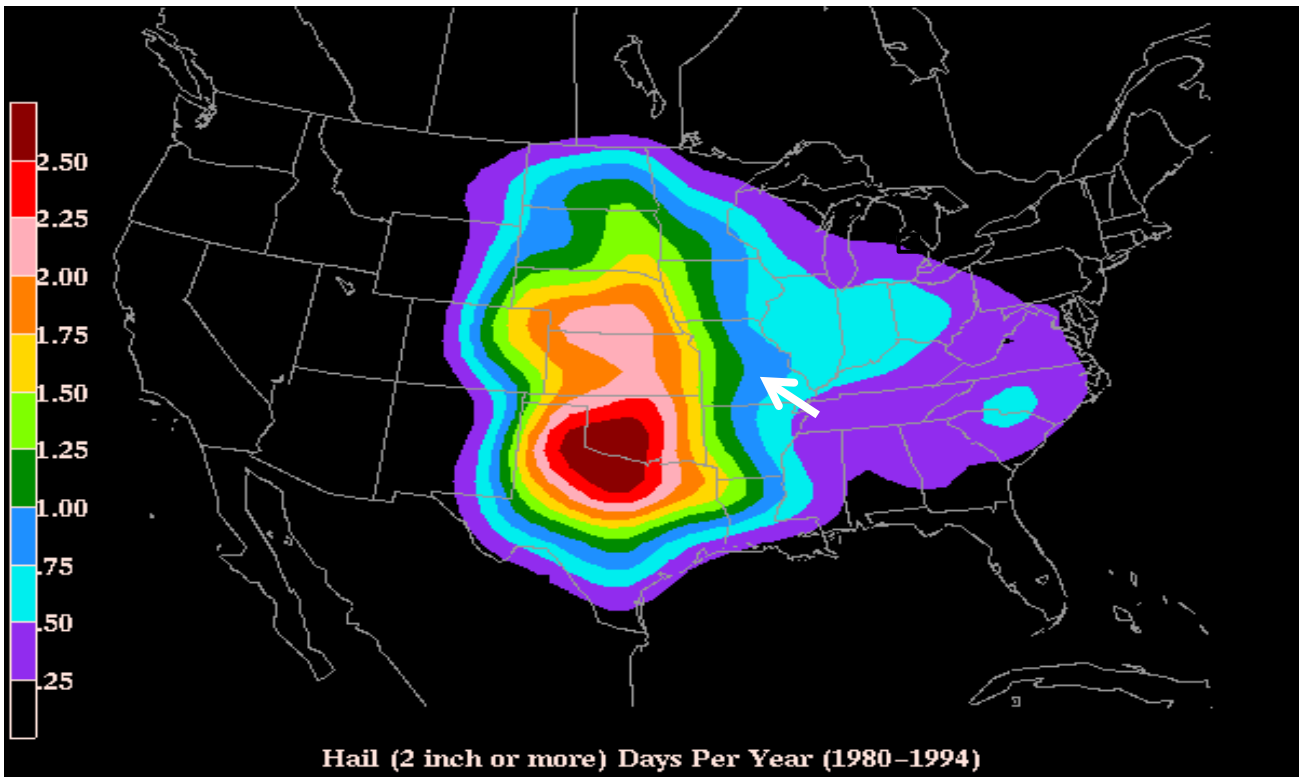
Location	Annual Avg. % P	Avg. # of Events
Dent County	100%	2.00

*P = probability; see page 3.24 for definition.

[46] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Figure 3.45 depicts a map based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. The location of Dent County is identified with a white arrow.

Figure 3.45. Annual Hailstorm Probability (2" diameter or larger), 1980- 1994



Source: NSSL,http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif
* White arrow indicates Dent County

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for vulnerability overview and analysis. Since severe thunderstorms occur frequently throughout Missouri, specific parameters were analyzed for each hazard. These parameters include damaging winds in excess of 67 mph (58 kts.), hail in excess of 0.75 inches, and damaging lightning strikes. **Table 3.66** illustrates housing density, building exposure, and crop exposure for Dent County. Moreover, **Table 3.67** provides additional statistical data for the vulnerability analysis.

Table 3.66. Dent County Housing Density, Building Exposure and Crop Exposure

County	Housing Units/sq. mi.	Total Building Exposure ($)	Crop Exposure (2007 Census of Ag.)	Social Vulnerability Index
Dent	9.7	$1,382,572,000	$1,270,000	4

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.67. Additional Statistical Data Compiled for Vulnerability Analysis

County	Total Hail Incidences	Total hail Property Loss ($)	Total Crop Insurance Paid for Hail Damage ($)	Total Wind Incidence ($)	Total Wind Property Loss ($)	Total Crop Insurance Paid for wind Damage ($)	Total Lightning Incidences	Total Lightning Property Loss ($)
Dent	75	$19,000	$0	68	$1,279,800	$0	0	$0

Source: 2013 Missouri State Hazard Mitigation Plan

Five factors were utilized in the overall vulnerability analysis of lightning. These factors include housing density, likelihood of occurrence, building exposure, average annual property loss ratio, and social vulnerability. For hail and wind, crop exposure and average annual crop insurance claims were also utilized. To better analyze the vulnerability analysis of severe thunderstorms, rating values were established; low, medium-low, medium, medium-high, and high (**Table 3.68**).

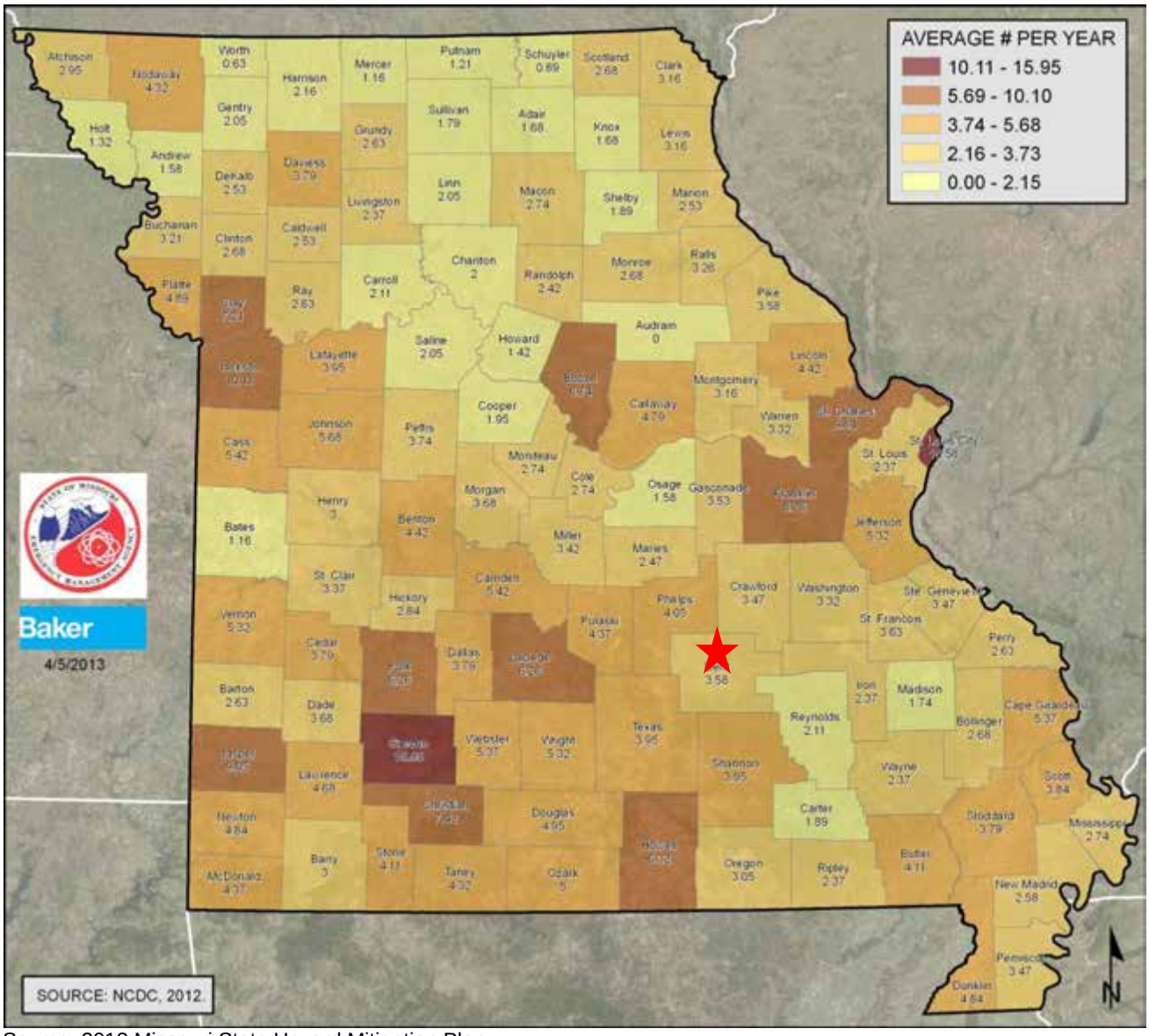
Table 3.68. Ranges for Severe Thunderstorm Vulnerability Factor Ratings

Factors considered	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Common Factors					
Housing Density (# per sq. mile)	<50	50 to 99	100 to 299	300 to 499	>500
Crop Exposure ($ in millions) (hail and wind only)	<$10,000	$10,000 to $24,999	$25,000 to $49,999	$50,000 to $99,999	>$100,000
Social Vulnerability	1	2	3	4	5
Wind					
Likelihood of Occurrence (# of events/ yrs. Of data)	0 to 2.15	2.16 to 3.73	3.74 to 5.68	5.60 to 10.10	10.11 to 15.95
Average Annual Property Loss Ratio (annual property loss/exposure)	0.00 - 0.000027	0.000028 - 0.000092	0.000093 - 0.000231	0.000232 - 0.000489	0.000490 - 0.001273
Wind Crop Loss Ratio (annual crop claims/exposure)	0 - 0.000084	0.000085 - 0.000250	0.000251 - 0.000250	0.000715 - 0.001398	0.001399 - 0.003574
Hail					
Likelihood of Occurrence (# of events/ yrs. Of data)	0.78 to 3.10	3.11 to 5.26	5.27 to 7.89	7.90 to 12.10	12.11 to 18.48
Average Annual Property Loss Ratio (annual property loss/exposure)	0 - 0.000034	0.000035 - 0.000149	0.000280 - 0.000269	0.000280 - 0.000460	0.000461 - 0.001090
Hail Crop Loss Ratio (annual crop claims/exposure)	0 - 0.0000270	0.000271 - 0.000974	0.000975 - 0.000974	0.002305 - 0.003698	0.003699 - 0.007516
Lightning					
Likelihood of Occurrence (# of events/ yrs. Of data)	0 to 0.05	0.06 to 0.15	0.16 to 0.26	0.27 to 0.42	0.43 to 0.74
Average Annual Property Loss Ratio (annual property loss/exposure)	0 - 0.000001	0.000002 - 0.000003	0.000004 - 0.000006	0.000007 - 0.000015	0.000016 - 0.000037

Source: 2013 Missouri State Hazard Mitigation Plan

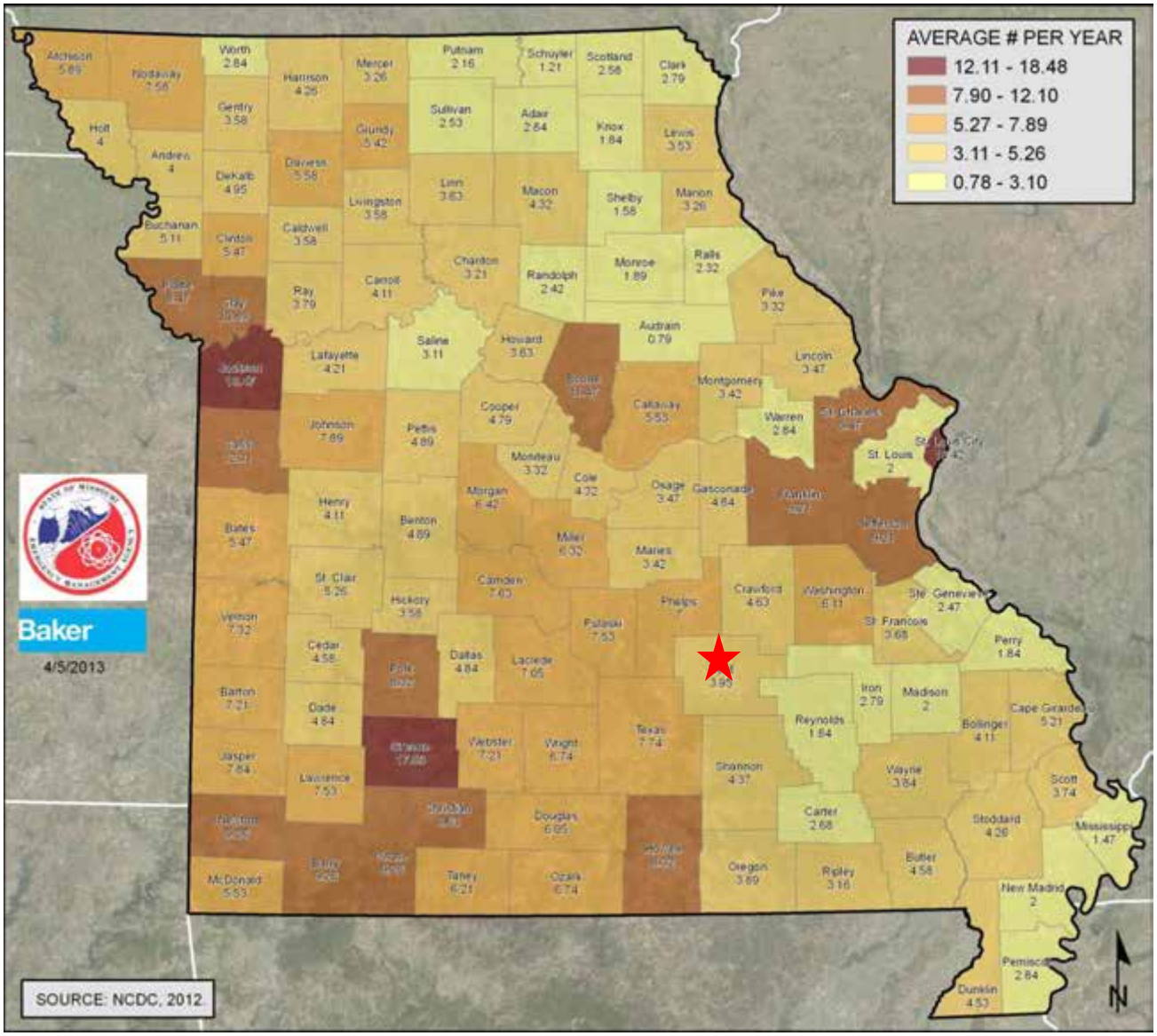
Figure 3.46 through **Figure 3.48** depicts the likelihood of occurrence of high winds, hail, and lightning events in Missouri.

Figure 3.46. Likelihood of Occurrence of High Wind Events (67 MPH and higher)



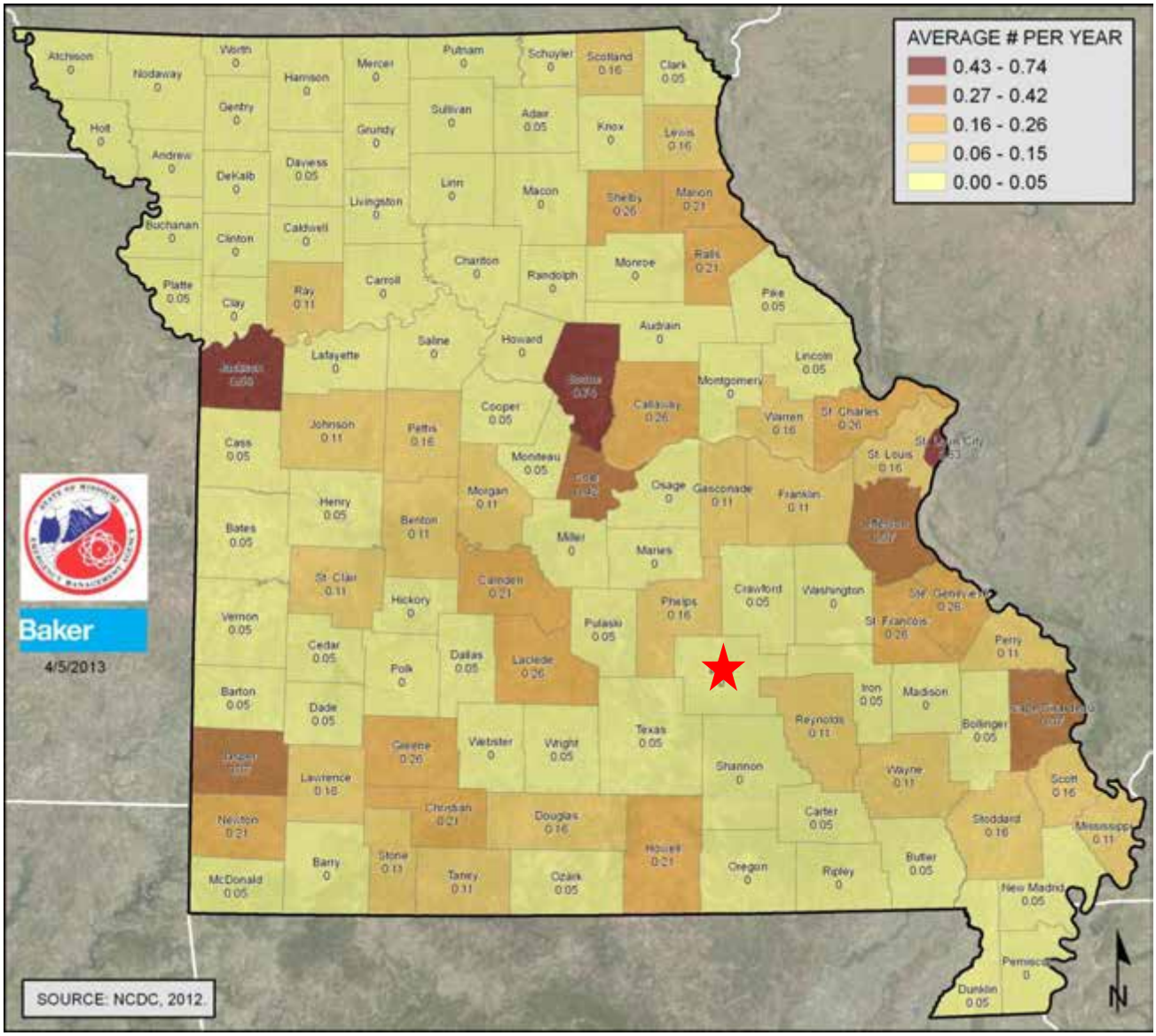
Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.47. Likelihood of Occurrence of Damaging Hail Events (.75 inches and larger)



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Figure 3.48. Likelihood of Occurrence of Damaging Lightning Events



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

After ranges were applied to all factors in the analysis for wind, hail, and lightning, they were weighted equally and factored together to determine an overall vulnerability rating. Following, a combined vulnerability rating was calculated. The following data provides the calculated rages applied to determine overall vulnerability of Missouri counties to severe thunderstorms (**Table 3.69**). **Table 3.70** provides the calculated vulnerability rating for the severe thunderstorm hazard. **Figure 3.49** that follows provides the mapped results of this analysis by county[47].

[47] 2013 Missouri State Hazard Mitigation Plan

Table 3.69. Ranges for Severe Thunderstorm Combined Vulnerability Rating

	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Severe Thunderstorm Combined Vulnerability	9 to 11	12 to 14	15 to 17	18 to 20	21 to 26

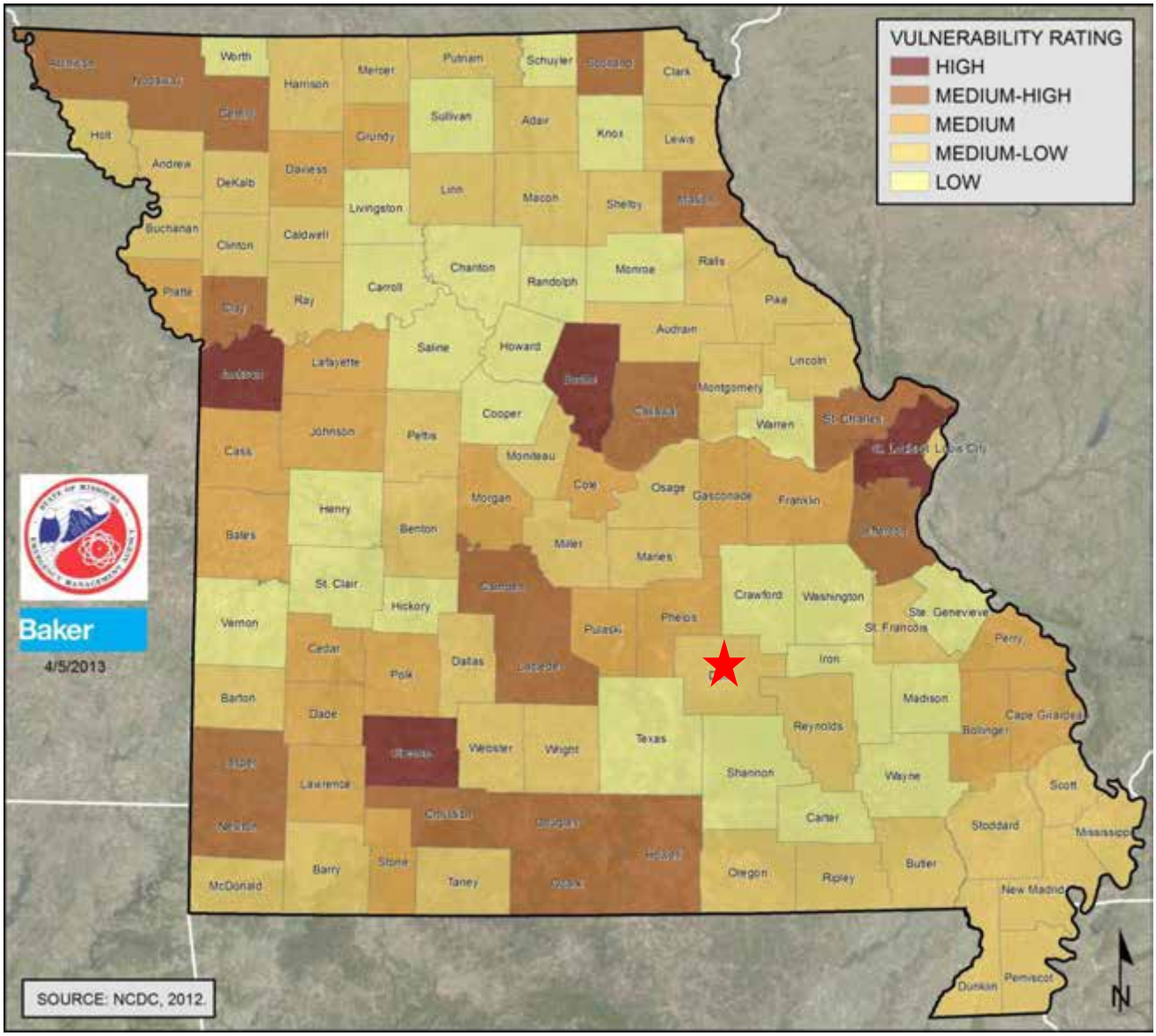
Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.70. Severe Thunderstorm Combined Vulnerability Rating

County	Housing Density Rating	Wind Likelihood Rating	Annualized Wind Property Loss	Annualized Wind Crop Loss	Hail Likelihood Rating	Annualized Hail Property Loss	Annualized Hail Crop Loss	Lightning Likelihood Rating	Annualized Lightning Property Loss	Total Thunderstorm Vulnerability	Combined Vulnerability
Dent	1	2	2	1	2	1	1	1	1	12	Medium-Low

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.49. Vulnerability Summary for Severe Thunderstorms



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Potential Losses to Existing Development

According to the NCEI Dent County experienced approximately $21,000 in property damages from severe thunderstorms between 1998 and 2017. Most of the property damage caused by storms is covered by private insurance and data is not available. In addition, most damage from severe thunderstorms occurs to vehicles, roofs, siding, and windows. However, there is a variety of impacts from severe thunderstorms. Moreover, secondary effects from hazards, falling trees and debris, can cause destruction within the planning area[48].

[48] 2015 Boone County Hazard Mitigation Plan

Future Development

As previously mentioned, the population within Dent County is expected to increase by approximately 116 within the next 2 to 12 years. It is difficult to determine future impacts, however, anticipated development in each jurisdiction will result in increased exposure (**Page 3.23**). Likewise, increased development of residential structures will increase jurisdiction's vulnerability to damages from severe thunderstorms/ high winds/lightning/hail.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, there are demographics indicating higher losses in one jurisdiction as compared to another. Jurisdictions with high percentages of housing built before 1939 are more prone to damages from severe thunderstorms. The jurisdictions with the highest percent of houses build before 1939 include both Salem and unincorporated Dent County. Additionally, unincorporated Dent County has a higher percentage of mobile homes and unsecured buildings, which are more prone to damages.

Problem Statement

Early warnings are possibly the best hope for residents when severe weather strikes. Cities that do not already possess warning systems should plan to purchase a system. Additional public awareness also includes coverage by local media sources. Storm shelters are another important means of mitigating the effects of severe thunderstorms. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

3.4.9 Tornado

Some specific sources for this hazard are:

- Enhanced F Scale for Tornado Damage, NWS, www.spc.noaa.gov/faq/tornado/ef-scale.html;
- Enhanced Fujita Scale's damage indicators and degrees of damage table, NOAA Storm Prediction Center, www.spc.noaa.gov/efscale/ef-scale.html;
- Tornado Activity in the U.S. map (1950-2006), FEMA 320, Taking Shelter from the Storm, 3rd edition;
- Tornado Alley in the U.S. map, http://www.tornadochaser.net/tornalley.html
- Enhanced Fujita Scale, www.spc.noaa.gov/efscale/ef-scale.html
- National Centers for Environmental Information, http://www.ncdc.noaa.gov/stormevents/
- Tornado History Project, map of tornado events, http://www.tornadohistoryproject.com/tornado/Missouri

Hazard Profile

Hazard Description

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado.

High winds not associated with tornadoes are profiled separately in this document in **Section 3.4.8,** Thunderstorm/High Wind/Hail/Lightning.

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States due to its unique geography and presence of the jet stream. The jet stream is a high-velocity stream of air that separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun moves north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine. During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

A typical tornado can be described as a funnel-shaped cloud in contact with the earth's surface that is "anchored" to a cloud, usually a cumulonimbus. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National Weather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to 70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening, but have been known to occur at all hours of the day and night.

Geographic Location

In Missouri, tornadoes occur most frequently between April and June, with April and May usually producing the most tornadoes. However, tornadoes can arise at any time of the year. While tornadoes can happen at any time of the day or night, they are most likely to occur between 3 p.m. and 9 p.m. Furthermore, tornadoes can occur anywhere across the state of Missouri, including Dent County.

Severity/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (**Table 3.71**) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F Scale was implemented in the U.S. on February 1, 2007.

Table 3.71. Enhanced F Scale for Tornado Damage

Fujita Scale			Derived EF Scale		Operational Scale	
F #	Fastest 1/4 - Mile (mph)	3 Second Gust (mph)	EF #	3 Second Gust (mph)	EF #	3 Second Gust (mph)
0	40 - 72	45 - 78	0	65 - 85	0	65 - 85
1	73 - 112	79 - 117	1	86 - 109	1	86 - 110
2	113 - 157	118 - 161	2	110 - 137	2	111 - 135
3	158 - 207	162 - 209	3	138 - 167	3	136 - 165
4	208 - 260	210 - 261	4	168 - 199	4	166 - 200
5	261 - 318	262 - 317	5	200 - 234	5	Over 200

Source: The National Weather Service, www.spc.noaa.gov/faq/tornado/ef-scale.html

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 3.72**. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator.

Table 3.72. Enhanced Fujita Scale with Potential Damage

Enhanced Fujita Scale			
Scale	**Wind Speed (mph)**	**Relative Frequency**	**Potential Damage**
EF0	**65-85**	**53.5%**	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	**86-110**	**31.6%**	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	**111-135**	**10.7%**	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	**136-165**	**3.4%**	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	**166-200**	**0.7%**	Devastating. Well-constructed houses and whole frame houses completely levelled; cars thrown and small missiles generated.
EF5	**>200**	**<0.1%**	Explosive. Strong frame houses levelled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/ef-scale.html

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

Previous Occurrences

Table 3.73 illustrates NCEI data reported for tornado events and damages from 1998 to 2017 in the planning area. Prior to 1993, only highly destructive tornadoes were recorded.

There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments.

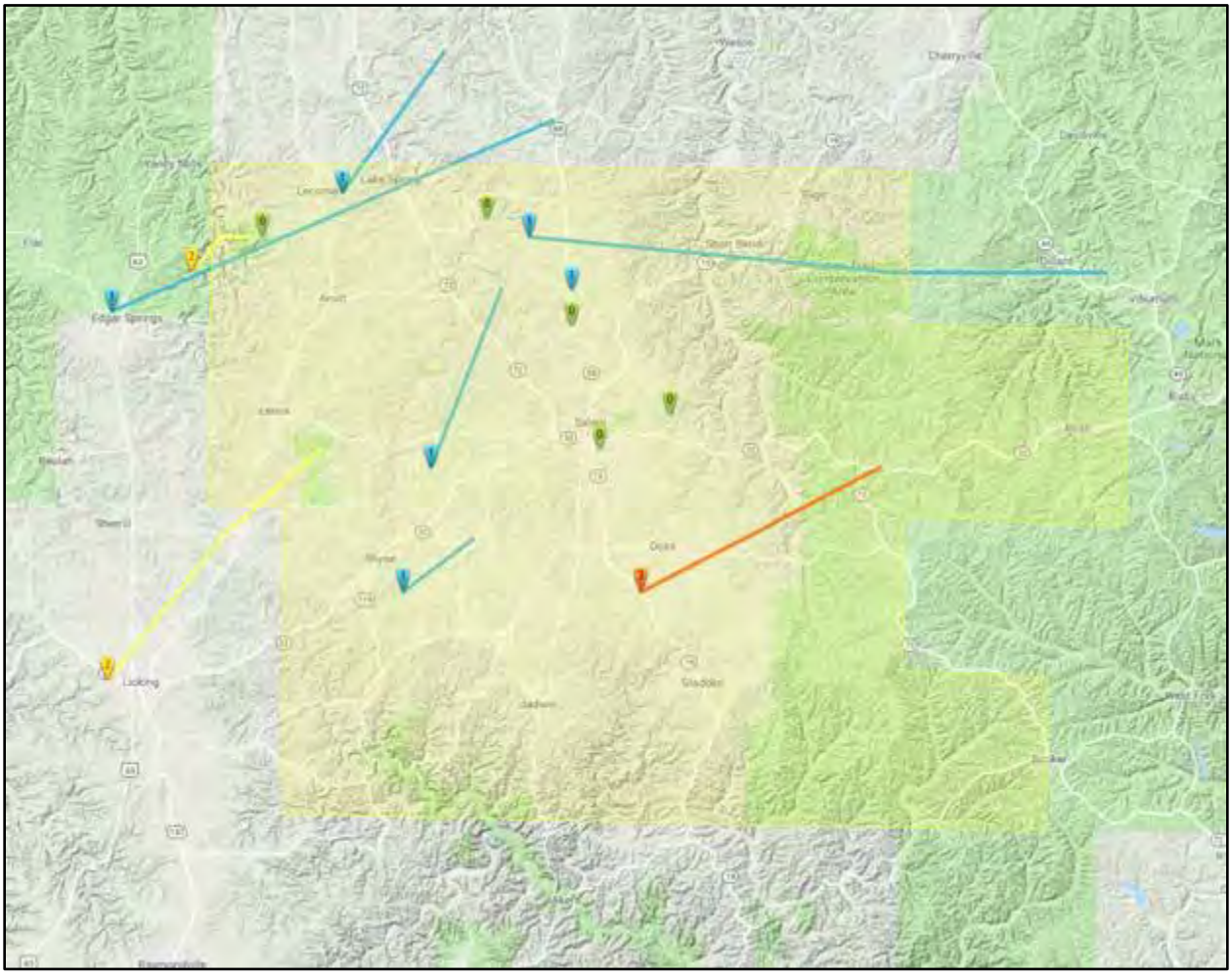
Table 3.73. Recorded Tornadoes in Dent County, 1998 – 2017

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
06/01/1999	5SW Lecoma	4SW Lecoma	1	250	F2	0	0	60.00K	0
06/01/1999	3SW Lecoma	3SW Lecoma	.2	100	F0	0	0	0	0
05/04/2003	4N Salem	4NSalem	.2	20	F0	0	0	0	0
08/24/2007	8NNW Salem	8NNW Salem	.0	25	EF0	0	0	0	0
12/31/2010	1ESE Lecoma	1WNW Lake SPG	1.23	100	EF1	2	0	450.00K	0
02/29/2012	5WNW Anutt	2ENE Lake SPG	9	75	EF1	0	0	0	0
03/29/2017	2SSW Short Bend	1NE Short Bend	2.5	200	EF1	0	0	50.00K	0
05/27/2017	1S Lake SPG	1S Lake SPG	0.01	50	EF0	0	0	0	0
Total	**-**	**-**	**-**	**-**	**-**	**2**	**0**	**560.00K**	**0**

Source: National Centers for Environmental Information, http://www.ncdc.noaa.gov/stormevents/

Figure 3.50 depicts historic tornado paths across Dent County.

Figure 3.50. Dent County Map of Historic Tornado Paths (1974 – 2016)



Source: http://www.tornadohistoryproject.com/tornado/Missouri

According to the USDA Risk Management Agency's record, there were no insurance payments in Dent County for crop damages as a result of tornadoes between 1998 and 2017.

Probability of Future Occurrence

From the data obtained from the NCEI[49], an annual average percent probability was calculated for tornadoes within Dent County (**Table 3.74).** There is a 40 percent annual average probability of a tornado occurrence (8 events/20 years x 100). Tornado events can be found in **Table 3.73**. In addition, **Figure 3.51,** obtained from the 2013 Missouri State Hazard Mitigation Plan, also illustrates tornado probabilities across the State.

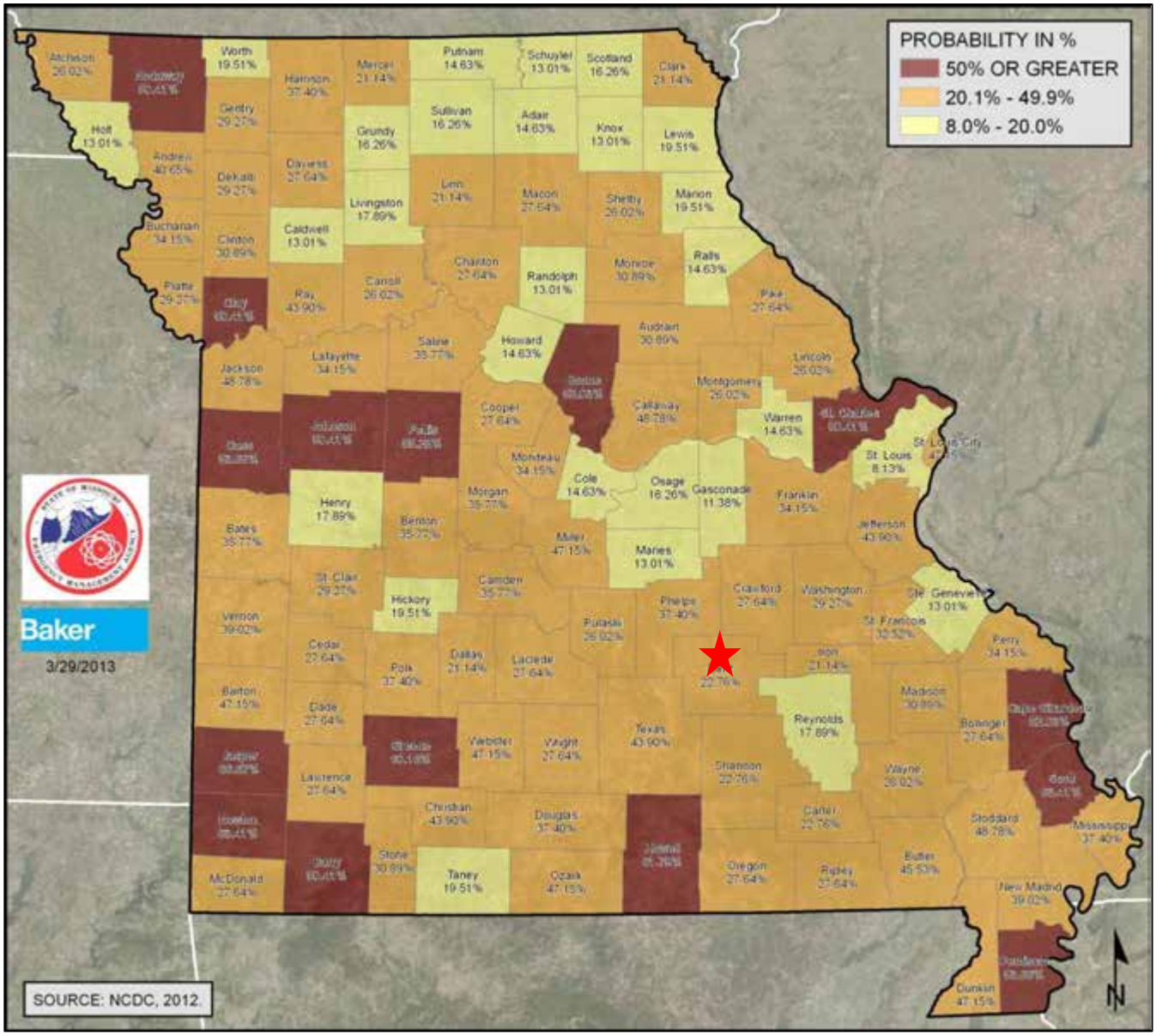
[49] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Table 3.74. Annual Average % Probability of Tornadoes in Dent County

Location	Annual Avg. % P
Dent County	40%

*P = probability; see page 3.24 for definition.

Figure 3.51. Missouri Tornado Probability



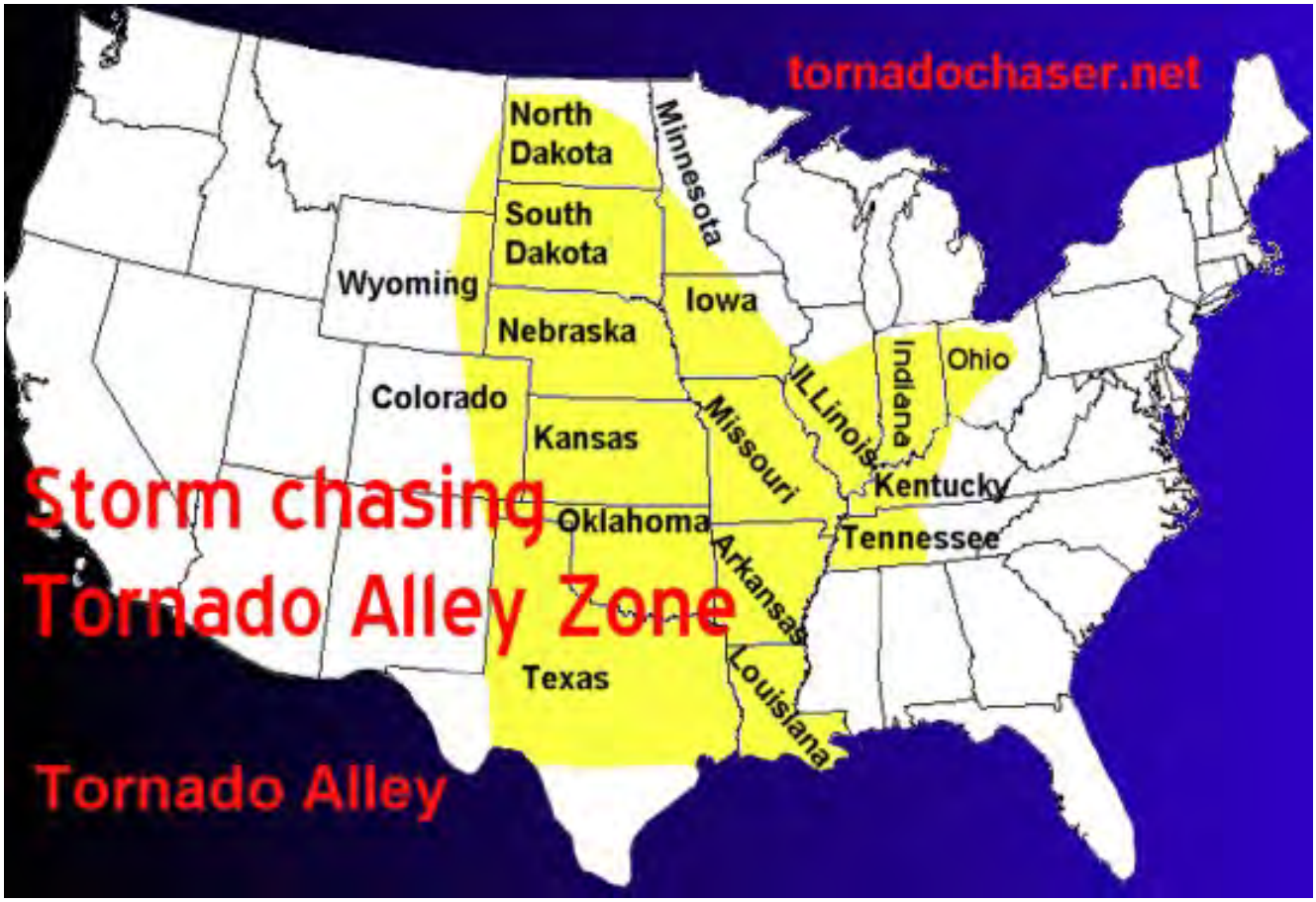
Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Vulnerability

Vulnerability Overview

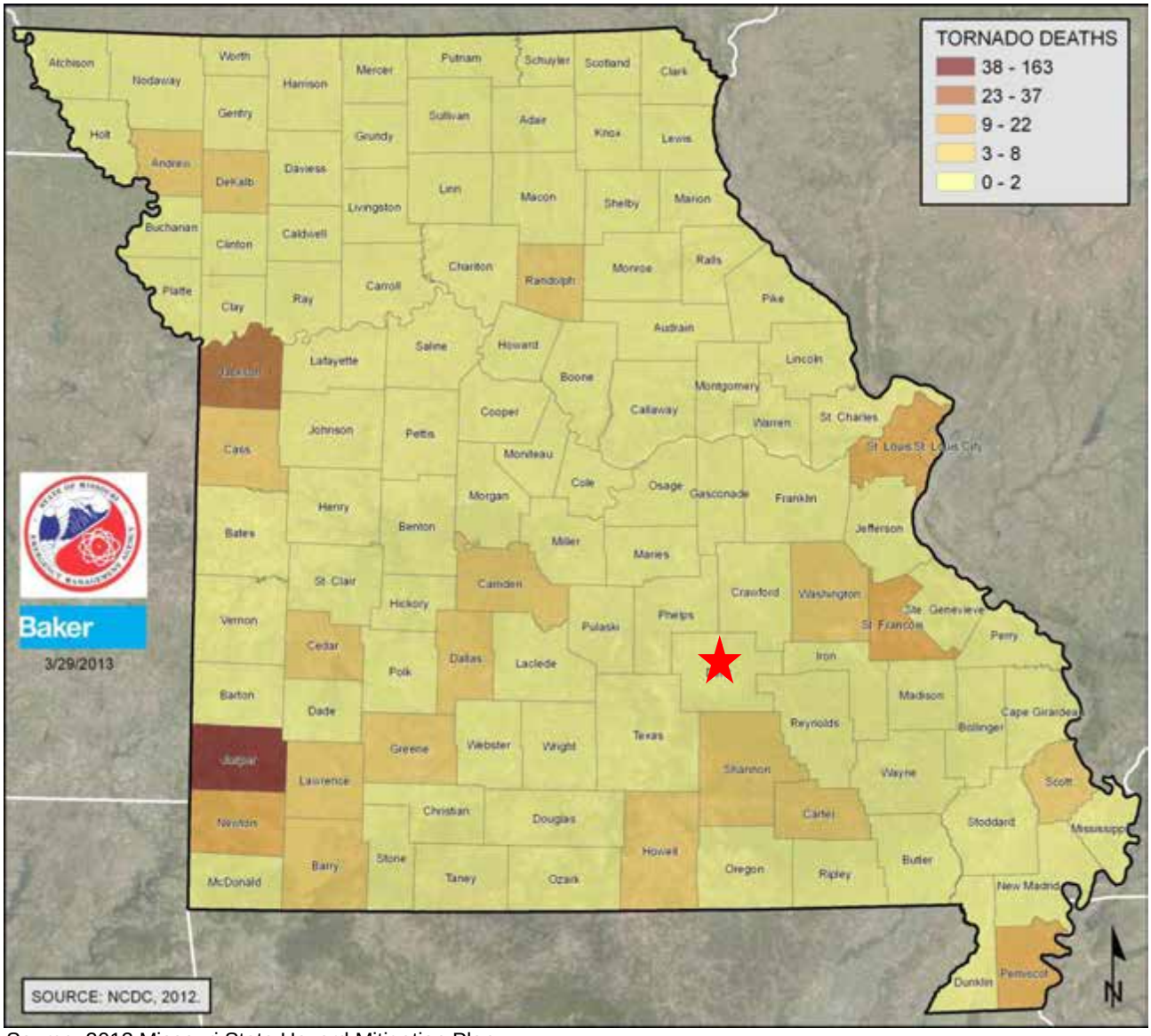
Dent County resides in a region of the United States that has a high frequency of dangerous and destructive tornadoes. This region seen in **Figure 3.52** is referred to as "Tornado Alley". Furthermore, **Figure 3.53** illustrates areas where perilous tornadoes historically have occurred in Missouri.

Figure 3.52. Tornado Alley in the U.S.



Source: http://www.tornadochaser.net/tornalley.html

Figure 3.53. Missouri Tornado Deaths by county, 1950 – March 17, 2012



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

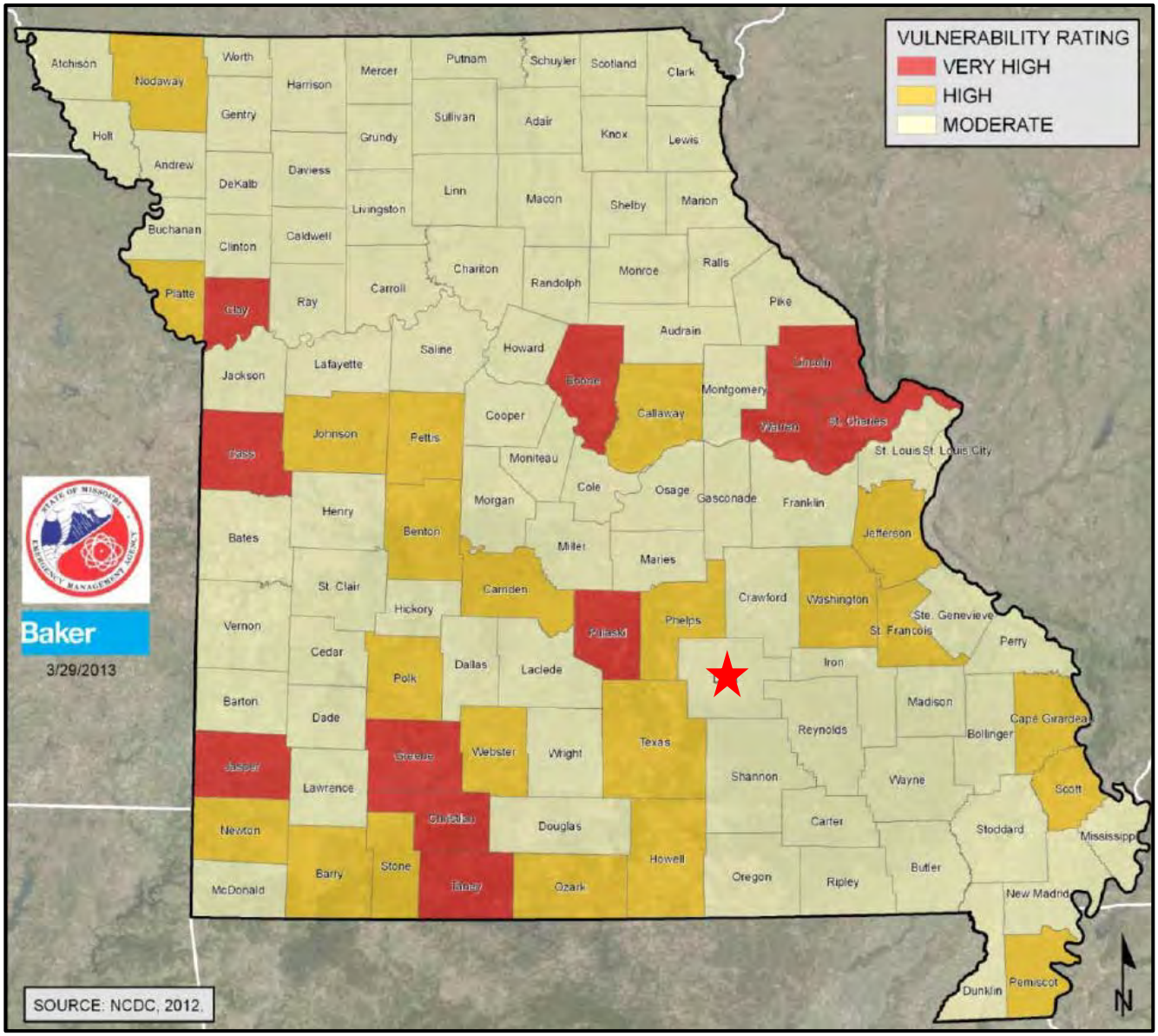
Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for tornado vulnerability. The analysis depicts the likelihood of future tornado impacts, average annual property loss ratio, population change, and house change. Factors were ranked from 1 to 3; moderate, high, and very high, respectively. The factor scores are totaled to estimate Dent County's vulnerability to tornadoes (**Table 3.75**). Since tornadoes are probable to occur across the state, the lowest risk factor is still considered moderate. **Figure 3.54** depicts the vulnerability summary for tornadoes across Missouri by county.

Table 3.75. Factors and Ranges Considered in Tornado Vulnerability Analysis

Factors Considered	Moderate (1)	High (2)	Very High (3)
Likelihood of Occurrence (# of events/ yrs. Of data)	6 - 24	25 - 49	50 - 68
Loss Ratio %	0 - .113	0.114 -.226	0.227 - 0.340
Population % Change	Below 6	7 - 22	23 - 39
Housing % Change	Below 12	13 - 25	26 - 39
Overall Vulnerability Rating	4 and 5 Rating	6 and 7 Rating	3 and 9 Rating

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.54. Vulnerability Summary for Tornadoes



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Table 3.76 provides information in regards to tornado probability, potential loss, and risk summary for Dent County. This table was calculated to determine 10 counties with the largest annualized historic tornado losses between 1950 and July 31, 2012 (**Table 3.77** and **Figure 3.55**).

Table 3.76. Tornado Probability, Potential Loss, and Risk Summary

County	# of Tornadoes	Likelihood of Occurrence	Probability Rating	Total Exposure ($)	Annualized Historic Loss	Loss Ratio	Loss Ratio Rating	Population Growth % Change	Pop. Change Rating	House % Change	Housing Ratio Rating	Total Vulnerability
Dent	14	22.76%	1	$1,382,572,000	$36,661	0.003%	1	4.9%	1	5.95%	1	Moderate

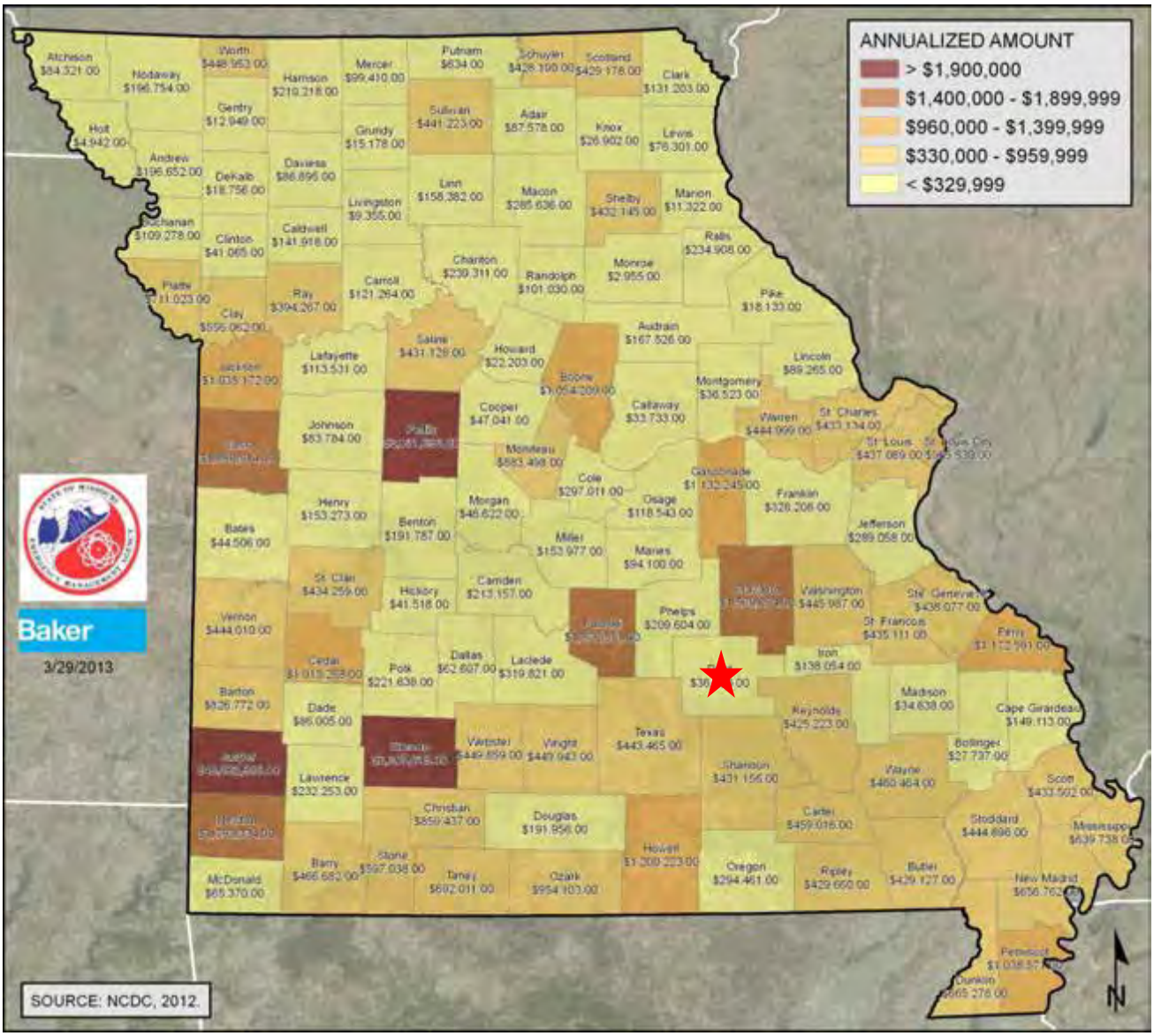
Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.77. Top 10 Counties Ranked by Annualized Historic Tornado Loss 1950 – July 2012

County	Annualized Historic Loss 1950 - July 31, 2012
Jasper	$48,523,987
Greene	$2,305,620
Pettis	$2,031,696
Cass	$1,890,914
Phelps	$1,876,552
Newton	$1,793,334
Crawford	$1,569,054
Perry	$1,172,592
Howell	$1,200,223
Gasconade	$1,132,245

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.55. Annualized Tornado Damages



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Potential Losses to Existing Development

There has been a total of $560,000 in damage due to tornadoes within Dent County in the previous 20 years. With this information we can estimate that each year there will be approximately $28,000 in loss to existing development. Additionally, the largest recorded tornado in the planning area has been an F-2. Utilizing this information we can infer that there is potential for another tornado of equivalence.

Future Development

As populations and development increases across the county, the vulnerability will increase as well. In order to protect jurisdictions from increased tornado vulnerabilities future analysis, training, and implementation should be considered at the planning, engineering, and architectural design stages.

Hazard Summary by Jurisdiction

As previously stated, a tornado event could occur anywhere in the planning area. However, some jurisdictions would suffer heavier damages because of the age of housing or high concentration of mobile homes. See **Table 3.34** for jurisdictions most vulnerable to damage due to the age of the structure. Furthermore, data was obtained from the U.S. Census Bureau for the number of mobile homes in Dent County. From the information provided in **Table 3.78,** unincorporated Dent County is most vulnerable to losses due to the number of mobile homes residing within the jurisdiction.

Table 3.78. Percentage of Mobile Homes in Dent County, 2016

Jurisdiction	Number of Mobile Homes	Percentage of Mobile Homes*
Unincorporated Dent County	1,284	17.7
Salem	173	7.1

Source: U.S. Census Bureau, 2012-2016 5-Year American Community Survey
*Number of mobile homes per jurisdiction/total housing units per jurisdiction
**Total housing units for all jurisdictions = 7,242

Problem Statement

Early warnings are possibly the best hope for residents when severe weather strikes. While more than two hours warning is not possible for tornados, citizens must immediately be aware when a city will be facing a severe weather incident. Jurisdictions that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of tornados. Additional public awareness also includes coverage by local media sources. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

3.4.10 Winter Weather/Snow/Ice/Severe Cold

Some specific sources for this hazard are:

- Wind chill chart, National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml;
- Average Number of House per year with Freezing Rain, American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf;
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- Any local Road Department data on the cost of winter storm response efforts.
- National Centers for Environmental Information, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/

Hazard Profile

Hazard Description

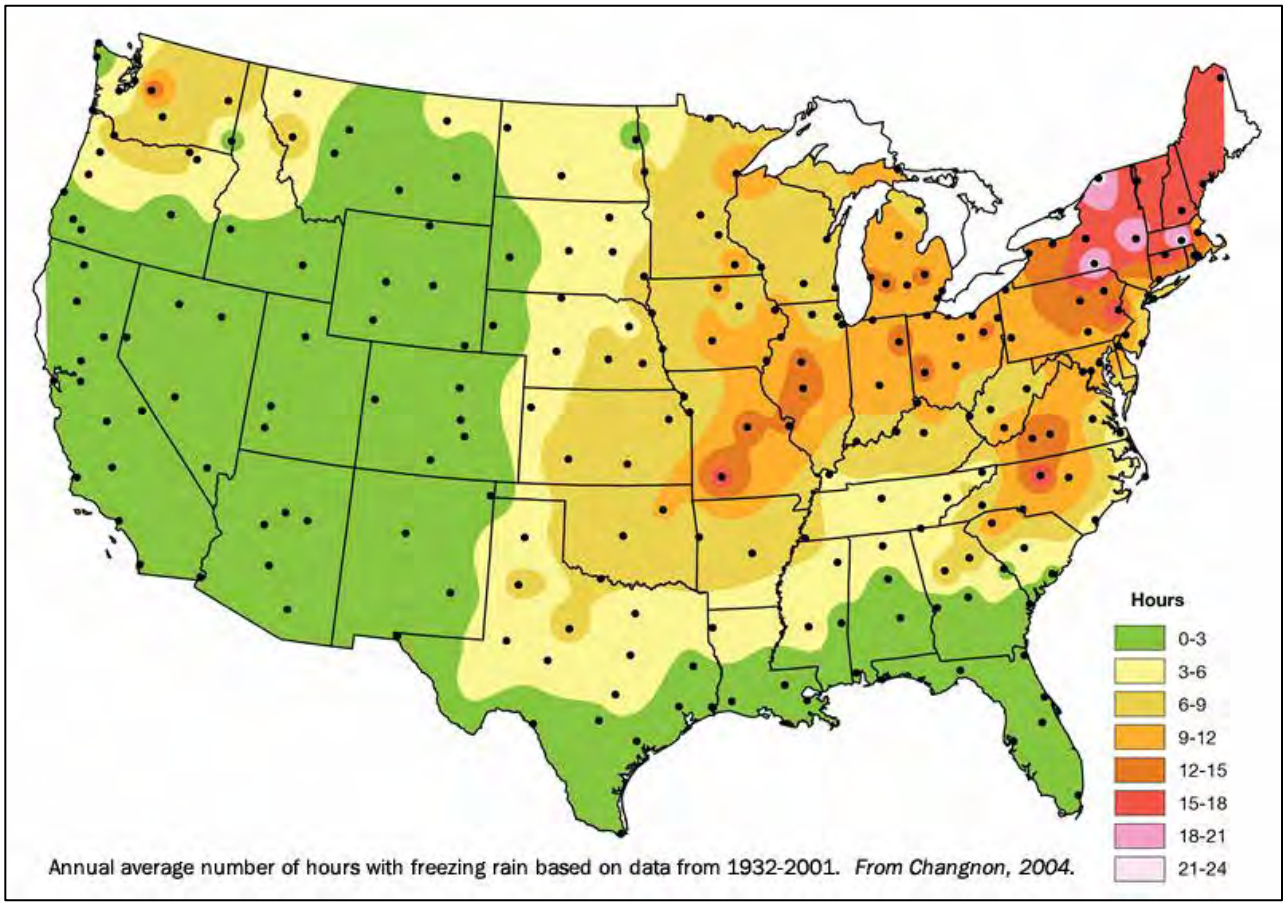
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **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.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Geographic Location

Severe winter weather typically strikes Missouri more than once every year. Dent County receives winter weather events from heavy snows to freezing rain annually. Major snowstorms typically occur once each year, causing multiple school closings, as well as suspending business and government activity. Dent County is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. **Figure 3.56** illustrates statewide average number of hours per year with freezing rain. Dent County receives approximately 9 to 12 hours.

Figure 3.56. NWS Statewide Average Number of Hours per Year with Freezing Rain



Source: Changon, 2004, http://mrcc.isws.illinois.edu/living_wx/icestorms/

Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have some kind of bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at risk are those without shelter, those who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

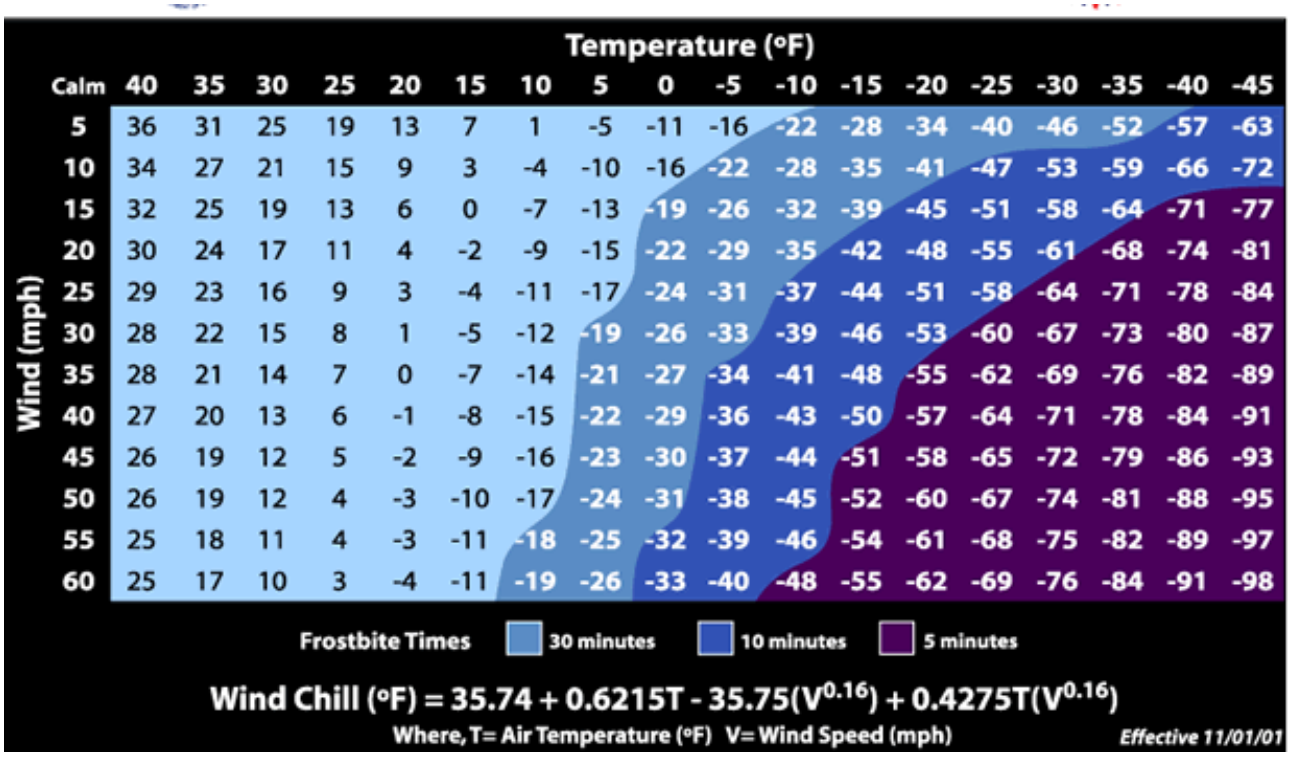
Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular, ice accumulation during winter storms can damage power lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacement of damaged facilities, and lost economic opportunities for businesses.

Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. Standard values for loss of service for utilities reported in FEMA's 2009 BCA Reference Guide, the economic impact as a result of loss of power is $126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, **Figure 3.57** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Winter storms, cold, frost, and freeze all can influence or negatively impact crop production. However, data obtained from the USDA's Risk Management Agency for insured crop losses indicates that there were no claims paid in Dent County between 1998 and 2017 for severe winter weather.

Figure 3.57. Wind Chill Chart



Source: National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml

Previous Occurrences

Data was obtained from the NCEI for winter weather reported events and damages between 1998 and 2017 **(Table 3.79**). This data includes variables such as blizzard, cold/wind chill, extreme cold/wind chill, heavy snow, ice storm, sleet, winter storm, and winter weather. Additionally, narratives for specific events are listed below.

Table 3.79. NCEI County A Winter Weather Events Summary, 1998 - 2017

Type of Event	Inclusive Dates	# of Injuries	Property Damages	Crop Damages
Winter Storm	12/20/1998	0	0	0
Winter Storm	1/1/1999	0	150.00K	0
Winter Storm	3/13/1999	0	0	0
Extreme Cold/Wind	12/12/2000	0	0	0
Heavy Snow	12/12/2000	0	0	0
Ice Storm	12/15/2000	0	0	0
Extreme Cold/Wind	1/1/2001	0	0	0
Ice Storm	2/21/2001	0	0	0
Winter Storm	12/4/2002	0	0	0
Winter Storm	12/24/2002	0	0	0
Winter Storm	2/23/2003	0	0	0

Type of Event	Inclusive Dates	# of Injuries	Property Damages	Crop Damages
Ice Storm	1/25/2004	0	0	0
Winter Storm	2/5/2004	0	0	0
Winter Storm	11/30/2006	0	0	0
Winter Storm	1/20/2007	0	0	0
Ice Storm	12/10/2007	0	0	0
Ice Storm	2/11/2008	0	0	0
Ice Storm	2/21/2008	0	0	0
Heavy Snow	3/4/2008	0	0	0
Winter Storm	1/26/2009	0	0	0
Winter Storm	2/28/2009	0	0	0
Winter Storm	2/1/2011	0	0	0
Winter Storm	2/21/2013	0	0	0
Winter Storm	12/5/2013	0	0	0
Winter Storm	1/5/2014	0	0	0
Winter Storm	3/2/2014	0	0	0
Winter Storm	2/15/2015	0	0	0
Winter Storm	2/20/2015	0	0	0
Winter Storm	2/28/2015	0	0	0
Winter Storm	3/4/2015	0	0	0
Ice Storm	1/13/2017	0	0	0
Total	**31**	**0**	**150.00K**	**0**

Source: NCEI, data accessed [5/16/18]

Notable Winter Narratives:

1. **01/01/1999:** A band of snow and sleet (in addition to the ice) fell from southwest to central Missouri. Three to six inch amounts occurred in southwest Missouri in the Springfield, Galena, Ozark, and Buffalo areas. Heavier amounts of 5 to 10 inches occurred in central Missouri near the Lake of the Ozarks. The heaviest 8 to 10 inches of snow occurred in Morgan and northern Miller Counties.

Probability of Future Occurrence

From the data obtained from the NCEI [50], annual average percent probabilities were calculated for winter weather within Dent County (**Table 3.80)**. There were 31 recorded events (**Table 3.79**) over a 20 year period. There is 100 percent annual average probability of winter weather occurrence (31 events/20 years)**,** with an average of 1.55 events per year.

[50] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Table 3.80. Annual Average % Probability of Winter Weather in Dent County

Location	Annual Avg. % P	Avg. # of Events
Dent County	100%	1.55

*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for vulnerability information regarding Dent County. Various data sources were utilized for statistical analysis including the following:

- National Centers for Environmental Information (NCEI)
- FEMA's Public Assistance Funds
- Crop Insurance Claims data from the USDA's Risk Management Agency
- HAZUS-MR4
- U.S. Census Data
- USDA's Census of Agriculture

The following Table (**Table 3.81**) includes data elements for severe winter weather.

Table 3.81. Dent County Housing Density, Building Exposure, Crop Exposure, Social Vulnerability Index, Total incidents, Total Property Loss, and Total Crop Insurance Paid Data

County	Housing Units/sq. mi.	Total Building Exposure ($)	Crop Exposure (2007) ($)**	Total Incidences	Total $ Property Los ($)	Total Crop Insurance Paid ($)
Dent	9.7	$1,382,572,000	$1,270,000	24	$9,195,000	$0

Seven factors were utilized to determine overall severe winter storm vulnerability. These factors include housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims and social vulnerability. Furthermore, 5 rating values were developed for each factor. **Table 3.82** illustrates vulnerability analysis rating factors.

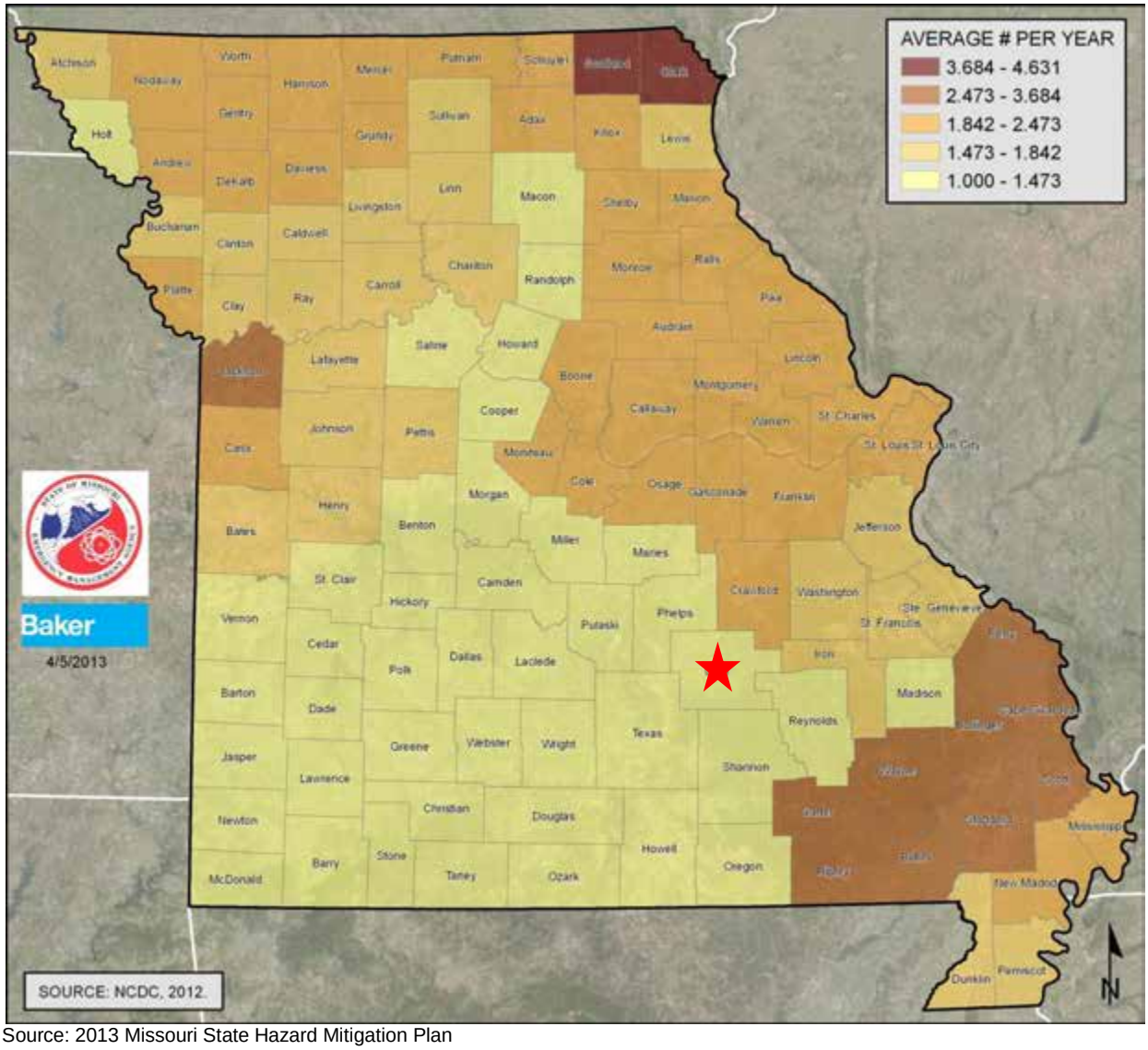
Table 3.82. Vulnerability Analysis Rating Factors

Factors considered	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Housing Density (# per sq. mile)	<50	50 - 99	100 - 299	300 - 499	>500
Crop Exposure (4)	<$10M	$10M to $24M	$25M to $49M	$50M to $99M	>$100M
Social Vulnerability	1	2	3	4	5
Likelihood of Occurrence (# of events/ yrs. Of data)	1.000 - 1.473	1.473 - 1.842	1.842 - 2.473	2.473 - 3.684	3.684 - 4.631
Annualized Property Loss Ratio (annual property loss/exposure)	0.0 - 0.000110	0.000111 - 0.000274	0.000275 - 0.000636	0.000637 - 0.001397	0.001398 - 0.003270

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.58 illustrates the likelihood of occurrence of severe winter weather across Missouri. Dent County was estimated to have an average of 1.000 to 1.473 severe winter weather events per year.

Figure 3.58. Likelihood of Occurrence of Severe Winter Weather



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

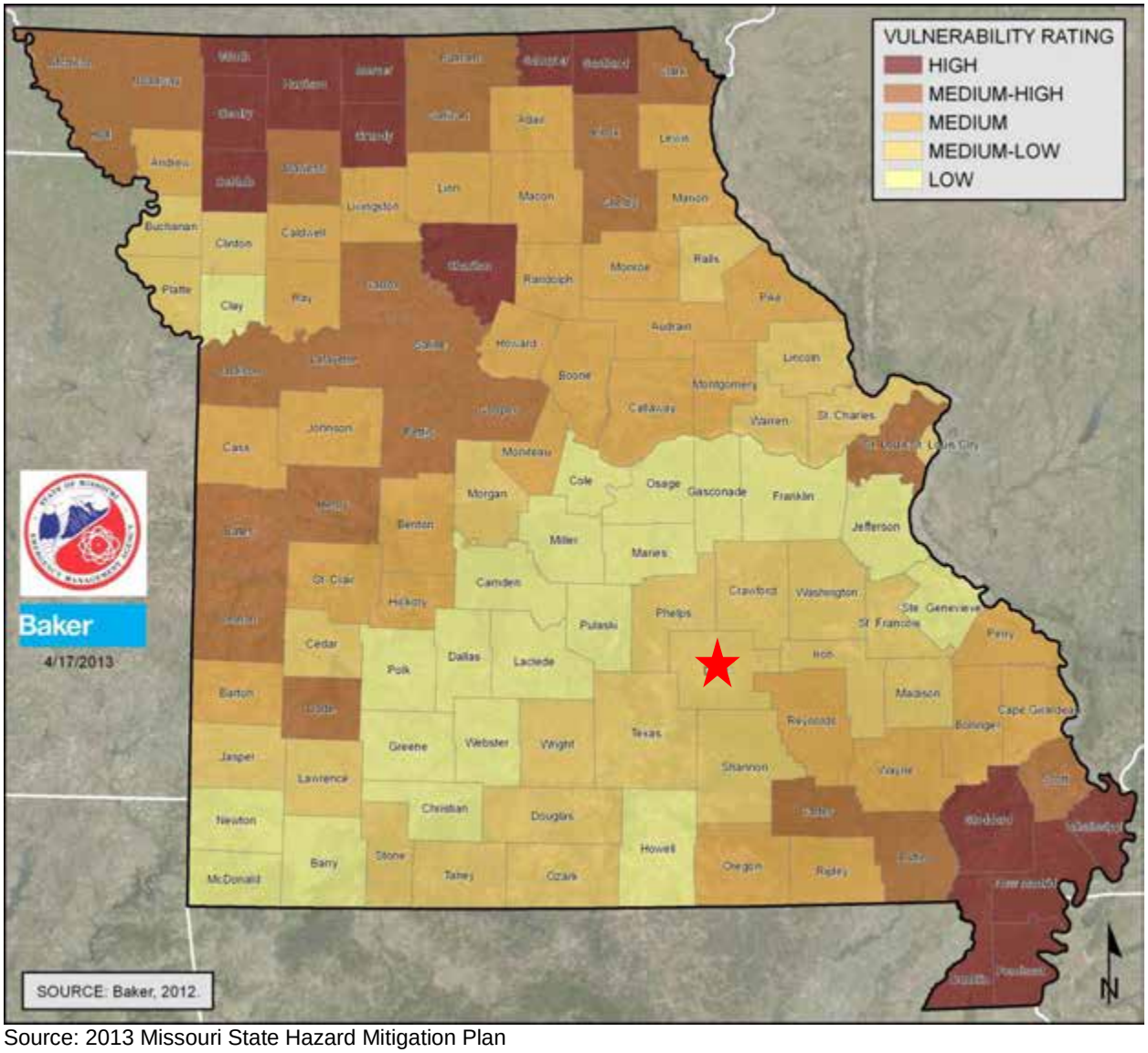
Table 3.83 depicts the calculated vulnerability rating for each factor considered in the vulnerability analysis for severe winter weather hazards. The overall vulnerability rating for severe winter weather in Dent County is medium-low. Moreover, **Figure 3.59** illustrates vulnerability ratings for each county within Missouri.

Table 3.83. Dent County Vulnerability Analysis for Severe Winter Weather

County	Housing Density Rating	Likelihood Rating	Property Loss Rating	Crop Exposure Rating	Crop Loss Ratio Rating	Social Vulnerability Index	Total Score and Vulnerability	Vulnerability Rating
Dent	1	1	3	1	1	4	11	Medium-Low

Source: 2013 Missouri State Hazard Mitigation Plan

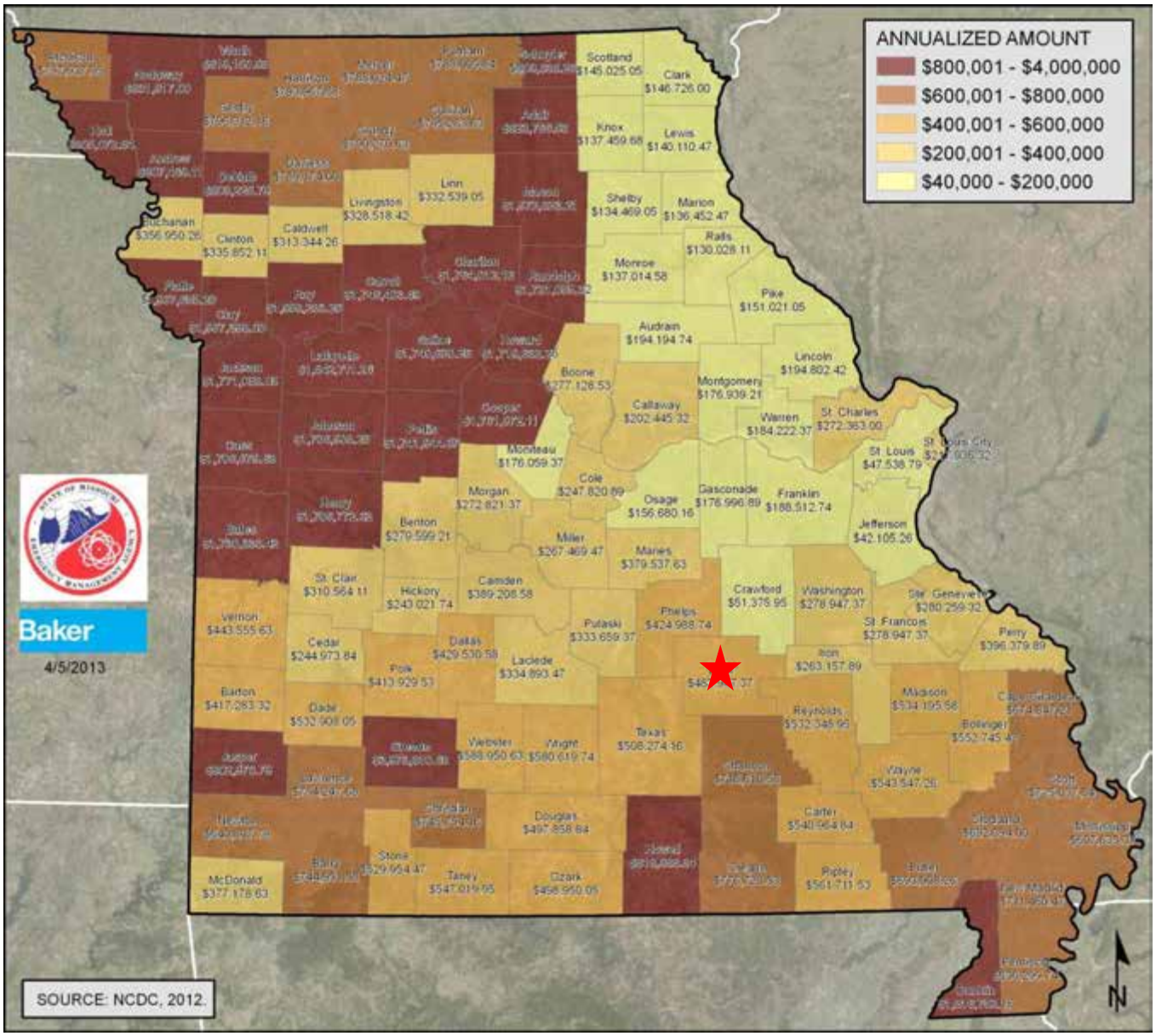
Figure 3.59. Vulnerability Summary for Severe Winter Storm



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Annualized severe winter weather damages were obtained from the 2013 Missouri State Hazard Mitigation Plan. Dent County is estimated as having $400,001 to $600,000 in damages per year due to severe winter weather (**Figure 3.60**).

Figure 3.60. Annualized Severe Winter Weather Damages



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Dent County

Potential Losses to Existing Development

The next severe winter storm will most likely close schools and businesses for multiple days, and make roadways hazardous for travel. Heavy ice accumulation may damage electrical infrastructures, causing prolonged power outages for large portions of the region. In addition, freezing temperatures make water lines vulnerable to freeze/thaw. Fallen tree limbs also pose a threat to various structures/infrastructures across the county.

Future Development

Data for future development for the planning area is sparse. However, winter weather will affect the county as a whole. Any future development is at risk to damages and increased exposure. In addition, the county's population is anticipated to increase, which would increase the number of individuals at risk during a winter weather event.

Hazard Summary by Jurisdiction

Variations in impacts are not anticipated for severe winter weather across the planning area. Yet, areas with high number of mobile homes tend to experience increased damages. Unincorporated Dent County has the highest abundance of mobile homes, making the area more prone to increase exposure to damage.

Problem Statement

In summary, Dent County is expected to experience at least one severe winter weather events annually; however the county has a medium-low vulnerability rating. Jurisdictions should enhance their weather monitoring to be better prepared for severe weather hazards. If jurisdictions monitor winter weather, they can dispatch road crews to prepare for the hazard. County and city crews can also trim trees along power lines to minimize the potential for outages due to snow and ice. Citizens should also be educated about the benefits of being proactive to alleviate property damage as well preparing for power outages.

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy developed by the Mitigation Planning Committee (MPC). The mitigation strategy was developed through a collaborative group process. The process included review of general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's *Local Hazard Mitigation Review Guide (October 1, 2012)*.

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.

- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

4.1 Goals

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

This planning effort is Dent County's first hazard mitigation plan. The MPC conducted a discussion session during their second meeting to develop the plan goals. To ensure that the goals developed for this plan were comprehensive and supported State goals, the 2013 State Hazard Mitigation Plan goals were reviewed. As the existing goals were broad, still applicable, and supported the 2013 State Hazard Mitigation Plan goals, the MPC saw no reason to make any changes. The Dent County goals are as follows:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

During the second MPC meeting, action items were discussed and developed for the plan. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

The MPC determined to include problem statements in the plan at the end of each hazard profile. The problem statements summarize the risk to the planning area presented by each hazard, and include possible methods to reduce that risk.

The focus of Meeting #3 was to review, prioritize and update the mitigation strategy. Facilitators also provided suggestions for actions based on what some of the surrounding counties had included in their plans. Participants were also encouraged to refer to the current State Plan and provided a link to the FEMA's publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).* This document was developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters.

During the review of the plan document, MPC members were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction.

Copies of the list of actions for each jurisdiction were provided to MPC members at planning meetings and were emailed out to all members. Action items were reviewed and the MPC provided updates on the status of action items during both planning meetings and the meeting with the road and bridge department. Each action item was reviewed and assigned one of the following:

- Completed, with a description of the progress,
- Not Started/Continue in Plan Update, with a discussion of the reasons for lack of progress,
- In Progress/Continue in Plan Update, with a description of the progress made to date or
- Deleted, with a discussion of the reasons for deletion.

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

Jurisdictional MPC members were encouraged to meet with others in their community to discuss the actions to be included in the updated mitigation strategy. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis, and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC worked together to review and assign scores. The process posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

Definitely yes = 3 points
Maybe yes = 2 points
Probably no = 1
Definitely no = 0

The following questions were asked for each proposed action.

S: Is the action socially acceptable?
T: Is the action technically feasible and potentially successful?
A: Does the jurisdiction have the administrative capability to successfully implement this action?
P: Is the action politically acceptable?
L: Does the jurisdiction have the legal authority to implement the action?
E: Is the action economically beneficial?
E: Will the project have an environmental impact that is either beneficial or neutral? (score "3" if positive and "2" if neutral)

Will the implemented action result in lives saved?
Will the implanted action result in a reduction of disaster damage?

In addition to the STAPLEE process, each action item was also reviewed for Benefit/Cost. These two aspects of the prioritization process were scored as follows:

Benefit – two (2) points were added for each of the following avoided damages (8 points maximum = highest benefit)

- Injuries and/or casualties
- Property damages

- Loss-of-function/displacement impacts
- Emergency management costs/community costs

Cost – points were subtracted according to the following cost scale (-5 points maximum = highest cost)

- (-1) = Minimal – little cost to the jurisdiction involved
- (-3) = Moderate – definite cost involved but could likely be worked into operating budget
- (-5) = Significant – cost above and beyond most operating budgets; would require extra appropriations to finance or to meet matching funds for a grant

Note: For the Benefit/Cost Review, the benefit and cost of actions which used the word "encourage" were evaluated as if the action or strategy being encouraged was actually to be carried out.

In addition, the group considered the cost of mitigation versus the long-term savings in relation to potential lives saved and property damage avoided.

Total Score – The scores for the STAPLEE Review and Benefit/Cost Review were added to determine a Total Score for each action.

Priority Scale – To achieve an understanding of how a Total Score might be translated into a Priority Rating, a sample matrix was filled out for the possible range of ratings an action might receive on both the STAPLEE and Benefit/Cost Review. The possible ratings tested ranged between:

- A hypothetical action with "Half probably NO and half maybe YES" answers on STAPLEE (i.e. poor STAPLEE score) and Low Benefit/High Cost: Total Score = 7
- A hypothetical action with "All definitely YES" on STAPLEE and High Benefit/Little Cost: Total Score = 28

An inspection of the possible scores within this range led to the development of the following Priority Scale based on the Total Score in the STAPLEE- Benefit/Cost Review process:

20 – 28 points = High Priority
14-19 points = Medium Priority
13 points and below = Low Priority

The results of the STAPLEE process and Benefit/Cost analysis were then mailed out to all MPC members for feedback and consensus.

The final scores are listed below in the analysis of each action. Correspondence regarding the STAPLEE process is included in Appendix C: A spreadsheet with the action items and final scores is illustrated in Figure 4.1.

Jurisdictional Floodplain Management Programs

The City of Salem is the only jurisdiction within the county to regulate development in the floodplain by reviewing permit applications for all development including new and existing structures. Elevation certificates are required for all new construction, and existing structures with 50% or more damage following a flood are required to elevate. Floodplain maps are available in hard copy at the city hall. Furthermore floodplain maps can be found online through FEMA's website https://msc.fema.gov/portal. Salem does not currently participate in active monitoring activities within the floodplain.

Table 4.1. Jurisdictional Floodplain Ordinance Adoption Date

Community Name	Ordinance Adoption Date
*Dent County	Not Participating in NFIP
Salem	8/1/1979

Source: Data Collection Questionnaires
* Listed as not participating in the NFIP per FEMA's Community Status Book Report[1]; NSFHA (SEMA)

[1] www.fema.gov/cis/mo.html

Figure 4.4 Prioritization of Mitigation Actions		3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.1	Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency survival kits with water, blankets, flashlights, etc. and how to shut off their home utilities during emergencies. Ready-in-3 brochures/videos and information will be made readily available to the public through the health department and local government offices.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.2	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.3	Actively seek funding to assist jurisdictions in obtaining early warning systems, improving communication systems, and updating existing systems.	3	2	2	3	3	2	2	17	IC, PD, LF, EMCC	8	-3	5	22	H
1.4	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies.	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-2	6	24	H
1.5	Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.	3	3	3	3	3	3	2	20	IC, PD, LF, EMCC	8	-3	5	25	H
1.6	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
1.7	Regularly review and update school emergency plans	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-2	6	27	H
1.8	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.	3	2	2	3	3	3	3	19	IC, LF, EMCC	6	-1	5	24	H
1.9	Seek funding to install additional fire doors in school buildings.	3	3	2	3	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
1.10	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.	3	3	2	3	3	2	3	19	IC, EMCC	4	-2	2	21	H

	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.11	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.	3	3	3	3	3	3	3	21	IC, EMCC	4	-1	3	24	H
1.12	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.	3	3	3	3	3	3	3	21	IC, EMCC	4	-1	3	24	H
1.13	Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.	3	3	3	3	3	2	2	19	IC, PD, LF, EMCC		-3	5	24	H
1.14	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.	3	3	3	3	3	3	3	21	IC, LF, EMCC	6	-1	5	26	H
1.15	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with “sister” facilities.	3	2	2	3	3	2	3	18	IC, EMCC		-1	3	21	H
1.16	Conduct a study of County Roads 2470, 4210, 6230, 5150, and 5110 to find mitigation solutions for flooding, flash flooding, and landslides.	3	3	2	3	3	1	3	18	IC, PD, LF, EMCC	8	-5	3	21	H
1.17	Seek funding opportunities to improve phone, radio, and broadband radio reception/coverage across the county.	3	2	2	3	3	1	3	17	IC, PD, LF, EMCC	8	-2	6	23	H
2.1.	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.	3	2	2	3	3	3	2	18	IC, PD, LF, EMCC	8	-2	6	24	H
2.2	Seek funding opportunities for the installation of backup generators for critical infrastructure such as water systems and emergency services.	3	3	3	3	3	2	3	20	LF, EMCC	4	-3	1	21	H
2.3	Educate Salem residents, realtors and contractors about the dangers of floodplain development and the benefits of the NFIP.	2	2	2	2	3	2	3	16	IC, PD, LF, EMCC	8	-1	7	23	H
2.4	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements in Salem.	2	2	2	2	3	2	3	16	IC, PD, LF, EMCC	8	-3	5	21	H
2.5	Encourage the City of Salem to develop and implement regulations for securing hazardous materials tanks and mobile homes to reduce hazards during storms and flooding.	2	2	2	2	3	2	3	16	IC, PD, LF, EMCC	8	-3	5	21	H
3.1	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.	3	2	2	3	3	3	3	19	IC, PD, LF, EMCC	8	-2	6	25	H

	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
3.2	Distribute SEMA brochures on natural disasters at public facilities and events.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
3.3	Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, preparedness and how to mitigate.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
3.4	Encourage and promote weather spotter classes throughout the county on an annual or bi-annual basis.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
3.5	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.	3	3	3	2	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
3.6	Encourage county health department and local Red Cross Chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought, heat wave)	3	3	2	3	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
3.7	Encourage the development of a county-wide CERT and/or VOAD program and educate the public on how they can benefit from these types of programs.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
4.1	Encourage elected officials to disseminate information about hazard mitigation projects to the public.	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-1	7	25	H
4.2	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).	3	1	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-1	7	25	H
4.3	Pool different agency resources to achieve widespread mitigation planning results.	2	2	2	2	3	2	3	16	IC, PD, LF, EMCC	8	-1	7	23	H
4.4	Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.	3	3	2	3	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
5.1	Provide information to the City of Salem on the benefits and costs of developing storm water management plans.	2	2	2	2	3	2	3	16	IC, PD, LF, EMCC	8	-1	7	23	H
5.2	Coordinate and integrate hazard mitigation activities where appropriate with emergency operations plans and procedures.	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-2	6	24	H
5.3	Encourage the City of Salem to require contractor storm water management plans in all new development – both residential and commercial properties.	2	2	2	2	3	2	3	16	PD, EMCC	4	-2	2	18	M
6.1	Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities.	3	3	3	3	3	3	3	21	IC, LF, EMCC	8	-1	7	28	H

	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
6.2	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	3	2	2	2	3	2	3	17	IC, LF, EMCC	8	-2	6	23	H
6.3	Work with state/local/federal agencies to include mitigation in economic & community development projects when applicable.	3	2	2	2	3	2	3	17	IC, LF, EMCC	8	-2	6	23	H
6.4	Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.	2	3	2	2	3	3	3	18	IC, LF, EMCC	8	-1	7	25	H
6.5	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole	2	2	2	2	3	2	3	17	IC, LF, EMCC	8	-1	7	24	H
6.6	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.	3	3	3	3	3	3	3	21	IC, LF, EMCC	8	-1	7	28	H

Dent County

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.

Action 1.1: Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency survival kits with water, blankets, flashlights, etc. and how to shut off their home utilities during emergencies. Ready-in-3 brochures/videos and information will be made readily available to the public through the health department and local government offices.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Residents are not always prepared to manage on their own for up to 72 hours following an event – especially an event which results in power outage or loss of utilities. This action item will improve the preparedness of individual households.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Personal Preparedness Education/Awareness Program
Action or Project Description:	Local emergency responders and EMDs will promote Ready in 3 and other personal preparedness education programs through the distribution of brochures, press releases and presentations at special events and through the county health department and local government offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$500 -$3,500 estimated cost
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD and County Health Dept.
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.2: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Development of emergency plans by businesses.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.3: Actively seek funding to assist jurisdictions in obtaining early warning systems, improving communication systems, and updating existing systems.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Dent County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.4: Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of information/data on some hazards such as dam failure, tornadoes, sinkholes, land subsidence and wildfire in Dent County.
Hazard(s) Addressed:	Tornadoes, sinkholes, land subsidence, wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Improving information/data for risk assessments and planning
Action or Project Description:	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Local Planners
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.5: Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with poor road infrastructure, including bridges and low water crossings, during flood and earthquakes events.
Hazard(s) Addressed:	Floods and Earthquake
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Review road and bridge upgrades for potential mitigation actions
Action or Project Description:	Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Dent County Commission, Road & Bridge Dept.
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan, Capital Improvement Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.12: Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.
Action or Project Description:	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.13: Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Infrastructure issues associated with tree branches and dead trees
Hazard(s) Addressed:	Severe Weather, Winter Storms, Tornadoes, Fire, Earthquake
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	Disseminate information on tree trimming and dead tree removal programs
Action or Project Description:	Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Road & Bridge Dept.
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.14: Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of cooling centers during extreme heat and power outages
Hazard(s) Addressed:	Severe Weather, Winter Storms, Tornadoes, Fire, Earthquake, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.
Action or Project Description:	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$15,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.15: Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of alternative shelter locations for vulnerable populations
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.
Action or Project Description:	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.16: Conduct a study of County Roads 2470, 4210, 6230, 5150, and 5110 to find mitigation solutions for flooding, flash flooding, and landslides.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with flooding, flash flooding, and landslides on CR 2470, 4210, 6230, 5150, and 5110
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.16
Name of Action or Project:	Conduct a study of roads vulnerable to floods, flash floods, and landslides
Action or Project Description:	Conduct a study of County Roads 2470, 4210, 6230, 5150, and 5110 to find mitigation solutions for flooding, flash flooding, and landslides.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, Road & Bridge Dept., Local Planners
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Transportation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.17: Seek funding opportunities to improve phone, radio, and broadband radio reception/coverage across the county.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated poor phone, radio, and broadband radio reception/coverage
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.17
Name of Action or Project:	Seek funding opportunities to improve communications
Action or Project Description:	Seek funding opportunities to improve phone, radio, and broadband radio reception/coverage across the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, Local Planners
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes and Tornadoes
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Self-inspection awareness program for critical facilities to determine earthquake, tornado and severe weather resistance of structures.
Action or Project Description:	Provide information on conducting self-inspections or where to seek help in having facilities inspected to determine their resistance to earthquakes, tornados or severe weather.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, local emergency response agencies
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Capital Improvement Plan, Hazard Mitigation Plan, Critical Facility Budgets
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Local Planners, MPC
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Emergency Plan, Comprehensive Plans, Capital Improvement Plan, Economic Development Plan, Transportation Plan, Land-use Plan, Floodplain Ordinances, Storm Water Plans/Ordinances
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.2: Distribute SEMA brochures on natural disasters at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Distribute SEMA brochures at public facilities and events
Action or Project Description:	Distribute SEMA brochures on natural disasters at public facilities and events.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, local emergency response agencies, County Health Dept.
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.3: Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, drills, preparedness and how to mitigate.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information regarding hazards, where they strike, frequency, preparedness, and how to mitigate.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3
Name of Action or Project:	Public education
Action or Project Description:	Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, drills, preparedness and how to mitigate.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.4: Encourage and promote weather spotter classes throughout the county on an annual or bi-annual basis.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of weather spotters/training
Hazard(s) Addressed:	Severe Weather, Tornadoes
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Public education
Action or Project Description:	Encourage and promote weather spotter classes throughout the county on an annual or bi-annual basis.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission, EMD, MRPC, HSOC, SEMA, Emergency Response Agencies
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.6: Encourage county health department and local Red Cross Chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought, heat wave)

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of awareness/education on individual preparedness.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Individual preparedness education program.
Action or Project Description:	Encourage county health department and local Red Cross Chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought, heat wave)
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Health Dept., Red Cross
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.7: Encourage the development of a county-wide CERT and/or VOAD program and educate the public on how they can benefit from these types of programs.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of awareness/education on individual and community preparedness.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Individual and community preparedness education program.
Action or Project Description:	Encourage the development of a county-wide CERT and/or VOAD program and educate the public on how they can benefit from these types of programs.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1: Encourage elected officials to disseminate information about hazard mitigation projects to the public.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public knowledge of hazard mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.1
Name of Action or Project:	Public education on mitigation projects
Action or Project Description:	Encourage elected officials to disseminate information about hazard mitigation projects to the public.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, County Health Dept.
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, Emergency Response Agencies
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Action 4.4: Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Outdated mutual aid agreements between emergency response agencies and insufficient response capabilities.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.4
Name of Action or Project:	Update mutual aid agreements between emergency response agencies
Action or Project Description:	Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, City Council, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1: Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge on new mitigation funding opportunities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1
Name of Action or Project:	Mitigation funding opportunities
Action or Project Description:	Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$200 -$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC
Action/Project Priority:	18 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities that can occur when infrastructure projects do not include mitigation considerations.
Hazard(s) Addressed:	Floods, Earthquakes
Action or Project	
Action/Project Number:	6.2
Name of Action or Project:	Including mitigation in grant proposals
Action or Project Description:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $7,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, County Commission, Road & Bridge Dept.
Action/Project Priority:	13 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plan, Regional Transportation Plan, Road & Bridge Dept. Budget
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3
Name of Action or Project:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500-$9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Engineers, County Commission, City Council, Grant Writers, Local Planners, MRPC
Action/Project Priority:	23 - High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.4: Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to implement mitigation projects.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission, EMD, City Council, MRPC
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.5: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects for individuals
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.5
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	Example: Local government works with landowners and cost-shares the installation of culverts on private driveways.

Action 6.7: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Dent County
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.7
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$750 - $2,750
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, City Council, Local Planners, City/County Engineers, MPC, MRPC
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Salem

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.

Action 1.1: Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency survival kits with water, blankets, flashlights, etc. and how to shut off their home utilities during emergencies. Ready-in-3 brochures/videos and information will be made readily available to the public through the health department and local government offices.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Residents are not always prepared to manage on their own for up to 72 hours following an event – especially an event which results in power outage or loss of utilities. This action item will improve the preparedness of individual households.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Personal Preparedness Education/Awareness Program
Action or Project Description:	Local emergency responders and EMDs will promote Ready in 3 and other personal preparedness education programs through the distribution of brochures, press releases and presentations at special events and through the county health department and local government offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$500 -$3,500 estimated cost
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.2: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Development of emergency plans by businesses.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.3: Actively seek funding to assist jurisdictions in obtaining early warning systems, improving communication systems, and updating existing systems.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Dent County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.4: Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of information/data on some hazards such as dam failure, tornadoes, sinkholes, land subsidence and wildfire in Dent County.
Hazard(s) Addressed:	Tornadoes, sinkholes, land subsidence, wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Improving information/data for risk assessments and planning
Action or Project Description:	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Local Planners
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.5: Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with poor road infrastructure, including bridges and low water crossings, during flood and earthquakes events.
Hazard(s) Addressed:	Floods and Earthquake
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Review road and bridge upgrades for potential mitigation actions
Action or Project Description:	Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, Road & Bridge Dept., EMD, City Administrator
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Capital Improvement Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.12: Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.
Action or Project Description:	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.13: Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Infrastructure issues associated with tree branches and dead trees
Hazard(s) Addressed:	Severe Weather, Winter Storms, Tornadoes, Fire, Earthquake
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	Disseminate information on tree trimming and dead tree removal programs
Action or Project Description:	Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Road & Bridge Dept.
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.14: Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of cooling centers during extreme heat and power outages
Hazard(s) Addressed:	Severe Weather, Winter Storms, Tornadoes, Fire, Earthquake, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.
Action or Project Description:	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$15,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.15: Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of alternative shelter locations for vulnerable populations
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.
Action or Project Description:	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes and Tornadoes
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Self-inspection awareness program for critical facilities to determine earthquake, tornado and severe weather resistance of structures.
Action or Project Description:	Provide information on conducting self-inspections or where to seek help in having facilities inspected to determine their resistance to earthquakes, tornados or severe weather.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Capital Improvement Plans, Hazard Mitigation Plan, Critical Facility Budgets
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 2.2: Seek funding opportunities for the installation of backup generators for critical infrastructure such as water systems and emergency services.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with critical infrastructure power outages
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Seek funding opportunities for the installation of backup generators for critical infrastructure such as water systems and emergency services.
Action or Project Description:	Seek funding opportunities for the installation of backup generators for critical infrastructure such as water systems and emergency services.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, City Administrator, Emergency Response Agencies
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Capital Improvement Plans, Hazard Mitigation Plan, Critical Facility Budgets
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 2.3: Educate Salem residents, realtors and contractors about the dangers of floodplain development and the benefits of the NFIP.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate Salem residents, realtors and contractors about the dangers of floodplain development and the benefits of the NFIP.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Floodplain Manager
Action/Project Priority:	23– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, Floodplain Ordinance
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 2.4: Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements in Salem.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack flood damage prevention/floodplain management ordinances and resulting costs/property damage.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.4
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements in Salem.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Floodplain Manager
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, Floodplain Ordinance
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 2.5: Encourage the City of Salem to develop and implement regulations for securing hazardous materials tanks and mobile homes to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, Tornadoes
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Encourage the City of Salem to develop and implement regulations for securing hazardous materials tanks and mobile homes to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - 5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Floodplain Manager, City Council
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, Floodplain Ordinances, Building Codes
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Local Planners, MPC
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Emergency Plan, Comprehensive Plans, Capital Improvement Plan, Economic Development Plan, Transportation Plan, Land-use Plan, Floodplain Ordinances, Storm Water Plans/Ordinances
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.2: Distribute SEMA brochures on natural disasters at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Distribute SEMA brochures at public facilities and events
Action or Project Description:	Distribute SEMA brochures on natural disasters at public facilities and events.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.3: Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, drills, preparedness and how to mitigate.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information regarding hazards, where they strike, frequency, preparedness, and how to mitigate.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3
Name of Action or Project:	Public education
Action or Project Description:	Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, drills, preparedness and how to mitigate.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, EMD, MRPC, HSOC, SEMA, Emergency Response Agencies
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1: Encourage elected officials to disseminate information about hazard mitigation projects to the public.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of public knowledge of hazard mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.1
Name of Action or Project:	Public education on mitigation projects
Action or Project Description:	Encourage elected officials to disseminate information about hazard mitigation projects to the public.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Floodplain Managers, City Councils/Boards
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Action 4.4: Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Outdated mutual aid agreements between emergency response agencies and insufficient response capabilities.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.4
Name of Action or Project:	Update mutual aid agreements between emergency response agencies
Action or Project Description:	Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.1: Provide information to the City of Salem on the benefits and costs of developing storm water management plans.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of storm water management plan
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.1
Name of Action or Project:	Storm water management plan
Action or Project Description:	Provide information to the City of Salem on the benefits and costs of developing storm water management plans
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Manager, EMD, City Council, MRPC
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance, Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission, City Council, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 5.3: Encourage the City of Salem to require contractor storm water management plans in all new development – both residential and commercial properties.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm water planning with new development
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	5.3
Name of Action or Project:	Storm water management plans for residential and commercial properties
Action or Project Description:	Encourage the City of Salem to require contractor storm water management plans in all new development – both residential and commercial properties.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include property damages, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Floodplain Administrator, City Council
Action/Project Priority:	18 – Medium Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1: Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge on new mitigation funding opportunities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1
Name of Action or Project:	Mitigation funding opportunities
Action or Project Description:	Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$200 -$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC
Action/Project Priority:	18 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities that can occur when infrastructure projects do not include mitigation considerations.
Hazard(s) Addressed:	Floods, Earthquakes
Action or Project	
Action/Project Number:	6.2
Name of Action or Project:	Including mitigation in grant proposals
Action or Project Description:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $7,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, City Council, Road & Bridge Dept.
Action/Project Priority:	13 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plan, Regional Transportation Plan, Road & Bridge Dept. Budget
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3
Name of Action or Project:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500-$9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Engineers, City Council, Grant Writers, Local Planners, MRPC
Action/Project Priority:	23 - High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.4: Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to implement mitigation projects.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, MRPC
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 6.5: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects for individuals
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.5
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans
Progress Report	
Action Status	Not Started
Report of Progress	Example: Local government works with landowners and cost-shares the installation of culverts on private driveways.

Action 6.7: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Salem
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	6.7
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$750 - $2,750
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, Local Planners, City Engineers, MPC, MRPC
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Dent-Phelps R-III

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.6: Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.7: Regularly review and update school emergency plans.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Outdated school emergency plans and policies
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	School emergency plan updates.
Action or Project Description:	Regularly review and update school emergency plans.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.8: Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Loss of life due to inadequate safe areas.
Hazard(s) Addressed:	Tornado and Earthquake
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Re-evaluation of school designated safe areas
Action or Project Description:	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.9: Seek funding to install additional fire doors in school buildings.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Onset of fire and smoke that can inhibit safe egress and damage property
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Fire door funding
Action or Project Description:	Seek funding to install additional fire doors in school buildings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, school emergency plan, capital improvement plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent, School Board
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Crisis Management Plans,
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, HSOC, SEMA, Superintendents
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, School Superintendents
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, City Councils/Boards, School Boards, and Superintendents
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Dent-Phelps R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Green Forest R-II

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.6: Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.7: Regularly review and update school emergency plans.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Outdated school emergency plans and policies
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	School emergency plan updates.
Action or Project Description:	Regularly review and update school emergency plans.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.8: Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Loss of life due to inadequate safe areas.
Hazard(s) Addressed:	Tornado and Earthquake
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Re-evaluation of school designated safe areas
Action or Project Description:	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.9: Seek funding to install additional fire doors in school buildings.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Onset of fire and smoke that can inhibit safe egress and damage property
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Fire door funding
Action or Project Description:	Seek funding to install additional fire doors in school buildings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, school emergency plan, capital improvement plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent, School Board
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Crisis Management Plans,
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, HSOC, SEMA, Superintendents
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, School Superintendents
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, City Councils/Boards, School Boards, and Superintendents
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Green Forest R-II
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

North Wood R-IV

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.6: Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.7: Regularly review and update school emergency plans.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Outdated school emergency plans and policies
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	School emergency plan updates.
Action or Project Description:	Regularly review and update school emergency plans.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.8: Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Loss of life due to inadequate safe areas.
Hazard(s) Addressed:	Tornado and Earthquake
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Re-evaluation of school designated safe areas
Action or Project Description:	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.9: Seek funding to install additional fire doors in school buildings.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Onset of fire and smoke that can inhibit safe egress and damage property
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Fire door funding
Action or Project Description:	Seek funding to install additional fire doors in school buildings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, school emergency plan, capital improvement plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent, School Board
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Crisis Management Plans,
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, HSOC, SEMA, Superintendents
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, School Superintendents
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, City Councils/Boards, School Boards, and Superintendents
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	North Wood R-IV
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Oak Hill R-I

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.6: Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.7: Regularly review and update school emergency plans.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Outdated school emergency plans and policies
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	School emergency plan updates.
Action or Project Description:	Regularly review and update school emergency plans.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.8: Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Loss of life due to inadequate safe areas.
Hazard(s) Addressed:	Tornado and Earthquake
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Re-evaluation of school designated safe areas
Action or Project Description:	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.9: Seek funding to install additional fire doors in school buildings.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Onset of fire and smoke that can inhibit safe egress and damage property
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Fire door funding
Action or Project Description:	Seek funding to install additional fire doors in school buildings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, school emergency plan, capital improvement plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent, School Board
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Crisis Management Plans,
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, HSOC, SEMA, Superintendents
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, School Superintendents
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, City Councils/Boards, School Boards, and Superintendents
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Oak Hill R-I
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Salem R-80

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.6: Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards, emergency plans, and evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.7: Regularly review and update school emergency plans.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Outdated school emergency plans and policies
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	School emergency plan updates.
Action or Project Description:	Regularly review and update school emergency plans.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.8: Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Loss of life due to inadequate safe areas.
Hazard(s) Addressed:	Tornado and Earthquake
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Re-evaluation of school designated safe areas
Action or Project Description:	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent, EMD
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.9: Seek funding to install additional fire doors in school buildings.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Onset of fire and smoke that can inhibit safe egress and damage property
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Fire door funding
Action or Project Description:	Seek funding to install additional fire doors in school buildings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.10: Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with schools and large employer facilities that do not have certified tornado safe rooms and use alternative facilities to shelter students, staff, and employees in the event of high winds/tornados.
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	Increasing the number of certified tornado safe rooms and storm shelters in high population areas
Action or Project Description:	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents, School Boards
Action/Project Priority:	21 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, school emergency plan, capital improvement plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 1.11: Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of advanced warning about threatening weather.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Promote use of weather radios
Action or Project Description:	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1: Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent, School Board
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, Hazard Mitigation Plan, School Crisis Management Plans,
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 3.5: Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, MRPC, HSOC, SEMA, Superintendents
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plans
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.2: Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Emergency Response Agencies, School Superintendents
Action/Project Priority:	25 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

Action 4.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources to carry out mitigation projects
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	Pool different agency resources to achieve widespread mitigation results.
Action or Project Description:	Bring together different agencies and organizations that have similar goals and work together to pool resources to move mitigation projects forward.
Applicable Goal Statement:	Strengthen communication and coordinate participation between agencies, stakeholders, jurisdictions, and the public to create widespread interest in mitigation.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, Dent County Commission, Floodplain Managers, City Councils/Boards, School Boards, and Superintendents
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Floodplain Ordinances, LEOP, Capital Improvement Plans, School Emergency Plan
Progress Report	
Action Status	Continuing in progress
Report of Progress	N/A

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2: Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Salem R-80
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not merging hazard mitigation activities, where appropriate, with emergency plans and procedures
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	5.2
Name of Action or Project:	Merging appropriate hazard mitigation activities with emergency plans and procedures
Action or Project Description:	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$500-$4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	School Board, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP, School Emergency Plan
Progress Report	
Action Status	Not Started
Report of Progress	N/A

5 PLAN MAINTENANCE PROCESS

This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

5.1 Monitoring, Evaluating, and Updating the Plan

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

5.1.1 Responsibility for Plan Maintenance

Periodic revisions and updates of the Plan are required by Missouri SEMA to ensure that the goals and objectives for Dent County are kept current. More importantly, revisions may be necessary to ensure the plan is in full compliance with Federal regulations and state statutes. This portion of the plan outlines the procedures for completing such revisions and updates.

A key component of the ongoing plan monitoring, evaluating and updating will be the Dent County Hazard Mitigation Planning Committee (MPC). In order to carry out the activities necessary for maintaining the plan, the MPC will need to remain in place and meet periodically. The coordination of this group, as indicated in the mitigation strategy, should be a responsibility of the county EMD. On-going activities of the MPC are:

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;

- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Report on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The MPC (or other designated responsible entity) is an advisory body and can only make recommendations to county, city, town, or district elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

5.1.2 Plan Maintenance Schedule

The MPC (or other designated responsible entity) agrees to meet annually and after a state or federally declared hazard event, as appropriate, to monitor progress and update the mitigation strategy. The Dent County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC (or other designated responsible entity) to the meeting.

In coordination with all participating jurisdictions, a five-year written update of the plan will be submitted to the Missouri State Emergency Management Agency (SEMA) and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC (or other designated responsible entity) during the annual meeting should review changes in vulnerability identified as follows:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions;
- Increased vulnerability due to hazard events; and/or
- Increased vulnerability as a result of new development (and/or annexation).

Future 5-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation;
- Documentation of success stories where mitigation efforts have proven effective;
- Documentation of unsuccessful mitigation actions and why the actions were not effective;
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval;
- Incorporation of new data or studies with information on hazard risks;
- Incorporation of new capabilities or changes in capabilities;

- Incorporation of growth data and changes to inventories; and
- Incorporation of ideas for new actions and changes in action prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the participating jurisdictions will adopt the following process:

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to the jurisdictional MPC (or designated responsible entity) member on action status. The entity will provide input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing risk.
- If the action does not meet identified objectives, the jurisdictional MPC (or designated responsible entity) member will determine necessary remedial action, making any required modifications to the plan.

Changes will be made to the plan to remedy actions that have failed or are not considered feasible. Feasibility will be determined after a review of action consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring of this plan. Updating of the plan will be accomplished by written changes and submissions, as the MPC (or designated responsible entity) deems appropriate and necessary. Changes will be approved by the Dent County Hazard Mitigation Planning Committee and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Additionally, as jurisdictions review and update existing planning mechanisms, relevant action items and data from the HMP will be integrated. Those existing plans and programs were described in **Section 2.2** of this plan. Based on the capability assessments of the participating jurisdictions, communities in Dent County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- Regional Comprehensive Economic Development Strategy (CEDS) document
- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Dent County Local Emergency Operations Plan (LEOP);
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, storm water management plans, and parks and recreation plans;
- School and Special District Plans and budgets; and
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of this plan.

The MPC (or designated responsible entity) members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The MPC (or designated responsible entity) is also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, the Dent County Emergency Management Director (EMD) will provide the updated Mitigation Strategy with current status of each mitigation action to the County (Boards of Supervisors or Commissions) as well as all Mayors, City Clerks, and School District Superintendents. The EMD will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

Table 1.1 below lists the planning mechanisms by jurisdiction into which the Hazard Mitigation Plan will be integrated.

Table 1.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms
Unincorporated Dent County	County Emergency Operations Plan County Mitigation Plan. Land-Use Plan Regional Transportation Plan Comprehensive Economic Development Strategy
Salem	Comprehensive Plan Capital Improvement Plan City Emergency Operations Plan County Emergency Operations Plan County Mitigation Plan Debris Management Plan Economic Development Plan transportation Plan Land-use Plan Critical Facilities Plan Regional Transportation Plan Comprehensive Economic Development Strategy
Salem R-80	Master Plan School Emergency Plan Weapons Policy
Oak Hill R-I	Capital Improvements Plan School Emergency Plan Weapons Policy
Dent-Phelps R-III	Master Plan School Emergency Plan Weapons Policy
North Wood R-IV	School Emergency Plan Weapons Policy
Green Forest R-II	Master Plan School Emergency Plan Weapons Policy

Source: Jurisdiction surveys 2017

Including hazard mitigation is now routine for any planning projects or plan updates carried out by the Meramec Regional Planning Commission (MRPC). Applicable goals and action items from hazard mitigation plans have been incorporated into the regional transportation plan as well as the Community Economic Development Strategy for the region. Both of these documents are resources for cities and counties within the eight county area and are updated on a regular basis with input from city and county representatives. This review and update process has helped city and county representatives better understand and appreciate the importance of including hazard mitigation in all applicable plans. In addition, MRPC and the hazard mitigation planning committee are also working to encourage the incorporation of hazard mitigation into the planning activities of all local governments, school districts and local entities through presentations and participation in planning activities.

5.3 Continued Public Involvement

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper as well as on the Meramec Regional Planning Commission's website following each annual review of the mitigation plan. When the MPC reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort to update and revise the plan. Public notice will be posted and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.

6 Appendix

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B: Planning Process

HMPC Mailing list

Presiding Commissioner Darrell Skiles
Dent County
400 N. Main
Salem, MO 65560

Assoc. Commissioner Gary Larson
Dent County
400 N. Main
Salem, MO 65560

Assoc. Commissioner Dennis Purcell
Dent County
400 N. Main
Salem, MO 65560

Clerk Angie Curley
Dent County
400 N. Main
Salem, MO 65560

Public Administrator
Dent County
400 N. Main
Salem, MO 65560

City Administrator Ray Walden
City of Salem
400 N Iron St.
Salem, MO 65560

Dent Co. Road and Bridge Dept.
1621 W Scenic Rivers Blvd.
Salem, MO 65560

Sheriff Bob Wells
Dent Co. Sheriff's Office
112 E. Fifth St., Suite 7
Salem, MO 65560

Fire Chief Brad Nash
Dent Co. Fire Prot. Dist.
#2 S. Main St.
Salem, MO 65560

Mayor Brad Nash
City of Salem
400 N. Iron St.
Salem, MO 65560

Clerk
City of Salem
400 N. Iron St.
Salem, MO 65560

Street Supt.
City of Salem
400 N. Iron St.
Salem, MO 65560

Police Chief Keith Steelman
Salem Police Dept.
500 N Jackson St.
Salem, MO 65560

Fire Chief
Montauk Rural Fire Dept.
2742 Hwy 119
Salem, MO 65660

Fire Chief Jack Ficker
Jadwin Vol. Fire Dept.
22 Hwy ZZ
Jadwin, MO 65501

Fire Chief Donald L. Good
Lenox Rural Fire Dept.
18231 Hwy Cn
Lenox, MO 65541

Kendra Mobray
Dent Co. Health Center
601 South MacArthur Ave.
Salem, MO 65560

Superintendent John McColloch
Salem R-80
1409 W. Rolla Rd.
Salem, MO 65560

Superintendent Douglas Dunn
Oak Hill R-I
6200 Hwy 19 South
Salem, MO 65560

Superintendent Kevin Prugh
Green Forest R-II
6111 Hwy F
Salem, MO 65560

Superintendent Victoria Brooker
Dent-Phelps R-III
27870 Hwy C
Salem, MO 65560

Superintendent Dr. Jeff Dodson
North Wood R-IV
3734 N Hwy 19
Salem, MO 65560

Administrator
Seville Care Center
35625 MO-72
Salem, MO 65560

Administrator
Salem Care Center
1203 N Jackson St.
Salem, MO 65560

Administrator
Salem Residential Care
1207 E Roosevelt St.
Salem, MO 65560

MoDOT
Rte. 1, Box 2785
Salem, MO 65560

Disaster Program Man. Kath Mayne
American Red Cross
431 E. McCarty St.
Jefferson City, MO 65101

Administrator Kasey Lucas
Salem Memorial Dist. Hospital
35629 Hwy 72
Salem, MO 65560

Intercounty Electric
PO Box 209, 102 Maple Ave.
Licking, MO 65542

Crawford Electric Cooperative
10301 N. Service Rd.
PO BOX 10
Bourbon, MO 65441

Captain James W. Remillard
Troop I
PO BOX 128
Rolla, MO 65402

MO State Emergency Management Agency
Floodplain Management Officer
2302 Militia Drive, PO Box 116
Jefferson City, MO 65102

U.S. Army Corps of Engineers
US Army Engineer District, St. Louis
Matt Shively
1222 Spruce Street
St. Louis, MO 63103-2822

FEMA Region VII
ATTN: Ken Sessa
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3372

U.S. Fish & Wildlife Service
Ecological Services Field Office
Josh Hundley, Biologist
101 Park DeVille Drive, Suite A
Columbia, MO 65203-0057

Missouri Department of Conservation
ATTN: Resource Science Division
2901 W. Truman Blvd., PO Box 180
Jefferson City, MO 65102

USDA, NRCS
Parkade Center, Suite 250
601 Business Loop 70 West
Columbia, MO 65203

Fidelity Communications
501 N. Washington St.
Salem, MO 65560

CenturyLink
828 E High St. #14
Potosi, MO 63664

The Salem News
PO BOX 798, 500 N Washington St.
Salem, MO 65560

Water & Sewage Supt. Jack Emory
City of Salem
1205 S Wines St.
Salem, MO 65560

Electric Supt. Bryon Johns
City of Salem
1205 S Wines
Salem, MO 65560

For Immediate Release

April 14, 2017

For more information contact

Ryan Dunwoody at (573) 265-2993

Planning meeting scheduled for developing Dent County Hazard Mitigation Plan

SALEM– City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a planning meeting May 15 to discuss development of the Dent County Hazard Mitigation Plan.

The meeting will be held from 2 to 4 p.m. at the Salem City Hall Auditorium, 202 N. Washington, in Salem. This meeting is open to the public and interested citizens are encouraged to attend.

The county must have an approved hazard mitigation plan in order for Dent County schools, local governments, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of current capabilities, analysis of natural hazards and sets goals and action items to reduce the impact of natural hazards in the future.

Local school districts urged Dent County Commission to move forward with developing a plan and the county submitted a letter of commitment for matching funds to the Missouri State Emergency Management Agency in August 2016. SEMA then applied to FEMA for grant funds to cover the cost of developing the hazard mitigation plan.

Unlike emergency operations plans, a hazard mitigation plan examines how local communities can take steps to reduce vulnerability to damage from natural disasters before the disaster happens. Examples would include elevating roads that flood regularly or building tornado shelters for schools.

Meramec Regional Planning Commission (MRPC) is developing the plan in partnership with the Dent County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993 Ext. 110.

Formed in 1969, MRPC is a voluntary council of local governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 25, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

MEMORANDUM

TO: Dent County Hazard Mitigation Planning Committee

FROM: Tammy Snodgrass, MRPC Environmental Programs Manager

DATE: April 18, 2017

SUBJECT: Hazard mitigation planning meeting May 15, 2017

The Dent County Commission has asked MRPC to develop a hazard mitigation plan for Dent County, the City of Salem and the Dent County school districts. We need your help to successfully complete this project.

Counties and cities that do not have an approved hazard mitigation plan are not eligible for hazard mitigation funding, so it is in every jurisdictions' best interest to participate in the formation of this plan. Hazard mitigation funds are used for such projects as certified tornado shelters, burying electrical lines, bridge and drainage improvements, etc., projects that will make the county less vulnerable to natural hazards such as tornados and floods.

The first meeting for the Dent County hazard mitigation planning committee is scheduled for Monday, May 15, 2017 from 2:00 p.m. to 4:00 p.m. in the Salem Auditorium, located at 202 North Washington St., Salem, Mo. This meeting will be an introductory session on hazard mitigation and hazard mitigation planning. If time allows, we will have a brainstorming session on mitigation needs and what actions can be taken to meet those needs.

As the county, city and school districts will be asked to formally approve and adopt the Dent County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or agency's needs for hazard mitigation. It is important to include representatives from emergency management, public works, road and bridge departments, school districts, law enforcement, city/county officials, fire protection, local health services, interested citizens and other appropriate groups involved in planning and public works related projects.

Please make an effort to attend this meeting. Copies of plans adopted by neighboring counties will be available for viewing. Staff will be available to answer questions. You may e-mail me at tsnodgrass@meramecregion.org if you cannot attend the meeting but would like to be included in our mailing list and actively participate through e-mail correspondence or future meetings.

Thank you for your assistance in addressing hazard mitigation for Dent County. If you have any questions, please contact me at (573) 265-2993, extension 104, or via the email address listed above. I look forward to seeing you at the meeting.

TS

Advisory Committee Meeting
Dent County Hazard Mitigation Plan
AGENDA
2:00 p.m. ~ May 15, 2017
Salem City Auditorium
202 N Washington St., Salem, MO 65560

I. Welcome and Introductions – Tammy Snodgrass

II. Hazard Mitigation Planning Purpose
Staff will provide an overview of the purpose of hazard mitigation planning.

III. Grant Programs Linked to Approved Plan
Grant funds available after a hazard mitigation plan is approved will be reviewed along with eligible activities.

IV. Participation Requirements & Public Involvement
In order for a jurisdiction to be a participant in the hazard mitigation plan, requirements must be fulfilled. Those requirements will be reviewed. Public involvement and plan review will be discussed.

V. Data Collection Questionnaires
One of the most important requirements for jurisdictions to fulfill is the completion of FEMA's data collection questionnaire. Brief overview and questions will be answered after break.

VI. Discussion of Hazards
Eleven natural hazards will be reviewed specific to Dent Co. Deaths, previous events, annual average % probabilities, vulnerability ratings, and property damage will be cased.

VII. Critical Facilities
Overview and analysis of critical facilities within the county and why they are important to identify.

VIII. Next Steps in the Planning Process
Due date for data collection questionnaire, future planning meetings, agendas, etc.

IX. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **April 14, 4:00 p.m.**
Notice is hereby given that the **Dent County Hazard Mitigation Planning Committee** will meet at 2:00 p.m. on **Monday, May 15, 2017** at the Salem City Hall Auditorium located at 202 N. Washington St., Salem, Mo 65560.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Overview of Hazard Mitigation Planning and Dent County Hazard Mitigation Plan
- Discussion of Goals and Objectives for Next Five Years
- Integration of Other Data, Reports, Studies, Plans
- Review of Disasters/Deaths/Injuries over the Past Five Years
- Setting of Date and Time for Next Meeting
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Dent County Hazard Mitigation Plan Review Meeting
May 15, 2017 ~ 2:00 p.m.

Name	Representing	Email Address	Phone #	Address
Fred Nash	City of Salem Dent Co EMD Dent Co Fire Dept	dcfpd 801 @fidnet.com	573-247-2578	2 S. Main St Salem Mo.
Bryon Johns	City of Salem Electric	electric@ salemmo.com	573-247-3477	1201. S. Wines Salem MO 65560
Dennis Purcell	Dent County Commission	dpurcell@Centurylink	573-247-1043	~~115~~ 400 N Main Salem, MO.
Ron Brookshire	Brookshire Farms		573 308 0281	147 Hwy O Edgar Springs Mo 65462
Kevin Prugh	Green Forest School	kprugh@gfr2.k12.mo.us	573-729-~~[illegible]~~ 3902	6111 Hwy. F Salem Mo
Darrell Skiles	Dent County	darrellskiles@hotmail.com	573-308-5415	400 N. Main Salem Mo. 65560
Victoria Brooker	Dent-Phelps R-3	vbrooker@dentphelps.k12.mo.us	573-729-4680	27870 Hwy C Salem, Mo 65560
Andrew Shirley	The Salem News	AAShirley@Gmail.com	573-247-9008	—
Sherry Lea	Healthy Dent County	sherry@salemcommunitycenter.org	729-8163	PO Box 190 Salem

Name	Representing	Email Address	Phone #	Address
Kendra Mobray	Dent County Health Center	kendra.mobray@lpha.mo.gov	(573) 729-3100	401 S. MacArthur Salem, Mo 65560
Deron Gibbs	Oak Hill R1	dgibbs@oakhillr1.k12.mo.us	729 5618	6200 Stn 19 Salem
Deborah Hobson	SMDH	DHobson@Smdh.net	729-66626	35629 Hwy 72 Salem
John McCulloch	Salem R-80	John.McCulloch@Salem R80.org	729-0842	409 West R. Ila Rd Salem MO 65560
Allen Kimrey	City of Salem Emg mngt	AKimrey@Salem.com	247-0775	36272 Hwy 72 Salem Mo. 65560
Paul J. Dodson	North Woods R-IV	dodsonp@northwood.k12.mo.us	729-4607	3734 N. Hwy 19 Salem, MO
Stan Pawlowski	KSMO Radio	Stan@KSMOradio.com	729.6117	800 S. Main Salem MO
Ray Walden	City of Salem	cityadministrator@salemmo.com	(573) 729-4811	400 N. Iron St Salem, MO

For Immediate Release

May 30, 2017

For more information contact

Ryan Dunwoody at (573) 265-2993

Second public meeting planned June 12 for Dent County Hazard Mitigation Plan

SALEM – City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a public meeting at 2 pm on June 12 to discuss development of the Dent County Hazard Mitigation Plan.

The meeting will be held in the Salem City Hall Council Chambers, located at 202 N. Washington St., Salem, MO 65560.

The focus of this meeting will be to develop and prioritize action items. In addition, the group will discuss the integration of available data, reports, studies and plans.

The county must have an approved hazard mitigation plan in order for Dent County schools, local governments, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of natural hazards and establish goals and action items to reduce the impact of natural hazards in the future.

Meramec Regional Planning Commission (MRPC) is developing the plan in partnership with the Dent County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993.

Formed in 1969, MRPC is a voluntary council of governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 25, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

MEMORANDUM

TO: Dent County Hazard Mitigation Planning Committee

FROM: Ryan Dunwoody, MRPC Environmental Programs Specialist

DATE: May 26, 2017

SUBJECT: Second Hazard Mitigation Planning Meeting June 12, 2017

MRPC has been contracted by Dent County and the State Emergency Management Agency (SEMA) to develop a multi-jurisdictional hazard mitigation plan for Dent County, its cities and school districts. The project is being funded by state and federal dollars with matching funds from Dent County. We need your help to successfully complete this project.

The county must submit an approved hazard mitigation plan to SEMA and FEMA by the end of this year in order to be eligible for some hazard mitigation grants. It is in every jurisdiction's best interest to participate in the development of this plan. Hazard mitigation funds are used for such projects as structure elevation, mitigation reconstruction, burying electrical lines, soil stabilization, tornado shelters for schools, etc.

A **second meeting** of the **Dent County Hazard Mitigation Planning Committee** is **scheduled** for **Monday, June 12 at 2:00 p.m.** at the **Salem City Hall Council Chambers** located at **202 N. Washington St., Salem, MO 65560.** The focus of this meeting will be the review and prioritization of action items.

As the county, each city and school district will be asked to formally approve and adopt the Dent County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or department's needs for hazard mitigation. It is important to include representatives from emergency management offices, law enforcement, city/county officials, fire protection, local health services, disaster relief volunteer services and other appropriate groups. It is essential to have participation from all stakeholders in Dent County.

Reminder: Hazard Mitigation Questionnaires are due by **June 19, 2017**. If a jurisdiction **does not submit** a filled out **questionnaire,** it will be **ineligible** to **receive hazard mitigation funds**.

Thank you for your assistance in addressing hazard mitigation for Dent County. If you have any questions, contact me at (573) 265-2993, or via e-mail: rdunwoody@merameregion.org. I look forward to seeing you at the meeting.

RD

Enclosures

Advisory Committee Meeting
Dent County Hazard Mitigation Plan Update
AGENDA
2:00 p.m. ~ June 12, 2017
Council Chambers, Salem City Hall
202 N. Washington St., Salem, MO 65560

I. Welcome and Introductions – Tammy Snodgrass

II. Overview of Hazard Mitigation Planning and Dent County Hazard Mitigation Plan
Staff will provide an overview of the planning process and a brief review of the existing hazard mitigation plan

III. Discussion of Action Items for Next Five Years
A list of action items discussed at the last meeting will be distributed for viewing. Staff will lead the review of action items from the first planning meeting. Additional action items will be requested as the meeting progresses.

IV. Prioritization of Action Items
Attendees will be asked to provide input on the prioritization of action items in the plan.

V. Integration of Other Data, Reports, Studies, Plans
What other information is available locally that could be included in the hazard mitigation plan? What other plans need to incorporate aspects of the hazard mitigation plan?

VI. Setting of Date and Time for Next Meeting

VII. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **May 26, 2017 ~ 4:00 p.m.**
Notice is hereby given that the **Dent Co. Hazard Mitigation Planning Committee** will meet at 2:00 p.m. on **Monday, June 12, 2017** in the Salem City Hall Council Chambers located at 202 N. Washington St., Salem, MO 65560.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Discussion of Action Items for Next Five Years
- Review and Prioritize Action Items
- Integration of Other Data, Reports, Studies, Plans
- Jurisdiction and School District Questionnaire Assistance
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Dent County Hazard Mitigation Plan Review Meeting
June 12, 2017 ~ 2:00 p.m.

Name	Representing	Email Address	Phone #	Address
RAY WALDEN	CITY OF SALEM			
Darrell Skiles	Dent County	darrellskiles	573-308-5415	400 N Main Salem, Mo. 65560
[illegible]	Dent County	dpuecel@centurylink.net	573-247-1043	400 N main Salem, MO
Wanda Tatom	Green Forest R-II	tatomeagfr2.k12.mo.us	573-729-3922	6111 Hwy F Salem, Mo. 65560
Kevin Creighton	Dent-Phelps R-III	Kcreighton@dentphelps.k12.mo.us	573 729 4680	27870 Hwy C Salem, Mo 65560
Don Good	Zenox Fire Dept	ZRFD@EMBARQMAIL.com	573-247-3714	18231 Hwy C Zenox, MO. 65541
Kendra Mobray	Dent County Health Center	kendra.mobray@lphe.mo.gov	(573) 729-3160	601 S. MacArthur Salem, Mo 65560
DAVID BORG	MONTAUK FIRE DEPT	ERECS.MRFD@gmail.com	618 447-1604	845 CR 2470 SALEM, MO 65560
PHILLIP KARR	CITY OF SALEM SALEM R-80	salemgbb@gmail.com	573-453-0125	17 Magnolia Drive Salem, Mo. 65560

Dent - 2944

20-28 - H
14-19 - M
13↓ L

DENT	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 2 = Maybe YES 1 = Prob NO 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.1.1	Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency survival kits with water, blankets, flashlights, etc. and how to shut off their home utilities during emergencies. Ready-in-3 brochures/videos and information will be made readily available to the public through the health department and local government offices.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.1.2	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.1.3	Actively seek funding to assist jurisdictions in obtaining early warning systems, improving communication systems, and updating existing systems.	3	2	2	3	3	2	2	17	IC, PD, LF, EMCC	8	-3	5	22	H
1.1.4	Monitor developments in data availability concerning the impact of levee failure, dam failure, tornados, sinkholes, land subsidence, and wildfire upon Dent County and all jurisdictions through local, state, and federal agencies	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-2	6	24	~~M~~ H
1.1.5	Examine potential road and bridge upgrades and seek out sources of funding that would improve drainage, reduce flooding, and the risk to residents and property.	3	3	3	3	3	3	2	20	IC, PD, LF, EMCC	8	-3	5	25	H
[illegible]	Educate school staff on natural hazards, emergency plans, and funding opportunities. ?	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	~~M~~ H
1.1.7	Regularly review and update school emergency plans.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	~~-1~~ -2	~~7~~ 6	~~28~~ 27	~~M~~ H
	Seek funding to install additional fire doors in school buildings.	3	3	2	3	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
	Seek grants & funding to improve [illegible]	3	2	2	3	3	1	3	17	ALL	8	-2	6	23	H

	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 2 = Maybe YES			1 = Prob NO 0 = Def NO									
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.1.9	Regularly review school facilities and re-evaluate designated safe areas to insure that these areas are the safest locations to shelter students and staff.	3	2	2	3	3	3	3	19	IC, LF, EMCC	6	-1	5	24	M H
1.2.1	Disseminate information on the importance of and funding sources for constructing storm shelters, especially tornado safe rooms near schools and large employment centers that currently do not have access to safe rooms.	3	3	2	3	3	2	3	19	IC, EMCC	4	-2	2	21	H
1.2.2	Promote the use of weather radios by local residents and schools to insure advanced warning about threatening weather to those not served by smartphone apps	3	3	3	3	3	3	3	21	IC, EMCC	4	-1	3	24	H
1.2.3	Partner with local radio stations to ensure that appropriate warning of impending disasters is provided to all residents	3	3	3	3	3	3	3	21	IC, EMCC	4	-1	3	24	M H
1.2.4	Disseminate information on tree trimming and dead tree removal programs and policies to residents/property owners.	3	3	3	3	3	2	2	19	IC, PD, LF, EMCC	8	-3	5	24	H
1.2.5	Establish designated shelters for residents to be used as cooling centers during extreme heat or power outages	3	3	3	3	3	3	3	21	IC, LF, EMCC	6	-1	5	26	H
1.2.6	Facilities that house vulnerable populations such as disabled and elderly should review alternative locations for sheltering residents and MOUs with "sister" facilities.	3	2	2	3	3	2	3	18	IC, EMCC	4	-1	3	21	M H
1.2.7	Conduct a study of County Roads 2470, 4210, 6230, 5150, and 5110 to find mitigation solutions for flooding, flash flooding, and landslides.	3	3	2	3	3	1	3	18	IC,PD, LF, EMCC	8	-5	3	21	H
1.2.8	Seek funding opportunities to improve phone, radio, and broadband radio reception/coverage across the county.	3	3 2	2	3	3	2 1	3	1 19 17	IC PD LF, EMCC	2 8	-1 -2	1 6	20 23	M H
2.1.1	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.	3	2	2	3	3	3	2	18	IC, PD, LF, EMCC	8	-2	6	24	H

Figure 4.4 Prioritization of Hazard Mitigation Actions		3 = Def YES 2 = Maybe YES			1 = Prob NO 0 = Def NO.										
Action No.	Action No.	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
2.1.2	Seek funding opportunities for the installation of backup generators for critical infrastructure such as water systems and emergency services.	3	3	3	3	3	2	3	20	LF, EMCC	4	-3	1	21	H
2.2.1	Educate Salem residents, realtors and contractors about the dangers of floodplain development and the benefits of the NFIP.	2	2/3	2/3	2	3	2	3	18/16	IC, PD, LF, EMCC	8	-1	7	~~25~~ 23	~~M~~ H
2.2.2	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements in Salem.	2	2/3	2/3	2	3	2	3	18/16	IC, PD, LF, EMCC	8	-3	5	~~23~~ 21	M H
2.2.3	Encourage the City of Salem to develop and implement regulations for securing hazardous materials tanks and mobile homes to reduce hazards during storms and flooding.	2	2	2	2	3	2/3	3	17/16	IC, PD, LF, EMCC	8	-3	5	~~22~~ 21	~~M~~ H
3.1.1	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.	3	2	2	3	3	3	3	19	IC, PD, LF, EMCC	8	-2	6	25	H
3.1.2	Distribute SEMA brochures on natural disasters at public facilities and events.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
3.1.3	Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, preparedness and how to mitigate.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H

	Figure 4.4 Prioritization of Hazard Mitigation Actions	3 = Def YES 2 = Maybe YES			1 = Prob NO 0 = Def NO.									
Action No.	Action No.	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
3.1.4	Encourage and promote weather spotter classes throughout the county. on an annual or bi-annual basis	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	M H
3.1.5	Provide opportunities through existing meetings (Co. communications, HSOC, MRPC) for EMDs, city/county/school officials & SEMA to meet and familiarize officials with mitigation planning, implementation & budgeting for mitigation projects.	3	3	3	2	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	H
3.2.2	Encourage county health department and local Red Cross Chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought, heat wave)	3	3	2	3	3	2	3	19	IC, PD, LF, EMCC	8	-1	7	26	M H
3.2.3	Publicize county or citywide drills.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
3.2.4	Encourage the development of a county-wide CERT and/or VOAD program and educate the public on how they can benefit from these types of programs.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
4.1.1	Encourage elected officials to disseminate information about hazard mitigation projects to the public.	3	3 2	2	3	3	3 2	3	20 18	IC, PD, LF, EMCC	8	-1	7	27 25	M H
4.1.2	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-1	7	25	M H
4.1.3	Pool different agency resources to achieve widespread mitigation planning results.	3	2	2	2	3	2	3	17 16	IC, PD, LF, EMCC	8	-1	7	24 23	H

Figure 4.4 Prioritization of Hazard Mitigation Actions		3 = Def YES 2 = Maybe YES			1 = Prob NO 0 = Def NO.										
Action No.	Action No.	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
4.1.4	Encourage updated mutual aid agreements between emergency response agencies inside and outside the region.	3	3	2	3	3	~~3~~ 2	3	~~21~~ 19	IC, PD, LF, EMCC	8	-1	7	~~27~~ 26	H
5.1.1	Provide information to the City of Salem on the benefits and costs of developing storm water management plans.	~~3~~ 2	2	2	2	3	~~3~~ 2	3	~~18~~ 16	IC, PD, LF, EMCC	8	-2	6	~~25~~ 23	~~M~~ H
5.1.2	Coordinate and integrate hazard mitigation activities where appropriate with emergency operations plans and procedures.	3	2	2	3	3	~~3~~ 2	3	~~19~~ 18	IC, PD, LF, EMCC	8	-2	6	~~25~~ 24	H
5.1.3	Encourage the City of Salem to require contractor storm water management plans in all new development – both residential and commercial properties.	2	~~3~~ 2	2	2	3	~~3~~ 2	3	~~18~~ 16	PD, EMCC	4	-2	2	~~20~~ 18	M
6.1.1	Work with SEMA Region I coordinator and State Hazard Mitigation Officer to learn about new mitigation funding opportunities	3	3	3	3	3	3	3	21	IC, LF, EMCC	8	-1	7	28	H
6.1.2	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	3	2	2	2	3	~~3~~ 2	3	~~18~~ 17	IC, LF, EMCC	8	-2	6	~~24~~ 23	H
6.1.3	Work with state/local/federal agencies to include mitigation in economic & community development project when applicable.	3	2	2	2	3	~~3~~ 2	3	~~18~~ 17	IC, LF, EMCC	8	-2	6	~~24~~ 23	H
6.1.4	Provide information to local governments on the benefits of budgeting for and implementing hazard mitigation projects.	~~2~~ 3	2	2	~~2~~ 3	3	3	3	~~18~~ 17	IC, LF, EMCC	8	-1	7	~~26~~ 25	~~M~~ H
6.1.5	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole	~~3~~ 2	2	2	~~3~~ 2	3	~~3~~ 2	3	~~18~~ 17	IC, LF, EMCC	8	-1	7	~~26~~ 24	~~M~~ H

Figure 4.4 Prioritization of Hazard Mitigation Actions		3 = Def YES 2 = Maybe YES			1 = Prob NO 0 = Def NO.										
Action No.	Action No.	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
6.1.7	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.	3	2	2	3	3	3	3	19	IC, LF, EMCC	8	-1	7	28	H

For Immediate Release

September 7, 2017

For more information contact

Ryan Dunwoody at (573) 265-2993

Third public meeting planned Sept. 18 for Dent County Hazard Mitigation Plan

SALEM – City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a public meeting at 2 p.m. on Sept. 18 to continue development of the Dent County Hazard Mitigation Plan.

The meeting will be held in the Salem City Hall Council Chambers, located at 202 N. Washington St., Salem, MO 65560.

The focus of this meeting will be to review completed chapters of the plan. An overview of each completed chapter will be discussed. Those in attendance will be able to suggest edits and ask questions during the meeting.

The county must have an approved hazard mitigation plan in order for Dent County schools, local governments, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of natural hazards and establish goals and action items to reduce the impact of natural hazards in the future.

Meramec Regional Planning Commission (MRPC) is developing the plan in partnership with the Dent County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993.

Formed in 1969, MRPC is a voluntary council of governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 23, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

MEMORANDUM

TO: Dent County Hazard Mitigation Planning Committee

FROM: Ryan Dunwoody, MRPC Environmental Programs Specialist

DATE: September 11, 2017

SUBJECT: Third Hazard Mitigation Planning Meeting September 18, 2017

MRPC has been contracted by Dent County and the State Emergency Management Agency (SEMA) to develop a multi-jurisdictional hazard mitigation plan for Dent County, its cities and school districts. The project is being funded by state and federal dollars with matching funds from Dent County. We need your help to successfully complete this project.

The county must submit an approved hazard mitigation plan to SEMA and FEMA in order to be eligible for some hazard mitigation grants. It is in every jurisdiction's best interest to participate in the development of this plan. Hazard mitigation funds are used for such projects as structure elevation, mitigation reconstruction, burying electrical lines, soil stabilization, tornado shelters for schools, etc.

A **third meeting** of the **Dent County Hazard Mitigation Planning Committee** is **scheduled** for **Monday, September 18 at 2:00 p.m.** at the **Salem City Hall Council Chambers** located at **202 N. Washington St., Salem, MO 65560.** The focus of this meeting will be the review of completed chapters of the plan. Completed chapters will be available for viewing at www.meramecregion.org under "Hazard Mitigation Plans by County" on the right hand side of the home page. Attendees will be asked to provide input on the chapters.

As the county, each city and school district will be asked to formally approve and adopt the Dent County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or department's needs for hazard mitigation. It is important to include representatives from emergency management offices, law enforcement, city/county officials, fire protection, local health services, disaster relief volunteer services and other appropriate groups. It is essential to have participation from all stakeholders in Dent County.

Thank you for your assistance in addressing hazard mitigation for Dent County. If you have any questions, contact me at (573) 265-2993, or via e-mail: rdunwoody@merameregion.org. I look forward to seeing you at the meeting.

RD

Enclosures

Advisory Committee Meeting
Dent County Hazard Mitigation Plan Update
AGENDA
2:00 p.m. ~ September 18, 2017
Council Chambers, Salem City Hall
202 N. Washington St., Salem, MO 65560

I. Welcome and Introductions – Tammy Snodgrass

II. Overview of Hazard Mitigation Planning and Dent County Hazard Mitigation Plan
Staff will provide an overview of the planning process and a brief review of the existing hazard mitigation plan

III. Completed HMP Chapters
Completed chapters will be reviewed during the meeting with an overview of chapter format and content.

IV. Edits
Attendees will be asked to provide input on the completed chapters. Staff will record edits to be implemented.

V. Remaining Stages in the Planning Process
Staff will provide an overview regarding the remaining stages in the planning process (i.e. edits of remaining chapters, adoption resolutions, SEMA and FEMA review, etc.).

VI. Incorporating HMP in Local Planning Initiatives and Documents

VII. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **September 11, 2017 ~ 11:30 a.m.**
Notice is hereby given that the **Dent Co. Hazard Mitigation Planning Committee** will meet at 2:00 p.m. on **Monday, September 18, 2017** in the Salem City Hall Council Chambers located at 202 N. Washington St., Salem, MO 65560.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Brief overview of hazard mitigation planning
- Overview of completed chapters
- Collection of recommended edits
- Q and A
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Dent County Hazard Mitigation Plan Review Meeting
Sept. 18, 2017 ~ 2:00 p.m.

Name	Representing	Email Address	Phone #	Address
DAVID BORG	MONTAUK RURAL FIRE DEPT.	dborg845@gmail.com	618 447-1604	845 CR 2470 SALEM MO 65560
Dennis Purcell	Dent County Commission			
Darrell Stiles	Dent County Commission			
Kevin Pugh	Green Forest R-2	KPughgfr2.k12.mo.us	573-729-3902	611 Hwy. OF Salem, MO
John McCulloch	Salem R-80	John.mcculloch@salem80.org	729-6642	1409 W. R.V.a Rd Salem, MO 65560
Vicky Brooks	Dent-Phelps R-3	vbrooks@dentphelps.k12.mo.us	573-729-4650	12820 Hwy C Salem, MO.
Doug Dunn	Oak Hill R-1	ddunn@oakhillr1.k12.mo.us	729-5618	6200 S Hwy 19 Salem
Tony Floyd	Intercounty	tony.floyd@iecm.coop	417-464-0363	102 Hyle Ave, Licky
Allen Kimmey	Salem PA Salem Emo.	AKimmey@Salemmo.com	573-247-0775	500 N. Jackson Salem mo. 65560

Name	Representing	Email Address	Phone #	Address
RAY WALDEN	CITY OF SALEM	CITYADMINISTRATOR@SALEMMO.COM	573-729-4811	400 N IRON ST SALEM, MO

For Immediate Release

April 26, 2018

For more information contact

Ryan Dunwoody at (573) 265-2993

Fourth public meeting planned May 21 for Dent County Hazard Mitigation Plan

SALEM – City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a public meeting at 2 p.m. on May 21 to continue development of the Dent County Hazard Mitigation Plan.

The meeting will be held in the Salem City Hall Council Chambers, located at 202 N. Washington St., Salem, MO 65560.

The focus of this meeting will be to review the remaining draft chapters of the plan. An overview of each completed chapter will be discussed. Those in attendance will be able to suggest edits and ask questions during the meeting.

The county must have an approved hazard mitigation plan in order for Dent County schools, local governments, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of natural hazards and establish goals and action items to reduce the impact of natural hazards in the future.

Meramec Regional Planning Commission (MRPC) is developing the plan in partnership with the Dent County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993.

Formed in 1969, MRPC is a voluntary council of governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 23, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

MEMORANDUM

TO: Dent County Hazard Mitigation Planning Committee

FROM: Ryan Dunwoody, MRPC Environmental Programs Specialist

DATE: April 26, 2018

SUBJECT: Fourth Hazard Mitigation Planning Meeting May 21, 2018

MRPC has been contracted by Dent County and the State Emergency Management Agency (SEMA) to develop a multi-jurisdictional hazard mitigation plan for Dent County, its cities and school districts. The project is being funded by state and federal dollars with matching funds from Dent County. We need your help to successfully complete this project.

The county must submit an approved hazard mitigation plan to SEMA and FEMA in order to be eligible for some hazard mitigation grants. It is in every jurisdiction's best interest to participate in the development of this plan. Hazard mitigation funds are used for such projects as structure elevation, mitigation reconstruction, burying electrical lines, soil stabilization, tornado shelters for schools, etc.

A **fourth meeting** of the **Dent County Hazard Mitigation Planning Committee** is **scheduled** for **Monday, May 21 at 2:00 p.m.** at the **Salem City Hall Council Chambers** located at **202 N. Washington St., Salem, MO 65560.** The focus of this meeting will be the review of completed chapters 3, 4, and appendix. The draft plan will be available for viewing at http://www.meramecregion.org/publications/. Attendees will be asked to provide input on the chapters.

As the county, each city and school district will be asked to formally approve and adopt the Dent County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or department's needs for hazard mitigation. It is important to include representatives from emergency management offices, law enforcement, city/county officials, fire protection, local health services, disaster relief volunteer services and other appropriate groups. It is essential to have participation from all stakeholders in Dent County.

Thank you for your assistance in addressing hazard mitigation for Dent County. If you have any questions, contact me at (573) 265-2993, or via e-mail: rdunwoody@merameregion.org. I look forward to seeing you at the meeting.

RD

Enclosures

Advisory Committee Meeting
Dent County Hazard Mitigation Plan Update
AGENDA
2:00 p.m. ~ May 21, 2018
Council Chambers, Salem City Hall
202 N. Washington St., Salem, MO 65560

I. Welcome and Introductions – Tammy Snodgrass

II. Overview of Hazard Mitigation Planning and Dent County Hazard Mitigation Plan
Staff will provide an overview of the planning process and a brief review of the existing hazard mitigation plan

III. Completed HMP Chapters
Completed chapters (3, 4, and appendix) will be reviewed during the meeting with an overview of chapter format and content.

IV. Edits
Attendees will be asked to provide input on the draft plan. Staff will record edits to be implemented.

V. Remaining Stages in the Planning Process
Staff will provide an overview regarding the remaining stages in the planning process (i.e. edits of remaining chapters, adoption resolutions, SEMA and FEMA review, etc.).

VI. Incorporating HMP in Local Planning Initiatives and Documents

VII. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **April 26, 2018 ~ 1:00 p.m.**
Notice is hereby given that the **Dent Co. Hazard Mitigation Planning Committee** will meet at 2:00 p.m. on **Monday, May 21, 2018** in the Salem City Hall Council Chambers located at 202 N. Washington St., Salem, MO 65560.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Brief overview of hazard mitigation planning
- Review of completed chapters and draft plan in its entirety
- Collection of recommended edits
- Q and A
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Dent County Hazard Mitigation Plan Review Meeting
May 21, 2018 ~ 2:00 p.m.

Name	Representing	Email Address	Phone #	Address
RAY WALDEN	CITY OF SALEM	CITYADMINISTRATOR@SALEMMO.COM	573-729-4811	400 N IRON ST. SALEM, MO 65560
Brad Nash	City of Salem	Mayor@Salemmo.com	573-729-4811	400 N Iron St. Salem Mo 65560
GARY LARSON	Dent Co Commission	garymlarson@hotmail.com	573-368-9099	400 N Main Salem, MO 65560
Tony Floyd	Intercounty Electric	tony.floyd@TEC4.coop	417-464-0363	P.O. Box 209 Licking MO 65542
James Goodman	Seville Care Center	jgoodman@seville-comm-care.com	573.729.6141	35625 Hwy 72 Salem MO 65560
Jeff Dotson	North Wood R-IV	dotson@northwood.k12.mo.us	573 729 4607	3780 N. HWY 19 SALEM, MO., 65560
Kendra Mobray	Dent Co. Health Dept.	Kendra.Mobray@lphu.mo.gov	573-729-3106	601 S. MacArthur Salem, Mo
Wanda Tatom	Green Forest R-II	tatom@gfr2.k12.mo.us	573-729-3902	6111 Hwy F Salem, Mo. 65560
Vicky Brooker	Dent-Phelps R-III	vbrookes@dentphelps.k12.mo.us	573-729-4680	47870 Hwy C Salem, MO 65560

Name	Representing	Email Address	Phone #	Address
Darrell Stiles	Dent Co. Commission	darrellstiles@hotmail.com	573-508-5415	400 N. Main, Salem, Mo. 65560
Bill Wells	Dent County Sheriff's Office	BWells@dentcountysheriff.org	573-729-3241	112 E Fifth ST Salem MO
LEONARD PABIN	DENT COUNTY SHERIFF'S OFF.	pabin613@gmail.com	573-228-3241	112 E. 5TH ST. SALEM
Dennis Purcell	Dent Co. Commission	dpurcell@centurytel.net	573-247-1043	400. N. Main Salem, MO. 65560
John McCulloch	Salem R-80 S. Leads	John.McCulloch@Salemr80.org	573-729-6642	1409 West Rolla Rd Salem, MO 65560

C: Adoption Resolutions

Adoption resolutions have been mailed out to the jurisdictions and will be included in the final draft submitted to FEMA.

D: Critical/Essential Facilities

The table below (**Table 6.1**) provides information for critical facilities in the planning area. Specific information includes a Hazus ID if applicable, jurisdiction, building name/owner, and address.

Table 6.1 Dent County Critical Facilities by Type and Jurisdiction

HazusID	Jurisdiction	Building Name	Address	City	State	Zip
Emergency Facilities						
	Dent Co.	Salem Memorial Hospital Ambulance	35629 Hwy 72	Salem	MO	65560
	Salem	EOC	#2 S. Main St.	Salem	MO	65560
Fire Department Facilities						
	Dent Co.	Jadwin Vol. Fire Dept.	8861 Hwy K	Jadwin	MO	65501
	Dent Co.	Lenox Rural Fire Dept.	18231 Hwy C.	Lenox	MO	65541
	Dent Co.	Dent County Fire Prot. Dist.	#2 S. Main St.	Salem	MO	65560
	Dent Co.	Montauk Rural Fire Dist.	2742 Hwy 119	Salem	MO	65560
Law Enforcement Facilities						
	Salem	Salem Police Dept.	500 N Jackson St.	Salem	MO	65560
	Dent Co.	Dent Co. Sheriff's Dept.	112 E. 5th St., Suite 7	Salem	MO	65560
Medical Facilities						
	Dent Co.	Salem Memorial District Hospital	35629 Hwy. 72	Salem	Mo	65560
	Dent Co.	Dent County Health Center	601 S. MacArthur	Salem	Mo	65560
School Districts						
	Salem R-80	Salem R-80 School District	1409 W. Rolla Road	Salem	MO	65560
	Oak Hill R-I	Oak Hill R-I School District	6200 Hwy 19 S.	Salem	MO	65560
	Green Forest R-II	Green Forest R-II School District	6111 Hwy F	Salem	MO	65560
	Dent-Phelps R-III	Dent-Phelps R-III School District	27870 Hwy C	Salem	MO	65560
	North Wood R-IV	North Wood R-IV School District	3734 N Hwy 19	Salem	MO	65560

Source: Meramec Region Community Data Mining for Hazard Mitigation Planning (2014); Facilities, Missouri_SEMA, ArcGIS Online.

E: MDC Wildfire Data Search

View	Discovered Date	County	Station	Cause	Acres Burned	Member
2017-03331-165211	12/20/2017	Dent	MONTAUK RFD	Unknown	27.25	
2017-03322-163391	12/4/2017	Dent	Lenox Rural Fire Department	Unknown	5	
2017-03331-162773	12/3/2017	Dent	MONTAUK RFD	Debris	35.8	
2017-03322-163323	11/29/2017	Dent	Lenox Rural Fire Department	Miscellaneous	3	
2017-03322-163317	11/28/2017	Dent	Lenox Rural Fire Department	Debris	4.5	
2017-03322-163318	11/28/2017	Dent	Lenox Rural Fire Department	Debris	7	
2017-03322-163319	11/28/2017	Dent	Lenox Rural Fire Department	Debris	7.6	
2017-03322-163234	11/28/2017	Dent	Lenox Rural Fire Department	Debris	19	
2017-03322-163251	11/28/2017	Dent	Lenox Rural Fire Department	Debris	17	
2017-03322-163252	11/28/2017	Dent	Lenox Rural Fire Department	Debris	30.4	
2017-03322-163255	11/28/2017	Dent	Lenox Rural Fire Department	Debris	7.3	
2017-03322-163271	11/28/2017	Dent	Lenox Rural Fire Department	Debris	11.4	
2017-03322-163272	11/28/2017	Dent	Lenox Rural Fire Department	Debris	63	
2017-03322-163231	11/27/2017	Dent	Lenox Rural Fire Department	Debris	33	

2017-03322-162073	11/26/2017	Dent	Lenox Rural Fire Department	Unknown	10
2017-03331-162011	11/25/2017	Dent	MONTAUK RFD	Unknown	35
2017-03322-162071	11/14/2017	Dent	Lenox Rural Fire Department	Unknown	1
2017-03322-160051	9/15/2017	Dent	Lenox Rural Fire Department	Debris	1
2017-03331-158257	7/26/2017	Dent	MONTAUK RFD	Miscellaneous	1
2017-03331-147598	2/25/2017	Dent	MONTAUK RFD	Miscellaneous	0.3
2017-03322-145781	2/19/2017	Dent	Lenox Rural Fire Department	Miscellaneous	1
2017-03322-145780	2/17/2017	Dent	Lenox Rural Fire Department	Debris	1
2017-03331-147597	2/17/2017	Dent	MONTAUK RFD	Debris	0.2
2017-03322-145256	2/13/2017	Dent	Lenox Rural Fire Department	Debris	1
2017-10164-145243	2/12/2017	Dent	Timber Community Fire Protection District	Debris	150
2017-03322-143813	12/29/2016	Dent	Lenox Rural Fire Department	Debris	3
2016-03331-136191	4/15/2016	Dent	MONTAUK RFD	Debris	6.1
2016-03322-135519	4/3/2016	Dent	Lenox Rural Fire Department	Miscellaneous	1
2016-03331-135215	4/2/2016	Dent	MONTAUK RFD	Unknown	6.87
2016-03322-134924	3/22/2016	Dent	Lenox Rural Fire Department	Debris	10
2016-03331-	3/17/2016	Dent	MONTAUK RFD	Debris	4

134572					
2016-10164-134733	3/17/2016	Dent	Timber Community Fire Protection District	Debris	0.25
2016-03331-134571	3/17/2016	Dent	MONTAUK RFD	Debris	2
2016-10164-134015	3/6/2016	Dent	Timber Community Fire Protection District	Debris	10
2016-76409-134140	3/5/2016	Dent	SALEM FORESTRY	Miscellaneous	2
2016-10164-134014	3/5/2016	Dent	Timber Community Fire Protection District	Equipment	3
2016-03322-133189	2/20/2016	Dent	Lenox Rural Fire Department	Miscellaneous	5
2016-03322-133188	2/20/2016	Dent	Lenox Rural Fire Department	Miscellaneous	7
2016-03322-132977	1/27/2016	Dent	Lenox Rural Fire Department	Miscellaneous	1
2015-03322-130792	11/24/2015	Dent	Lenox Rural Fire Department	Debris	3
2015-03331-130591	11/20/2015	Dent	MONTAUK RFD	Debris	5
2015-03322-129912	10/20/2015	Dent	Lenox Rural Fire Department	Unknown	1
2015-03322-122970	4/23/2015	Dent	Lenox Rural Fire Department	Debris	1
2015-10164-123310	4/21/2015	Dent	Timber Community Fire Protection District	Equipment	5
2015-03322-122299	4/17/2015	Dent	Lenox Rural Fire Department	Debris	1.5
2015-03322-122300	4/17/2015	Dent	Lenox Rural Fire Department	Debris	1.9
2015-03331-122250	4/17/2015	Dent	MONTAUK RFD	Debris	10

2015-76409-122450	4/17/2015	Dent	SALEM FORESTRY	Debris	1.5
2015-03332-129467	4/17/2015	Dent	Jadwin Volunteer Fire Department	Debris	10
2015-76409-123470	4/16/2015	Dent	SALEM FORESTRY	Unknown	5
2015-03331-122030	4/11/2015	Dent	MONTAUK RFD	Debris	1
2015-03322-122298	4/11/2015	Dent	Lenox Rural Fire Department	Debris	4
2015-03331-121875	4/10/2015	Dent	MONTAUK RFD	Debris	1
2015-03322-122297	4/6/2015	Dent	Lenox Rural Fire Department	Debris	1
2015-03322-122292	3/30/2015	Dent	Lenox Rural Fire Department	Debris	3
2015-03322-122291	3/30/2015	Dent	Lenox Rural Fire Department	Debris	10
2015-03332-129466	3/23/2015	Dent	Jadwin Volunteer Fire Department	Unknown	2
2015-76409-122452	3/20/2015	Dent	SALEM FORESTRY	Debris	25
2015-03322-122290	3/11/2015	Dent	Lenox Rural Fire Department	Miscellaneous	4
2015-03322-118691	2/15/2015	Dent	Lenox Rural Fire Department	Debris	1
2015-76409-117493	1/28/2015	Dent	SALEM FORESTRY	Miscellaneous	1
2015-03322-117751	1/28/2015	Dent	Lenox Rural Fire Department	Miscellaneous	1
2015-03322-117151	1/24/2015	Dent	Lenox Rural Fire Department	Debris	1
2015-03332-	1/24/2015	Dent	Jadwin Volunteer Fire Department	Debris	1

119790					
2015-03332-129468	1/24/2015	Dent	Jadwin Volunteer Fire Department	Debris	1
2015-03322-117112	1/19/2015	Dent	Lenox Rural Fire Department	Debris	1
2015-03322-117113	1/19/2015	Dent	Lenox Rural Fire Department	Miscellaneous	1
2014-03322-109246	8/26/2014	Dent	Lenox Rural Fire Department	Debris	2
2014-03316-110222	8/6/2014	Dent	Dent County Fire Protection District	Debris	0.1
2014-03316-110449	8/6/2014	Dent	Dent County Fire Protection District	Not Reported	1
2014-03322-109049	8/6/2014	Dent	Lenox Rural Fire Department	Unknown	2
2014-03322-109048	8/6/2014	Dent	Lenox Rural Fire Department	Unknown	1
2014-03316-110447	8/6/2014	Dent	Dent County Fire Protection District	Not Reported	1
2014-03322-109047	8/6/2014	Dent	Lenox Rural Fire Department	Unknown	1
2014-03316-110445	8/4/2014	Dent	Dent County Fire Protection District	Not Reported	1
2014-03316-110424	8/4/2014	Dent	Dent County Fire Protection District	Equipment	2
2014-03322-109046	8/4/2014	Dent	Lenox Rural Fire Department	Unknown	7
2014-03316-110423	8/4/2014	Dent	Dent County Fire Protection District	Equipment	1
2014-03316-110422	8/4/2014	Dent	Dent County Fire Protection District	Equipment	5
2014-03316-110462	7/16/2014	Dent	Dent County Fire Protection District	Debris	0.1

2014-03322-106184	5/20/2014	Dent	Lenox Rural Fire Department	Miscellaneous	1
2014-10164-105926	5/19/2014	Dent	Timber Community Fire Protection District	Unknown	0.5
2014-03316-110463	5/18/2014	Dent	Dent County Fire Protection District	Debris	2
2014-04718-106802	5/16/2014	Dent	Quad County Fire Protection District	Unknown	10
2014-03322-106183	5/6/2014	Dent	Lenox Rural Fire Department	Debris	3
2014-03316-110464	5/4/2014	Dent	Dent County Fire Protection District	Debris	0.25
2014-03316-110465	5/4/2014	Dent	Dent County Fire Protection District	Debris	0.25
2014-03316-110466	5/3/2014	Dent	Dent County Fire Protection District	Equipment	2
2014-03332-119615	5/3/2014	Dent	Jadwin Volunteer Fire Department	Debris	12
2014-03322-106182	5/3/2014	Dent	Lenox Rural Fire Department	Miscellaneous	2
2014-00010-104862	5/3/2014	Dent	SALEM FORESTRY	Unknown	20
2014-10164-105925	5/3/2014	Dent	Timber Community Fire Protection District	Arson	20
2014-03316-111526	4/26/2014	Dent	Dent County Fire Protection District	Debris	1
2014-03322-103322	4/23/2014	Dent	Lenox Rural Fire Department	Unknown	5
2014-03332-119613	4/23/2014	Dent	Jadwin Volunteer Fire Department	Debris	1
2014-03332-119510	4/20/2014	Dent	Jadwin Volunteer Fire Department	Debris	20
2014-10164-	4/20/2014	Dent	Timber Community Fire Protection District	Debris	20

2014-03316-102843					
2014-03316-111528	4/20/2014	Dent	Dent County Fire Protection District	Debris	40
2014-03332-119551	4/19/2014	Dent	Jadwin Volunteer Fire Department	Debris	1
2014-03332-119530	4/19/2014	Dent	Jadwin Volunteer Fire Department	Debris	25
2014-03316-111529	4/18/2014	Dent	Dent County Fire Protection District	Debris	0.75
2014-03332-119550	4/18/2014	Dent	Jadwin Volunteer Fire Department	Debris	1
2014-03322-102423	4/18/2014	Dent	Lenox Rural Fire Department	Debris	5
2014-03322-102422	4/18/2014	Dent	Lenox Rural Fire Department	Debris	20
2014-03316-111530	4/18/2014	Dent	Dent County Fire Protection District	Equipment	0.5
2014-03331-101302	4/11/2014	Dent	MONTAUK RFD	Unknown	8
2014-03322-101066	4/5/2014	Dent	Lenox Rural Fire Department	Debris	1
2014-03322-101065	3/31/2014	Dent	Lenox Rural Fire Department	Debris	1
2014-03322-101064	3/30/2014	Dent	Lenox Rural Fire Department	Debris	2
2014-03316-111522	3/30/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03316-111520	3/28/2014	Dent	Dent County Fire Protection District	Debris	3
2014-03332-119614	3/28/2014	Dent	Jadwin Volunteer Fire Department	Debris	1
2014-03316-111517	3/26/2014	Dent	Dent County Fire Protection District	Unknown	1

2014-03316-111515	3/26/2014	Dent	Dent County Fire Protection District	Unknown	0.25
2014-03322-101063	3/25/2014	Dent	Lenox Rural Fire Department	Miscellaneous	9
2014-03322-101062	3/25/2014	Dent	Lenox Rural Fire Department	Debris	34
2014-03316-111512	3/24/2014	Dent	Dent County Fire Protection District	Debris	1
2014-03316-111511	3/22/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-10714-099572	3/22/2014	Dent	Licking Fire Dept.	Unknown	10
2014-03331-096427	3/22/2014	Dent	MONTAUK RFD	Equipment	20
2014-03322-100984	3/22/2014	Dent	Lenox Rural Fire Department	Miscellaneous	12
2014-03322-100986	3/22/2014	Dent	Lenox Rural Fire Department	Miscellaneous	12
2014-03322-100987	3/22/2014	Dent	Lenox Rural Fire Department	Miscellaneous	6
2014-03322-100983	3/22/2014	Dent	Lenox Rural Fire Department	Debris	21
2014-03322-100982	3/21/2014	Dent	Lenox Rural Fire Department	Debris	1
2014-03331-095995	3/21/2014	Dent	MONTAUK RFD	Equipment	0.5
2014-76409-095782	3/18/2014	Dent	SALEM FORESTRY	Arson	1.5
2014-03316-111510	3/18/2014	Dent	Dent County Fire Protection District	Debris	5
2014-03316-111508	3/15/2014	Dent	Dent County Fire Protection District	Unknown	30
2014-03316-	3/15/2014	Dent	Dent County Fire Protection District	Unknown	25

111507					
2014-03316-111506	3/15/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03316-111505	3/15/2014	Dent	Dent County Fire Protection District	Equipment	20
2014-03332-119553	3/15/2014	Dent	Jadwin Volunteer Fire Department	Equipment	5
2014-76409-095578	3/15/2014	Dent	SALEM FORESTRY	Miscellaneous	15
2014-03332-119616	3/15/2014	Dent	Jadwin Volunteer Fire Department	Debris	17
2014-10164-102842	3/15/2014	Dent	Timber Community Fire Protection District	Debris	15
2014-03322-096123	3/13/2014	Dent	Lenox Rural Fire Department	Debris	158
2014-03322-096136	3/13/2014	Dent	Lenox Rural Fire Department	Miscellaneous	17
2014-04718-099983	3/13/2014	Dent	Quad County Fire Protection District	Unknown	400
2014-03013-112680	3/13/2014	Dent	Long Lane Volunteer Fire Department	Debris	60
2014-03316-111531	3/12/2014	Dent	Dent County Fire Protection District	Debris	4
2014-03316-111503	3/12/2014	Dent	Dent County Fire Protection District	Unknown	1
2014-03316-111501	3/10/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03316-111500	3/10/2014	Dent	Dent County Fire Protection District	Debris	2
2014-03316-111499	3/9/2014	Dent	Dent County Fire Protection District	Debris	0.25
2014-02813-094945	3/1/2014	Dent	Steelville Fire Protection District	Unknown	25

2014-03322-096133	3/1/2014	Dent	Lenox Rural Fire Department	Debris	7
2014-03332-119612	3/1/2014	Dent	Jadwin Volunteer Fire Department	Unknown	6
2014-03316-111498	3/1/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03322-096122	2/28/2014	Dent	Lenox Rural Fire Department	Miscellaneous	6
2014-03316-111494	2/28/2014	Dent	Dent County Fire Protection District	Equipment	2
2014-03332-119500	2/28/2014	Dent	Jadwin Volunteer Fire Department	Equipment	10
2014-03331-094586	2/25/2014	Dent	MONTAUK RFD	Unknown	2
2014-03332-119499	2/23/2014	Dent	Jadwin Volunteer Fire Department	Debris	1
2014-03332-119556	2/22/2014	Dent	Jadwin Volunteer Fire Department	Debris	207
2014-03322-096121	2/22/2014	Dent	Lenox Rural Fire Department	Unknown	207
2014-03332-119552	2/22/2014	Dent	Jadwin Volunteer Fire Department	Miscellaneous	2
2014-03322-096120	2/22/2014	Dent	Lenox Rural Fire Department	Miscellaneous	1
2014-03331-094584	2/22/2014	Dent	MONTAUK RFD	Debris	207
2014-76409-094684	2/22/2014	Dent	SALEM FORESTRY	Miscellaneous	207
2014-03316-111495	2/21/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03332-119555	2/21/2014	Dent	Jadwin Volunteer Fire Department	Miscellaneous	57
2014-76409-	2/21/2014	Dent	SALEM FORESTRY	Miscellaneous	56.5

2014-03331-094585	2/21/2014	Dent	MONTAUK RFD	Equipment	56
2014-76409-094519	2/20/2014	Dent	SALEM FORESTRY	Miscellaneous	29.4
2014-03322-096119	2/20/2014	Dent	Lenox Rural Fire Department	Equipment	15
2014-03316-111496	2/20/2014	Dent	Dent County Fire Protection District	Equipment	0.5
2014-03316-111497	2/19/2014	Dent	Dent County Fire Protection District	Unknown	1
2014-03316-110468	1/30/2014	Dent	Dent County Fire Protection District	Unknown	1
2014-03316-110469	1/28/2014	Dent	Dent County Fire Protection District	Unknown	10
2014-03316-111490	1/26/2014	Dent	Dent County Fire Protection District	Debris	80
2014-03322-096128	1/26/2014	Dent	Lenox Rural Fire Department	Unknown	100
2014-03332-119497	1/26/2014	Dent	Jadwin Volunteer Fire Department	Equipment	158
2014-76409-093729	1/26/2014	Dent	SALEM FORESTRY	Equipment	192
2014-03316-111491	1/26/2014	Dent	Dent County Fire Protection District	Equipment	100
2014-03316-111492	1/26/2014	Dent	Dent County Fire Protection District	Debris	5
2014-03332-119498	1/26/2014	Dent	Jadwin Volunteer Fire Department	Equipment	190
2014-03322-093557	1/26/2014	Dent	Lenox Rural Fire Department	Debris	3.5
2014-03316-111493	1/24/2014	Dent	Dent County Fire Protection District	Equipment	0.5

2014-02813-093508	1/24/2014	Dent	Steelville Fire Protection District	Unknown	350
2014-04718-093970	1/24/2014	Dent	Quad County Fire Protection District	Unknown	450
2014-03332-119496	1/20/2014	Dent	Jadwin Volunteer Fire Department	Miscellaneous	6
2014-04718-093968	1/19/2014	Dent	Quad County Fire Protection District	Unknown	4
2014-03322-093556	1/18/2014	Dent	Lenox Rural Fire Department	Debris	1
2014-03322-093555	1/17/2014	Dent	Lenox Rural Fire Department	Debris	1
2014-03322-093554	1/16/2014	Dent	Lenox Rural Fire Department	Miscellaneous	5
2013-03316-110467	12/28/2013	Dent	Dent County Fire Protection District	Unknown	1
2013-03316-112550	11/29/2013	Dent	Dent County Fire Protection District	Miscellaneous	0.25
2013-03316-112551	11/29/2013	Dent	Dent County Fire Protection District	Debris	0.5
2013-03322-096125	11/27/2013	Dent	Lenox Rural Fire Department	Debris	1
2013-03331-091663	11/18/2013	Dent	MONTAUK RFD	Unknown	5
2013-03331-091662	11/18/2013	Dent	MONTAUK RFD	Unknown	25
2013-03316-112552	11/17/2013	Dent	Dent County Fire Protection District	Debris	1
2013-03331-091661	11/17/2013	Dent	MONTAUK RFD	Unknown	1
2013-03316-112553	11/13/2013	Dent	Dent County Fire Protection District	Debris	1.5
2013-03316-	11/10/2013	Dent	Dent County Fire Protection District	Debris	0.25

112554					
2013-03322-091322	10/4/2013	Dent	Lenox Rural Fire Department	Unknown	2
2013-03331-089822	9/10/2013	Dent	MONTAUK RFD	Equipment	25
2013-03331-091862	9/10/2013	Dent	MONTAUK RFD	Equipment	20
2013-03316-112492	7/13/2013	Dent	Dent County Fire Protection District	Unknown	1.5
2013-03316-112493	7/4/2013	Dent	Dent County Fire Protection District	Debris	0.25
2013-03332-090385	7/4/2013	Dent	Jadwin Volunteer Fire Department	Unknown	3
2013-03316-112490	6/10/2013	Dent	Dent County Fire Protection District	Debris	0.25
2013-03332-090384	5/14/2013	Dent	Jadwin Volunteer Fire Department	Debris	5
2013-03331-091861	4/14/2013	Dent	MONTAUK RFD	Debris	5
2013-03332-090383	4/14/2013	Dent	Jadwin Volunteer Fire Department	Debris	3
2013-03316-112130	4/7/2013	Dent	Dent County Fire Protection District	Debris	1.5
2013-03331-091860	3/15/2013	Dent	MONTAUK RFD	Debris	8
2013-03316-112110	3/14/2013	Dent	Dent County Fire Protection District	Not Reported	0.5
2013-03332-090382	3/9/2013	Dent	Jadwin Volunteer Fire Department	Debris	1
2013-03316-112093	3/7/2013	Dent	Dent County Fire Protection District	Not Reported	2
2013-03316-112090	2/17/2013	Dent	Dent County Fire Protection District	Debris	5

2013-03316-112091	2/12/2013	Dent	Dent County Fire Protection District	Debris	1
2013-03316-112092	2/6/2013	Dent	Dent County Fire Protection District	Debris	2
2012-76409-080166	12/3/2012	Dent	SALEM FORESTRY	Arson	4
2012-03332-082102	8/6/2012	Dent	Jadwin Volunteer Fire Department	Lightning	1
2012-03322-076654	7/31/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-076665	7/29/2012	Dent	Lenox Rural Fire Department	Lightning	0.5
2012-76409-074305	7/24/2012	Dent	SALEM FORESTRY	Equipment	61
2012-76409-073693	7/12/2012	Dent	SALEM FORESTRY	Equipment	42
2012-03322-073673	7/11/2012	Dent	Lenox Rural Fire Department	Equipment	10
2012-03322-073361	7/4/2012	Dent	Lenox Rural Fire Department	Unknown	1
2012-03332-082082	7/1/2012	Dent	Jadwin Volunteer Fire Department	Equipment	6
2012-03322-073343	6/29/2012	Dent	Lenox Rural Fire Department	Debris	4
2012-76409-072924	6/27/2012	Dent	SALEM FORESTRY	Equipment	5
2012-03322-073342	6/27/2012	Dent	Lenox Rural Fire Department	Equipment	7
2012-03322-073698	6/24/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-073697	6/23/2012	Dent	Lenox Rural Fire Department	Equipment	2
2012-03322-	5/27/2012	Dent	Lenox Rural Fire Department	Smoking	0.5

072942					
2012-03322-072943	5/16/2012	Dent	Lenox Rural Fire Department	Not Reported	0.5
2012-03322-072941	5/14/2012	Dent	Lenox Rural Fire Department	Debris	0.5
2012-03332-082064	5/13/2012	Dent	Jadwin Volunteer Fire Department	Debris	1.8
2012-10164-071041	4/9/2012	Dent	Timber Community Fire Protection District	Debris	70
2012-03332-082063	4/9/2012	Dent	Jadwin Volunteer Fire Department	Unknown	60
2012-76409-080165	4/9/2012	Dent	SALEM FORESTRY	Miscellaneous	71
2012-03322-071001	4/1/2012	Dent	Lenox Rural Fire Department	Debris	7
2012-03332-082062	4/1/2012	Dent	Jadwin Volunteer Fire Department	Arson	253
2012-76409-069481	4/1/2012	Dent	SALEM FORESTRY	Arson	253
2012-03332-082043	3/30/2012	Dent	Jadwin Volunteer Fire Department	Unknown	1
2012-03332-082042	3/6/2012	Dent	Jadwin Volunteer Fire Department	Miscellaneous	2
2012-76409-080164	3/6/2012	Dent	SALEM FORESTRY	Debris	97
2012-00001-069541	3/6/2012	Dent	MDC REPORTING REGION - CENTRAL	Debris	15
2012-03322-069083	3/6/2012	Dent	Lenox Rural Fire Department	Debris	2
2012-03322-069084	3/6/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-069073	3/6/2012	Dent	Lenox Rural Fire Department	Debris	1

2012-03322-069074	3/6/2012	Dent	Lenox Rural Fire Department	Debris	2
2012-03322-069082	3/3/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-069070	3/3/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-069071	3/3/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-03322-069069	2/23/2012	Dent	Lenox Rural Fire Department	Miscellaneous	1
2012-03322-066182	1/7/2012	Dent	Lenox Rural Fire Department	Debris	1
2012-76409-065090	1/2/2012	Dent	SALEM FORESTRY	Arson	20
2011-10164-063382	11/26/2011	Dent	Timber Community Fire Protection District	Debris	0.5
2011-03322-061721	10/9/2011	Dent	Lenox Rural Fire Department	Campfire	1
2011-03322-056885	4/9/2011	Dent	Lenox Rural Fire Department	Unknown	2
2011-03322-056886	4/9/2011	Dent	Lenox Rural Fire Department	Unknown	1
2011-76409-059241	3/23/2011	Dent	SALEM FORESTRY	Debris	73
2011-03322-056884	3/23/2011	Dent	Lenox Rural Fire Department	Arson	12
2011-76409-080162	3/23/2011	Dent	SALEM FORESTRY	Arson	25
2011-03322-056883	3/16/2011	Dent	Lenox Rural Fire Department	Debris	1.5
2011-03322-055069	3/12/2011	Dent	Lenox Rural Fire Department	Debris	3
2011-03322-	3/12/2011	Dent	Lenox Rural Fire Department	Debris	1.5

055070					
2011-03322-055067	3/12/2011	Dent	Lenox Rural Fire Department	Debris	6.5
2011-03322-055105	3/11/2011	Dent	Lenox Rural Fire Department	Equipment	60
2011-03322-055106	3/11/2011	Dent	Lenox Rural Fire Department	Equipment	1
2011-76409-080163	3/11/2011	Dent	SALEM FORESTRY	Unknown	55
2011-03322-055107	3/11/2011	Dent	Lenox Rural Fire Department	Debris	1.5
2011-03322-055108	3/11/2011	Dent	Lenox Rural Fire Department	Debris	3.5
2011-03322-055066	3/11/2011	Dent	Lenox Rural Fire Department	Equipment	40
2011-03322-055104	3/11/2011	Dent	Lenox Rural Fire Department	Equipment	40
2011-03322-055065	3/3/2011	Dent	Lenox Rural Fire Department	Debris	5
2011-03322-055102	2/20/2011	Dent	Lenox Rural Fire Department	Debris	25
2011-00005-054335	2/20/2011	Dent	MDC REPORTING REGION - OZARK	Debris	35
2011-03322-055101	2/18/2011	Dent	Lenox Rural Fire Department	Debris	0.5
2011-00005-054334	2/17/2011	Dent	MDC REPORTING REGION - OZARK	Equipment	50
2011-03332-056241	1/29/2011	Dent	Jadwin Volunteer Fire Department	Debris	15
2011-03332-056123	1/28/2011	Dent	Jadwin Volunteer Fire Department	Campfire	8.4
2011-03332-056109	1/4/2011	Dent	Jadwin Volunteer Fire Department	Equipment	5

2010-03322-051596	11/22/2010	Dent	Lenox Rural Fire Department	Debris	1
2010-03322-051597	11/22/2010	Dent	Lenox Rural Fire Department	Debris	1
2010-03322-051595	11/20/2010	Dent	Lenox Rural Fire Department	Debris	0.25
2010-08100-049784	11/12/2010	Dent	ROLLA FORESTRY	Debris	19
2010-03322-049102	10/23/2010	Dent	Lenox Rural Fire Department	Miscellaneous	10
2010-03322-049395	10/23/2010	Dent	Lenox Rural Fire Department	Debris	2.5
2010-03322-049396	10/23/2010	Dent	Lenox Rural Fire Department	Debris	3.5
2010-03322-049397	10/23/2010	Dent	Lenox Rural Fire Department	Debris	4
2010-03322-049101	10/17/2010	Dent	Lenox Rural Fire Department	Campfire	3
2010-76409-047368	8/4/2010	Dent	SALEM FORESTRY	Equipment	0.25
2010-03322-047362	7/1/2010	Dent	Lenox Rural Fire Department	Miscellaneous	0.5
2010-03322-047363	7/1/2010	Dent	Lenox Rural Fire Department	Debris	0.5
2010-03322-047381	6/29/2010	Dent	Lenox Rural Fire Department	Debris	0.5
2010-03322-047361	6/27/2010	Dent	Lenox Rural Fire Department	Lightning	2
2010-76409-045659	4/14/2010	Dent	SALEM FORESTRY	Debris	11
2010-76409-045657	4/14/2010	Dent	SALEM FORESTRY	Miscellaneous	5
2010-76409-	4/14/2010	Dent	SALEM FORESTRY	Miscellaneous	12

045658					
2010-04718-046013	4/5/2010	Dent	Quad County Fire Protection District	Unknown	1
2010-76409-045662	4/4/2010	Dent	SALEM FORESTRY	Smoking	4
2010-10164-045403	3/23/2010	Dent	Timber Community Fire Protection District	Debris	1
2010-03322-045683	3/23/2010	Dent	Lenox Rural Fire Department	Debris	0.25
2010-03322-045684	3/23/2010	Dent	Lenox Rural Fire Department	Debris	0.5
2010-03322-045741	3/23/2010	Dent	Lenox Rural Fire Department	Debris	0.5
2010-03322-044855	3/6/2010	Dent	Lenox Rural Fire Department	Debris	1.5
2010-03322-044854	3/6/2010	Dent	Lenox Rural Fire Department	Debris	1.5
2010-03322-044863	3/4/2010	Dent	Lenox Rural Fire Department	Debris	5
2010-03322-044853	3/4/2010	Dent	Lenox Rural Fire Department	Debris	10
2010-03322-069072	3/3/2010	Dent	Lenox Rural Fire Department	Debris	1
2009-03331-042512	11/13/2009	Dent	MONTAUK RFD	Debris	2
2009-03322-043109	11/3/2009	Dent	Lenox Rural Fire Department	Unknown	3
2009-03322-043122	11/2/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.5
2009-76409-041207	7/1/2009	Dent	SALEM FORESTRY	Unknown	1
2009-00005-039486	3/23/2009	Dent	MDC REPORTING REGION - OZARK	Debris	40

2009-00005-039482	3/23/2009	Dent	MDC REPORTING REGION - OZARK	Debris	15
2009-00005-039472	3/23/2009	Dent	MDC REPORTING REGION - OZARK	Debris	30
2009-03332-039578	3/22/2009	Dent	Jadwin Volunteer Fire Department	Debris	30
2009-03322-039425	3/20/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.5
2009-03332-039577	3/17/2009	Dent	Jadwin Volunteer Fire Department	Equipment	0.5
2009-03331-038923	3/17/2009	Dent	MONTAUK RFD	Miscellaneous	0.5
2009-03322-039424	3/16/2009	Dent	Lenox Rural Fire Department	Unknown	0.5
2009-03332-039576	3/15/2009	Dent	Jadwin Volunteer Fire Department	Equipment	0.1
2009-03332-039575	3/14/2009	Dent	Jadwin Volunteer Fire Department	Unknown	55
2009-00005-039226	3/14/2009	Dent	MDC REPORTING REGION - OZARK	Debris	10
2009-03331-038921	3/14/2009	Dent	MONTAUK RFD	Unknown	1.5
2009-00005-039455	3/14/2009	Dent	MDC REPORTING REGION - OZARK	Debris	10
2009-00005-039456	3/7/2009	Dent	MDC REPORTING REGION - OZARK	Arson	0.25
2009-03322-039423	3/7/2009	Dent	Lenox Rural Fire Department	Debris	1
2009-03332-039574	3/6/2009	Dent	Jadwin Volunteer Fire Department	Debris	0.25
2009-03322-039422	3/5/2009	Dent	Lenox Rural Fire Department	Debris	15
2009-00005-	2/25/2009	Dent	MDC REPORTING REGION - OZARK	Debris	6

039471					
2009-03332-039573	2/25/2009	Dent	Jadwin Volunteer Fire Department	Debris	1.5
2009-03331-037963	2/23/2009	Dent	MONTAUK RFD	Miscellaneous	35
2009-03322-037665	2/20/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.8
2009-00005-037449	2/3/2009	Dent	MDC REPORTING REGION - OZARK	Arson	0.5
2009-00005-036879	1/15/2009	Dent	MDC REPORTING REGION - OZARK	Arson	250
2009-02626-037165	1/9/2009	Dent	Russellville-Lohman Fire Protection District	Debris	5
2009-03322-037664	1/9/2009	Dent	Lenox Rural Fire Department	Unknown	0.5
2009-03322-037663	1/9/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.5
2009-03322-037661	1/9/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.25
2009-03322-037662	1/9/2009	Dent	Lenox Rural Fire Department	Miscellaneous	0.25
2008-00005-036878	12/30/2008	Dent	MDC REPORTING REGION - OZARK	Unknown	65
2008-03331-036457	12/29/2008	Dent	MONTAUK RFD	Miscellaneous	4
2008-03331-035985	11/5/2008	Dent	MONTAUK RFD	Campfire	80
2008-03332-035027	5/3/2008	Dent	Jadwin Volunteer Fire Department	Equipment	0.83
2008-03322-034006	3/29/2008	Dent	Lenox Rural Fire Department	Miscellaneous	0.25
2008-04718-034203	3/24/2008	Dent	Quad County Fire Protection District	Unknown	113

2008-08853-035028	3/23/2008	Dent	Northeast R-IV Rural Fire Protection District	Arson	0.25
2008-00005-033932	3/12/2008	Dent	MDC REPORTING REGION - OZARK	Arson	3
2008-03332-033939	3/2/2008	Dent	Jadwin Volunteer Fire Department	Debris	1
2008-03332-033938	2/29/2008	Dent	Jadwin Volunteer Fire Department	Debris	1.5
2008-03322-033459	2/10/2008	Dent	Lenox Rural Fire Department	Debris	10
2008-03322-033458	1/27/2008	Dent	Lenox Rural Fire Department	Debris	12
2008-03332-033936	1/27/2008	Dent	Jadwin Volunteer Fire Department	Unknown	3
2008-03322-033457	1/26/2008	Dent	Lenox Rural Fire Department	Debris	0.5
2007-00005-032190	11/17/2007	Dent	MDC REPORTING REGION - OZARK	Arson	2
2007-03332-033934	10/21/2007	Dent	Jadwin Volunteer Fire Department	Equipment	0.5
2007-03332-033933	8/16/2007	Dent	Jadwin Volunteer Fire Department	Unknown	0.1
2007-00005-031487	8/16/2007	Dent	MDC REPORTING REGION - OZARK	Miscellaneous	4
2007-03322-030447	7/22/2007	Dent	Lenox Rural Fire Department	Debris	3
2007-00005-030474	7/6/2007	Dent	MDC REPORTING REGION - OZARK	Equipment	0.25
2007-03322-030454	6/14/2007	Dent	Lenox Rural Fire Department	Debris	0.4
2007-10164-029958	4/30/2007	Dent	Timber Community Fire Protection District	Debris	1
2007-00005-	4/30/2007	Dent	MDC REPORTING REGION - OZARK	Debris	4

029567					
2007-10164-029956	4/30/2007	Dent	Timber Community Fire Protection District	Debris	4
2007-10164-029957	4/30/2007	Dent	Timber Community Fire Protection District	Debris	5
2007-03332-030446	4/29/2007	Dent	Jadwin Volunteer Fire Department	Debris	25
2007-00005-029365	4/22/2007	Dent	MDC REPORTING REGION - OZARK	Debris	5
2007-00005-029364	4/22/2007	Dent	MDC REPORTING REGION - OZARK	Miscellaneous	10
2007-03332-030445	4/22/2007	Dent	Jadwin Volunteer Fire Department	Miscellaneous	5
2007-00005-029367	4/20/2007	Dent	MDC REPORTING REGION - OZARK	Debris	15
2007-10164-029953	4/16/2007	Dent	Timber Community Fire Protection District	Debris	3
2007-09343-029366	4/10/2007	Dent	Sac Osage Fire Protection District	Children	10
2007-00005-029081	3/27/2007	Dent	MDC REPORTING REGION - OZARK	Arson	750
2007-03332-030437	3/19/2007	Dent	Jadwin Volunteer Fire Department	Debris	0.02
2007-10164-029569	3/19/2007	Dent	Timber Community Fire Protection District	Debris	9
2007-10164-029565	3/18/2007	Dent	Timber Community Fire Protection District	Debris	41
2007-04718-028887	3/10/2007	Dent	Quad County Fire Protection District	Unknown	5
2007-04718-028885	3/7/2007	Dent	Quad County Fire Protection District	Unknown	20
2007-03332-030438	3/7/2007	Dent	Jadwin Volunteer Fire Department	Debris	0.25

2007-03316-028032	3/5/2007	Dent	Dent County Fire Protection District	Arson	5
2007-00005-028108	2/22/2007	Dent	MDC REPORTING REGION - OZARK	Debris	0.25
2007-00005-028109	2/22/2007	Dent	MDC REPORTING REGION - OZARK	Debris	65
2007-03332-030440	2/19/2007	Dent	Jadwin Volunteer Fire Department	Debris	0.03
2007-03322-030455	2/11/2007	Dent	Lenox Rural Fire Department	Debris	3.1
2006-03332-030441	12/30/2006	Dent	Jadwin Volunteer Fire Department	Debris	1
2006-00005-026437	11/29/2006	Dent	MDC REPORTING REGION - OZARK	Arson	0.25
2006-03322-030453	11/24/2006	Dent	Lenox Rural Fire Department	Unknown	0.4
2006-03322-030452	10/31/2006	Dent	Lenox Rural Fire Department	Debris	5
2006-03332-030442	8/23/2006	Dent	Jadwin Volunteer Fire Department	Unknown	1
2006-00005-025350	8/22/2006	Dent	MDC REPORTING REGION - OZARK	Debris	25
2006-00005-025347	8/18/2006	Dent	MDC REPORTING REGION - OZARK	Arson	2
2006-00005-025348	8/18/2006	Dent	MDC REPORTING REGION - OZARK	Arson	2
2006-03332-030443	8/8/2006	Dent	Jadwin Volunteer Fire Department	Unknown	1
2006-10164-025388	8/8/2006	Dent	Timber Community Fire Protection District	Arson	1
2006-10164-025390	8/8/2006	Dent	Timber Community Fire Protection District	Arson	4
2006-00005-	8/8/2006	Dent	MDC REPORTING REGION - OZARK	Debris	1

2006-03322-030450	8/5/2006	Dent	Lenox Rural Fire Department	Debris	1
2006-03322-030451	8/5/2006	Dent	Lenox Rural Fire Department	Debris	1.4
2006-00005-025191	8/2/2006	Dent	MDC REPORTING REGION - OZARK	Unknown	30
2006-03322-030449	8/2/2006	Dent	Lenox Rural Fire Department	Unknown	15
2006-03322-030448	7/25/2006	Dent	Lenox Rural Fire Department	Debris	10
2006-00005-024823	7/20/2006	Dent	MDC REPORTING REGION - OZARK	Lightning	10
2006-03332-030444	7/20/2006	Dent	Jadwin Volunteer Fire Department	Unknown	30
2006-00005-012719	4/5/2006	Dent	MDC REPORTING REGION - OZARK	Debris	20
2006-00005-012717	4/4/2006	Dent	MDC REPORTING REGION - OZARK	Arson	20
2006-00005-012718	4/1/2006	Dent	MDC REPORTING REGION - OZARK	Debris	2
2006-03332-012466	3/16/2006	Dent	Jadwin Volunteer Fire Department	Debris	1
2006-03332-012465	3/16/2006	Dent	Jadwin Volunteer Fire Department	Debris	15
2006-00005-012333	3/16/2006	Dent	MDC REPORTING REGION - OZARK	Debris	27
2006-00005-012332	3/15/2006	Dent	MDC REPORTING REGION - OZARK	Debris	2
2006-00005-011911	3/3/2006	Dent	MDC REPORTING REGION - OZARK	Debris	0.25
2006-00005-012335	3/2/2006	Dent	MDC REPORTING REGION - OZARK	Debris	0.25

2006-03332-012464	2/26/2006	Dent	Jadwin Volunteer Fire Department	Unknown	20
2006-00005-011254	2/24/2006	Dent	MDC REPORTING REGION - OZARK	Arson	37
2006-00005-010783	1/24/2006	Dent	MDC REPORTING REGION - OZARK	Unknown	31
2005-10164-011139	11/25/2005	Dent	Timber Community Fire Protection District	Miscellaneous	7
2005-00005-010008	11/12/2005	Dent	MDC REPORTING REGION - OZARK	Smoking	1
2005-76409-009877	11/9/2005	Dent	SALEM FORESTRY	Arson	0.25
2005-10164-009753	7/31/2005	Dent	Timber Community Fire Protection District	Debris	0.2
2005-00005-008194	4/19/2005	Dent	MDC REPORTING REGION - OZARK	Debris	15
2005-03332-009747	4/17/2005	Dent	Jadwin Volunteer Fire Department	Debris	7.5
2005-00005-007343	4/10/2005	Dent	MDC REPORTING REGION - OZARK	Arson	35
2005-03332-007346	4/10/2005	Dent	Jadwin Volunteer Fire Department	Arson	35.5
2005-03332-007345	4/8/2005	Dent	Jadwin Volunteer Fire Department	Unknown	12.1
2005-10164-007347	4/8/2005	Dent	Timber Community Fire Protection District	Unknown	12.1
2005-00005-007342	4/4/2005	Dent	MDC REPORTING REGION - OZARK	Debris	40
2005-00005-007341	4/2/2005	Dent	MDC REPORTING REGION - OZARK	Debris	1
2005-03332-007344	3/31/2005	Dent	Jadwin Volunteer Fire Department	Miscellaneous	60
2005-03332-	3/30/2005	Dent	Jadwin Volunteer Fire Department	Unknown	30.7

2005-10399-007073					
007287	3/30/2005	Dent	Puxico Fire Department	Unknown	0.1
2005-02813-007398	3/30/2005	Dent	Steelville Fire Protection District	Unknown	600
2005-10164-007348	3/28/2005	Dent	Timber Community Fire Protection District	Equipment	1.5
2005-00005-007083	3/21/2005	Dent	MDC REPORTING REGION - OZARK	Debris	35
2005-10164-006963	3/17/2005	Dent	Timber Community Fire Protection District	Equipment	108.7
2005-00005-007082	3/17/2005	Dent	MDC REPORTING REGION - OZARK	Equipment	110
2005-03332-007074	3/17/2005	Dent	Jadwin Volunteer Fire Department	Equipment	108.7
2005-10164-006964	3/14/2005	Dent	Timber Community Fire Protection District	Miscellaneous	300
2005-00005-006938	3/12/2005	Dent	MDC REPORTING REGION - OZARK	Debris	25
2005-08100-007061	3/12/2005	Dent	ROLLA FORESTRY	Debris	95
2005-00005-006939	3/12/2005	Dent	MDC REPORTING REGION - OZARK	Debris	25
2005-00005-006937	3/10/2005	Dent	MDC REPORTING REGION - OZARK	Debris	4
2005-00005-006782	3/3/2005	Dent	MDC REPORTING REGION - OZARK	Debris	29
2005-03332-006945	3/3/2005	Dent	Jadwin Volunteer Fire Department	Debris	29.5
2005-00005-006781	3/3/2005	Dent	MDC REPORTING REGION - OZARK	Debris	30
2005-00005-006780	3/2/2005	Dent	MDC REPORTING REGION - OZARK	Debris	2

2005-76409-006700	3/1/2005	Dent	SALEM FORESTRY	Arson	1
2005-76409-006666	2/4/2005	Dent	SALEM FORESTRY	Miscellaneous	5
2005-03332-006950	2/4/2005	Dent	Jadwin Volunteer Fire Department	Miscellaneous	5
2005-10164-006541	1/22/2005	Dent	Timber Community Fire Protection District	Debris	2
2004-03316-006419	12/30/2004	Dent	Dent County Fire Protection District	Debris	5
2004-76409-006400	12/30/2004	Dent	SALEM FORESTRY	Debris	5
2004-76409-006399	12/29/2004	Dent	SALEM FORESTRY	Arson	0.5
2004-03316-006418	12/29/2004	Dent	Dent County Fire Protection District	Unknown	1
2004-03316-006417	12/27/2004	Dent	Dent County Fire Protection District	Debris	0.5
2004-03316-006416	12/14/2004	Dent	Dent County Fire Protection District	Debris	1
2004-03316-006415	10/7/2004	Dent	Dent County Fire Protection District	Debris	0.25
2004-03332-005998	10/7/2004	Dent	Jadwin Volunteer Fire Department	Not Reported	10
2004-03316-006414	10/5/2004	Dent	Dent County Fire Protection District	Debris	0.1
2004-03316-006413	10/5/2004	Dent	Dent County Fire Protection District	Debris	0.5
2004-03316-006412	10/4/2004	Dent	Dent County Fire Protection District	Debris	0.25
2004-03316-006411	9/27/2004	Dent	Dent County Fire Protection District	Smoking	0.5
2004-03316-	9/25/2004	Dent	Dent County Fire Protection District	Debris	0.25

006410					
2004-03316-006409	9/12/2004	Dent	Dent County Fire Protection District	Debris	0.1
2004-03332-005889	9/9/2004	Dent	Jadwin Volunteer Fire Department	Equipment	2
2004-03316-006408	9/9/2004	Dent	Dent County Fire Protection District	Unknown	2
2004-03316-006407	9/8/2004	Dent	Dent County Fire Protection District	Not Reported	1
2004-03316-006406	9/7/2004	Dent	Dent County Fire Protection District	Debris	2
2004-03332-004593	4/17/2004	Dent	Jadwin Volunteer Fire Department	Debris	3
2004-03316-006405	4/17/2004	Dent	Dent County Fire Protection District	Unknown	1
2004-03332-004592	4/16/2004	Dent	Jadwin Volunteer Fire Department	Debris	5
2004-03316-006404	4/14/2004	Dent	Dent County Fire Protection District	Unknown	0.1
2004-03316-006403	4/14/2004	Dent	Dent County Fire Protection District	Debris	30
2004-7640-004299	4/14/2004	Dent	VAN BUREN FORESTRY	Debris	30
2004-03332-004589	4/12/2004	Dent	Jadwin Volunteer Fire Department	Debris	13.3
2004-03316-006402	4/12/2004	Dent	Dent County Fire Protection District	Unknown	0.25
2004-03316-006401	4/8/2004	Dent	Dent County Fire Protection District	Debris	4
2004-03316-006398	4/3/2004	Dent	Dent County Fire Protection District	Unknown	1
2004-03332-004588	4/3/2004	Dent	Jadwin Volunteer Fire Department	Not Reported	

2004-03316-006397	4/2/2004	Dent	Dent County Fire Protection District	Debris	1
2004-03316-006396	4/1/2004	Dent	Dent County Fire Protection District	Unknown	2
2004-00005-007067	3/30/2004	Dent	MDC REPORTING REGION - OZARK	Debris	270
2004-03316-006395	3/19/2004	Dent	Dent County Fire Protection District	Debris	0.25
2004-03316-006394	3/19/2004	Dent	Dent County Fire Protection District	Miscellaneous	1.5
2004-03331-004506	3/18/2004	Dent	MONTAUK RFD	Unknown	7
2004-76409-005658	3/18/2004	Dent	SALEM FORESTRY	Debris	15
2004-03316-006393	3/18/2004	Dent	Dent County Fire Protection District	Unknown	0.5
2004-03332-004586	3/18/2004	Dent	Jadwin Volunteer Fire Department	Debris	15
2004-03316-006392	3/12/2004	Dent	Dent County Fire Protection District	Debris	0.1
2004-03316-006391	3/12/2004	Dent	Dent County Fire Protection District	Unknown	2
2004-03331-004507	3/11/2004	Dent	MONTAUK RFD	Arson	0.5
2004-03316-006386	3/8/2004	Dent	Dent County Fire Protection District	Debris	0.5
2004-03316-006385	3/7/2004	Dent	Dent County Fire Protection District	Debris	10
2004-03316-006384	3/7/2004	Dent	Dent County Fire Protection District	Miscellaneous	1
2004-03331-004508	3/6/2004	Dent	MONTAUK RFD	Miscellaneous	20
2004-03316-	3/2/2004	Dent	Dent County Fire Protection District	Unknown	30

006383					
2004-03316-006382	3/2/2004	Dent	Dent County Fire Protection District	Debris	1
2004-76409-005447	3/1/2004	Dent	SALEM FORESTRY	Debris	4
2004-03331-004509	3/1/2004	Dent	MONTAUK RFD	Debris	4
2004-03316-006381	3/1/2004	Dent	Dent County Fire Protection District	Debris	2
2004-03316-006380	3/1/2004	Dent	Dent County Fire Protection District	Debris	0.1
2004-03316-006379	3/1/2004	Dent	Dent County Fire Protection District	Debris	35
2004-76409-005452	3/1/2004	Dent	SALEM FORESTRY	Debris	10
2004-76409-005446	3/1/2004	Dent	SALEM FORESTRY	Debris	60
2004-03316-006378	2/29/2004	Dent	Dent County Fire Protection District	Unknown	1
2004-03316-006377	2/29/2004	Dent	Dent County Fire Protection District	Unknown	2.5
2004-03316-006376	2/28/2004	Dent	Dent County Fire Protection District	Debris	20
2004-03316-006375	2/27/2004	Dent	Dent County Fire Protection District	Debris	0.75
2004-03316-006374	2/26/2004	Dent	Dent County Fire Protection District	Debris	1.5
2004-03332-005473	2/26/2004	Dent	Jadwin Volunteer Fire Department	Debris	3
2004-03316-006373	2/23/2004	Dent	Dent County Fire Protection District	Unknown	1.5
2004-76409-005458	2/23/2004	Dent	SALEM FORESTRY	Debris	4

2004-03316-006372	2/23/2004	Dent	Dent County Fire Protection District	Debris	3
2004-03316-006371	2/23/2004	Dent	Dent County Fire Protection District	Debris	4
2004-03316-006370	2/21/2004	Dent	Dent County Fire Protection District	Unknown	1
2004-03316-006369	2/21/2004	Dent	Dent County Fire Protection District	Debris	5
2004-03316-006368	2/21/2004	Dent	Dent County Fire Protection District	Debris	0.25
2004-03332-005474	2/21/2004	Dent	Jadwin Volunteer Fire Department	Miscellaneous	
2004-03316-006367	2/19/2004	Dent	Dent County Fire Protection District	Unknown	0.12
2004-03316-006366	2/19/2004	Dent	Dent County Fire Protection District	Debris	5
2004-03332-005462	2/19/2004	Dent	Jadwin Volunteer Fire Department	Debris	10
2004-76409-005442	2/18/2004	Dent	SALEM FORESTRY	Debris	2
2004-03316-006365	2/18/2004	Dent	Dent County Fire Protection District	Debris	2
2004-03316-006364	2/17/2004	Dent	Dent County Fire Protection District	Equipment	0.5
2004-03332-004488	1/14/2004	Dent	Jadwin Volunteer Fire Department	Debris	3
2003-03316-006363	12/26/2003	Dent	Dent County Fire Protection District	Debris	0.1
2003-03316-006362	12/21/2003	Dent	Dent County Fire Protection District	Unknown	0.25
2003-00005-003209	11/29/2003	Dent	MDC REPORTING REGION - OZARK	Arson	10
2003-00005-	11/13/2003	Dent	MDC REPORTING REGION - OZARK	Debris	20

003090					
2003-03332-003609	11/13/2003	Dent	Jadwin Volunteer Fire Department	Debris	20
2003-03332-005464	11/13/2003	Dent	Jadwin Volunteer Fire Department	Debris	20
2003-00005-003089	10/29/2003	Dent	MDC REPORTING REGION - OZARK	Debris	3
2003-00005-004148	8/24/2003	Dent	MDC REPORTING REGION - OZARK	Smoking	1
2003-00005-004149	8/5/2003	Dent	MDC REPORTING REGION - OZARK	Lightning	3
2003-03332-003087	8/5/2003	Dent	Jadwin Volunteer Fire Department	Lightning	4
2003-03332-003088	8/5/2003	Dent	Jadwin Volunteer Fire Department	Lightning	3
2003-03332-002925	4/29/2003	Dent	Jadwin Volunteer Fire Department	Debris	2
2003-00005-001545	4/14/2003	Dent	MDC REPORTING REGION - OZARK	Debris	0.5
2003-00005-001528	4/2/2003	Dent	MDC REPORTING REGION - OZARK	Debris	2
2003-00005-001513	4/1/2003	Dent	MDC REPORTING REGION - OZARK	Debris	10
2003-00005-001502	3/31/2003	Dent	MDC REPORTING REGION - OZARK	Debris	6
2003-00005-001367	3/24/2003	Dent	MDC REPORTING REGION - OZARK	Debris	20
2003-03316-001325	3/15/2003	Dent	Dent County Fire Protection District	Debris	5
2003-03316-001172	3/15/2003	Dent	Dent County Fire Protection District	Debris	5
2003-03316-001167	3/9/2003	Dent	Dent County Fire Protection District	Debris	1

2003-03316-001169	3/9/2003	Dent	Dent County Fire Protection District	Debris	1
2003-03316-001165	3/9/2003	Dent	Dent County Fire Protection District	Miscellaneous	2
2003-10164-002784	3/8/2003	Dent	Timber Community Fire Protection District	Unknown	1
2003-03332-001953	3/8/2003	Dent	Jadwin Volunteer Fire Department	Debris	
2003-10100-002827	3/8/2003	Dent	EMINENCE FORESTRY	Debris	2
2003-03316-001166	3/8/2003	Dent	Dent County Fire Protection District	Miscellaneous	2
2003-03316-001164	3/8/2003	Dent	Dent County Fire Protection District	Debris	2
2003-03332-001128	3/7/2003	Dent	Jadwin Volunteer Fire Department	Debris	5
2003-03316-001163	1/27/2003	Dent	Dent County Fire Protection District	Equipment	1
2003-03331-001576	1/9/2003	Dent	MONTAUK RFD	Debris	1.5
2002-03316-001161	12/21/2002	Dent	Dent County Fire Protection District	Debris	3
2002-03332-000759	11/22/2002	Dent	Jadwin Volunteer Fire Department	Debris	2
2002-03332-000749	11/21/2002	Dent	Jadwin Volunteer Fire Department	Equipment	
2002-03332-000728	11/14/2002	Dent	Jadwin Volunteer Fire Department	Smoking	
2002-03331-000842	11/13/2002	Dent	MONTAUK RFD	Debris	2
2002-00005-001337	11/8/2002	Dent	MDC REPORTING REGION - OZARK	Miscellaneous	0.25
2002-00005-	9/12/2002	Dent	MDC REPORTING REGION - OZARK	Debris	1

001314					
2002-00005-001316	9/12/2002	Dent	MDC REPORTING REGION - OZARK	Debris	1
2002-00005-001306	8/8/2002	Dent	MDC REPORTING REGION - OZARK	Debris	150
2002-00005-001301	8/8/2002	Dent	MDC REPORTING REGION - OZARK	Debris	15
2002-00005-001299	8/7/2002	Dent	MDC REPORTING REGION - OZARK	Debris	3
2002-03331-000839	7/14/2002	Dent	MONTAUK RFD	Debris	1
2002-03331-000837	7/2/2002	Dent	MONTAUK RFD	Equipment	1
					11234.97