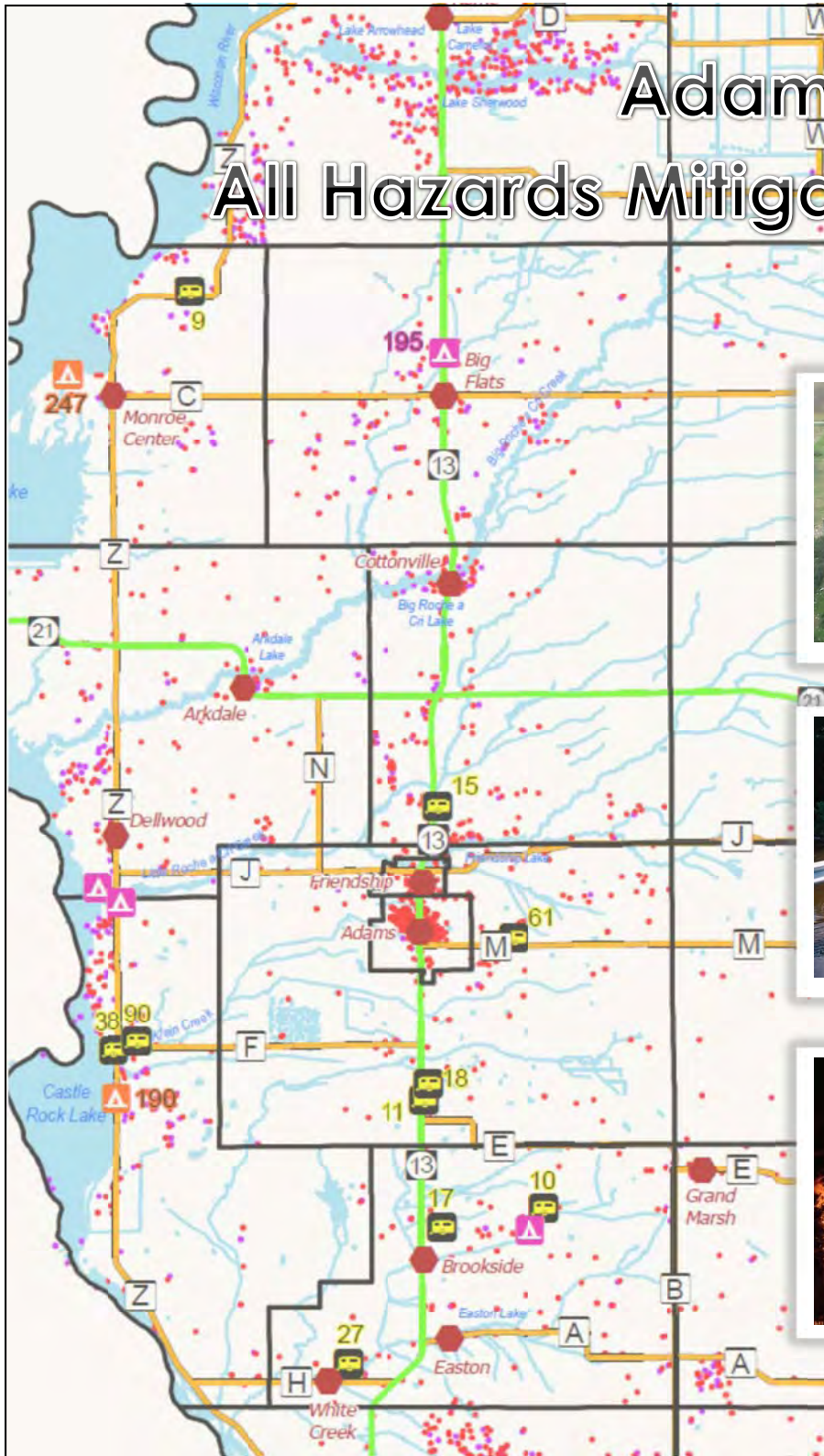


# Adams County All Hazards Mitigation Plan Update



Prepared by:

**North Central Wisconsin  
Regional Planning Commission**



## ADAMS COUNTY ALL HAZARDS MITIGATION PLAN UPDATE

prepared for:

Adams County Emergency Management

by:

North Central Wisconsin Regional Planning Commission

adopted by Adams County Board on:

August 18, 2015

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This update was prepared at the request and under the supervision of the Adams County Public Safety and Judiciary Committee and its Emergency Management Director by the North Central Wisconsin Regional Planning Commission (NCWRPC). For more information, contact:

NORTH CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION  
210 McCLELLAN STREET, SUITE 210  
WAUSAU, WI 54403



Telephone: 715-849-5510

FAX: 715-849-5110

email: [staff@ncwrpc.org](mailto:staff@ncwrpc.org)

[www.ncwrpc.org](http://www.ncwrpc.org)

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**Introduction**

Part I of the Adams County All Hazards Mitigation Plan (AHMP) Update describes and documents the process used to develop the plan update. This includes how it was prepared and who (committee, organizations, departments, staff, consultants, etc.) was involved in the update process. It also describes the local governments involvement, the time period in which the update was prepared, and who to contact to answer questions and make recommendations for future amendments to the plan.

**Disaster Mitigation Act of 2000**

The development of the Adams County All Hazards Mitigation Plan Update is a response to the passage of the Disaster Mitigation Act of 2000 (DMA2K). On October 30, 2000, DMA2K was signed into law by the U.S. Congress in an attempt to stem the losses from disasters, reduce future public and private expenditures, and to speed up response and recovery from disasters. This Act (Public Law 106-390) amended the Robert T. Stafford Relief and Emergency Assistance Act. The following is a summary of the parts of DMA2K that pertain to local governments and tribal organizations:

- The Act establishes a new requirement for local governments and tribal organizations to prepare an All Hazards Mitigation Plan in order to be eligible for funding from FEMA through the Pre-Disaster Mitigation Assistance Program and Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards such as tornados, floods, wildfires need to be addressed in the risk assessment and vulnerability analysis parts of the All Hazards Mitigation Plan. Manmade types such as hazardous waste spills are encouraged but not required to be addressed.
- The Act authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state after a federal disaster to be used for development of state, local, and tribal organization All Hazards Mitigation Plans.
- The Act establishes November 1, 2004 as the date by which local governments and tribal organizations are to prepare and adopt their respective plans in order to be eligible for the FEMA's Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program.
- If a plan is not prepared by November 1, 2004, and a major disaster is declared, in order for a local government or tribal organization to

be eligible to receive funding through the Hazard Mitigation Grant Program, they must agree to prepare an All Hazards Mitigation Plan within one year.

- In addition, by not having an All Hazard Mitigation Plan, local governments and tribal organizations cannot utilize funding through the Pre-Disaster Mitigation Grant Program.
- All Hazard Mitigation Plans must be updated every five years.

**The Five Parts of an All Hazards Mitigation Plan Update**

The Adams County All Hazards Mitigation Plan Update was categorized into five parts in order to address FEMA’s local mitigation plan requirements. The five parts are as followed:

- Part I: Update Planning Process
- Part II: Planning Area
- Part III: Risk Assessment
- Part IV: Mitigation Strategy
- Part V: Plan Maintenance Process and Adoption

**Development of the All Hazards Mitigation Plan Update**

The Adams County Emergency Management Department received a Planning Grant in 2013 to update its All Hazards Mitigation Plan through the Hazard Mitigation Grant Program (HMGP).

In late 2013, the North Central Wisconsin Regional Planning Commission (NCWRPC) finalized a work agreement with Adams County and began preparation of the All Hazards Mitigation Plan at the request of the County Emergency Management Director in October of 2013.

The update process included regular Task Force Committee meetings as well as extensive involvement from the local units of government within Adams County and the counties surrounding Adams. A variety of local and regional agencies were involved in the development of the plan update at various stages, and extensive opportunity for public participation was provided including public informational meetings and hearings. All sections of the plan update report were reviewed and analyzed by the planning team at subsequent meetings and revised as established in the design of the update process for this Plan.

The remainder of this chapter expands on and provides more detail on key aspects of the update development process.



**Key Elements Of The Update To The 2009 Plan**

The major enhancements to the Adams County All Hazards Mitigation Plan develop through this update are as follows:

- ✓ Review of Recommended Revisions - The final Crosswalk for the previous plan approval listed a number of "recommended revisions" which were addressed in this update through the experience of subsequent plan adoptions from other counties.
- ✓ Review and update of planning area chapter - The planning area description and inventory was expanded and improved with additional information and updated statistics.
- ✓ Addition of economic impact modeling of the cumulative effects of job loss (due to hazard event) in the top industry sectors of the County.
- ✓ Review and update of risk assessment - The risk assessment was updated with documentation on recent hazard events. The priority level of hazards facing the County was also reviewed and updated.
- ✓ Review and update of Mitigation Strategy - The mitigation strategies chapter begins with a complete progress report on the strategies from the 2009 plan, establishment of new set of strategies for next five-year cycle and an updated prioritization of projects.

**All Hazards Mitigation Plan Update Taskforce**

The Adams County All Hazard Mitigation Plan Update was prepared under the guidance of an advisory taskforce that consisted of a cross section of government, agency and interest group representatives from across the County. Periodic meetings were held with the NCWRPC staff, the County Emergency Management Director (Jane Gervais), and the Task Force to provide input on the types of hazards to be considered, appropriate mitigation strategies, and to review draft reports. Task Force members and their representation are as follows:

Jan Baumgartner	Mayor, City of Adams
Marge Edwards	Supervisor, Adams County Board
Jon Gessner	Operations Manager, Adams-Columbia Electric Coop
Phil McLaughlin	Administrator, Adams County Planning and Zoning
Heidi Roekle	Director, Adams County Chamber of Commerce
Marc Sass	Forester, Wisconsin Dept of Natural Resources
Tony Sleeman	President, Village of Friendship

**Local Government Involvement**

There were a number of opportunities for the local units of government to become involved in the update process. All jurisdictions participated in the original plan as well as this update through one or more of these opportunities.

In June of 2014 a hazard mitigation issues survey was sent to each town chairperson and clerk requesting which hazards are a concern, input on past and future mitigation measures, and to document other information that could be incorporated into the All Hazards Mitigation Plan Update. Responses were received from 9 of 17 towns. A significant amount of information was gleaned from these questionnaires and incorporated into the planning document.

The City of Adams and Village of Friendship were extensively involved in the development of the plan update in two ways: 1) seats on the Update Planning Taskforce and 2) participation in formal City/Village Mitigation Planning Meeting. Mayor Jan Baumgartner represented the City on the Update Taskforce, and President Tony Sleeman represented the Village of Friendship.

A formal meeting to jointly involve the City and Village in the development of the All Hazards Mitigation Plan Update was held on October 27, 2014. City and Village officials were formally introduced to the update process by NCWRPC staff and walked through an exercise to develop plan elements specific to the City and Village. Participants in this meeting included the following:

- Bret Anderson      City of Adams Police Department
- Jan Baumgartner    City of Adams Mayor
- Bob Berry            Adams/Friendship Water Utility
- Jane Gervais        Adams County Emergency Management
- Mike Zant            Village of Friendship Public Works
- Tony Sleeman        Village of Friendship President

The participants at this meeting provided information on hazards that have significance to the area, discussed critical facilities and provided mitigation strategy ideas for the plan update.

**Neighboring Community Involvement**

One of the requirements of the update process was to include neighboring communities. In previous plans, the NCWRPC experienced low attendance in response to invitations to county emergency management staff from surrounding counties. As a result, NCWRPC staff

teleconferenced during the update process with staff from Columbia, Juneau, Marquette, Portage, Waushara and Wood counties. Ideas were exchanged about All Hazards Mitigation planning processes and strategies between the various counties.

**Local and Regional Agency Involvement**

Another requirement of the update process was to involve local and regional agencies that have a role in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-private interests. To meet this objective, the NCWRPC invited a diverse group of stakeholders to discuss potential hazard mitigation strategies.

The meeting was held on October 27, 2014 at the Adams County Courthouse in Friendship. Agencies and organizations represented include the following:

- Diane Anderson - WI Dept of Natural Resources
- Jane Gervais - Adams County Emergency Management
- Jon Gessner - Adams Columbia Electric Cooperative
- Sarah Grosshuesch- Adams County Health and Human Services
- Don Harnisch - Alliant Energy
- Brady Heck - Allied Coop
- Lucas Killick - Chula Vista Resort
- Darryl Landeau - North Central WI Regional Planning
- Amy Luebke - WI Dept of Natural Resources
- Greg Pulver - Alliant Energy
- Marc Sass - WI Dept of Natural Resources
- Wally Sedlar - Adams County Land & Water Conservation
- Joel Torkilsen - WE-Energies
- Phil Wenzel - Chula Vista Resort

A number of other agencies were invited but chose not to attend.

During the meeting, the Plan Update and its components were introduced to the attendees. Mitigation strategy ideas were solicited and a number of ideas were discussed at length with the group. Part IV of the Plan was revised based on the meeting.

During the meeting a number of issues were discussed. Meeting attendees brought up issues with power outage and gas leakage, high volume tourist attractions, health concerns associated with disaster events, evacuation and shelter, communication and public education, and coordination and cooperation.

**Public Review Process and Plan Adoption**

Opportunities for public comment were provided to review the Plan during the drafting stage and prior to Plan approval. See APPENDIX A for copies of public meeting notices. A copy of draft Plan elements were made available on the Internet during the planning process. Links that open an email submission form to the County Emergency Management Director or NCWRPC Staff were provided for questions or comments. The final Plan document will remain on the Internet until the next draft update is posted for review. The public can continue to submit questions or comments at any time via the email link. (See Contact Information, below, for web addresses.)

County Public Safety & Judiciary Committee meetings are always open to the public (unless entering into legal closed session), and the public can bring questions or comments regarding this Plan Update to any regular meeting. Meeting schedules can be obtained by checking the County website, contacting the County Clerk's Office or the Emergency Management Director (see Contact Information, below).

A public informational meeting on the draft update was held at the Adams County Courthouse on October 27, 2014. Notices were distributed to each local unit of government and posted in the local newspapers. However, no one from the public attended, and thus no public comments were received. In addition, no written comments were submitted.

A public hearing was held by the County Public Safety & Judiciary Committee on August 12, 2015. No one from the public attended and thus no public comments were received. In addition, no written comments were submitted. Committee members noted some issues with the background data and a typo in one of the recommendations that needed to be addressed. Following the public hearing, the County Board approved the plan update at a subsequent meeting, see the resolution in Appendix B for details on this meeting. A brief overview of the update process and resulting updated plan was provided by Staff, and there was some general discussion by the Board.

The City and Village were asked to adopt the plan update for their jurisdictions at their own properly posted and open public meeting, see APPENDIX B for the County and other local units resolutions of adoption.

**Incorporated Plans, Studies, Reports And Technical Data**

Many plans, reports, and technical data were referenced and incorporated into the Adams County All Hazards Mitigation Plan Update. The following is comprehensive list of the data was used:

- Adams County Comprehensive Plan
- Town of Rome Community Wildfire Protection Plan
- Big Flats-Monroe Community Wildfire Protection Plan
- County Economic Development Strategy Report
- Adams County Emergency Operations Plan
- Emergency Action Plans – various dams within county
- Flood Insurance Study...for Adams County and Incorporated Areas
- DFIRM Maps for Adams County
- Hazard Analysis for the State of Wisconsin
- Land and Water Resource Management Plan – Adams County
- Zoning Ordinance – Adams County
- State of Wisconsin Hazard Mitigation Plan
- Adams County All Hazards Mitigation Plan 2009
- Hazardous Materials Commodity Flow Study, Adams County, 2013

**Contact Information**

Jane Gervais, Director  
Adams County Emergency Management  
Adams County Courthouse  
400 Main Street  
Friendship, WI 53934

608-339-4248  
[emmgmt@co.adams.wi.us](mailto:emmgmt@co.adams.wi.us)

Go to:

[www.ncwrpc.org/adams/adamshzdplan/index.html](http://www.ncwrpc.org/adams/adamshzdplan/index.html)

[www.co.adams.wi.gov/Departments/EmergencyManagement/tabid/74/Default.aspx](http://www.co.adams.wi.gov/Departments/EmergencyManagement/tabid/74/Default.aspx)

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**INTRODUCTION**

Part 2 of the Adams County All-Hazard Mitigation Plan Update provides general geographical information on Adams County including demographic and economic characteristics. The general development patterns of the County are described in terms of current land use and future development trends.

In addition to developing an understanding of the planning area, this chapter represents the beginning stages of assessing vulnerability by inventorying the numbers, types and values of existing buildings, infrastructure and critical facilities within each participating jurisdiction in the planning area. This overall summary of each jurisdiction's vulnerability to hazards describes the potential impact on the community.

Land use and development trends are analyzed to project the number and type of potential future buildings, infrastructure and critical facilities within each jurisdiction so that mitigation options can be considered in future land use decisions.

The resulting information is an important element of the update process, since sound alternative mitigation strategies cannot be formulated and evaluated without an in-depth knowledge of the relevant conditions in the study area.

**GENERAL GEOGRAPHY****LOCATION**

Adams County is located in central Wisconsin (See Map 1). The largest urban areas are the City of Adams and the Village of Friendship, which border each other and are located in the center of the County. The City of Wisconsin Dells is encroaching from the south into the southwest corner of the County but is covered under Columbia County's mitigation plan. The County is bounded on the north by Portage and Wood Counties, on the east by Marquette and Waushara, on the south by Columbia, and on the west by Juneau County.

Adams County lies 150 miles northwest of Milwaukee; 116 miles southwest of Green Bay; 87 miles east of La Crosse and 78 miles north of Madison. Major metropolitan areas outside of Wisconsin with transportation linkages to Adams County are Chicago, 219 miles southeast; Minneapolis-St. Paul, 202 miles northwest; and Duluth, 294 miles north.

**CIVIL DIVISIONS**

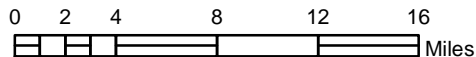
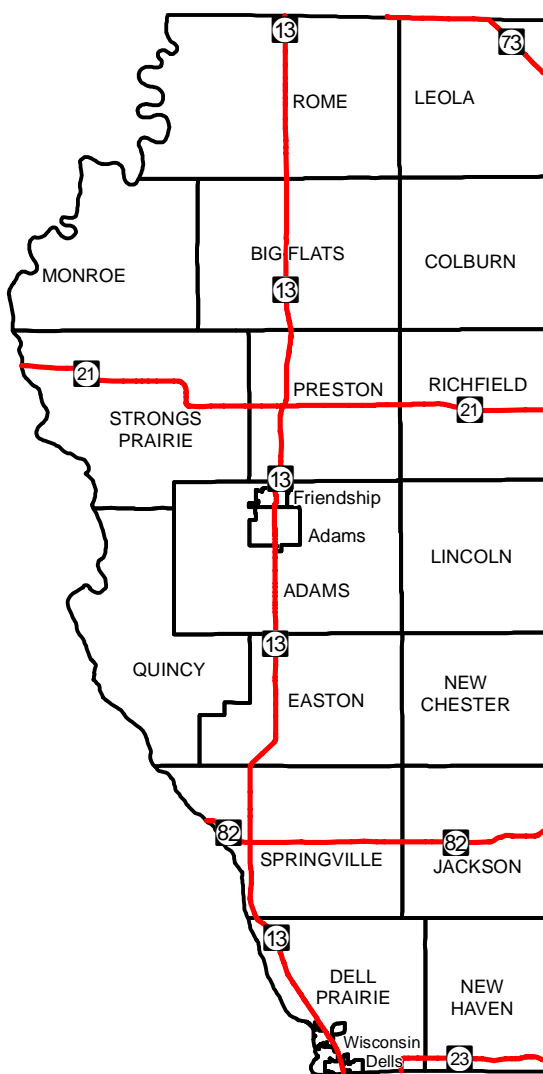
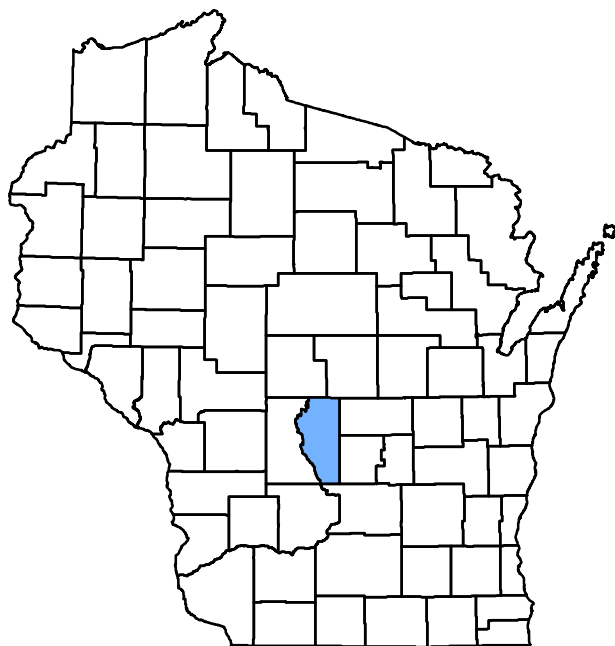
There are 20 municipalities (17 towns, 1 village, and 2 cities) in the Adams County planning area. The Village of Friendship is the County Seat. These units of government provide the basic structure of the decision-making framework.

Although not general-purpose units of governments, there are also 9 lake and/or sanitary districts. The County has a total surface area of 688 square miles, of which 6.2 % is water. The area and proportion of the County within each civil division is presented in Table 1. The County recently rectified some ambiguity in its boundaries with Juneau County due to the river and flowages between them which may explain some variation in comparing data sets on land area.

<b>Municipality</b>	<b>Area in square miles</b>			<b>Area as % of County</b>
	<b>Water area</b>	<b>Land area</b>	<b>Total area</b>	
Adams city	0	2.94	2.94	0.43%
Adams town	0.31	50.09	50.4	7.33%
Big Flats town	0.16	47.89	48.05	6.98%
Colburn town	0.01	35.86	35.87	5.21%
Dell Prairie town	1.19	31.52	32.71	4.75%
Easton town	0.09	36.02	36.11	5.25%
Friendship village	0.04	0.90	0.94	0.14%
Jackson town	1.00	34.64	35.64	5.18%
Leola town	0.03	37.22	37.25	5.41%
Lincoln town	0.05	36.05	36.1	5.25%
Monroe town	16.56	21.87	38.43	5.59%
New Chester town	0.26	31.09	31.35	4.56%
New Haven town	1.25	29.12	30.37	4.41%
Preston town	0.49	35.33	35.82	5.21%
Quincy town	7.02	32.54	39.56	5.79%
Richfield town	0.01	35.54	35.55	5.17%
Rome town	8.11	54.11	62.22	9.04%
Springville town	0.97	43.71	44.68	6.49%
Strongs Prairie town	4.69	47.27	51.96	7.55%
Wisconsin Dells (part)	0.06	1.72	1.78	0.26%
Adams County	42.30	645.43	687.73	100.00%

Source: U.S. Census, 2010 and NCWRPC, 2014





Source: WIDNR, NCRWPC

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCRWPC is not responsible for any inaccuracies herein contained.



Prepared By:  
**North Central  
 Wisconsin Regional  
 Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 staff@ncwrpc.org - www.ncwrpc.org

**TOPOGRAPHY**

Adams County is in the Wisconsin Central Plain, which is characterized by flat or gently undulating topography. Relief is generally low, and the county has extensive wetlands of various types. There are also occasional pinnacles and hills of sandstone such as Pilot Knob, Rabbit Mound, Friendship Mound and Roche-A-Cri Mound.

Roche-A-Cri Mound rises 300 feet above the surrounding plain to an elevation of 1,185 feet. Elevations along the Wisconsin River range from 850 feet in the southern part of the County to 950 feet in the northern part. The altitude of the outwash plain ranges from 1,000 to 1,100 feet.

The Johnstown moraine in southeastern Adams County divides the drainage between the Wisconsin and Fox Rivers. The principal drainage in Adams County is westward to the Wisconsin River. Little Roche-A-Cri Creek, Big Roche-A-Cri Creek and Fourteen Mile Creek are the major tributaries. Drainage east of the moraine is to the Fox River via Neenah Creek, Widow Green Creek, and other tributaries.

Streams in Adams County begin in outwash plains, which provide relatively large and constant amounts of ground water. Average regional runoff is about 9 inches per year. The Wisconsin River is regulated by dams and has a relatively constant flow. Floodplains in Adams County are small, and floods occur only during periods of exceptionally heavy rainfall.

**CLIMATE**

Adams County has a continental climate that is characterized by long, cold, snowy winters; warm summers; and springs and falls that are often short. From late fall through spring, the weather changes every few days because of air masses that are part of pressure systems moving eastward and northeastward over the northern states.

In winter, the average temperature is 18 degrees F., and the average daily minimum temperature is 8 degrees. The lowest temperature on record is -43 degrees, which occurred in 1951. The number of days at or below 0 degrees has varied from 9 in 1931 to 57 in 2008. In summer, the average temperature is 69 degrees and the average daily temperature is 82 degrees. The highest recorded temperature is 114 degrees, which occurred in 1936. The number of days at or above 90 degrees has varied from 1 in 1951 to 53 in 1931.

Average total annual precipitation is 34.14 inches. Of this, about 70% usually falls in April through September. The heaviest 1-day rainfall on record was 7.67 inches on August 7, 1980. Thunderstorms occur on about 39 days each year.

Hail falls on an average of two days a year. Average seasonal snowfall is 39.8 inches, with 97.4 inches (2007-8) being the greatest total on record.

**DEMOGRAPHIC AND ECONOMIC PROFILE**

**POPULATION AND HOUSEHOLDS**

The official state 2013 population estimate for Adams County shows a population of 20,834 people for the County. This represents essentially no change from the 2010 Census reported population of 20,875 people. Since 2000, the population of Adams County has increased by 4.6% or by 914 people. Historically, Adams County has been among the fastest growing counties in the state going back to 1990, outpacing its neighbors, and only more recently being matched and surpassed (refer to Table 2). If the growth rate continues at the current level, there will be approximately 21,795 people in Adams County in 2026, and 22,798 people in 2039.

Population concentrations and trends are important when prioritizing hazard mitigation strategies. Adams/Friendship is one of the most densely populated and developed areas in the County. Other areas of population concentrations are around Lakes Camelot, Sherwood, and Arrowhead in the Town of Rome; along Castle Rock Lake in the Town of Quincy; and the communities of Dellwood, Easton, Brooks, Grand Marsh, and Big Flats. Map 2 (below) shows areas of residential population concentrations in the County. Overall population density of the County is 30.28 persons-per-square-mile and ranges from a high of 736 in the Village of Friendship to a low of 4.4 in the Town of Richfield.

<b>County</b>	<b>2000</b>	<b>2013</b>	<b># Change</b>	<b>% Change</b>
Adams	19,920	20,834	914	4.6%
Columbia	52,468	56,804	4,336	8.3%
Juneau	24,316	26,912	2,596	10.7%
Marquette	14,555	15,376	821	5.6%
Portage	67,182	70,903	3,721	4.9%
Waushara	23,066	24,481	1,415	6.1%
Wood	75,555	74,583	-969	-1.3%
Wisconsin	5,363,675	5,717,110	353,435	6.6%

*Source: U.S. Census, 2000, WisDOA, 2014 and NCWRPC, 2014*

Between 2000 and 2013, most communities within Adams County have experienced an increase in their population base (refer to Table 3). The greatest amount of growth occurred in the Town of Colburn with a 25% increase

between 2000 and 2013. The Town of Dell Prairie continued to have strong growth, increasing 14% over that time period. The City of Wisconsin Dells has also exhibited strong growth numbers within Adams County as a result of annexing into the Town of Dell Prairie. However, the relatively small numbers involved skew the result.

<b>MINOR CIVIL DIVISION</b>	<b>2000 Population</b>	<b>2000 Households</b>	<b>2013 Population</b>	<b>2013 Households</b>	<b>% '00-'13 Population</b>	<b>'00-'13 % Households</b>
Adams town	1,267	547	1,353	588	6.8%	7.5%
Big Flats town	946	402	1,023	447	8.1%	11.1%
Colburn town	181	83	227	111	25.4%	33.4%
Dell Prairie town	1,415	553	1,614	659	14.1%	19.1%
Easton town	1,194	486	1,130	477	-5.4%	-1.9%
Jackson town	926	397	1,001	463	8.1%	16.7%
Leola town	265	107	307	126	15.8%	18.1%
Lincoln town	311	129	291	127	-6.4%	-1.5%
Monroe town	363	168	407	206	12.1%	22.4%
New Chester* town	2,141	371	2,185	946	2.1%	155.0%
New Haven town	657	260	658	265	0.2%	2.0%
Preston town	1,360	561	1,399	622	2.9%	10.8%
Quincy town	1,181	569	1,167	575	-1.2%	1.0%
Richfield town	144	62	157	77	9.0%	24.7%
Rome town	2,656	1,181	2,741	1,293	3.2%	9.5%
Springville town	1,167	487	1,322	540	13.3%	10.8%
Strongs Prairie town	1,115	502	1,155	532	3.6%	6.0%
Friendship village	781	257	692	302	-11.4%	17.6%
Adams city	1,831	769	1,944	884	6.2%	14.9%
Wisconsin Dells city (part)	19	9	61	31	221.1%	244.0%
<b>Adams County Total</b>	<b>19,920</b>	<b>7,900</b>	<b>20,834</b>	<b>9,270</b>	<b>4.6%</b>	<b>17.3%</b>

Source: U.S. Census, 2010, WisDOA, 2014 and NCWRPC, 2010 \*Includes Oxford Federal Prison in pop. totals.

According to the Wisconsin Department of Workforce Development the median age in Adams County is 48.9, and characterizes it as "relatively old in comparison to the State's median age of 38.5. The County has been identified as a retirement area resulting from being a vacation spot for many seasonal homeowners. Location of seasonal housing is a strong indicator in terms of retirement location. In Adams County 44.3% of all housing units have been identified as seasonal/recreational, which is among the highest percentages in the State.

**SEASONAL POPULATION**

The impact of this seasonal population cannot be overlooked when planning for hazards. Table 4 shows potential seasonal residents by municipality estimated based on seasonal housing data presented in the 2010 Census. Determining when and for how long these seasonal residents will be in the County is problematic, but the numbers give some indication of what weekend or other peak period population levels might be.

<b>Municipality</b>	<b>Seasonal Housing Units</b>	<b>Estimated Seasonal Population</b>
Adams town	261	600
Big Flats town	599	1,372
Colburn town	100	205
Dell Prairie town	249	610
Easton town	312	739
Jackson town	595	1,285
Leola town	82	199
Lincoln town	82	188
Monroe town	350	693
New Chester town	262	605
New Haven town	101	250
Preston town	473	1,064
Quincy town	1,050	2,132
Richfield town	56	114
Rome town	1,917	4,064
Springville town	460	1,127
Strongs Prairie town	690	1,497
Adams city	24	55
Friendship village	26	57
Wisconsin Dells (part)	35	69
<b>Adams County</b>	<b>7,724</b>	<b>16,926</b>

*Source: U.S. Census, 2010 and NCWRPC, 2014*

Another component of the seasonal population includes short-term accommodations such as campgrounds or hotel-style lodging. The scope of this plan did not provide for a detailed inventory of accommodations, however

the Adams County Outdoor Recreation Plan identifies about 1,900 campsites within the County including 500 at Petenwell County Park in the Town of Monroe, 200 at Castle Rock County Park in the Town of Quincy, 41 at Roche-A-Cri State Park in the Town of Preston and 1,160 private sites in various campgrounds across the County.

In addition, the NCWRPC estimates that there are over 860 resort / motel type rooms within the County including the 620 room (equivalents) Chula Vista Resort within the area annexed to the City of Wisconsin Dells and 160 units at Northern Bay in Strongs Prairie.

## EMPLOYMENT

The County's highly seasonal economy is reflected in the large share of workers in seasonal leisure and hospitality jobs. The leisure and hospitalities industries employ more than a quarter of total employment. Employment in the leisure and hospitality sector swells to cater to the waves of tourists that move through the County each year, as well as to the retirees relocating here. As a result, Adams has a higher concentration of food preparation and sales related occupations than the statewide average.

<b>Company</b>	<b>Product or Service</b>	<b>Size</b>	<b>Location</b>
Chula Vista Inc.	Hotels and motels...	500-999	C. Wisconsin Dells
Adams-Friendship Public School	Elementary and secondary schools	250-499	Various locations
Oxford Federal Correctional Institution	Correctional institutions	250-499	T. of New Chester
County of Adams	Public services	200-249	Various locations
Rock Tenn Services Inc.	Corrugated & solid fiber box mfg	100-249	C. of Adams
Moundview Hospital and Clinics	General medical & surgical hospitals	100-249	V. of Friendship
Heartland Farms Inc.	Potato Farming	50-99	Various locations
Spencer Super AF County Market	Supermarkets and other grocery stores	50-99	C. of Adams
Villa Pines Living Ctr	Nursing care facilities	50-99	V. of Friendship
Woodside Sports (Formerly Mike & Tim Properties LLC)	Amusement and Theme Parks	50-99	Various locations

*Source: Wisconsin Department of Workforce Development, 2013*

Accommodation and food services and drinking places together employ over 1,165 workers. Many of these jobs are seasonal or part-time. As resorts in the Wisconsin Dells area continue to expand, the accommodations sector within the County has added significant jobs. Chula Vista Resort has actually grown into the largest employer in Adams County, refer to Table 5.

The education and health sector is the second largest source of jobs in the County. The Adams-Friendship School District is the second largest employer in the County. Moundview Hospital is one of the largest employers in the County, and Villa Pines Living Center nursing home is also in the top ten employers. Government is also a significant employer, where the Oxford Federal Corrections Facility near Grand Marsh is the third largest employer in the County.

<b>Estimated Employment Level within Municipality</b>	
<b>Municipality</b>	<b>Estimated Employment 2010</b>
Adams town	94
Big Flats town	93
Colburn town	31
Dell Prairie town	190
Easton town	168
Jackson town	168
Leola town	42
Lincoln town	39
Monroe town	78
New Chester town	558
New Haven town	99
Preston town	232
Quincy town	80
Richfield town	72
Rome town	229
Springville town	175
Strongs Prairie town	191
Adams city	1,177
Friendship village	562
Wisconsin Dells (part)	538
Adams County	4,818

*(Editor's Note: The content of this table was taken from the current Adams County Comprehensive Plan adopted in 2006. The numbers reflect projections based on assumptions of employees per acre of land area by type in 2004 and historical growth rates. While the information and assumptions used to generate it are somewhat dated, employment figures for individual municipalities are not readily available, making the table a good representation of the number of employees that may be found on a given day in each municipality.)*

Source: Adams County Comp Plan, 2006 and NCWRPC, 2014

Looking at the concentration of employment geographically shows the number of jobs spread across the County, see Table 6. However, the locations of major employers again become evident: the City of Adams has the highest concentration of jobs as the commercial center of the County, Friendship has County government and New Chester the Federal prison, while Chula Vista is in Wisconsin Dells. Identifying locations of large employment is important when prioritizing hazard mitigation strategies.

In addition to the seasonal swells in employment, the number of people working in a given locality fluctuates on a daily basis. The average commute time for Adams County residents is nearly 28 minutes. The county is a net exporter of labor. In other words, the County has fewer local jobs than residents who work. Over half of the County's workforce leaves the County for work while only about 1/5<sup>th</sup> comes in from other counties.

Agriculture is a major component of the economy in Adams County. There is significant agricultural employment in the area. The fact that a large portion of this employment is made up of migrant seasonal workers makes it difficult to quantify and track.

Adams County has a significant poverty rate, with the average annual per capita income more than \$4,700 under the Wisconsin state average.

**Economic Impact of Job Loss in Adams County**

To help determine the potential impact of a hazard occurrence on the economy of the County, EMSI economic modeling software was used to estimate the cumulative effects of job losses in the some of the top industry sectors of the County. A catastrophic, worst case, scenario is examined. Actual impacts would vary by degree of severity of the event. APPENDIX C contains a detailed printout of the analysis, and Table 7 shows a summary.

<b>Table 7</b>				
<b>Economic Impact of Catastrophic Event on Major Industrial Sectors of Adams County</b>				
<b>Sector</b>	<b># Firms</b>	<b>Multiplier</b>	<b>Potential Jobs Impacted</b>	<b>Earnings</b>
Crop Production	22	1.25	1,208	\$41,138,951
Corrugated Box Mfg	1	1.22	336	\$19,378,418
Convenience Stores	8	1.14	153	\$2,933,519
Hotels/Motels	5	1.18	775	\$19,213,446
Source: EMSI Economic Modeling Specialists and NCWRPC, 2015.				



**LAND USE/LAND COVER AND DEVELOPMENT PATTERNS**

Land use is an important determinant in the potential impact a particular hazard may have, and in action which may be taken to mitigate the hazard impacts. An understanding of the amount, type, and spatial distribution of urban and rural land uses within the County is an important consideration in the development of a sound hazard mitigation plan.

The Adams County Comprehensive Plan has categorized land use in Adams County into classifications. Aerial photos were used to digitize a land use Geographic Information System (GIS) coverage. Map 2 shows the land use and development concentrations in Adams County. Table 7 shows the acreage and percent of each classification.

**FORESTRY AND AGRICULTURE**

The dominant land uses in Adams County are forestry and agriculture. Land area in the County is approximately 58 percent forested, comprised of 258,000 acres of woodland. Agricultural land covers another 26 percent of the county's land area. The main agricultural practices in the county are irrigated vegetables and dairy farming. Cranberry production has expanded in the County, particularly in the Town of Leola. Agriculture is scattered throughout the county but much of it is on the eastern side. According to the Wisconsin Agricultural Statistic Service, Adams County actually gained farmland during the 1980's and 1990's – something uncharacteristic compared to the majority of Wisconsin's counties. FSA crop statistics indicate this trend is continuing with active croplands increasing from 69,498 acres in 2010 to 78,589 acres in 2014.

<b>Description</b>	<b>Acres</b>	<b>Percent</b>
Agriculture*	115,218.80	26.2%
Commercial and Industrial	1,961.67	0.4%
Public / Institutional	742.07	0.2%
Outdoor Recreation	1,652.68	0.4%
Residential	19,370.89	4.4%
Transportation	15,039.11	3.4%
Water	27,771.33	6.3%
Woodlands	258,480.90	58.7%
<b>Total</b>	<b>440,237.45</b>	<b>100.0%</b>

*Source: NCWRPC Inventory 2010, updated in T. Rome 2014 \*Broadly Includes farm areas in addition to active cropland: cranberry, open field & grasslands and other lands.*

**RESIDENTIAL DEVELOPMENT**

Land in residential development makes up 4.4 percent of the total county area. Residential concentrations are scattered throughout the county (see “Population and Households” above). Much of the scattered rural development is related to direct recreational demand as various types of housing have clustered along streams and lakes.

There are a number of mobile home parks in the county. According to the U.S. Census, there were 4,380 mobile homes in 2010. This is about 25 percent of housing units for the County compared to about 4 percent for the entire state. This is significant due to their vulnerability in natural hazards especially tornados. Map 15 displays the mobile home concentrations within the County.

**COMMERCIAL AND INDUSTRIAL DEVELOPMENT**

Commercial and industrial development makes up only about 0.4 percent of the total area of the County. Land use for commercial and industrial development is also scattered throughout the county. There are four designated industrial parks in Adams County. They are in the City of Adams, Village of Friendship, Town of Preston, and Town of Rome. Other industrial sites are located in the towns of Jackson and Lincoln. Commercial activity is located in the City of Adams and Friendship where it serves as a sub regional service center supported by the surrounding agri-business and tourist industry. Commercial activity in the unincorporated areas is primarily dominated by private commercial recreation.

**SURFACE WATER**

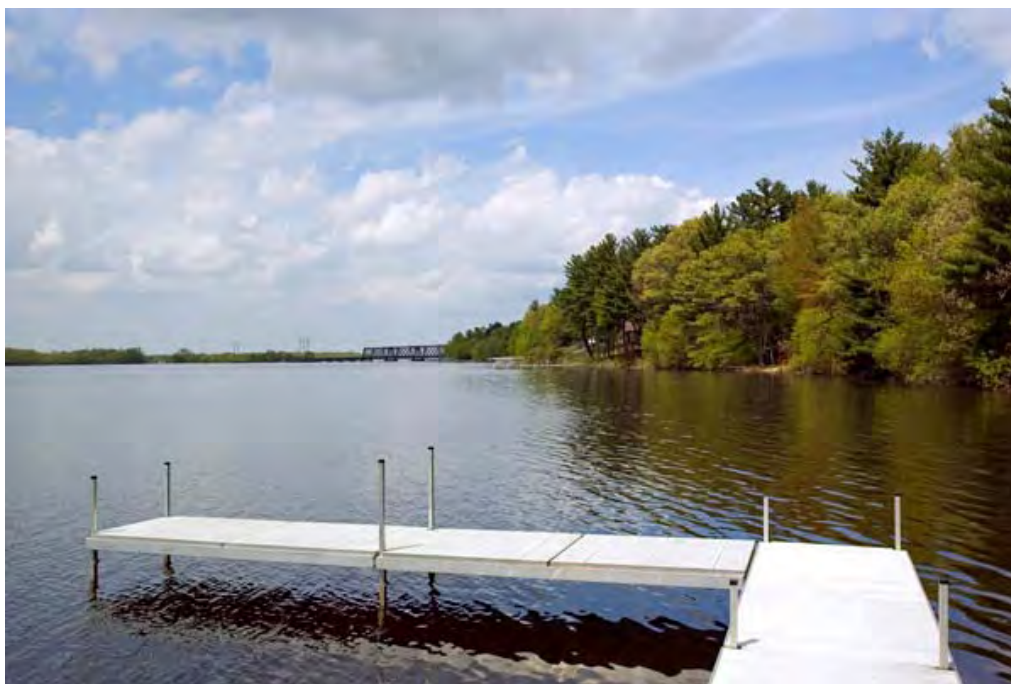
The majority of the land in the County is part of the Central and Upper Wisconsin River Basins. Five main watersheds make up the two Wisconsin River basins in Adams County – Fourteen Mile Creek, Big Roche A Cri, Little Roche A Cri, Duck and Plainville Creeks, and Neenah Creek (see Map 3). The Johnstown terminal moraine in southeastern Adams County forms the drainage divide between the Wisconsin and Upper Fox River Basins. Neenah Creek is the main watershed in Adams County for Upper Fox Basin.

Within the watersheds, there are 73 interior streams covering 234.5 linear miles and 450 surface acres (see Map 3), but 12 (of 26) named steams and 27 (of 47) unnamed streams possessing 31 percent of the total stream frontage have average widths of less than 10 feet, making them relatively undesirable for development. However, all the streams, like the lakes, are important in the hydrological and ecological regime and should be protected by shoreland zoning and physical protective measures.

Streams in Adams County, except the Wisconsin River, have their headwaters in outwash plains, which contribute relatively large and constant amounts of

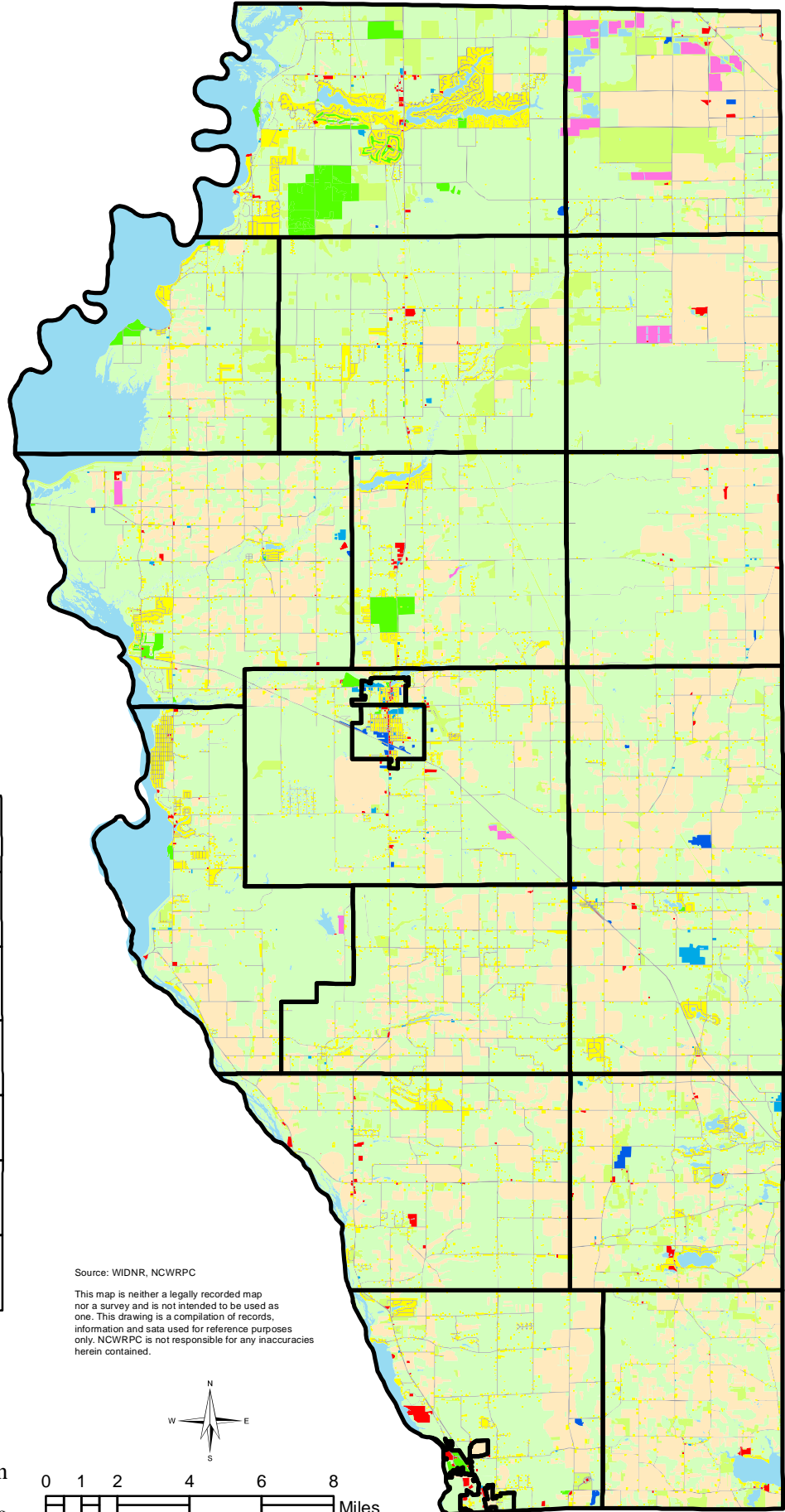
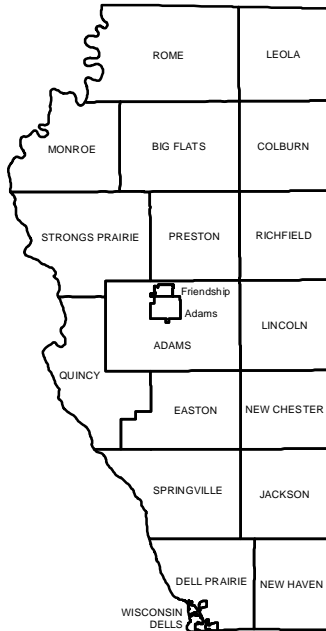
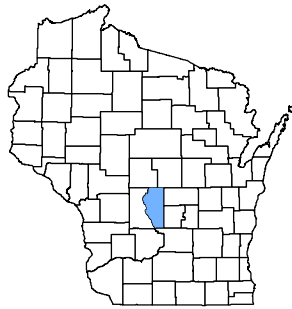
groundwater base flow to the streams. Regional average runoff in Adams County is about nine inches/0.7 cfs per square mile of drainage basin. The Wisconsin River is well regulated and has a relatively constant flow.

The total surface water area of lakes and streams in Adams County exceeds 25,000 acres. Petenwell and Castle Rock flowages, the 2<sup>nd</sup> and 5<sup>th</sup> largest lakes in the state, cover 16,295 acres together. Unlike most counties in the west central part of the state, Adams County has 7 natural lakes, all located on the east side of the moraine, in the Towns of Jackson and New Chester. All the other lakes in the county are impoundments (man-made lakes). Most of these are located west of the moraine. The 48 interior lakes add 2,439 acres, of which 22 have surface areas of less than 5 acres. Twenty-nine lakes have maximum depths of less than 10 feet. Several are subject to winter fishkill because of their shallowness. The two flowages and the 22 named lakes provide the bulk of the County’s high quality lake resources. Of the 26 unnamed lakes, the largest is 12.5 acres, only one is over ten feet deep, and 17 have no fishery. Named lakes have a total of about 71 miles of shoreline, and unnamed lakes add another 7.



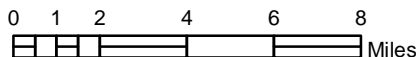
*Castle Rock Lake*

- Minor Civil Divisions
- Agriculture
- Commercial
- Cranberry Bog
- Governmental
- Industrial
- Multi-Family
- Open Lands
- Outdoor Recreation
- Residential
- Transportation
- Water
- Woodlands



Source: WIDNR, NCWRPC

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



Prepared By:  
**North Central  
 Wisconsin Regional  
 Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 staff@ncwrpc.org - www.ncwrpc.org

Lake Sherwood, Lake Camelot, and Lake Arrowhead Dams are located in the Town of Rome, see Map 4. These lakes were designed for recreational and economic purposes related to property development. They were formed by artificially constructing earthen dams made of native soil material across the river valleys. In 1967, Lake Sherwood was the first of the three dams created by damming Fourteen Mile and Spring Branch creeks. Lake Camelot was created in 1969 by damming Spring Branch Creek near the end of the upper arm of Lake Sherwood and Fourteen Mile Creek near the end of the lower arm. A channel between the two diverts part of the flow of Fourteen Mile Creek to the upper part of Lake Camelot to reduce stagnation problems that could have arisen from low flow in Spring Branch Creek and the resultant slow replacement of water in the lake. The Lake Arrowhead Dam was the last of the dams constructed in 1978 over Fourteen Mile Creek and is located approximately 2.7 miles west of State Highway 13. Nine of the dams in the county are owned by Adams County and managed by the Adams County Land & Water Conservation Department.

Floodplains and wetlands are important subsidiary components to the surface water system as described below.

### **Floodplain**

The primary value of floodplains is their role in natural flood control. Flood plains represent areas where excess water can be accommodated whether through drainage by streams or through storage by wetlands and other natural detention/retention areas. Specific areas that will be inundated will depend upon the amount of water, the distance and speed that water travels, and the topography of the area. If uninterrupted by development, the areas shown on a map as floodplains should be able to handle the severest (regional) flood, i.e. those that have a probability of occurring once every one hundred years.

There is a value in preserving and protecting these natural flood control areas from encroachment. First, by preventing development in the floodplain, the cost of building dikes, levies, or other man-made flood control devices will be saved. Second, for each structure that is constructed in a flood-prone area, that flood-prone area expands, potentially subjecting other structures originally built outside the delineated flood hazard area to the risk of flooding. Each new structure (or modification to existing) placed in the flood plain puts more life and property in danger.

Counties, cities, and villages are required to adopt reasonable and effective floodplain zoning ordinances. The requirement is found in section 87.30 of the Wisconsin Statutes and Chapter NR 116 of the Wisconsin Administrative Code.

Floodplain zoning is designed to protect individuals, private property, and public investments from flood damage.

Floodplain zoning maps identify areas where major floods occur. Regulations prohibit development in the floodway, the most dangerous flood area. In other flood areas, the flood fringe, development that is built above flood levels and otherwise flood-protected is allowed if it is in accordance with local ordinances. For regulatory purposes, a floodplain is generally defined as land where there is a 1% chance of flooding in any year (also known as the 100-year floodplain).

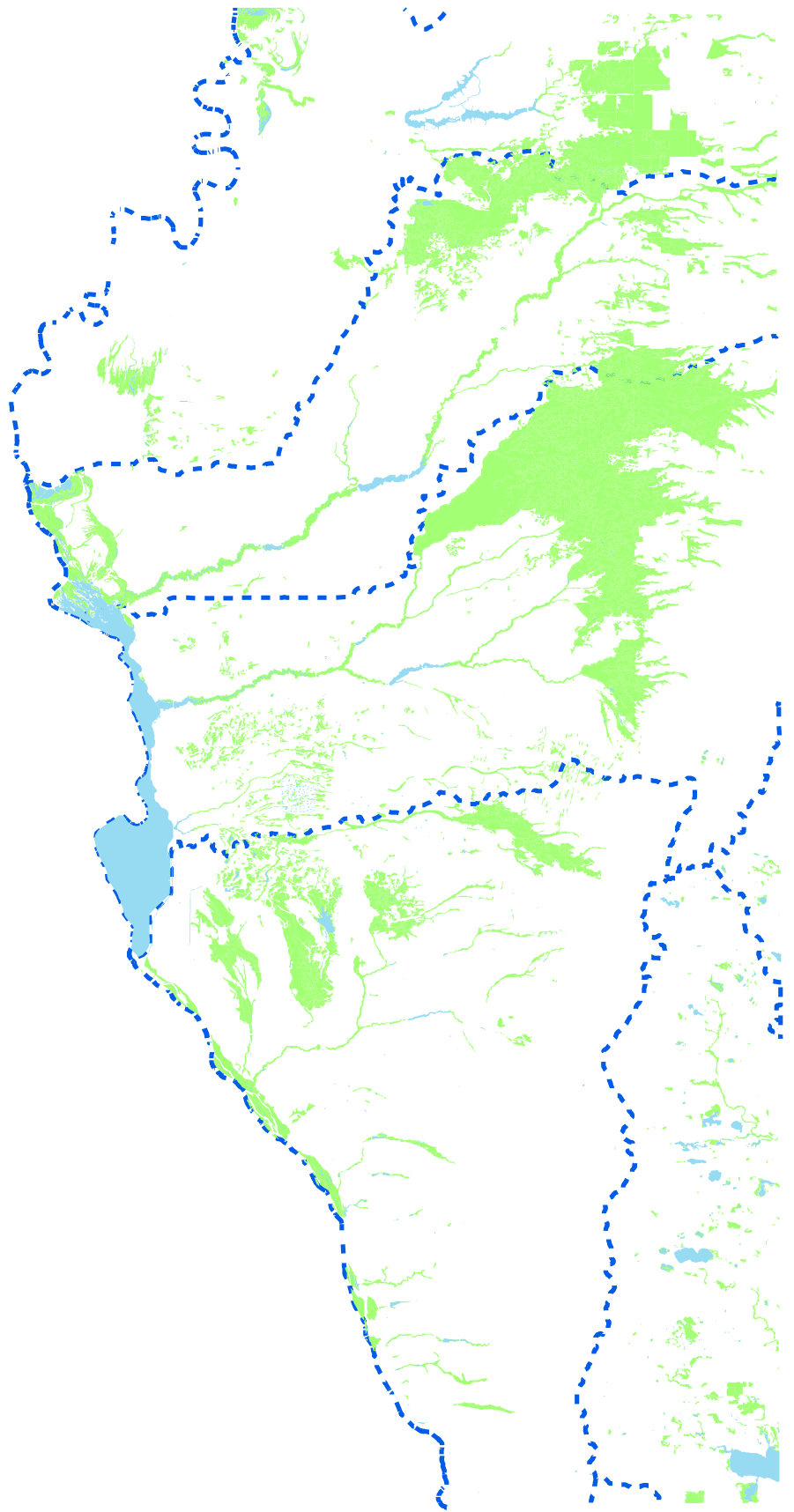
In order to participate in the Federal Emergency Management Agency’s (FEMA) National Flood Insurance Program (NFIP), the County, City of Adams, and Village of Friendship have completed a Flood Insurance Study and a Flood Insurance Rate Map (FIRM) that encompasses Adams County, see Table 9 for summary of NFIP status. This FIRM delineates the “A” Zones including the floodway and flood fringe which are those areas inundated by the 100-year flood within the County. Adams County has updated its FIRM to digital standards. The digital FIRMs are referred to as DFIRM. The NCWRPC downloaded the DFIRM from FEMA's website for use in this plan. Although unofficial, the digital files indicate there are 19,016 acres floodplain in Adams County, or 4.6 percent of the land area. Map 4 shows the approximate floodplains in Adams County. Floodplains in Adams are small and floods occur only during periods of exceptionally heavy rainfall.

<b>Table 9 FEMA Community Status Book Report Communities Participating in the National Flood Insurance Program Wisconsin - Adams County</b>				
<b>Community</b>	<b>Initial FHBM</b>	<b>Initial FIRM</b>	<b>Current Map</b>	<b>Program Entry</b>
Adams County	02/20/76	11/16/90	06/17/08	11/16/90
City of Adams	05/14/76	09/01/88	NSFHA*	09/06/88
Village of Friendship	05/03/74	11/16/90	06/17/08	11/16/90
<i>*No special flood hazard area - all zone C.</i>				

*Source: FEMA, 2014*

Currently, there are no repetitive loss structures, those with multiple flood insurance claims, in Adams County.

Adams County has also chosen to participate in the Community Rating System (CRS), which is a voluntary program that provides incentives for floodplain management activities that exceed minimum requirements for NFIP. Adams County has qualified for a Class 7 rating in the CRS which results in a 15% discount for flood insurance premiums.






























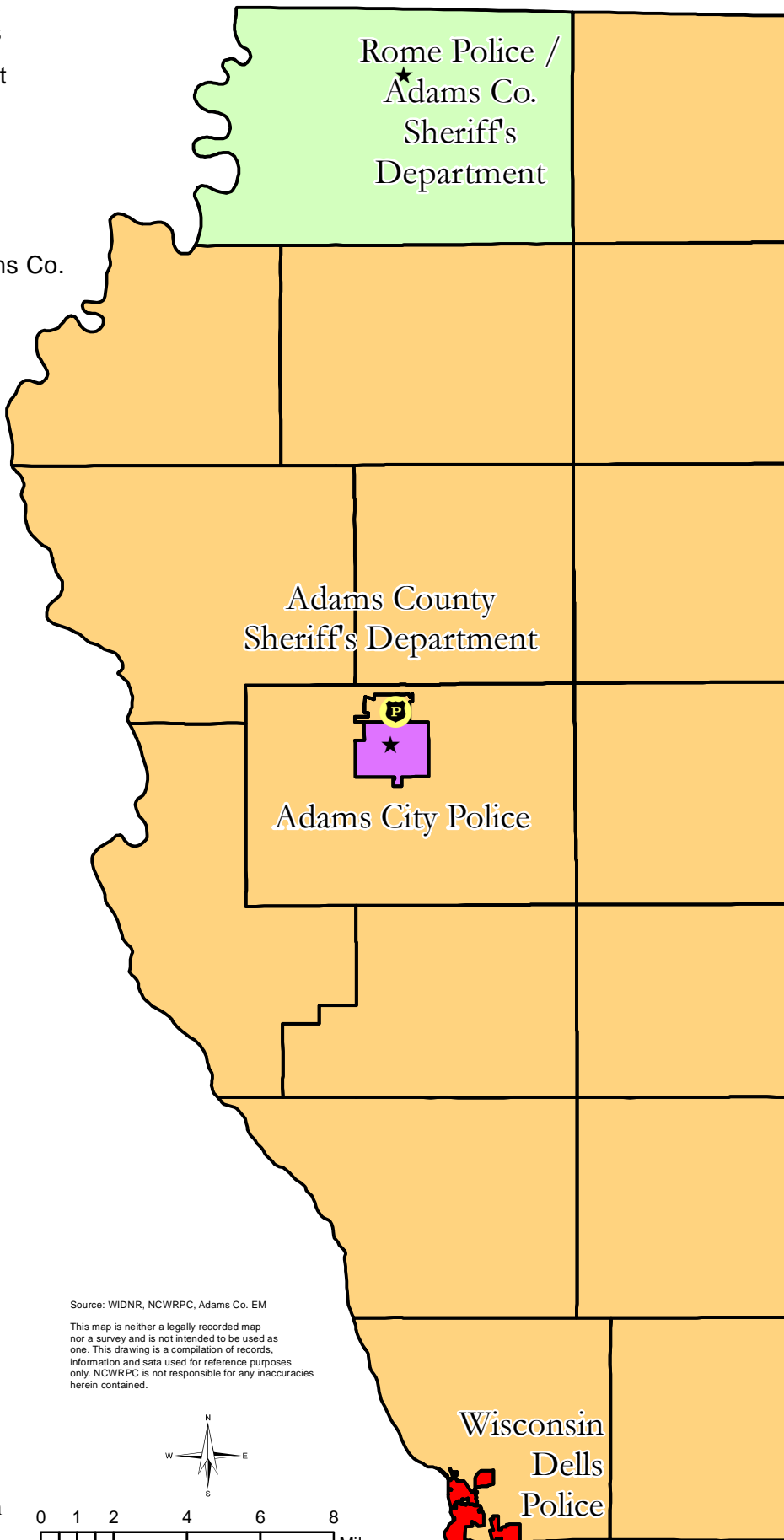
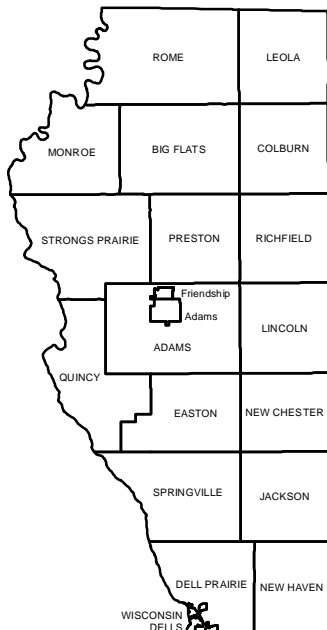




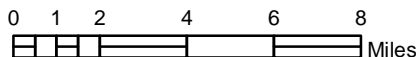




-  Minor Civil Divisions
-  Sheriff's Department
-  Police Department
-  Adams City Police
-  Adams County Sheriff's Dept.
-  Rome Police / Adams Co. Sheriff's Dept.
-  Wisconsin Dells Police



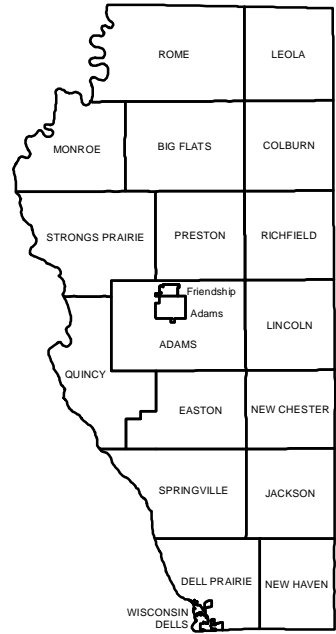
Source: WIDNR, NCWRPC, Adams Co. EM  
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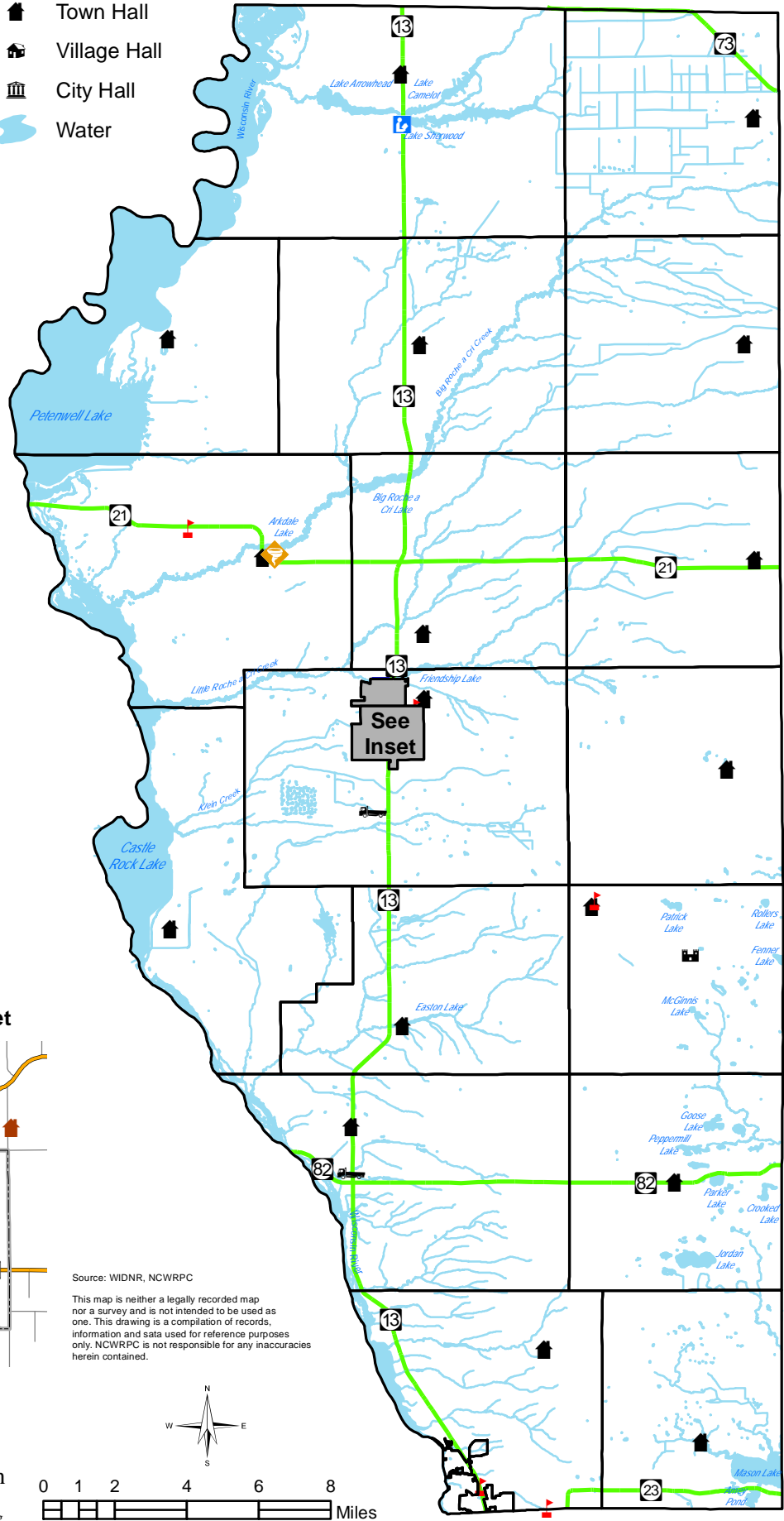
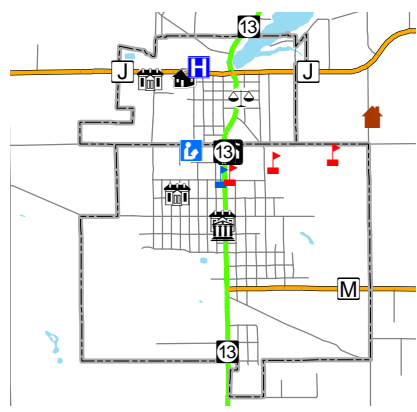
Wisconsin Dells Police

- Minor Civil Divisions
- State Highways
- 🏠 Tornado Shelter
- 🏠 Residential Care Facilities
- 🏠 Correctional Facility
- ⚖️ Courthouse
- 👮 DNR Ranger Station
- 🚓 Highway Department
- 🏥 Hospitals
- 📖 Library
- 🏫 Schools
- 🎓 Tech College

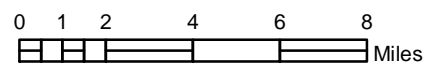
- 🏠 Town Hall
- 🏠 Village Hall
- 🏠 City Hall
- 💧 Water



Adams - Friendship Inset



Source: WIDNR, NCWRPC  
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**INVENTORY & VALUE OF STRUCTURES & PROPERTY IN ADAMS COUNTY**

The value of the real estate and personal property in a community reflects the upper end of the potential for property damages in each community. The annual equalized value of each municipality represents the Department of Revenue estimate of market value (Agricultural land is included at Use Value) of all taxable property. Property tax levies of jurisdictions are apportioned to each municipality on the basis of equalized value. Table 10 lists each municipality's total equalized values for real estate, personal property, and all property and the percent each municipality represents of the county total.

<b>District</b>	<b>Real Estate</b>	<b>Personal Property</b>	<b>Total</b>	<b>% of Total</b>
Adams town	\$111,303,000	\$2,191,800	\$113,494,800	4.85%
Big Flats town	\$85,424,800	\$494,100	\$85,918,900	3.67%
Colburn town	\$43,375,900	\$341,800	\$43,717,700	1.87%
Dell Prairie town	\$149,898,000	\$1,031,300	\$150,929,300	6.45%
Easton town	\$83,336,000	\$271,600	\$83,607,600	3.57%
Jackson town	\$159,932,600	\$435,600	\$160,368,200	6.85%
Leola town	\$36,895,500	\$286,900	\$37,182,400	1.59%
Lincoln town	\$37,917,300	\$141,500	\$38,058,800	1.63%
Monroe town	\$90,815,600	\$467,800	\$91,283,400	3.90%
New Chester town	\$80,509,700	\$814,400	\$81,324,100	3.47%
New Haven town	\$51,218,200	\$295,700	\$51,513,900	2.20%
Preston town	\$130,641,900	\$419,100	\$131,061,000	5.60%
Quincy town	\$164,732,300	\$2,435,500	\$167,167,600	7.14%
Richfield town	\$26,949,300	\$290,800	\$27,340,100	1.17%
Rome town	\$577,433,800	\$1,948,600	\$579,382,400	24.76%
Springville town	\$108,868,700	\$759,900	\$109,628,600	4.68%
Strongs Prairie town	\$181,784,400	\$1,246,600	\$183,031,000	7.82%
Friendship village	\$28,642,800	\$1,589,900	\$30,232,700	1.29%
Adams city	\$75,776,700	\$6,180,100	\$81,956,800	3.50%
Wisconsin Dells (part)	\$90,112,600	\$3,142,600	\$93,255,200	3.98%
<b>Adams County</b>	<b>\$2,315,569,100</b>	<b>\$24,785,400</b>	<b>\$2,340,354,500</b>	<b>100.00%</b>

Source: WisDOR, 2014

The valuation of property in a community reflects the potential for property damages across the community. However, only taxable properties are included in this valuation. Tax exempt government properties are not included. With Adams County owning many critical facilities that are needed in times of disaster, the potential for damages to these structures could be devastating for the county. In Table 10a, the county owned critical facilities are listed with the

general location they are in and the value of the facilities. Estimates for local government facilities are given in Table 10b - d.

<b>Name</b>	<b>Value*</b>	<b>Location</b>
Courthouse / Sheriff	\$20,846,797	Friendship village
Fairgrounds	\$2,118,405	Friendship village
County Storage	\$864,370	Friendship village
Solid Waste Main Facility	\$3,492,533	Strongs Prairie
Social Services	\$2,039,151	Friendship village
Airport	\$468,121	Adams town
Industrial Park	\$244,169	Jackson town
Highway Department	\$4,880,516	Adams town
Highway Dept. Satellites	692,599	Various Locations
Community Center	\$3,583,848	Adams city
HHS Practical Cents Store	\$1,587,287	Adams city
Parks	\$3,788,393	Various locations
Emergency Shelters	\$186,740	Various Locations
Misc. Other	\$793,299	Various locations
<b>Total</b>	<b>\$45,586,328</b>	<b>Above Locations</b>

\*=Includes insured buildings, contents, and property in the open.

Source: Statement of Values State of Wisconsin Local Government Property Insurance Fund, 2014.

<b>Property</b>	<b>Value*</b>
Municipal Building	\$2,252,336
City Garage	\$421,435
Pump Station	\$288,470
Treatment Plant	\$6,106,008
Pavilion	\$73,217
3 Well Houses	\$1,638,804
2 Water Towers	\$1,560,292
Lift Station	\$404,242
Misc Other	\$330,195
<b>Total</b>	<b>\$13,075,002</b>

\*includes insured building contents and property in the open.

Source: Local Government Property Insurance Statement of Values and NCWRPC estimate, 2014

<b>Property</b>	<b>Value*</b>
Village Hall	\$896,018
Public Works Building	\$735,250
Beach Park	\$166,849
Park	\$182,696
Lift Station	\$78,387
Other Misc.	\$269,603
<b>Total</b>	<b>\$2,359,862</b>

*\*includes insured building contents  
Source: Local Government Property Insurance Statement of Values  
and NCWRPC estimate, 2014*

<b>Municipality</b>	<b>Property</b>	<b>Value*</b>
Adams town	Town Hall/Garage	\$163,800
Big Flats town	Town Hall/Fire Dept	\$936,000
Colburn town	Town Hall/Garage	\$163,800
Dell Prairie town	Town Hall	\$81,900
Easton town	Town Hall	\$81,900
Jackson town	Town Hall	\$125,219
Leola town	Town Hall	\$76,678
Lincoln town	Town Hall/Garage	\$162,630
Monroe town	Town Hall/Garage/Fire Dept	\$691,000
New Chester town	Town Hall/Fire Department	\$837,708
New Haven town	Town Hall	\$168,246
Preston town	Town Hall/Garage	\$140,400
Quincy town	Town Hall/Fire Department	\$936,000
Richfield town	Town Hall	\$79,196
Rome town	Town Properties - 10 Locations	\$8,931,171
Springville town	Town Hall	\$309,900
Strongs Prairie town	Town Hall / Fire Dept	\$577,932

*\*includes insured building contents and property in the open  
Source: Local Government Insurance Policy Declarations and NCWRPC, 2014*



*Town of Rome Brush Fire Unit*



**INTRODUCTION**

Analyzing the hazards in a community is an important and critical step in the mitigation planning process. Before mitigation strategies can be determined, a risk assessment must be made. Part III of Adams County All-Hazards Mitigation Plan Update will focus on the following:

- Identification of all types of natural hazards that may affect Adams County; and
- An analysis of the hazards identified as pertinent to Adams County.

The Hazard Analysis will consist of:

- Background Information;
- History of previous occurrences of hazard events;
- An assessment of the County’s vulnerability to future events; and
- An estimate of future probability and potential losses from the hazard.

**HAZARD IDENTIFICATION**

The process of identifying those hazards that should be specifically addressed in the Adams County All-Hazards Mitigation Plan Update was based on consideration of a number of factors. The process included a review of past hazard events to determine the probability of future occurrences and threat to human safety and property damage.

Worksheets from the Wisconsin Guide to All-Hazards Mitigation Planning were used by the Planning Taskforce to evaluate and rank the listing of possible hazards to help identify which hazards should be included in the Plan Update according to threat to human safety and possible damage to property. The ranking was compared against the ranking from the original County mitigation plan and a similar exercise by the Health Dept.

After review of the hazard scoring exercise results, the Committee decided to move flooding ahead of Drought/Extreme Heat in priority because flooding is a serious recurring problem in the County with more opportunity for effective mitigation projects. This not to diminish the significance of Drought, which the Committee acknowledged as an on-going problem in recent years with impacts on agriculture and tourism, which are major components of the County's economy.

The resulting priority ranking of hazards accepted by the Committee is as follows:

1. Tornado

2. Winter Storms/Extreme Cold
3. Forest Fire
4. Flood/Dam Failure
5. Drought/Extreme Heat
6. Severe Thunderstorms/Lightning/Hail
7. Hazardous Materials Incidents

This Plan Update focuses on natural hazards that have or could cause disasters that can be mitigated on a local level. Technological or manmade hazards include things like transportation incidents, civil disturbances, mass casualty events, war, and terrorism. Adams County already has action plans for these types of events, so they are not included in this planning process. Low magnitude earthquakes occur in Wisconsin every few years, but none have exceeded a magnitude of 3.9, which would have vibrations similar to the passing of a semi-truck, therefore, earthquakes are not covered in this plan. Adams County does not have avalanche, coastal hazard, hurricane, tsunami or volcano issues and conditions for landslide, subsidence or expansive soil problems are not significant in the County.

Although a significant concern, human communicable diseases are not addressed in the plan. The Adams County Health Department and area hospitals work with the Wisconsin Department of Health Services (WDHS) and the CDC to monitor and plan for these situations.

### **HAZARD ANALYSIS**

The hazard analysis for each hazard included in this plan update is broken down into four components, as follows:

**1. Background on Hazard** - The next step after identifying a hazard is to define the hazard and give some general background behind it. This can include occurrence of the hazard within the County or State. This section may also give some indication of the risk to public health and safety and to personal and public property.

**2. History of Hazard** - Past experience of disasters is an indication of the potential for future disasters for which Adams County would be vulnerable. A review of past occurrences for each identified hazard in Adams County was completed.

Some disasters have had damages that exceeded the capabilities of local communities and state agencies. Federal assistance is then requested. Federal assistance may be offered through a variety of

programs. Assistance may be directed to agricultural producers, individuals and families, businesses, or local governments. There have been 10 natural disasters in Adams where Presidential Declaration was requested from 1971-2010. They include the following:

- 1973 Flood – Disaster Declaration Approved
- 1976 Drought - Disaster Declaration Approved
- 1993 Flood - Disaster Declaration Approved
- 1994 Tornados - Disaster Declaration Denied
- 2000 Severe Storms/Flooding - Disaster Declaration Approved
- 2001 Severe Storms/Flooding - Disaster Declaration Approved
- 2002 Severe Storms/Flooding - Disaster Declaration Approved
- 2004 Severe Storms/Flooding/Tornado - Disaster Dec. Approved
- 2005 Cottonville Wildfire - State Disaster Fund
- 2008 Flood – Disaster Declaration Approved
- 2010 Blizzard

It should be noted that this significantly underestimates the number of hazards that have occurred in Adams County. Almost every year there are significant weather events or disasters that cause thousands of dollars in damage for which no Federal disaster assistance is requested. Major indicators of hazard severity are the deaths, injuries, and economic losses resulting from natural hazards and disasters.

The National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) publish the National Weather Service (NWS) data describing recorded weather events and resulting deaths, injuries, and damages. From January 1, 1950 to December 31, 2013, NCDC reported 311 severe weather events for Adams County.

Note that since the earlier NCDC data is somewhat incomplete, this report focuses on the 10-year period from 2004 to 2013 for hazard analysis purposes. Other sources of data are used to supplement the NCDC data. These sources included other plans and reports, documents from the Adams County Emergency Management Department, past local newspaper articles, the Wisconsin Department of Natural Resources (DNR), Wisconsin Emergency Management (WEM), and the National Weather Service.

**3. Vulnerability Assessment For Hazard** - For each hazard identified, a summary of the impact that may be felt by the community is given. When possible, existing buildings, infrastructures, and critical facilities located in the hazard areas are identified. Critical facilities are community buildings that are especially important to the health and

welfare of the population following hazard events. Examples of such facilities include hospitals, police & fire stations, town halls, and shelters.

Because this is a multi-jurisdictional plan, FEMA requires that the plan access each jurisdiction's risks where they vary from the risks facing the entire planning area. This section of the plan will identify variations in vulnerability for specific municipalities where they occur.

**4. Future Probability and Potential Dollar Losses from Hazard** - The historic data and vulnerability assessment for each hazard is used to project the potential future probability of that hazard occurring in the County and the potential damages in dollars that might be reasonably expected. This section sets the benchmark to mitigate for each hazard.

### **HAZARD ANALYSIS: TORNADOS**

#### **Background on Tornado Hazard:**

A tornado is a relatively short-lived storm composed of an intense rotating column of air, extending from a thunderstorm cloud system. It is nearly always visible as a funnel, although its lower end does not necessarily touch the ground. Average winds in a tornado, although never accurately measured, are between 100 and 200 miles per hour, but some tornados may have winds in excess of 300 miles per hour.

A tornado path averages four miles, but may reach up to 300 miles in length. Widths average 300 to 400 yards, but severe tornados have cut swaths a mile or more in width, or have formed groups of two or three funnels traveling together. On average, tornados move between 25 and 45 miles per hour, but speeds over land of up to 70 miles per hour have been recorded. Tornados rarely last more than a couple of minutes in a single location or more than 15 to 20 minutes in a ten-mile area.

Tornados are classified into six intensity categories, EF0-EF5. This scale is an updated or "enhanced" version of the Fujita Tornado Scale (or "F Scale"). The scale estimates wind speeds within tornados based upon the damage done to buildings and structures. It is used by the National Weather Service in investigating tornados and by engineers in correlating building design and construction standards against anticipated damage caused by different wind speeds.

Wisconsin lies along the northern edge of the nation's maximum frequency belt for tornados, known as "Tornado Alley". Tornado Alley extends northeast from Oklahoma into Iowa and then across to Michigan

and Ohio. Winter, spring and fall tornados are more likely to occur in southern Wisconsin than in northern counties. Tornados have occurred in Wisconsin every month except February.

Table 11 Tornado Wind and Damage Scale		
Tornado Scale	Wind Speeds	Damage
EF0	65 to 85 MPH	Some damage to chimneys, TV antennas, roof shingles, trees, and windows.
EF1	86 to 110 MPH	Automobiles overturned, carports destroyed, trees uprooted
EF2	111 to 135 MPH	Roofs blown off homes, sheds and outbuildings demolished, mobile homes overturned.
EF3	136 to 165 MPH	Exterior walls and roofs blown off homes. Metal buildings collapsed or are severely damaged. Forests and farmland flattened.
EF4	166 to 200 MPH	Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.
EF5	OVER 200 MPH	Homes leveled with all debris removed. Schools, motels, and other larger structures have considerable damage with exterior walls and roofs gone. Top stories demolished

Source: National Weather Service

**History of Tornados in Adams County:**

Adams County has had 5 verified tornados from 2004 to 2013. These tornados are documented along with 22 other historic tornados in Table 12. The most recent was on April 10 2011 when the National Weather Service confirmed that a second tornado formed near County Highway G and Buttercup Avenue to the north of where the Arkdale - Cottonville tornado had dissipated. EF1 damage was noted to homes and trees, along Buttercup Avenue as the tornado tracked into Waushara County. Several center-post irrigation systems were destroyed along with some roof damage to homes and downed power lines. Damage estimates for this tornado were approximately \$426,000.

Date	Time CST	Location	Other Counties Affected	Length (miles)	Width (yards)	Deaths**	Injuries**	F-EF Scale
4/10/11	1730	Colburn	Waushara	3.86	100	0	0	EF1
4/10/11	1712	Strongs Prairie (Arkdale) - Preston (Cottonville) - Richfield	None	17.1	800	0	0	EF2
6/7/08	1357	New Haven	Marquette	3	50	0	0	EF0
8/18/05	1641	Springville	None	1	30	0	0	F1
6/23/04	1855	Quincy, Easton, New Chester	Juneau	17	50	0	11	F1
8/27/94	2210	Plainville 1SE	None	0.1	25	0	0	F0
8/27/94	2041-2057	Monroe Center 2SE	None	10.5	850	2	22	F3
6/8/93	1635	Adams 8E	None	0.5	25	0	0	F0
6/8/93	1630	Adams 7ESE	None	2	75	0	0	F0
6/8/93	1552	Rome 1SE	None	1.5	75	0	0	F0
6/8/93	1548	Rome 2.5W	None	1	50	0	0	F0
6/8/93	1330	Brooks 1N	None	1.5	75	0	0	F0
8/29/92	1900	Big Flats 3.5E	None	5	100	0	0	F1
5/24/89	1730	Adams 5W	None	0.5	50	0	0	F0
7/10/84	1551-1553	Castle Rock	None	4	500	0	0	F2
4/2784	1410	Brooks 3S	None	2	220	0	0	F1
7/3/83	1900	Lake Mason	None	0.1	10	0	0	F0
7/3/83	1845	Plainville	None	0.1	12	0	0	F0
7/3/83	1803	Dellwood	None	6	50	0	0	F1
7/19/80	2345	T. Quincy & T. Adams	None	2	?	0	0	F2
5/18/79	1645	southeast Adams Co.	None	0.1	35	0	0	F1
4/17/75	2145	Leola	None	0.3	20	0	0	F0
6/9/74	1430	Highway 73 & CTH 1	None	?	?	0	0	F1
5/18/71	1640	Adams-Friendship to Hancock	Waushara	15.9	100	0	5	F1
5/8/64	1815	Lyndon Station 3NW to Adams	Juneau	23.5	150	0	0	F2
6/25/34	2330	Briggsville	None	1.5	880	0	0	?
10/3/03	1600	Rome 5E	Portage	22	200	5	40	F4

\* The data in this table came from *Storm Data, Significant Tornadoes--1680-1991* by Thomas P. Grazulis, *Wisconsin Tornado Database 1950-2000* Geographic Techniques Report No. ST-WTDB01, NCDC database and Adams County EM.  
 \*\* Injuries and Deaths are for the entire tornado track.

Source: National Weather Service

That was the second of two tornados affecting Adams County when a cold front pushed east into Wisconsin during the late afternoon and evening hours of April 10th. Severe thunderstorms developed along the cold front and produced very large hail and three tornadoes over portions of western and central Wisconsin. The hail ranged from quarter to tennis ball size and caused extensive damage to siding and cars in the southern portions of the City of La Crosse. Damage estimates from insurance companies and contractors in the area were between 20 and 30 million dollars from the one hail storm. National Weather Service storm survey teams confirmed two EF1 tornadoes and an EF2 tornado in Juneau and Adams counties.

The Arkdale-Cottonville tornado was the National Weather Service confirmed EF2 tornado, which tracked from about three miles west of Arkdale toward County Highway G. This tornado caused extensive damage to barns, trees, power lines and houses two miles west of Arkdale. A cement silo was also knocked over. The tornado crossed Highway 21 north of Arkdale hitting nearby homes, irrigation systems and hundreds of trees. Winds were estimated around 125 mph. Several more farms, homes, and trees were hit as the tornado continued toward the south side of Big Roche A Cri Lake near Cottonville. Several cars and mobile homes were flipped or heavily damaged. A lake association building on the southwest side of Big Roche A Cri Lake was completely destroyed and numerous center-pivot irrigation systems were twisted or destroyed across the county.

By this time the tornado had grown to nearly a half mile wide. It crossed Highway 13 at Cottonville and gradually began to weaken, hitting more seasonal homes, trees and roof tops. It dissipated south of the Colburn Wildlife Area. Damage estimates for this tornado were about \$3.3 million with 7 homes and 3 businesses destroyed.

A funnel cloud was reported on July 4, 2009 just west of Big Flats. A funnel cloud was also observed in Clark County, but neither touched down.

On June 7, 2008 an EF0 tornado hit the Town of New Haven about 2.5 miles north of Briggsville before crossing into Marquette County and strengthening to EF1. Power lines and trees were downed and some homes received minor damage. Adams County estimated about \$75,000 in damages. A warm front extending east to west across the Upper Mississippi River Valley was the focus for a significant severe weather event on June 7. A total of four tornados were confirmed, while numerous reports of wind damage and large hail were received from law enforcement officials and storm spotters across the state.

A tornado briefly touched down near the intersection of Highway 82 and 13 in the Town Springville August 18, 2005. One of six tornados that affected southwest Wisconsin, this tornado was part of an all-time one day record of 27 tornados hitting the state. Mobile homes were damaged, along with nearby trees and the roof of a home under construction. Damages were estimated at about \$5,000.

A line of thunderstorms that moved out of Minnesota produced wind damage, hail and several tornados in June of 2004. A Presidential Disaster Declaration was issued as a result. One tornado formed in eastern Juneau County, about 2 miles west of Castle Rock Dam. That tornado moved east-northeast across Castle Rock Lake and into western Adams County. It tracked near or along Edgewood Avenue with extensive tree damage in the Quincy Bluff area, including the ranger lookout tower there. Hundreds of trees were blown down from strong winds in excess of 90 mph at times. The tornado tracked east to areas just north of Edgewood Drive crossing Highway 13 approximately 5 miles south of Adams/Friendship. Downburst winds on the south side of the storm demolished at least 8 mobile homes in Edgewood Estates that were orientated north-south and took the full brunt of the cross wind. Most of the Town of Easton had extensive damage with hundreds of trees down. It continued to move east-southeast before lifting shortly before the



*2004 Tornado Damage*

Adams-Marquette County line about 3 miles southeast of Grand Marsh around 7:55 pm. A broad area of straight line wind damage was found south of this tornado track with widespread tree damage occurring up to 1 mile south of the track. The tornado path was approximately 17 to 18 miles in length. The tornado was rated an F1 with estimated winds in the 73 to 112 mph range.

Adams County reported that 11 people were injured including 2 that required airlifting to UW-Madison Hospital. A total of 16 homes were destroyed along with 41 having major damage and another 67 with minor damage. Governmental expenses exceeded \$500,000. Private sector damage were estimated at about \$6.5 million primarily agricultural including entire farms and many irrigation systems and other equipment as well as crops.

In August of 1994, a F3 tornado tore a 13-mile long, ¼ wide swath through Adams County. Two people were killed and 22 people injured by this



tornado. Damage was estimated at \$4.5 million with 24 homes, a tavern, a potato warehouse, and numerous out buildings destroyed. Eight homes suffered major damage, and 160 were reported to have light to moderate damage, primarily in the Town of Big Flats. In addition, the Big Flats Fire Department and town hall were destroyed, as well as a thrift shop. Seventy cows were crushed to death in one barn as the walls blew out and the upper floor, filled with 16,000 bales of hay and roof collapsed. Presidential Disaster Declaration was not issued for this event.

The largest and deadliest tornado recorded in Adams County occurred a century ago in 1903 in the Town of Rome. A large F4 tornado apparently formed over northern Adams County and then moved east-northeast passing 1.5 miles south of Bancroft in Portage County. The tornado was up to a half mile wide but most of the damage was in Portage County. Five people were killed and forty were injured by this tornado.

Only the 1994 and 1903 tornados have caused deaths, however several others have caused significant damages. The July 10, 1984, a F2 tornado that touched down in the Dellwood subdivision near Castle Rock Lake hit 59 homes and destroyed 14. More than 2,000 trees were downed.

#### **Tornado Vulnerability Assessment:**













Though Adams County is mostly a rural county, there are concentrations of population scattered throughout. Subdivisions, rural unincorporated communities, and the Adams/Friendship area can be regarded as more vulnerable because these areas pose more of a threat to human safety and property damage in more concentrated areas. Map 11 illustrates these areas within the County.

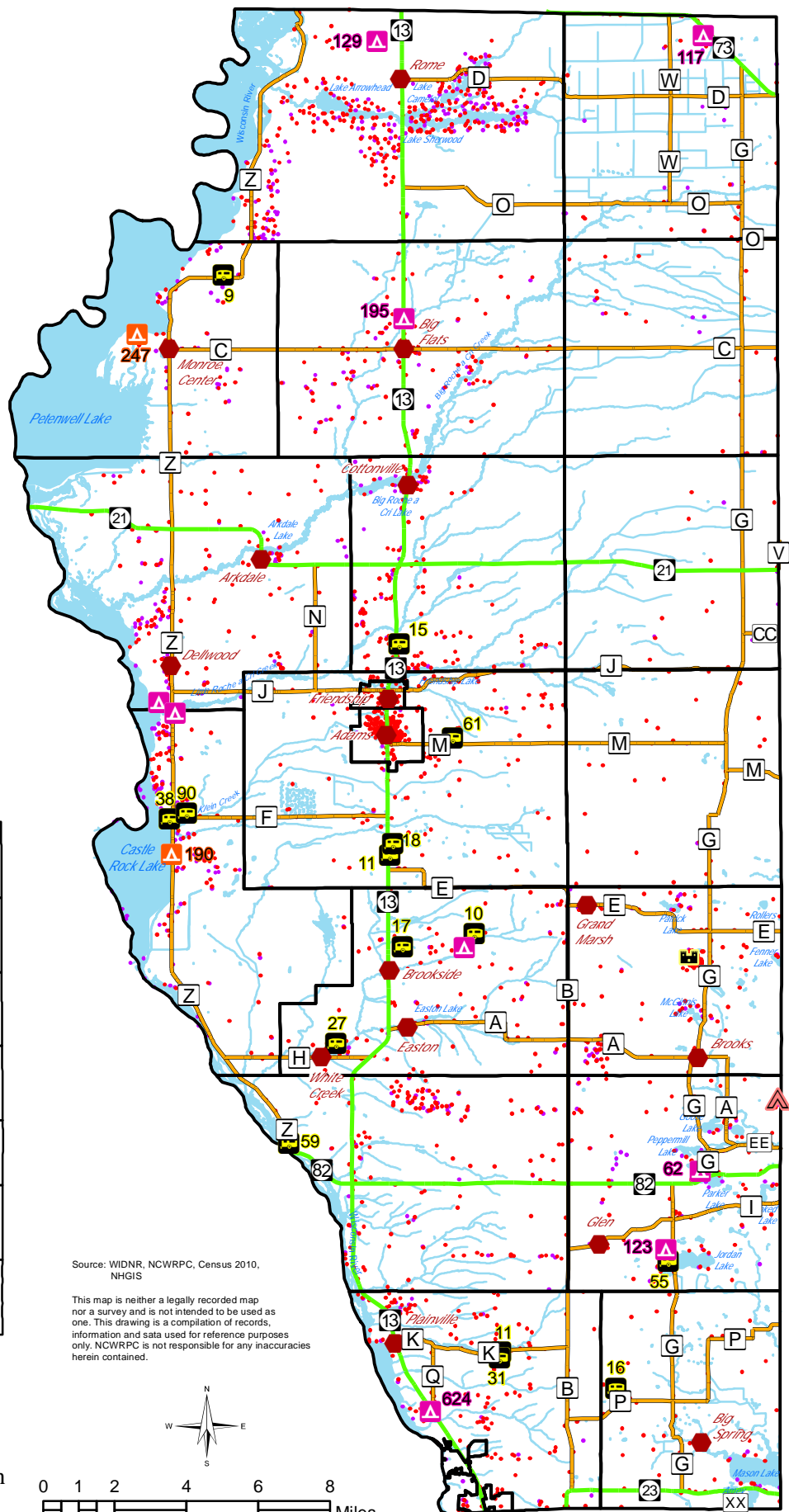
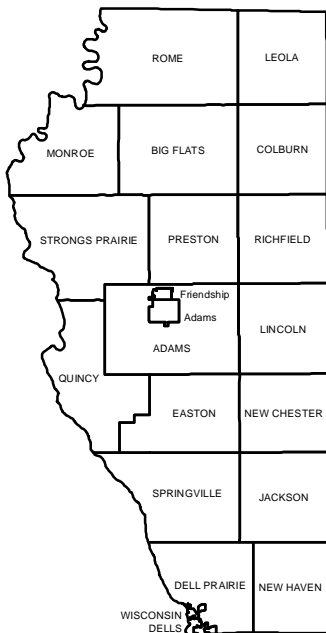
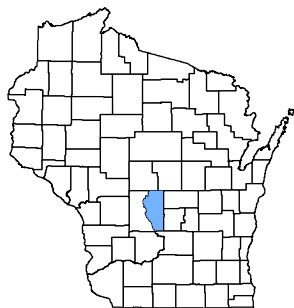
Mobile homes are of significant concern in assessing the hazard risks from tornados. In general, it is much easier for a tornado to damage and destroy a mobile home than standard constructed houses and buildings.



*Foster Trailer Park Tornado Damage*

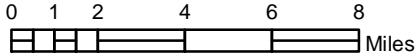
Since 25 percent of Adams County's housing units are mobile homes, vulnerability to health and safety along with property damage is much greater. Research by the NWS shows that between 1985 and 1998, 40 percent of all deaths in the nation from tornados were in mobile homes, compared to 29 percent in permanent homes, and 11 percent in vehicles.

-  Minor Civil Divisions
-  State Highways
-  County Highways
-  Population Concentration
-  Boy Scout Summer Camp
-  Correctional Facility
-  Mobile Home Parks
-  County Campgrounds
-  Private Campgrounds
-  Water
-  Resident Population Pattern, 1 Dot = 10
-  Seasonal Housing Unit Pattern, 1 Dot = 10



Source: WIDNR, NCWRPC, Census 2010, NHGIS

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



The 2010 U.S. Census reported there are 4,380 mobile homes in Adams County. While mobile homes are scattered throughout the County, many are concentrated in mobile home parks. Map 11 also displays the location of the mobile home parks with approximate number of units.

In addition to mobile homes, there are many other areas vulnerable to tornados such as campgrounds. Like mobile homes parks, campgrounds are of concern in the County because often times there is a concentration of people in them and there is little shelter provided. Map 11 also shows the location of campgrounds in the County.

The following is a list of things that may be affected by a tornado. Much of this list can be referenced in Part II.

- Community facilities – hospitals, schools, "prisons/jails"
- Public Service - police and fire departments
- Utilities - power lines, telephone lines, radio communication
- Transportation – debris clean-up
- Residential – nursing homes, mobile home/parks, garages, trees and limbs, siding, windows
- Businesses – signs, windows, siding, billboards
- Agricultural - buildings, crops, livestock

Based on review of the historic events of tornados, there are no specific areas in the county that have unusual risks. The events are relatively uniform and a countywide concern. However, during the City/Village Planning Meeting for this Plan Update, both the City of Adams and the Village of Friendship identified tornados (severe winds) as a major vulnerability concern due to the potential for power outage and resulting impact on municipal services and the population itself (heating/cooling, food & water safety).

**Future Probability and Potential Dollar Losses – Tornados:**

Based on the historic data presented here (frequency of past events), Adams County can expect a tornado about once every 2 years on average. This equates to a probability of 0.5 or about a 50 percent chance in a given year. Table 13 indicates the probability of tornados of a specific magnitude. There was a trend of a major damaging tornado event (over \$2 million in damages) every 10 years: 1984, 1994, 2004 until 2011 when the Arkdale-Cottonville EF2 came early.

Tornado Scale	F/EF0	F/EF1	F/EF2	F/EF3	F/EF4	F/EF5
Number of Reported Tornados*	11	9	3	1	0	0
Probability of Occurrence	46%	37%	12%	4%	<1.0%	<1.0%

*Source: Nat'l Weather Service & NCWRPC – \*Based on historical data from 1971 to 2013.*

Historic data is again used to estimate potential future dollar losses due to tornado. Estimated damages resulting from various tornados in Adams County range from \$0 to \$7 million. On average, Adams County might expect damages of \$2.1 million per tornado based on the study period of 2004 to 2013. However, going back to 1971, only four of these 24 historic tornados resulted in damages exceeding \$1 million, three others had \$250,000+, and the rest were \$25,000 or less. Over the next ten-year period, tornado losses in Adams County could approach \$10.5 million.

### **HAZARD ANALYSIS: WINTER STORMS / EXTREME COLD**

#### **Background on Winter Storms/Extreme Cold Hazard:**

A variety of weather phenomena and conditions can occur during winter storms. For clarification, the following are National Weather Service approved descriptions of winter storm elements:

*Heavy snowfall* – the accumulation of six or more inches of snow in a 12-hour period or eight or more inches in a 24-hour period.

*Blizzard* – the occurrence of sustained wind speeds in excess of 35 miles per hour accompanied by heavy snowfall or large amounts of blowing or drifting snow.

*Ice Storm* – an occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.

*Freezing drizzle/freezing rain* – the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32 degrees Fahrenheit or below.

*Sleet* – solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.

*Wind chill* – an apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin.

Winter storms can vary in size and strength and include heavy snowfall, blizzards, ice storms, freezing drizzle/freezing rain, sleet, wind chill, and blowing and drifting snow conditions. Extremely cold temperatures

accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death.

True blizzards are rare in Wisconsin. They are more likely to occur in the northwestern part of the state than in south-central Wisconsin, even though heavy snowfalls are more frequent in the southeast. However, blizzard-like conditions often exist during heavy snowstorms when gusty winds cause the severe blowing and drifting of snow. Heavy snow and ice storms have been part of nearly every winter in Adams County.

Dangerously cold conditions can be the result of the combination of cold temperatures and high winds. The combination of cold temperatures and high wind creates a perceived temperature known as "wind chill". Wind chill is the apparent temperature that describes the combined effect of wind and air temperatures on exposed skin. When wind blows across the skin, it removes the insulating layer of warm air adjacent to the skin. When all factors are the same, the faster the wind blows the greater the heat loss, which results in a colder feeling. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The National Weather Service issues wind chill advisories when wind chill readings of -20 to -34 degrees are expected. Wind chill warnings are issued when wind chill values are expected at or below -35 degrees. Extreme cold events are most likely during the months of January and February.

#### **History of Winter Storms/Extreme Cold in Adams County:**

The NCDC has reported 39 major snow events for Adams County between 2004 and 2013. All of these storms contained some form of snow, sleet, freezing rain, or ice conditions.

Most recently, on December 22, 2013, a strong area of low pressure moved out of the Southern Plains into the Ohio River Valley. Heavy snow on the northwest side of this system fell over parts of southwest into central Wisconsin. A band of 6 to 8 inches fell across Grant and Richland Counties into the southern sections of Adams and Juneau Counties.

On February 10, 2013, the NCDC reported one person was killed in a two vehicle accident on State Highway 82 in the Township of Jackson. The accident occurred as a result of icy roads from freezing rain that was occurring at the time.

Reports of blizzard conditions appear to becoming more frequent. Over the period of analysis, 2004 - 2013 there have been 4 blizzard reports by NCDC. The last of which was in 2012.

A strong area of low pressure moved out of the Central Plains into Illinois and the Great Lakes region on December 19th and 20th. As this storm moved by, it produced a period of blizzard conditions during the morning and afternoon of the 20th as sustained north winds of 25 to 35 mph with higher gusts created poor visibility from falling and blowing snow. Impacts from the blizzard included closed roads, trapped vehicles, power outages, region wide school closings on the 20th with some schools remaining closed on the 21st or started 2 hours late. The Governor issued an executive order declaring a state of emergency before the storm hit. This placed the state emergency management, National Guard, State Patrol and other state and county agencies on high alert.

The accumulating snow started in southwest Wisconsin during the middle of the evening on the 19<sup>th</sup>, reaching central Wisconsin in the early morning hours of the 20th. Accumulations reached winter storm criteria of 6 inches between midnight and 7 a.m. on the 20th. Two bands of heavy snow, with accumulations of 10 or more inches, occurred. The first was from Grant County northeast through Richland County into the southern sections of Adams and Juneau Counties. The second was across northern Buffalo and Trempealeau Counties into northwest Jackson and southwest Clark Counties. The highest reported snow total in the southern band was 14.5 inches in Grant County with 15.0 inches in the northern band in Trempealeau County. National Guard troops were used to help rescue stranded drivers.

Blizzard conditions were reported across Adams County during the morning and afternoon of the 20th with north winds between 25 and 35 mph and higher gusts. As a result of the blizzard, roads were closed, vehicles became trapped in the snow, some power outages occurred and all schools in the county were closed. The highest reported snow total was 11.0 inches in the Town of Adams.

In December 2010, a powerful low pressure system tracked across the Upper Midwest and Great Lakes region during the evening hours of December 10th into the morning hours of December 12th. This storm brought heavy snow and blizzard conditions across portions of western and central Wisconsin. Snowfall amounts of 19.9 inches were measured at Friendship. In addition to the heavy snow, sustained wind speeds of 25 to 30 miles per hour with gusts up to 50 miles per hour caused whiteout

conditions, widespread road closures, stranded motorists and power outages.

On February 17, 2008, a powerful winter storm moved from Missouri to lower Michigan. This system brought freezing rain initially during the early morning hours. Ice accumulations ranged from a quarter of an inch to as much as an inch. By mid-morning, precipitation changed to all snow and was accompanied by strong northwest winds gusting up to 30 to 35 mph. The combination of heavy snow and strong winds caused blizzard conditions generally along and east of a line from Cassville to Necedah. Snowfall accumulations of 10 to 15 inches occurred, with the highest amount of 15.5 inches reported near Richland Center. Snowfall total was 11.2 inches at Friendship.

The winter of 2007-2008 was one of the worst on record for Adams County with 97.4 inches setting a seasonal snowfall record. The NCDL had nine heavy snow/winter storm reports including the February blizzard.

Blizzard conditions affected southwest Wisconsin on February 24-25, 2007. Winds gusting to around 40 mph caused whiteout conditions, especially on the ridge tops near the Wisconsin River. Considerable blowing and drifting snow occurred due to the strong winds, with drifts as high as 4 to 5 feet in some locations.

On December 20-21, 2004, the northern 1/3 of the County sustained a power outage due to a winter storm. A power substation in Wood County failed leaving 5,100 customers in the Towns of Big Flats and Rome without power with temperatures below zero. Most had power restored in about a day, but 700 were without power for two days. Critical facilities affected by the outage included the Town of Rome Police and Fire Stations. This event required opening of the County EOC, Red Cross and Salvation Army shelter operations and door-to-door notification/transportation for elderly.

In February of 2001, Adams County was hit by consecutive ice storms. The first period of freezing rain produced a widespread coating of 1/4 to 1/2 inch of ice, which was followed by 1 to 3 inches of snow accumulation. This caused hazardous traveling conditions, but law enforcement officials reported only minor accidents. The second period of freezing rain affected southwest and central Wisconsin. Even though glazing was widespread, with ice accumulations of 1/4 inch, law enforcement officials reported only minor automobile accidents.

Arctic cold outbreaks are common in the upper Midwest and sub-zero readings occur 22 times per winter on average. Occasionally strong northwest winds will combine with cold outbreaks to create dangerous wind chill conditions. The coldest temperatures are usually in January and February with average lows in the single digits and record lows colder than -25 degrees. The all-time record low in Adams County is -43 degrees (actual) set in 1951. The NCDC reports 10 extreme cold events between 2004 and 2013.

A cold spell hit the region to start the year in January of 2010 with temperatures below zero for several days and extremely low wind chills at times. It was the coldest first few days of a January since 1979 and one of the coldest starts to the New Year in history with average temperatures just above zero. Wind chills were well below -30 on January 2nd. The year prior, an arctic cold front over southern Canada moved southeast into the Ohio River valley in the evening hours of January 14, 2009. This brought bitterly cold temperatures and wind chills across portions of southwest and central Wisconsin in the evening hours of the 14th through the morning hours of the 16th. Wind chill values ranged from -33F in Jackson county to -42F in Grant county. Although unofficial, the lowest wind chill value of -43F was observed at Friendship in the morning hours on January 15th.

Following consecutive snow storms in December of 2008, northwest winds gusting to 25 to 35 mph in the wake of an arctic cold front produced blowing and drifting snow, especially. In addition to the wind and snow, sharply falling temperatures resulted in bitterly cold wind chills of 20 below to 40 below, which lingered into December 22. Lowest wind chill values included -37 at Friendship. The wind chill at Friendship hit -44 degrees on January 30, 2008. An arctic cold front moved across southwest and central Wisconsin on January 29. Very cold temperatures and strong northwest winds combined to produce dangerously cold wind chill values between 30 below and 45 below during the night and mainly into the morning hours of January 30. In February 2007, an extended period of cold weather and wind created dangerously low wind chill values across much of central and western Wisconsin with -38 at Friendship during the morning of February 5th. It was the coldest start to a February since 1996.

#### **Winter Storms / Extreme Cold Vulnerability Assessment:**

Winter storms present a serious threat to the health and safety of affected citizens and can result in significant damage to property. Heavy snow or accumulated ice can cause the structural collapse of buildings, down power lines, motor vehicle accidents or isolate people from assistance or services.



The following is a list of things that may be adversely affected by a winter storm. Much of these community assets can be referenced in Part II.

- Infrastructure – operation of emergency services, operation of public facilities and schools
- Utilities – down power and telephone lines
- Transportation – automobile accidents, roadway plowing, salting/sanding
- Residential – roofs
- Businesses – commerce
- Agricultural - livestock

Based on review of the historic events of winter storms and extreme cold, there are no specific areas in the county that have unusual risks. Winter storms cover a broad area and are a region-wide concern. However, during the City/Village Planning Meeting for this Plan Update, both the City of Adams and the Village of Friendship identified winter snows and in particular ice storms as a major vulnerability concern due to the potential for power outage and resulting impact on municipal services and the population itself (heating/cooling, food & water safety).

The extreme cold weather can affect the entire county. The risk to public health includes the chance of getting frostbite and hypothermia, and motor vehicle accidents. Everyone is at risk for becoming injured in extreme cold weather, either because of a frail body or because of travel in a motor vehicle.

**Future Probability & Potential Dollar Losses – Winter Storms/Extreme Cold:**

Based on historical frequency, Adams County can expect 3.9 significant winter storms per year on average. In other words the probability is 1.0 or a 100 % chance in a given year. For extreme cold temperatures, based on historical frequency, Adams County can expect an occurrence every year on average. So again, the probability is 1.0 or a 100 % chance in a given year.

Estimating potential future losses for winter storms is difficult. Damages and losses are typically widespread. Auto accidents and additional snow removal time are typical impacts of winter storms, and such claims are not aggregated or tracked for monetary damage. About 189 annual motor vehicle accidents occur with snow/ice/slush road conditions, and produce about 71 injuries and 1.4 deaths annually. Winter storms do have the potential to be extremely destructive, particularly in the case of ice storms. Potential future losses per incident might range from \$5,000 to \$2 million based on experiences from other counties.

## HAZARD ANALYSIS: FOREST FIRES

### **Background on Forest Fire Hazard:**

In Wisconsin by Statute, Forest fire means uncontrolled, wild, or running fires occurring on forest, marsh, field, cutover, or other lands or involving farm, city, or village property and improvements incidental to the uncontrolled, wild, or running fires occurring on forest, marsh, field, cutover, or other lands.

Forest fires can occur at any time the ground is not completely snow covered. The season length and peak months may vary appreciably from year to year. Land use, vegetation, amount of combustible materials present and weather conditions such as wind, low humidity and lack of precipitation are the chief factors for fire season length.

### **History of Forest Fire in Adams County:**

The Wisconsin DNR maintains a database of forest fire data. This data represents the most comprehensive source of information for analyzing fire trends in an area such as Adams County. However, the data is only current through 2009, so the 10-year span from 2000 through 2009 is used for analysis. Between 2000 and 2009, there was an average of 60 fires that have burned 83 acres, annually (excluding Cottonville). The typical fire in Adams County burns about 1.4 acres.

April is the leading month for fire in Adams with 33% of the total number of fires between 2000 and 2009. However, fires have occurred in each month of the year in Adams.

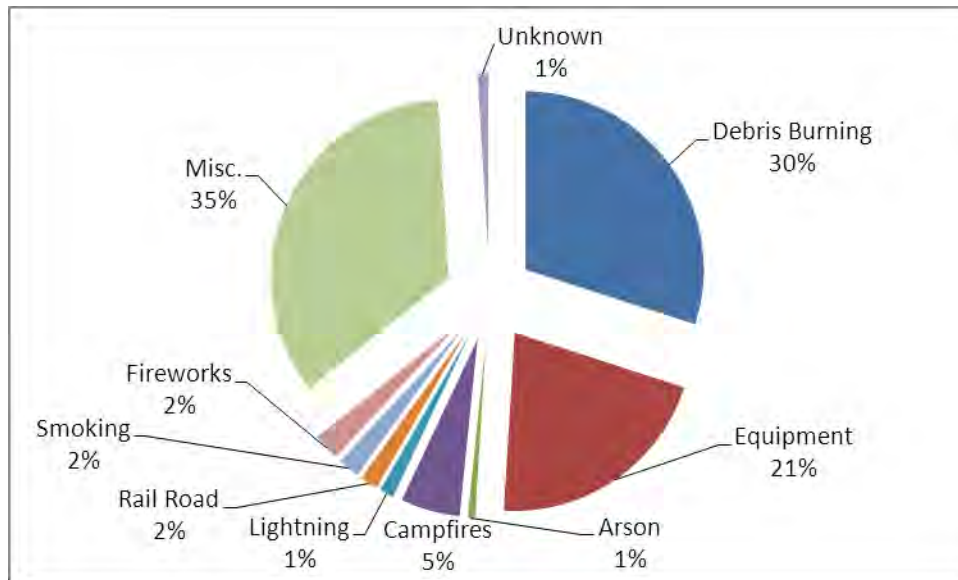
The Town of Rome experienced the most fires between 2000 and 2009 with 79, however, Easton would have led in total acres burned with 159, if not for the Cottonville fire. The data base attributes the entire fire to the town in which it starts, so Preston is "credited" with 3,400 acres for Cottonville. The Town of Colburn tied with the City of Adams for the fewest fires with 2 over that period. Oxford had the least area burned, with only 0.4 acres affected.



*Cottonville Fire, 2005*

The chart below breaks down the causes of wildfire within Adams County between 2000 and 2009 as classified by the WDNR. The principle cause of wildfire in Adams County and Wisconsin as a whole is debris burning which resulted in 184 or 30% of wildfires within the County. Equipment is the next leading category at 21% and includes vehicle, motor and other machinery related causes except railroad. Miscellaneous includes a variety of factors such as power lines, structure fires, and improper ash disposal. Arson resulted in less than 1% of wildfires. Lightning, the only natural cause of fire, was responsible for only 8 of the fires or less than 1%.

Fire Causes in Adams Co. 2000-2009



Source: WDNR

In 2005, Adams County experienced one of the largest wildfires in Wisconsin history. Known as the Cottonville Fire, the fire began on May 5 when debris burning in a fire pit got out of control. Approximately 3,410 acres were burned in the Towns of Big Flats, Colburn and Preston covering an area 1.5 miles wide and 7 miles long. Weather conditions were ideal for fire: warm and windy with very low humidity. Part of "sand country", Adams County's dominant vegetation is grass, pine and scrub oak, which are all known to burn quickly and intensely. Fire spread quickly to the tops of the pine trees.

Losses included 9 primary homes, 21 seasonal homes, and 60 outbuildings. Damage was sustained to 15 other homes. Evacuation of 200 residents was required. Firefighting efforts were massive with 5 aircraft (1 from Minnesota DNR), 200 WDNR personnel from across the state, 30 volunteer fire departments and law enforcement from State Patrol, Adams,

LaCrosse and Vernon County Sheriffs and Onalaska Police. The fire took 11 hours to bring under control and several days for mop -up. The courts set restitution at over \$1.4 million indicating the level of damages.

According to the National Climatic Data Center's database, very dry conditions and strong winds across portions of central Wisconsin caused a controlled burn of grass clippings in a wooded area to quickly become out of control in Adams County on April 17, 2009. The wildfire burned approximately 106 acres and destroyed several vehicles, outbuildings, personal property, permanent and seasonal residences. One person was injured and damages were estimated at about \$500,000.

The NCDC also reported a wildfire, fanned by gusty winds, charred 158 acres of red pine in the Town of Rome during the early morning of April 13, 1998. The fire necessitated the evacuation of some nearby residences. Nobody was injured and no homes were lost, but there was an estimated property value loss of \$80,000.

**Forest Fire Vulnerability Assessment:**

Adams County has 247,471 acres of forestland, or 56 percent of the total land area, scattered throughout the County. The potential for property damage from fire increases each year as more recreational and retirement homes are developed on wooded land.

The trend toward introducing more human development into fire prone areas has brought about the term wildland urban interface or WUI. The WUI identifies areas where structures and human development meet or intermingle with undeveloped wildlands. It is within these areas where wildfire poses the greatest risk to human lives and property.

The WDNR has completed a statewide evaluation of fire risk, referred to as the CAR or Communities At Risk assessment. This assessment uses extensive DNR geo-databases to analyze and map hazardous woodland fuel types and the degree of the intermixing of development with wildlands. The maps identify the level of risk for each community on a scale of very high, high, moderate, or low, and also have a community of concern designation. Virtually all of Adams County is rated very high or high except for Leola and Colburn, which are designated as communities of concern.

WDNR reports on the Cottonville Fire indicate that the loss of buildings was due, in part, to a lack of access (long, narrow driveways) and a lack of defensible space (free of fuels that can transmit fire to the structure and allow firefighters to safely operate).

Campgrounds are also a concern because of campfires. Adams County has seven campgrounds. Locations of the campgrounds are shown on Map 11.

#### **Future Probability and Potential Dollar Losses – Forest Fire:**

Forest and wild fires are relatively common occurrences in Adams County. Over the 10 year period of analysis, there has been an average of 60 fires per year in the County. In other words, the probability is 1.0 or 100% chance of wildfire each year. However, these fires are typically contained rapidly and remain small, so that each has a minimal impact. The probability of a fire becoming more substantial, like Cottonville, might be estimated at (less than) 10% per year or 0.1.

Because of the relatively small impact of typical individual fires in the County, loss data is not tracked. This makes it difficult to develop an estimate of potential future dollar losses. However, with 60 fires per year, the County should expect some fires to "get out of hand" and likely approach or exceed the \$1.4 million in damages of the Cottonville Fire.

### **HAZARD ANALYSIS: FLOODING/DAM FAILURE**

#### **Background on Flood Hazard:**

There are a variety of classifications for flooding including coastal, dam or levee failure, flash, lake, riverine, stormwater and urban/small stream. Adams County has the potential for all these types except coastal. The following descriptions of the types of flooding are compiled from various FEMA and other notable hazard planning sources:

*Coastal* – Different from other types of flooding which relate to movement of water through a watershed, coastal flooding is due to the effect of severe storm systems on tides resulting in a storm surge. Primarily known as an ocean-based event, the Great Lakes coastal areas can also be affected.

*Dam or levee Failure* – More of a technology related hazard than a natural hazard, various factors can result in the failure of the structural technology that is a dam, thus causing flooding of areas downstream of the dam often similar in effect to flash flooding.

*Flash* – Involves a rapid rise in water level moving at high velocity with large amounts of debris which can lead to damage including tearing out of trees, undermining buildings and bridges, and scouring new channels.

Dam failure, ice jams and obstruction of the waterway can also lead to flash flooding. Urban /built-up areas are increasingly subject to flash flooding due to removal of vegetation, covering of ground with impermeable surfaces and construction of drainage systems.

*Lake* – Prolonged wet weather patterns can induce water-level rises that threaten lakeshore areas.

*Riverine* – Also known as overbank flooding, this is the most common type of flooding event. The amount of flooding is a function of the size and topography of the watershed, the regional climate, soil and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods.

The cause of flooding in rivers is typically prolonged periods of rainfall from weather systems covering large areas. These systems may saturate the ground and overload the streams and reservoirs in the smaller sub-basins that drain into larger rivers. Annual spring floods are typically due to the melting of snowpack.

*Stormwater* – Water from storm event that exceeds the capacity of local drainage systems, either man-made or natural, can result in flooding. Inadequate storm sewers and drainage systems are often the primary factor resulting in this type of flooding.

*Urban and Small Stream* – Locally heavy rainfall can lead to flooding in smaller rivers and streams. Streams through urban or built-up areas are more susceptible due to increased surface runoff and constricted stream channels.

Major floods in Adams County tend to occur in the spring when melting snow adds to normal runoff and in summer or early fall after intense rainfalls. Flooding occurs in the spring due to snowmelt and frozen soil. This build up continues until the river or stream overflows its banks, for as long as a week or two and then slowly recedes inch by inch. The timing and location of this type of flooding is fairly predictable and allows ample time for evacuation of people and protection of property.



*New Haven Flood Damage*

Flooding is a significant hazard in Adams County, particularly because it borders the Wisconsin River. As described in Part II, there are approximately 235 miles of streams in Adams County within five main watersheds. Four are part of the Wisconsin River Basin, while the Neenah Creek Watershed is part of the Upper Fox River Basin.

Floodplains exist along the Wisconsin River and the tributaries that feed into it. These floodplains are narrow along tributaries and lakes but extensive throughout the County. Floodplains are described in Part II and shown on Map 4 of this plan. The Federal Emergency Management Agency (FEMA) identifies these floodplains on Digital Flood Insurance Rate Maps (DFIRMs) as downloaded by the NCWRPC from FEMA's website.

There are 52 dams in Adams County (See Map 3 and Table 14). These dams serve many useful purposes including agricultural uses, providing recreational areas, electrical power generation, erosion control, water level control and flood control. According to the DNR, Adams County has 18 large dams (including Castle Rock and Petenwell Dam), which have a structural height of over 6 feet and impounds 50 acre-feet or more. The other 34 are regarded as small dams. The Wisconsin DNR regulates all dams on waterways to some degree, however the small dams are not stringently regulated for safety purposes. The federal government has jurisdiction over large dams that produce hydroelectricity. Castle Rock and Petenwell Dams are the major producers of hydroelectricity in Adams County. Friendship and Big Roche-A-Cri also produce electricity.



*Friendship Dam*

A dam can fail for a number of reasons such as excessive rainfall or melting snow. It can also be the result of poor construction or maintenance, flood damage, weakening caused by burrowing animals or vegetation, surface erosion, vandalism or a combination of these. Dam failure can happen with little warning resulting in loss of life and significant property damage in an extensive area downstream of the dam.

The WDNR assigns hazard ratings to large dams within the state. When assigning hazard ratings, two factors are considered: existing land use and land use controls (zoning) downstream of the dam. Dams are classified into three categories that identify the potential hazard to life and property downstream should the dam fail. A high hazard indicates that a failure

Table 14		Dams in Adams County			
DAM NAME	DAM SIZE TYPE	MILES NEXT CITY IS DOWN FROM DAM	NAME OF NEXT CITY DOWN FROM DAM	HAZARD RATING	UPDATED EAP YEAR
CASTLE ROCK	LARGE	19	WISCONSIN DELLS	HIGH	2013
LAKE CAMELOT	LARGE	0	LAKE SHERWOOD SUBDIV	HIGH	2006
LAKE PETENWELL	LARGE	1	DELLWOOD SUBDIVISION	HIGH	2012
PEPPERMILL LAKE (Coddington)	LARGE	4	OXFORD	LOW	
SHERWOOD	LARGE	0	LAKE SHERWOOD SUBDIV	SIGNIFICANT	2006
ARKDALE	LARGE	0	ARKDALE	LOW	2000
BINGHAM CR 1 CECIL BROWN ETUX	SMALL	35	WISCONSIN DELLS	LOW	
CARTER CREEK (Splittek)	LARGE	0	NONE	LOW	
EASTON	LARGE	0	EASTON , CTH A	LOW	2010
FARREY (McGinnis Lake)	LARGE	2	BROOKS	LOW	
FEDLER	LARGE	0	NONE	LOW	
FRIENDSHIP	LARGE	0	FRIENDSHIP	HIGH	
HORNER (Fawn Lake)	LARGE	0	NONE	HIGH	
LAKE ARROWHEAD	LARGE	0	ROME	LOW	2006
LANDIS,CHARLES	SMALL	9	FRIENDSHIP	LOW	
LAVERNE NEWBY (White Creek)	SMALL	1	WHITE CREEK	LOW	
LEOLA 15	LARGE	17	NEW ROME	LOW	
LEOLA 19	SMALL	15	NEW ROME	LOW	
LEOLA 8	SMALL	12	NEW ROME	LOW	
LEOLA 2	SMALL	17	NEW ROME	LOW	
LEOLA 12	SMALL	15	NEW ROME	LOW	
LEOLA 7	SMALL	13	NEW ROME	LOW	
LEOLA 6	SMALL	12	NEW ROME	LOW	
LEOLA 5	SMALL	13	NEW ROME	LOW	
LEOLA 3	SMALL	15	NEW ROME	LOW	
LEOLA 14	SMALL	16	NEW ROME	LOW	
LEOLA 16	SMALL	18	NEW ROME	LOW	
LEOLA 17	SMALL	14	NEW ROME	LOW	
LEOLA 18	SMALL	14	NEW ROME	LOW	
LEOLA 20	SMALL	16	NEW ROME	LOW	
LEOLA 22	SMALL	17	NEW ROME	LOW	
LEOLA 23	SMALL	15	NEW ROME	LOW	
LEOLA 24	SMALL	16	NEW ROME	LOW	
NORTHERN DAM OR #9 (White Creek)	LARGE			HIGH	2014
ROCHE-A-CRI / COTTONVILLE (Big Flats)	LARGE	4	ARKDALE	HIGH	2004
SCHWAHN	LARGE	0	NONE	LOW	
WALKER, HARRY	LARGE	9	PLAINFIELD	LOW	
BINGHAM CR 2 CECIL BROWN ETUX	SMALL				



Table 13 Continued	Dams In Adams County				
EVANS, ORVEL	SMALL				
HENNING, H.A.	SMALL				
HENRY REEVES, ETUX	SMALL				
HOLM, HAROLD	SMALL				
HYLER, DONALD	SMALL				
JOHN KISH & ED KUBACKI	SMALL				
KOHL, KARL	SMALL				
RANDORF, CLAYTON	SMALL				
RICHARD E BIERI (Joe Lake)	SMALL				
SCIEPKO, JOSEPH	SMALL				
SUS, EDWARD	SMALL				
BOEHM DAM	SMALL			LOW	
PIERCE DAM	SMALL				
VAN ERT DAM	SMALL				

Source: DNR on-line database & NCWRPC

would most probably result in the loss of life. A significant hazard indicates a failure could result in appreciate property damage. A low hazard exists where failure would result in only minimal property damage and loss of life is unlikely. For Adams County, there are seven dams that have a high hazard rating: Castle Rock, Camelot, Horner (Fawn Lake), Roche-a-Cri, Friendship Northern Dam/#9 (White Creek) and Petenwell. Sherwood has a significant rating, while the rest are rated low.

**History of Flooding in Adam County:**

Flooding was the principal cause of damage in seven of eight Presidential Disaster Declarations in Adams County from 1971 to 2008. The most recent declaration as of this plan occurred in 2008 and included most of southern Wisconsin. Heavy rain resulted in flooding that caused numerous road and culvert washouts throughout the southern half of the County. Crop losses and water damage to homes and outbuildings including mold problems were significant. Public sector damages exceeded \$400,000, and individual losses have exceeded \$300,000. High wind including a tornado in the Town of New Haven was also associated with this event.

On the evening of September 22, 2010, a stationary front set up across central Wisconsin. As an unusually moist air mass flowed over this boundary, heavy rain developed and fell continuously across the area throughout the evening and overnight. Soils were abnormally wet for this time of year, so the extreme rainfall caused significant widespread flooding. Neighboring Juneau County was included along with Buffalo, Trempealeau, Jackson, Taylor, and Clark in a federal disaster declaration resulting from this event, but not Adams County.

Within Adams County, however, County Highway Z was underwater between County H and State Highway 82. Gem Court was also underwater west of State Highway 13, and the shoreline along Castle Rock Lake was flooded near the dam. There were 8 homes and 1 business that incurred minor damage due to the flooding

In 2004, severe storms resulted in flooding and a disaster declaration for central and southern Wisconsin including Adams County. Flash flooding occurred after 3 to 6 inches of rain fell within two hours. High water conditions persisted for some time after the initial flood. Several roads were impassable. Approximately 40 homes were damaged along with a number of government facilities throughout the County. NCDC reported property damages of \$125,000 and crop damages of \$25,000.

In 2002, at least 15 inches of rain fell in northern Adams County on June 21 and 22. The disaster declaration covered eight Wisconsin counties including Adams. Numerous roads were reported closed due to flooding. The risk of a dam failure was issued for areas along Lake Arrowhead, Lake Sherwood and Lake Camelot drainages. Runoff filled lakes to the point of nearly breaching the levees and embankments. Water had to be released into the drainage system to prevent levee and dike failures. In some locations, the water flooded homes and businesses, washed out roads, bridges and culverts, and damaged crops. Estimated damage by NCDC to Adams County was about \$577,000. The Town of Big Flats suffered major damage to roads, resulting in more than \$195,000 in repair costs.

Severe storms again resulted in flooding (and disaster declaration) in 2001 and 2000. Flash flooding was reported near Grand Marsh by the NCDC in 1997 with \$30,000 in damages.

The Flood of 1993 was one of the worst flood events experienced by Adams County, the state, and entire Midwest. The flooding in Adams County was a result of several compounding factors including heavy rains and flooding in the fall of 1992, above average amounts of precipitation in the Spring of 1993, and unusually heavy amounts of rain onto already saturated ground from early June throughout July. Fortunately, before the flood peaks arrived on the Wisconsin River in Adams County, the Petenwell and Castle Rock Reservoirs were drawn down. This created additional storage capacity that helped ease flow and lowered discharges downstream.

East of the Wisconsin River in the County, there was substantial flooding reported near the border of the City of Adams and the Village of Friendship. The Health and Social Services Building, DNR Offices, Jr. High School, and numerous homes all experienced flooding and water damage. Standing water plagued the area for months afterward. Adams County received approximately \$792,562 in disaster disbursements. The major impacts from flooding were to agriculture lands public roadway washouts. Nearly 50 percent of financial aid disbursements were for agriculture where wet croplands prevented normal farming operations and stunted or killed crops. Twenty percent of the funds were for public relief. High groundwater eroded road bases and caused excessive runoff that washed out culverts and embankments or stripped gravel surfaces off of town roads. In the private sector, the three most common problems were groundwater in basements, failing septic systems, and polluted wells.

Major flooding also occurred in 1973 affecting a large portion of the county with flooding along the entire length of the Mississippi River resulting in a disaster declaration. Flood crest at Wisconsin Dells was 20.7 feet compared to 18.2 feet in 1993. Other notable flooding includes 1967 and 1965 with crests measured at Wisconsin Dells of 19.2 and 19.0 feet respectively.

Prior to the construction of the reservoirs at Petenwell and Castle Rock, large-magnitude floods were recorded on the Wisconsin River in September 1911, July 1912, September 1938 and September 1941. A maximum discharge of 72,200 cubic feet per second (cfs) was recorded on September 14, 1938, on the Wisconsin River near Wisconsin Dells just south of the Adams County line.

Adams County has not experienced a dam failure with any loss of life or substantial property damage. However, there have been notable incidences of threatened failure. The Town of Rome avoided dam blowouts with the help of many volunteer sandbaggers during the June 2002 flooding when the Lake Camelot dam came within an inch of failure; Lake Arrowhead dam came within seven inches of failure; and Sherwood was about four inches away from failure.

In 2006, the Tri-Lakes dams were again threatening failure. The Kingsway Dam on Upper Lake Camelot is the uppermost dam in a series of dams. Failure of this dam could ultimately lead to failure of 3 other dams downstream and close State Highway 13 as well as various County and local roads. Rapid draw down of the lakes prevented the dam failure and allowed repair of a failing drain system.

In 2007, a bowed and leaking stop log at the base of the Easton Lake Dam required draw down and emergency repair. The dam was built in the 1860s to form a 24-acre millpond. During the repairs, other issues were revealed, and full replacement of the dam was subsequently planned.

**Flood Vulnerability Assessment:**





Flood events in the County have caused substantial property and infrastructure damage in the past and have the potential to cause future damage, since a significant number of structures still exist in the floodplain. Looking at past events, the following have been significantly impacted by flooding:

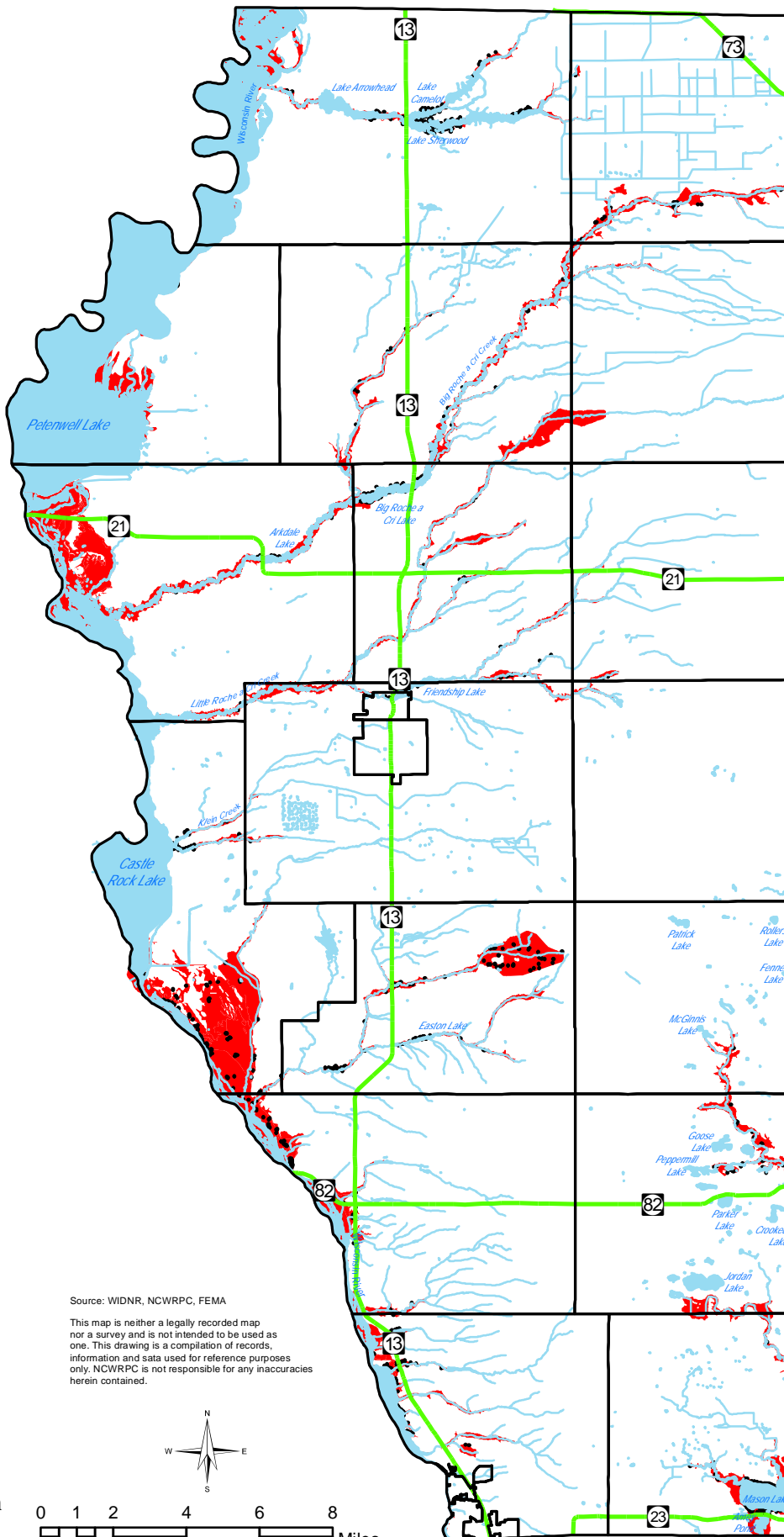
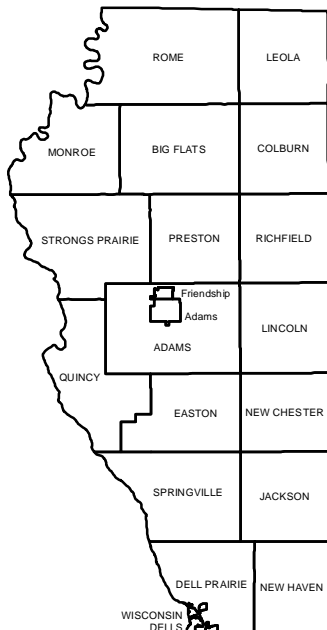
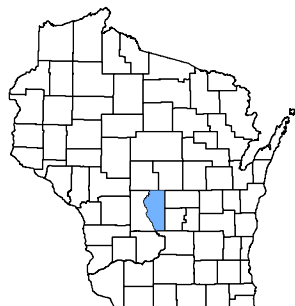
- Infrastructure – flooded public facilities and schools
- Utilities - down electric lines/poles/transformers, telephone lines, lost radio communication
- Roadways – washouts, inundated roadways, debris clean-up
- Residential structures – flooded basements, damaged septic systems
- Businesses – loss of commerce
- Agriculture - inundated cropland

To assess the vulnerability of the Adams County area to flooding hazards, basic inventory data described in Part II must be analyzed. For this purpose, consideration should be given to structures (specifically critical facilities), infrastructure, and cropland.

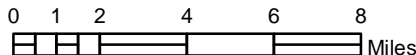
One of the first reports to reference in assessing vulnerability to structures during flooding is the Wisconsin Repetitive Loss Report. The Repetitive Loss Report provides information to the status of repetitive loss properties by community. FEMA classifies a repetitive loss structure “when more than one flood insurance claim of at least \$1,000 is made within a ten-year period”. The information is used as a floodplain management tool and to supplement information provided by communities for flood mitigation grants administered by WEM. According to the report, there are no repetitive loss structures within Adams County.

Since no structures are listed in the Repetitive Loss Report, structures within floodplains were analyzed, see methodology outlined below. The floodplain boundaries within Adams County are shown on Map 4. Table 15 shows the number of structures in each municipality identified as “vulnerable to flooding” according to proximity to floodplains. There were a total of 828 structures identified in the designated floodplain boundaries, see Map 12.

-  State Highways
-  Structures in DFirm
-  DFirm Floodplains
-  Water



Source: WIDNR, NCWRPC, FEMA  
 This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



<b>Municipality</b>	<b>Number</b>	<b>Total Value</b>	<b>Average Value</b>
Adams town	3	\$383,100	\$127,700
Big Flats town	22	\$2,193,400	\$99,700
Colburn town	1	\$154,800	\$154,800
Dell Prairie town	71	\$11,729,200	\$165,200
Easton town	95	\$10,535,500	\$110,900
Jackson town	27	\$3,979,800	\$147,400
Leola town	20	\$2,454,000	\$122,700
Lincoln town	0	\$0	\$0
Monroe town	5	\$761,000	\$152,200
New Chester town	1	\$111,800	\$111,800
New Haven town	80	\$13,000,000	\$162,500
Preston town	59	\$7,357,300	\$124,700
Quincy town	131	\$13,728,800	\$104,800
Richfield town	3	\$387,600	\$129,200
Rome town	196	\$41,944,000	\$214,000
Springville town	94	\$11,195,400	\$119,100
Strongs Prairie town	17	\$2,167,500	\$127,500
Friendship village	3	\$313,800	\$104,600
Wisconsin Dells (part)	0	\$0	\$0
Adams city	0	\$0	\$0
<b>Adams County</b>	<b>828</b>	<b>\$122,397,000</b>	<b>\$147,800</b>

Source: US Census and NCWRPC

Methodology – Structures within Floodplains:

1. NCWRPC downloaded the new DFIRM floodplain maps from the FEMA website into a GIS coverage for the County.
2. A building point cover was digitized from 2010 digital aerial photography of the floodplain areas.
3. The floodplain coverage was then combined with the building point coverage to identify those structures within the floodplain boundary.
4. Total structures with the floodplain were then tabulated by municipality.
5. Average Values from US Census data were used to determine the total value for the identified vulnerable structures by municipality.

Flooding in Adams County is often felt beyond the floodplain boundaries due to factors such as topography and high groundwater. The drainage (surface runoff) network in the County is poorly defined. During periods of extended rainfall and/or snowmelt, a general condition of flooding exists throughout the communities. During this time, basements and roadways suffer considerable damage.

In addition to structural damage from flooding, there would be significant damages to public roadways, particularly to roadway surfaces, culverts and bridges. Flooding would inundate or close roadways due to washouts from a period of a few days up to as much as three months. Such interruptions in the County transportation network cause travel delays through detours. Businesses are often impacted by this restriction in access.

Businesses can be forced to close due to septic system problems and other issues resulting from flooding and the high water table. Tourism is an important industry in the County and several campgrounds, lodges, and restaurants may be affected by flooding.

The agriculture industry is a sector that can face substantial losses during a flood. Flood conditions can leave farmers with the following economic setbacks:

- Delayed planting (reduced growing season)
- Prevention of fields from being seeded
- Seed and agricultural chemicals washing out of fields
- Rotting of plants due to excess moisture
- Areas where planted crops left in the fields due to excessive moisture
- Crops not reaching full maturity or stunted growth
- Requirements by farmers to expend higher amounts of money on additional soil amendments
- Lower quality (nutritional value) of harvestable crops as a feed source.

Reductions in quantity can result in loss of revenues from cash crops and increased expenses for purchasing the needed livestock feed from outside sources. Additionally, reductions in crop quality result in lower prices received for cash crops and increased amounts spent for nutritional supplements to animal feed, which need to be added even in much of the purchased feed.

Economic losses to farmers can generate a ripple affect to the local community as well. Reduction in farm income will curtail the farmers'

ability to purchase new equipment and make other improvements. Farmers will have less money to spend at farm dealers, farm supplies, building/hardware suppliers, fertilizer, feed and seed dealers, and other agribusiness and retail establishments. The State itself will have reduced tax revenues. Farmers will have less money to save and invest, and suffer still more increases in debt load.

The forest products industry is affected similarly to agriculture. Forestlands become too wet for logging operations and many water logged tree plantations suffer high mortality rates. Mill inventories become very low, resulting in increased prices for consumers.

The areas considered to have a higher risk for impact from flooding include those communities with structures in floodplains as shown in Map 12.

**Future Probability and Potential Dollar Losses – Flood:**

Based on the historic data presented here (frequency of past events), Adams County can expect a significant flood event about every 3 years on average. This equates to a probability of 0.3 or about a 30 percent chance in a given year.

Due to the significant number of dams and particularly large dams with high hazard ratings, dam failure is an important hazard event to plan for in Adams County. However, based on past experience, the actual probability of a major dam failure is very low. Considering the near failure of the Lake Camelot Dam in 2002 in conjunction with historic flood frequency data, probability of dam failure might be estimated at (less than) 0.08 or 8 percent chance in a given year, although this is not completely accurate, since failure of the dam was avoided by human intervention. The Easton Lake Dam and Kingsway Dam incidents in 2006 and 2007 may be an indicator that age and structural condition dams in the County may be pushing the probability of dam failure.

Historic data is again used to estimate potential future dollar losses due to flood. On average, Adams County might expect property and crop losses of \$114,000 on average, per flood occurrence based on the study period of 2004 to 2013. Over the next ten-year period, flood losses in Adams County could approach \$342,000. However, there is always the chance that a more significant flood will occur like 2002 or even 1993 with greater potential for damage.



**HAZARD ANALYSIS: DROUGHT / EXTREME HEAT****Background on Drought / Extreme Heat Hazard:**

A drought is an extended period of unusually dry weather, which may be accompanied by extreme heat (temperatures which are 10 or more degrees above the normal high temperature for the period). There are basically two types of drought in Wisconsin: agricultural and hydrologic. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. These two types of drought may, but do not necessarily, occur at the same time.

Droughts, both agricultural and hydrologic, are relatively common in the state. Small droughts of shortened duration have occurred at an interval of about every ten years since the 1930's.

Extended periods of warm, humid weather can create significant risks for people, particularly the elderly who may lack air conditioning or proper insulation or ventilation in their homes. Animals are also at risk during extended periods of heat and humidity. The National Weather Service issues a Heat Advisory when the Heat Index ranges from 105 to 114 degrees daytime and remains at or above 80 degrees at night, during a 24-hour period. The heat index combines the effects of heat and humidity to better reflect the risk of warm weather to people and animals. When heat and humidity combine to reduce the amount of evaporation of sweat from the body, outdoor activity becomes dangerous even for those in good shape. The index measures the apparent temperature in the shade. People exposed to the sun would experience an even higher apparent temperature. A heat index of 105 is considered dangerous and prolonged exposure can result in heat stroke, exhaustion and cramps. People should be reminded to use extreme caution when the heat index is between 95 and 105. A heat index of 95 occurs when the temperature is 90 degrees and the relative humidity is 50 percent.

**History of Drought / Extreme Heat in Adams County:**

National Weather Service reports indicate that much of Wisconsin including Adams County continues to struggle with drought conditions extending back to 2005.

NCDC reports from 2012 indicate that persistent below normal precipitation allowed severe drought conditions to develop across portions of western Wisconsin, including Adams County. Effects of the drought include damaged crops, pastures that have stopped growing,

river flows that were less than 20 percent of normal, falling ground water levels and high to extreme fire dangers resulting in burning bans. In addition, blue-green algae growing in area waterways was responsible for one illness after a person water skied and swam in Lake Petenwell. The Governor expanded the state of emergency due to drought to cover the entire state. In late July, the U.S. Dept. of Agriculture declared 23 counties in southern Wisconsin including Adams to be natural disasters areas. In October of 2012 enough rainfall occurred to ease the drought conditions in the county.

Severe drought conditions redeveloped across the southern two-thirds of Adams County in September of 2013. Precipitation deficits of 6 to 8 inches since the beginning of July, combined with above normal temperatures over the last half of August into September, led to the redevelopment of the drought. Non-irrigated corn fields across Adams County had plants that ranged from 2 to 5 feet tall with 0 to 3 ears. Some soybean fields in the county had plants half their normal height. The severe drought was downgraded to moderate after 2 inches of rain fell during the first week of October.

Adams County experienced the 1987-1988 drought with the rest of the Midwest. It was characterized not only by below level precipitation, but also persistent dry air and above normal temperatures. Stream flow measuring stations in the state indicated a recurrence interval of between 75 and 100 years. The drought occurred early in the growing season and resulted in a 30-60% crop loss, with agricultural losses set at \$1.3 billion for the state. No statistics were available for the amount of crops lost in Adams County, but 52 percent of the state's 81,000 farms were estimated to have losses of 50 percent or more, with 14 percent estimated having losses of 70 percent or more.

The drought of 1976-1977 was most severe in a wide band stretching from north to south across the state. Stream flow measuring stations recorded recurrence intervals from 10 to 30 years. Agricultural losses during this drought were set at \$624 million. Adams County was one of 64 counties that were declared federal drought areas and deemed eligible for assistance under the Disaster Relief Act.

Since 2004, the NCDC lists 2 incidences of excessive heat.

Five people died from the effects of a long duration heatwave that gripped western Wisconsin from July 2nd through July 7<sup>th</sup>, 2012. The nearest fatality occurred in Juneau County. Numerous people were also treated for heat related illnesses. The highest apparent temperatures

during the heatwave ranged from 100 to 110 each day. Other impacts from the heat included stimulating algae growth on area waterways which depleted oxygen levels leading to fish kills. Milk production was down during the heat as well, as cows started drinking more water and ate less feed leading to the drop. Campgrounds also reported a downturn in business as potential campers remained at home and numerous roads buckled and had to be repaired.

Warm and humid air invaded western Wisconsin on July 17, 2011 and remained in place for the next three days. Two people perished as a result of the excessive heat and at least eight other were treated for heat related illnesses (outside Adams). During this stretch, afternoon heat indices routinely topped out between 110 and 120. Little relief occurred at night, as overnight lows remained in the 70s. Most of the counties across western Wisconsin opened cooling centers.

Other notable occurrences include 2001 and 1999. The high temperature hit 90 degrees or higher for 9 consecutive days from July 31 to August 10, 2001. High humidity pushed the heat indices to 105-115. These dangerous levels lead to two deaths, although outside of Adams County. In 1999, temperatures reaching 95 to 100 combined with high humidity levels to produce heat indices of 105 to 115 over the Fourth of July holiday. Local hospitals reported treating a few people for heat exhaustion, but there were no deaths related to the excessive heat and humidity. Then, between July 23 and July 30, 1999, consecutive days of high temperatures in the 90s, combined with high humidity levels again caused afternoon heat indices of 105 to 115. An 80-year-old man died of heat stroke in Crawford County.

#### **Drought / Extreme Heat Vulnerability Assessment:**

Droughts can have a dramatic effect on Adams County. The County has 110,941 acres of farmland or 25% of its land area dedicated to farming. With agriculture being a critical sector of the County's economy, droughts have disastrous effects. Even small droughts of limited duration can significantly reduce crop growth and yields, adversely affecting farm income. More substantial events can decimate croplands and result in total loss, hurting the local economy.

There are a number of high capacity wells in the County, mostly for crop irrigation. Irrigation can withdraw significant amounts of groundwater. The Central Wisconsin Groundwater Data Center reports that 95 percent of all groundwater withdrawal was used for irrigation in Adams County.

Irrigation can draw water that otherwise would naturally go to aquifers or surface waters. Drought can exacerbate the problem when high withdrawal rates versus little precipitation deplete waterbodies and aquifer supplies, therefore decreasing drinking water supplies, drying streams, and hindering aquatic and terrestrial wildlife. During severe droughts, some wells - mainly private wells - will go dry.

Another significant area of impact from drought includes the tourism sector of the economy. As lake levels go down, there is less tourism seen in the county. Recent drought conditions have left lake levels down and many boat launches cannot be used.

Droughts can trigger other natural and man-made hazards as well. They greatly increase the risk of forest fires and wildfires because of extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

The following is a list of things that may be adversely affected by a drought. Much of these community assets can be referenced in Part II.

- Infrastructure – municipal water supplies
- Surface water –groundwater reserves, recreation, and wildlife
- Forests
- Agricultural - crops, livestock

The areas most susceptible to drought conditions would be agricultural towns. Agricultural land is scattered throughout the County but largely the Towns of New Haven, Lincoln, New Chester, Jackson, Colburn, and Leola.

According to the Wisconsin Emergency Management, excessive heat has become the most deadly hazard in Wisconsin in recent times. Extreme heat can happen anywhere within Adams County affecting everyone, however the elderly and young are the ones with the highest risk of getting heat related injuries, which can lead to death. Ways to prevent injuries include wearing light-colored clothing, drinking plenty of water, slowing down, and not staying in the sun for too long.

**Future Probability and Potential Dollar Losses – Drought/Extreme Heat:**

Based on the historic data presented here (frequency of past events), Adams County can expect a drought every ten years on average, which is a probability of 0.10 or a 10 percent chance in a given year. Significant

severe drought is somewhat less common, affecting Wisconsin once about every 15 years.

Drought is another hazard lacking good loss figures at the county level. However, a look at aggregate data for two major droughts can give some indication of potential impact. The two major droughts in Wisconsin resulted in losses of \$9.6 million (1976-77) to \$18 million (1987-88) per county on average.

Normally, central Wisconsin is known for its cold winters, however, extreme heat waves will affect Adams County in the future. Adams County can expect a heat wave once every 5 years or a 20 percent chance in a given year based on the historic data presented.

### **HAZARD ANALYSIS: SEVERE THUNDERSTORM/HIGH WIND/LIGHTNING/HAIL**

#### **Background on Severe Thunderstorm Hazard:**

The National Weather Service definition of a severe thunderstorm is a thunderstorm event that produces any of the following: downbursts with winds of 58 miles per hour or greater (often with gusts of 74 miles per hour or greater), hail 1 inch (recently increased from  $\frac{3}{4}$  inch) in diameter or greater or a tornado. Strong winds, hail, and lightning will be addressed in this section, however tornados will be referenced as a separate hazard.

Lightning results from discharge of energy between positive and negative areas separated by rising and falling air within a thunderstorm. This discharge heats the surrounding air to 50,000 degrees. Hail results as the warm rising air cools, forming ice crystals which are held by the updrafts until accumulating enough weight to fall. The hail size depends on strength of the updrafts keeping it up.

Thunderstorms frequency is measured in terms of incidence of thunderstorm days or days on which thunderstorms are observed. Wisconsin averages between 30 and 50 thunderstorm days per year depending on location. A given county may experience ten or more thunderstorm days per year. The southwestern area of the state normally has more thunderstorms than the rest of the state.

#### **History of Severe Thunderstorms in Adams County:**

The NCDC has reported 31 severe storm events for Adams County between 2004 and 2013. These storms typically contain some form of heavy rain, strong winds, and lightning. About 23 significant hail events,

typically related to a severe thunderstorm, were listed during this time period. There was also one notable lightning incident identified.

Most recently, thunderstorms that developed over northern Minnesota along a cold front, advanced into Wisconsin during the evening of August 6, 2013. The storms became oriented into a solid line as they moved across parts of western and central Wisconsin and produced large hail and damaging winds. Extensive damage was reported in neighboring counties including the roof being taken off one county building (Monroe County). Several trees were blown down in Rome. NCDC damage estimate was \$2,000.



*Wind Damage - Com. Tower*

Trees and power lines were blown down southeast of the City of Adams, as a front remained nearly stationary from southwest Wisconsin into western Minnesota on July 10, 2008. An upper level disturbance tracked along the front, triggering a line of severe thunderstorms. Some of the storms produced up to nickel size hail and wind gusts up to 70 mph. NCDC damage estimate was \$10,000.

On September 2, 2011, severe thunderstorms produced damaging winds during the morning hours across portions of southwest and central Wisconsin. Numerous trees and power lines were down from La Crosse eastward to Adams County. Over 10,000 residents lost power and schools were either delayed or closed in these areas. Trees and power lines were blown down across portions of Adams County blocking roadways and falling on top of homes and cars. Several six inch diameter trees were blown down near Castle Rock Park. Four miles north of Friendship, a tree fell on a vehicle on State Highway 21 at the entrance of Roche-A-Cri State Park. The Town of Preston was hit the hardest. NCDC damage estimate was \$42,000.

On October 26, 2010, a low pressure system deepened over northern Minnesota and set the Wisconsin state record for the lowest recorded barometric pressure. This system was responsible for high winds across portions of southwest and central Wisconsin in the morning hours of October 26th and the daytime hours of the 27th. Several trees were blown down across the county, including the areas around Dellwood, County Highway Z, and Arkdale. Some sporadic fires were started from trees falling onto power lines causing power outages. Sporadic damage to roofs and buildings also occurred. A few vehicle collisions also occurred with downed trees. Two pine trees, nearly seventy feet tall, blew

down in Friendship. One of the pine trees landed on a parked pick-up truck partially crushing the cab.

The most recent hail incident occurred on May 28, 2012 when thunderstorms developed along and ahead of cold front during the afternoon over central Wisconsin. These storms produced isolated reports of large hail (0.88 to 1.75 inch diameter) and damaging winds in Adams County. Golf ball sized hail was reported in Big Flats. NCDC damage estimate was \$7,000.

Severe thunderstorms produced large hail up to the size of quarters in parts of central Wisconsin during the late afternoon of October 2, 2006. NCDC damage reports between Easton, Adams/Friendship and Big Flats totaled \$35,000 plus another \$55,000 in crop damages.

On May 4, 2010, a lightning strike started a garage fire. Local fire officials indicated the garage was a complete loss, but there were no injuries as a result of the fire. The start time of the fire was corroborated with radar data, as well as with the detection of a cloud to ground lightning strike in the exact location of the fire at that time. NCDC damage estimate was \$8,000.

**Severe Thunderstorm Vulnerability Assessment:**

The National Weather Service can forecast and track a line of thunderstorms that may be likely to produce severe high winds, hail, and lightning but where these related hazards form or touch down and how powerful they might be, remains unpredictable. The distribution of thunderstorms and related hazard events have been widely scattered throughout the county.

Many thunderstorm events (without tornados) have caused substantial property and infrastructure damage, and have the potential to cause future damage. In order to assess the vulnerability of the Adams County area to thunderstorms and related storm hazards, a review of the past events indicate significant impacts to:

- Infrastructure – hospitals, schools, street signs, police and fire departments
- Utilities - electric lines/poles/transformers, telephone lines, radio communication
- Transportation – debris clean-up
- Residential - mobile homes, garages, trees and limbs, siding, windows
- Businesses – signs, windows, siding, billboards

- Agricultural - buildings, crops, livestock
- Vehicles – campers, boats, windshields, body, paint

Based on review of the historic patterns of thunderstorms associated with high wind, hail, or lightening, there are no specific municipalities that have unusual risks. The events are relatively uniform and a countywide concern. However, during the City/Village Planning Meeting for this Plan Update, both the City of Adams and the Village of Friendship identified severe thunderstorm winds (high straight line winds) as a major vulnerability concern due to the potential for power outage and resulting impact on municipal services and the population itself (heating/cooling, food & water safety).

**Future Probability and Potential Dollar Losses - Severe Thunderstorms:**

Based on historical frequency, Adams County can expect 3.1 thunderstorm events per year on average. In other words, the probability is 1.0 or a 100% chance of multiple storms in a given year. The probability of a thunderstorm with damaging hail in Adams County is also at 1.0 or 100% chance with about 2.3 incidents in a given year. There is not enough data available regarding lightning events to indicate probability.

According to the NCDC, historic thunderstorm events with associated high wind and reported damages averaged \$6,872 in property damage per incident and \$758 in reported crop damage. Historic thunderstorm events with associated hail that reported property damage averaged \$3,217 and \$2,870 in reported crop damage. Historic thunderstorm events with associated lightening that reported property damage averaged \$8,000. Losses in Adams County associated with severe thunderstorms could approach \$384,550 over the next ten-year period.

**HAZARD ANALYSIS: HAZARDOUS MATERIALS INCIDENTS****Background on Hazardous Materials Incidents Hazard:**

This type of hazard occurs with the uncontrolled release or threatened release of hazardous materials from a fixed site or during transport that may impact public health and safety and/or the environment.

Under the Emergency Planning and Community Right to Know Act (EPCRA), a hazardous material is defined as any chemical that is a physical hazard or health hazard [defined at 29 CFR 1910.1200(c)] for which the Occupational Health and Safety Administration (OSHA) requires a facility to maintain a Material Safety Data Sheet (MSDS). Under EPCRA there is no specific list of hazardous materials. An extremely hazardous



substance (EHS) is defined as one of 356 substances on the United States Environmental Protection Agency list of extremely hazardous substances, identified at 40 CFR Part 355.

EPCRA of 1986 also known as SARA Title III, brings industry, government and the general public together to address emergency planning for accidental chemical releases. The emergency planning aspect requires communities to prepare for hazardous chemical releases through emergency planning. This provides essential information for emergency responders. The community right-to-know aspect increases public awareness of chemical hazards in their community and allows the public and local governments to obtain information about these chemical hazards.

Counties in Wisconsin, including Adams County have a Local Emergency Planning Committee (LEPC) that is set up in accordance with the federal legislation and is responsible for implementation of EPCRA at the county level. The County Emergency Management Director is a member of the LEPC to ensure continuity and coordination of emergency response planning.

To meet the requirements of Title III of EPCRA, the LEPC developed the County Hazardous Materials Response Plan. This plan establishes policies and procedures for responding to hazardous material incidents. The LEPC is required to review, test, and update the Plan every two years. Methods for notification and reporting an incident are outlined in the plan. This plan also works in conjunction of the County Emergency Response Plan (ERP) where alert to the public, communications, and response procedures are outlined. The plan is tested through tabletop, functional and full-scale exercises and actual response situations.

To provide a high level of hazardous materials response capabilities to local communities, Wisconsin Emergency Management contracts with eight Regional or "Level A" Hazardous Materials Response Teams. The Regional team for Adams County is located at Oshkosh/Appleton. The Regional Response Team may be activated for an incident involving a hazardous materials spill, leak, explosion, injury or the potential of immediate threat to life, the environment, or property. The Regional or "Level A" Teams respond to the most serious of spills and releases requiring the highest level of skin and respiratory protective gear. This includes all chemical, biological, or radiological emergencies.

County or "Level B" Teams respond to chemical incidents which require a lower level of protective gear but still exceed the capabilities of standard

fire departments. Those teams may provide assistance to surrounding counties and are approved by the Local Emergency Planning Committees. At this time, Adams County is under contract with Juneau County to provide Level B coverage.

**History of Hazardous Materials Incidents in Adams County:**

There have not been any major reported hazardous material problems involving fixed facilities, roadways, railways, or pipelines. Hazardous materials incidents have occurred but on a relatively small scale. They still, however, can cause considerable property damage and can have a high risk in terms of loss of human life or injury. The WDNR Bureau for Remediation and Redevelopment Tracking System or BRRTS maintains a listing of contaminated properties on-line. The BRRTS database identifies 51 environmental spills in Adams County between 2004 and 2013. All of these spill sites have been cleaned and closed at this time.

**Vulnerability Assessment:**

In 2013, the Adams County LEPC sponsored a detailed Hazardous Materials Commodity Flow Study. This Study inventoried the risk factors that make hazardous materials incidents a keen concern in Adams County, which are reviewed below:

Fixed Facilities

The Commodity Flow Study identified 21 facilities within the County meeting reporting the requirements for one or more hazardous chemicals. These are sites that have hazardous substances present at any one time in amount equal to or exceeding the chemical-specific threshold planning quantity (TPQ).

Highway

Trucks carry the bulk of hazardous materials to and through the County. Regular shipments of gasoline, propane, acid and other substances are delivered across Wisconsin. Every roadway in the County is a potential route for hazardous material transport, but major transportation routes are State Highways 13, 21, and 82 (see Map 5).

The Commodity Flow Study monitored traffic at key locations and counted trucks with Hazardous Warning Placards. The locations of the intersections and the total number of trucks with hazardous materials are seen in Table 16a.

**Table 16a – Number of Trucks Carrying Hazardous Materials at Intersections in County**

Intersection	# of Trucks
State Hwys. 13 & 21	34
State Hwy. 13 & UP RR Intersection	7
State Hwys. 13 & 82	27

Source: Richland & Adams Co. LEPCs, 2013.

### Railroad

The Union Pacific Railroad – another mode for the transportation of hazardous material, provides 24 miles of track to Adams County (see Map 5) with a rail yard located on the south side of the City. Although trucks transport most of the hazardous materials in the state and the U.S., rail can carry significantly larger loads of hazardous materials. The Commodity Flow Study identified the hazardous materials being transported by rail through Adams County. Table 16b lists the top five with percent of total.

**Table 16b – Top Hazardous Commodities Carried on Rail In Adams County by Percentage**

Material	% of total
Molten Sulfur	33.41
Elevated Temp. Liquid NOS	19.40
Sulfuric Acid	13.66
Hydrochloric Acid	12.55
Ferric Chloride Solution	3.48

Source: Richland & Adams Co. LEPCs, 2013.

The study cited 4,100 rail car loads of hazardous materials moved through the County in 2012 with the average number of hazardous cars at about 11 per day.

### Pipeline

Enbridge Pipeline Company provides pipeline to move petroleum through the County (see Map 6). It runs 31 miles from the northern part of the county to the eastern part. Approximately 1.5 million barrels per day move through this pipeline. There had not been a major incident with the pipeline within Adams County, but the DNR database shows some significant spills such as in July 2012 when a crack in the pipeline allowed about 1,700 barrels of crude oil to spill in the town of Lincoln. Total property damage was listed at \$10.5 million. An example of a major incident is the leak of 176,000 gallons of crude oil in Rusk County in 2007. Groundwater contamination was the primary consequence of that spill.

There are also natural gas sub-transmission lines entering the County from the east. According to the Commodities Flow Study, natural gas pipelines while not common are not rare either and can be very dangerous. Large amounts of explosive gas can escape quickly from a breach.

A hazardous materials incident can have far reaching impacts, however, those communities which are traversed by major highways, rail or pipeline are susceptible to a higher risk, refer to Maps 5 and 6.

**Future Probability & Potential Dollar Loss – Hazardous Materials Incidents:**

Based on the historic data presented here (frequency of past events), Adams County can expect about 5.1 minor hazardous material releases each year on average, which is a probability of 1.0 or a 100 percent chance in a given year.

There is insufficient data to determine the probability of a major incident. However, with the number of verified trucks carrying hazardous materials, a major industrial railway and a petroleum pipeline moving through the County, the chances appear to be significant for a catastrophic hazardous materials incident occurring at some point in Adams County.

As with the probability, there is limited historic data to base an estimate of potential dollar losses from HazMat incidents. However, based on occurrences statewide, damages range from \$100 to \$10.5 million per incident. The higher end of the range is not impossible in Adams County.



*HAZMAT Exercise*

**INTRODUCTION**

Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property damage from natural hazards. This chapter describes the mitigation goals and actions to be taken by Adams County and the local units of government within the county for each of the hazards identified in Part III – Risk Assessment. The intention is to reduce or avoid long-term vulnerability to the identified hazards.

Part IV of the Adams County All Hazards Mitigation Plan Update will discuss the following factors in establishing the multi-jurisdictional mitigation strategies:

- Benchmark Progress of Previous Plan 2009-2014
- Review of Mitigation Goals
- Prioritize Identified Mitigation Strategies
- Establish Mitigation Action Plan

**PROGRESS REPORT 2009 - 2014**

Table 17 identifies the completed, deleted or deferred mitigation actions from the previous update in 2009. For each action recommendation, a brief status report is provided which describes the progress made on that measure. If an item remains unchanged, a description is provided as to why no action has been taken and whether that item is deferred to the new plan.

The table also provides the new status of each recommendation with regard to the updated plan alongside the previous timeframe target for comparison. Many of the recommendations are on-going efforts and are carried over as such in the updated action plan. Some have had significant progress or have been deferred, but are recommended for further action with new target date or on-going status. If the recommendation has been completed with no further specific action anticipated within the next five year planning period, it is shown as "deleted" and will not appear in the updated action plan. In some cases, an incomplete action is not selected for various reasons (noted) and is shown as deleted. In a few cases, related recommendations are combined as indicated.

This progress report serves as a benchmark for progress in achieving the multi-jurisdictional mitigation goals of Adams County and the local jurisdictions that participated in the Plan Update.

<b>TABLE 17 BENCHMARK FOR PROGRESS 2009 - 2014 PLAN</b>			
<b>2009-2014 Plan Measure</b>	<b>Progress Report</b>	<b>Original Status</b>	<b>New Status</b>
Continue to promote the increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios.	Regularly promotes NOAA alert radios including special events. Supports Storm Spotter training.	On-going (1)	On-going (1)
Continue to update/add Emergency Management Department link off existing County web site.	Website regularly maintained with hazard information.	On-going (2)	On-going (2)
Maintain Co. Emergency Response Zone Atlas - update, reprint and distribute.	Recurring cycle. Atlas was last updated in 2012. Minimum update 3 to 5 years.	2010 (3)	2017 (3)
Develop county-wide evac & sheltering plans...	Manning and liability limitations. Red Cross has updated their list.	2015 (4)	2019 (4)
Work toward development of county-wide early warning systems...	Some progress - County using Nixle system.	2016 (5)	On-going (5)
Update radio / emergency communications.	Public safety communications narrow banding requirements completed - using new WisCom.	On-going (6)	<i>Completed</i>
Continue to provide outreach efforts to homeowners on protecting homes and structures from wildfires.	A number of towns have done wildfire protection planning and are working with WisDNR on Firewise programs.	On-going (7)	On-going (17)
Provide ample training for volunteer fire fighters for larger fires.	Regular training and exercises being conducted cooperatively by the DNR, Adams County & local municipal FDs.	On-going (8)	On-going (18)
Support establishment of Firewise Communities across the County.	Wildfire protection plans and Firewise programs implemented in Towns of Rome, Big Flats and Monroe.	On-going (9)	On-going (19)
Develop Wildfire Protection Plans in high risk Towns.	Wildfire Protection Plans have been done in Rome, Big Flats and Monroe. But most of county is high risk so more are needed.	2014 (10)	2019 (20)
Enhance fire fighting capacity of the municipal water supply in the southern part of the city - of a new well	New municipal well installed.	2010 (11)	<i>Completed</i>
Obtain new fire engine and firefighting gear.	Village Dept. merged with Adams County Fire District.	2010 (12)	Deleted
Identify buildings that will provide protection to the public in the event of a tornado warning	Still identified as a need, but not yet completed as County & municipalities focused on other activities. Expand scope to include all hazards.	2012 (13)	2018 (11)
Identify and construct tornado shelters in areas where deficient	County has applied for funds for this recommendation and been denied. Campgrounds and areas where housing lacks basements, etc.	On-going (14)	On-going (12)

<b>TABLE 17 Continued</b>			
<b>2009 - 2014 Plan Measure</b>	<b>Progress Report</b>	<b>Original Status</b>	<b>New Status</b>
Require and promote construction standards and techniques (tornado/wind).	Ongoing enforcement of standards. Now "hurricane" clip requirements for new construction.	On-going (15)	On-going (13)
Establish shelters in the Towns of Leola, Monroe, New Haven and Rome.	No progress to date.	2010 (16)	2019 (14)
Mitigate impacts of flooding through acquisition / demolition of homes in the floodplain/flood damaged...	No progress to date. Budget issues.	2010 (17)	On-going (25)
Continue development of Emergency Action Plans (EAP) for all county owned dams.	County has completed break analysis and continues to make progress on completing EAPs for its dams.	On-going (18)	On-going (26)
County/City/Village continued compliance in the NFIP.	On-going efforts of the County, City and Village.	On-going (19)	On-going (28)
Improve Village stormwater capacity through installation of lift station / pumps.	Lift station improvements completed.	2010 (20)	<i>Completed</i>
Develop business park - EDA economic recovery project.	Business park initial development completed.	2010 (21)	<i>Completed</i>
Encourage the development of snow fences.	A number have been installed around the County but more are needed.	On-going (22)	On-going (15)
Promote winter hazards awareness, including home and travel safety measures.	County does annual winter awareness "PR" campaign.	On-going (23)	On-going (16)
Promote heat hazard awareness...	County does heat awareness "PR" campaign as needed.	On-going (24)	On-going (21)
Encourage farmers that irrigate to use irrigation scheduling programs and drop/misting systems.	Ongoing efforts of the County UWEX Agricultural Agent and FSA Office.	On-going (25)	On-going (22)
County should be prepared on how to inform farmers during times of drought.	Ongoing efforts of the County UWEX Agricultural Agent and FSA Office.	On-going (26)	On-going (23)
Inform farmers on purchasing crop insurance.	Ongoing efforts of the County UWEX Agricultural Agent and FSA Office.	On-going (27)	On-going (24)
Promote the planting of windbreaks to protect farmsteads, buildings & open fields from high winds.	A number of plantings have been installed around the County, but more is needed.	On-going (28)	On-going (30)
Enforce local building codes to improve structures' ability to withstand greater wind velocities.	Ongoing regulation of new buildings and renovations. Uniform Dwelling Code (UDC) has been updated.	On-going (29)	On-going (31)
Promote public awareness of proven lightning safety guidelines to reduce risk.	County EM has articles published in the local newspaper and posted information on the County website.	On-going (30)	On-going (32)
Develop Level B HazMat to respond to hazardous spill situations	County contracts with Juneau County to provide Level B HazMat.	2010 (31)	<i>Completed</i>

### LOCAL HAZARD MITIGATION GOALS

The mitigation strategy is based on a set of goals to reduce or avoid long-term vulnerabilities to the hazards identified in the Risk Assessment. The goals were established by the previous Plan Taskforce during the development of the last update. The Update Plan Taskforce reviewed the goals and concurred that these goals continue to represent the desired conditions to strive for through the mitigation efforts of the County and municipalities.

The mitigation goals for reducing or avoiding the long-term vulnerability of Adams County are as follows:

- Prepare and protect residents and visitors from all hazards.
- Lessen the impact floods have on people, property, and the environment.
- Eliminate the loss of life and reduce the risk of property damage in downstream areas that result from a dam failure.
- Minimize the threat to human life and property damage caused by associated high wind and lightning.
- Protect the health, safety, and welfare of county residents and visitors, along with mitigating future loss of property from tornados.
- Create safety awareness to citizens and travelers of Adams County to protect them during and after winter storm events or periods of extreme cold.
- Minimize crop loss while maintaining water supplies during times of drought.
- Protect the safety and property of residents from forest and wildfires.
- Protect people and natural resources from adverse affects of hazardous material incidents.



*Strongs Prairie Fire Department*



**PRIORITIZATION OF STRATEGIES**

The Update Plan Taskforce considered a number of factors in identifying and ranking proposed mitigation strategies. The matrix, below, describes the factors incorporated into the prioritization process. The resulting priority of each strategy is shown in the summary Table 18.

**Prioritization Factors for Adams County Mitigation Strategies**

<i>Strategy Prioritization Factor</i>	<i>Description of Factor Considerations</i>
Priority of Hazard Type	The ranking of hazard types, tornado, flooding, etc., accounts for threat to human safety and possible property damage and was carried over to groups of strategies by hazard type. Strategies believed to benefit multiple hazards (listed under "All Hazards") were valued higher.
Ease of Implementation	Strategies where existing staff and resources are adequate were valued higher than those where additional resources are necessary. Consideration was also given to strategies that meet other countywide goals or incorporated as part of another county project. Project timing was also a consideration as to when funding such as grant applications might be available and when various activities could be scheduled.
Perceived Cost versus Potential Benefit	Although a detailed cost-benefit analysis was deemed beyond the scope of this study, the Committee weighed the perceived costs of each strategy against the potential benefit anticipated. Proposals that seemed economically unfeasible were rejected.
Multi-jurisdictional Application	Strategies benefiting multiple jurisdictions were valued more than those pertaining to fewer jurisdictions.

Members of the Update Taskforce scored each strategy based on these prioritization factors and assigned a high, medium or low rating to reflect their relative level of priority for that strategy. A 3-point weighted scale was used to average the scores into the overall high, medium or low priority for the County or local units as shown in Table 18.

**MITIGATION ACTION PLAN**

The mitigation strategies are organized by hazard beginning with some overall strategies that apply to a number of different hazards and are listed under the category, “all hazards”. For each hazard, a goal was established as to what the County intends to achieve by implementing the specific action strategies and is based on the risk assessment findings. Each action strategy is then briefly described and followed by a discussion of the jurisdictions/agencies that will pursue the action including the proposed lead jurisdiction/agency.

Each section of this part is broken down as follows:

**Goal:**

Broad, long-term mitigation goals to reduce or avoid vulnerabilities to the identified hazard are stated.

**Action:**

Each action strategy proposed to aid in achieving the overall goal for the identified hazard is described. A given action strategy may be comprised of a number of related sub-actions.

**Participating Jurisdictions:**

The proposed lead agency or lead jurisdiction is identified along with a listing of the other agencies or jurisdictions that the recommended action applies to. This does not preclude other agencies or jurisdictions from participating in the action.

The chapter concludes with a summary of the recommended mitigation strategies shown in Table 18.

**Hazard: All Hazards**

**Goal:**

Prepare and protect residents and visitors from all hazards.

**Action 1:**

The County will continue to promote an increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios. NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous

weather information direct from a nearby National Weather Service office. NWR broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day. NWR is not only for storms, but also for other hazards as well making it a single source for comprehensive weather and emergency information. NWR also broadcasts warning and post-event information for all types of hazards--both natural and environmental (such as chemical releases or oil spills).

***Participating Jurisdictions for Action 1:***

Lead agency will be Adams County Emergency Management. Jurisdictions participating in this action will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 2:**

The County will continue to add and update information an Emergency Management Department link off their existing County web site. The web site should contain information describing the types of natural and manmade hazardous disasters in the County and how to respond when a hazard threatens. The site should also contain information on ordinances pertaining to hazards, locations of tornado shelters, and links to other sites with useful information on related matters such as burning permits and weather conditions.

***Participating Jurisdictions for Action 2:***

Lead agency will be Adams County Emergency Management. The only directly participating jurisdiction will be Adams County.

**Action 3:**

The county-wide emergency response zone atlas should be updated. Often referred to as a fire zone atlas, these atlas books were originally conceived to help direct fire fighting and evacuation operations in rural areas at high risk for wildfire. A number of counties across the state have developed, or are developing these atlases, typically sponsored by WisDNR. In Adams County, the atlas was credited as being instrumental in fighting the Cottonville Fire. Recognizing their potential value in responding to a wide variety of hazard events, many counties are utilizing them as a tool in responding to and managing other situations beyond fire.

Zones are drawn around groups of structures based on factors related to access and evacuation. The zones are named, colored-coded and indexed for ease of reference. Atlas books are distributed to police, fire and EMS units responsible for responding to emergency situations in rural areas of the county covered by the atlas.

***Participating Jurisdictions for Action 3:***

Lead agency will be Adams County Emergency Management Department in conjunction with the Wisconsin Department of Natural Resources. Jurisdictions participating in this action will include Adams County, City of Adams, Village of Friendship and all Towns.

**Action 4:**

Shelter and evacuation related concerns were again identified during the development of this All-Hazards Plan Update. To address these concerns, the County should work to develop a countywide disaster evacuation and shelter plan. One issue with shelters may stem from lack of knowledge regarding existence of shelters and procedures for use. Plan distribution and public informational efforts are recommended. The local American Red Cross chapter has recently updated its listing of designated shelters. This should be a starting point for discussions.

The plan should identify available shelters by function and determine where coverage is deficient. The function of a shelter is to protect people during a disaster event, to accommodate displaced people in the aftermath, or both. Existing facilities (schools, churches, public buildings, etc.) should be evaluated for suitability or locations determined for new structures. Mobile home parks, campgrounds and County parks within the County lack shelters and are a particular concern. Some of the problems identified include the availability of personnel willing to assume the responsibility of manning the sites along with the overall liability of maintaining such sites.

Establish zones to help people to identify which shelter they should go to and procedures for notification. It is also important to evaluate shelters for suitability for various types of hazards. For example, a shelter located within a floodplain may not be the best place to send people during a storm that could result in flooding. Adequate heat (and back-up source of energy to run it) is an important consideration when seeking to shelter people during a winter weather power outage. Local sponsors should be identified to help maintain shelters and ensure they are open in time of need. Transportation options should also be considered especially for the elderly and those with disabilities. The transportation and subsequent shelter of persons with special medical or other needs are critical factors to address.

***Participating Jurisdictions for Action 4:***

Lead agencies will be Adams County Emergency Management as well as Health and Human Services and the City of Adams and Village of Friendship. Jurisdictions participating in this action will include Adams County, City of Adams, Village of Friendship and all Towns. The American Red Cross Chapter should also be consulted.

**Action 5:**

The old standby for early warning, the warning siren, is still in use within Adams County. However, these sirens are an individual municipal responsibility, and some are starting to pull their sirens due to cost. Even with sirens in place, it is impossible to provide coverage in all parts of a rural area. Note that there was an expressed interest in siren coordination and testing (City of Adams).

Continue development of county-wide early warning and communication systems should be sought, including Emergency Alert System (EAS) capabilities and expanded use of emerging technologies such as IPAWS. Currently, NOAA weather radio is the primary trigger for activating the EAS on commercial radio, television and cable systems. Local access to these types of warning systems could facilitate more timely notification of a hazard situation as well as the ability to tailor important information or instructions for the specific area.

The County should also evaluate the continued / expanded use of the Nixle System. This is a free, subscriber based system that can be used to notify particular areas of the County via internet, email and/or cell phone text. Residents register and choose the type of information to receive such as: public safety notifications, weather alerts, school notifications, community news, etc. The service allows the users to determine the level of information they find important. The County could look at ways to better promote use of the Nixle system.

Another system called CodeRED is being used by a number of counties in Wisconsin such as neighboring Juneau County. It has some more advanced capabilities to deliver targeted emergency notifications to phone numbers in an affected area. However, this is a pay-to-play system which Adams County has decided not to utilize due to cost. There is a possibility to join in with Juneau County which should continue to be explored.

To be most effective, there needs to be a public awareness element to familiarize the citizenry with the systems being used and how they work.

***Participating Jurisdictions for Action 5:***

Lead agency will be Adams County Emergency Management. Jurisdictions participating in this action will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 6:**

Develop action plans and training for areawide cooperation and coordination during major incidents. WEM has funding available for training and exercises.

Work with energy companies, local government officials, and emergency responders to develop training on how the different energy systems function, what responders need to know and how the energy company can help in an emergency situation through early notification.

Address environmental health issues, such as: volunteer and responder safety issues (i.e. tetanus) and education on well testing follow-up, food safety in a LTPO situation, etc. Work with Health Department on the mass fatality management plan.

Address vulnerable populations particularly regarding communications and/or power outages. Identify and preplan for problem areas. For example, area power companies have information on customers in situations requiring power (ie O<sub>2</sub>) which they can combine with areas they know are without power during an outage. County and local government officials/emergency responders should develop relationships with power company representatives to streamline access to this type of information when needed.

In Adams County there are many people living in remote areas and/or have limited communications. The County Aging Unit could assist by helping to educate the elderly and disabled in these situations with information they need to help themselves. The County should coordinate with organizations like the Salvation Army and/or Red Cross for their assistance with door to door sweeps during an event. Evacuation is another multi-faceted issue that needs preplanning, training, coordination and cooperation.

Other issues identified during the planning process include: fuel supplies for emergency vehicles during long term power outage or other extreme situation; individual municipalities within the County do not have adequate manpower and equipment to effectively deal with extreme or large scale events; and public awareness.

***Participating Jurisdictions for Action 6:***

Lead agency will be Adams County Emergency Management. Jurisdictions participating in this action will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 7:**

Review Chula Vista emergency response plan and work with company representatives to develop cooperation & coordination in the event of a disaster.

Chula Vista is a 500 acre resort destination in southwestern Adams County and adjacent to the City of Wisconsin Dells that sees concentrations of guests and

staff ranging from 3,000 to 5,000 people. They have a well-organized and staff security team that has crisis management responsibilities. They have a command center and an emergency operations manual that deals with communications and emergency notifications, evacuation, etc. Tornado is their biggest concern but recognize the potential for straight-line winds to cause power outage.

Adams County Emergency Management has been discussing coordination and cooperation with Chula Vista Staff and is reviewing their operations manual. With Chula Vista being within the boundary of the City of Wisconsin Dells, these coordination efforts will also include the City.

***Participating Jurisdictions for Action 7:***

Lead agencies will be Adams County Emergency Management with Chula Vista Staff and City of Wisconsin Dells. Adams County will be the only directly participating jurisdiction.

**Action 8:**

The County Emergency Management Director provides assistance to local units of government in updating their local emergency plans. Town survey results indicate Colburn, Lincoln, Springville and Strongs Prairie have plans that need updating. It is recommended to proceed first with these towns.

Each Town should develop a local emergency response plan (ERP). An ERP helps the community determine the roles to be played by each emergency service, how communication channels will be utilized, lines of authority, and strategies or “game plans” for responding to different kinds of hazard situations. Wisconsin Emergency Management has plan templates that towns can use to fill in the blanks and begin formulating their own local ERP.

ERP’s should conform to the State and National Response Plans, which are organized by emergency support functions and incorporate the provisions of the National Incident Management System (NIMS). The NIMS is a comprehensive system that incorporates operations through the use of the Incident Command System (ICS) and application of standardized procedures and preparedness measures. It promotes development of cross-jurisdictional, statewide and interstate regional mechanisms for coordinating response and obtaining assistance during a large-scale or complex emergency incident.

***Participating Jurisdictions for Action 8:***

Lead agencies will be Adams County Emergency Management. Jurisdictions participating in this action will include: Adams County, the Towns of Colburn, Lincoln, Springville, Strongs Prairie and all other Towns.

**Action 9:**

The Town of Dell Prairie identified a need to install an emergency back-up generator at its Town Hall in response to the mitigation issues survey. They indicated this would allow them to use the Town Hall as a command center in emergency events.

***Participating Jurisdictions for Action 9:***

Lead agency will be the Town of Dell Prairie. Dell Prairie will be the only directly participating jurisdiction.

**Action 10:**

The City of Adams and Village of Friendship should establish drill/exercise programs to help evaluate if they are prepared for any given hazard. Issues include documentation and record keeping, equipment, manpower and public awareness.

***Participating Jurisdictions for Action 10:***

Lead agencies will be the City of Adams and Village of Friendship. County Emergency Management. Jurisdictions participating in this action will include: the City, the Village and Adams County.

**Hazard: Tornadoes****Goal:**

Protect health, safety, and welfare of county residents and visitors, along with mitigating future loss of property from tornadoes.

**Action 11:**

The County and the local units of governments should identify buildings that will provide protection to the public in the event of a tornado or other hazard. As an example, the pastor at the Trinity Lutheran Church in Arkdale opens the doors when a tornado warning is issued. There are a number of buildings in the County that can accommodate people during a tornado or other hazard. The basement at the City Hall in Adams for example provides ample room. Closed school buildings are maintained by the District and may have the potential to act as a shelter if needed. Part of this effort would be to work with building owners to reach understanding on use of facilities as shelter.

***Participating Jurisdictions for Action 11:***

Lead agency will be Adams County Emergency Management. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.



**Action 12:**

Upon identifying existing buildings that could provide protection, the County and its local units of governments should identify areas that remain deficit in tornado shelters. Shelters should be planned and constructed in these areas. Structures available to the public during tornado warnings should be publicized by a number of sources such as area newspapers, signs, county maps, and the County web site. A basement sharing concept may warrant further evaluation.

Funding for the construction of shelters may be available through the Wisconsin Department of Commerce's Committee Development Block Grant (CDBG). Adams County did apply for funding to build shelters but was not awarded. FEMA's hazard mitigation grants are another source of funding for shelters, community safe rooms and the like.

***Participating Jurisdictions for Action 12:***

Lead agency will be Adams County Emergency Management. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 13:**

The County should require and promote construction standards and techniques. To strengthen public and private structures against severe wind damage, communities can require or encourage wind engineering measures and construction techniques that may include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles. Also, architectural design can make roofs less susceptible to uplift. See also Action 31.

***Participating Jurisdictions for Action 13:***

Lead agencies will be Adams County Planning & Zoning, City of Adams, and the Towns of Dell Prairie, Lincoln and Rome. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns including: Adams, Big Flats, Colburn, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville and Strongs Prairie.

**Action 14:**

Establish shelter facilities in the Towns of New Haven and Strongs Prairie. These towns identified a need for tornado / emergency shelter within the Town in the mitigation issues survey distributed as part of this plan. Locations indicated vary by town, however the town hall or municipal building is a common site preference.

***Participating Jurisdictions for Action 14:***

Lead agency will be the Towns of New Haven and Strongs Prairie. These Towns will be the only directly participating jurisdictions for their area.

**Hazard: Winter Storms / Extreme Cold**

**Goal:**

Create safety awareness to citizens and travelers of Adams County to protect them during and after winter storm events or periods of extreme cold.

**Action 15:**

The County should encourage the development of snow fences for public safety. Using snow fences or “living snow fences” (rows of trees or other vegetation) can limit blowing and drifting of snow over critical roadway segments. Assistance can be provided by the County Land and Water Conservation Department and NRCS to develop windbreaks. Windbreaks would be advantageous to the County Highway Department and towns to prevent blowing and drifting on roadways. Stretches of STH 21 and CTH D were identified as critical locations for snow fence / wind break establishment.

***Participating Jurisdictions for Action 15:***

Lead agencies will be Adams County Land & Water Conservation and Highway Departments. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 16:**

The County should promote winter hazards awareness, including home and travel safety measures, such as avoiding travel during winter storms. If travel cannot be avoided, having a shovel, sand, warm clothing, food, water, etc. should be encouraged to have in vehicles.

***Participating Jurisdictions for Action 16:***

Lead agency will be Adams County Emergency Management. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Hazard: Forest Fire**

**Goal:**

Protect the safety and property of residents from forest and wildfires.

**Action 17:**

The County and DNR should continue to make outreach efforts to homeowners on protecting their homes and structures from wildfires. Since Adams County is mostly rural with many industrial woodland parcels, emphasis should be placed on building construction materials and establishing defensible areas around structures. Roofs and exterior siding should be made of ignition-resistant materials. At least 30 feet should be left between homes and surrounding combustible vegetation. Outreach efforts can exist in the form of web sites, local newspaper articles, and pamphlets to homeowners.

***Participating Jurisdictions for Action 17:***

Lead agencies will be Adams County Emergency Management with WisDNR. Adams County will be the only directly participating jurisdiction.

**Action 18:**

Local fire departments should provide more training for responding to larger fires.

***Participating Jurisdictions for Action 18:***

Lead agencies will be Adams County Emergency Management and fire districts serving Adams County. Other participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 19:**

Support establishment of Firewise Communities across the County. The national Firewise Communities program is a multi-agency program, which promotes partnerships between community leaders, homeowners, planners, developers and others to promote wildfire preparedness - before a fire starts. The Firewise approach emphasizes local community responsibility for designing and maintaining safe communities through land use planning, mitigation activities, collective decision-making and effective response.

Firewise Communities/USA is a project of the National Wildfire Coordinating Group's Wildland/Urban Interface Working Team and is the latest component of the Firewise program. According to the NWCG, the Firewise Communities concept "provides citizens with the knowledge necessary to maintain an acceptable level of fire readiness, while ensuring firefighters that they can use equipment more efficiently during a wildland fire emergency."

Becoming a Firewise Community involves a 7-step process.

- Step 1: Contact Firewise
- Step 2: Site visit with local Firewise Communities USA representatives

- Step 3: Community representatives create a multi-discipline Firewise board/committee
- Step 4: Assessment & evaluation
- Step 5: Create plan – Create agreed-upon, area-specific solutions to its WUI fire issues
- Step 6: Implement solutions – Local solutions are implemented following a schedule designed by the local Firewise board and WUI specialist.
- Step 7: Apply for recognition

Mitigation grants are available to assist communities with hazardous fuels reduction, ie clean-up of excess woody debris from storm damage for example.

***Participating Jurisdictions for Action 19:***

Lead agency will be the respective jurisdictions. Jurisdictions participating in this action will include: Adams County, City of Adams, Village of Friendship and all Towns including: Adams, Big Flats, Colburn, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville and Strongs Prairie.

**Action 20:**

Towns with high risk of wildfire should develop Community Wildfire Protection Plans (CWPPs). In Adams County, virtually all towns have been identified by WDNR as very high or high risk for wildfire except Leola and Colburn, which are identified as "communities of concern" for wildfire risk. A CWPP identifies and prioritizes areas for hazardous fuels reduction treatments and recommends types and methods of treatment that will protect at-risk areas and critical infrastructure. WisDNR has grant funding available for community wildfire protection planning. The Towns of Big Flats, Monroe and Rome have completed CWPPs with DNR grants, however, they are approaching time for an update.

***Participating Jurisdictions for Action 20:***

Lead agency will be the respective jurisdictions. Jurisdictions participating in this action will include: Adams County, City of Adams, Village of Friendship and all Towns including: Adams, Big Flats, Colburn, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville and Strongs Prairie.

**Hazard: Drought / Extreme Heat**

**Goal:**

Minimize crop loss while maintaining water supplies during times of drought.

**Goal:**

Create safety awareness in citizens of Adams County to help protect themselves during extreme heat events.

**Action 21:**

The County should promote heat hazards awareness, including home and travel safety measures. Include suggestions regarding checking on neighbors or other known that live alone or that may be at a disadvantage in fending for themselves.

***Participating Jurisdictions for Action 21:***

Lead agency will be Adams County Emergency Management. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns.

**Action 22:**

The County should encourage farmers that irrigate to use irrigation scheduling programs and drip or misting systems. Also work with corporate growers. Research-based programs can assist growers in determining frequency and amounts of irrigation throughout the growing season; it can be extremely helpful during a drought.

***Participating Jurisdictions for Action 22:***

Lead agencies will be Adams County Land and Water Conservation and Adams County UW-Extension. Adams County will be the only directly participating jurisdiction.

**Action 23:**

The County should be prepared on how to inform farmers during times of drought. This could include feed assistance or financial assistance programs and managing crops and livestock during drought conditions.

***Participating Jurisdictions for Action 23:***

Lead agencies will be Adams County Land and Water Conservation and Adams County UW-Extension. Adams County will be the only directly participating jurisdiction.

**Action 24:**

The County should inform farmers on the advantages/disadvantages of crop insurance for preserve economic stability for farmers during a drought.

***Participating Jurisdictions for Action 24:***

Lead agencies will be Adams County UW-Extension with FSA. Adams County will be the only directly responsible jurisdiction.

## **Hazard: Flooding / Dam Failure**

### **Goal:**

Lessen the impact floods have on people, property, and the environment.

### **Goal:**

Eliminate the loss of life and reduce the risk of property damage in downstream areas that result from a dam failure.

Please note: actions denoted with an asterisk (\*) relate to compliance with the NFIP.

### **Action 25\*:**

Adams County should seek to mitigate the impacts of flooding through the acquisition and demolition of homes in the floodplain, particularly those flood damaged.

#### ***Participating Jurisdictions for Action 25:***

Lead agencies will be Adams County Planning & Zoning and Emergency Management. Adams County will be the only directly participating jurisdiction.

### **Action 26:**

The Adams County Land and Water Conservation Department (LWCD) has completed dam break analysis for all county owned dams. The County will continue to develop Emergency Action Plans (EAPs) based on the dam break analysis for each of these dams. The LWCD Committee has already approved a schedule for this to take place and significant progress has been made.

#### ***Participating Jurisdictions for Action 26:***

Lead agencies will be Adams County Land & Water Conservation and Emergency Management. Adams County will be the only directly participating jurisdiction.

### **Action 27:**

Address Friendship Dam situation and develop emergency action plan. The dam is currently in need of maintenance and has no emergency action plan. Failure of this dam would take out a major highway.

#### ***Participating Jurisdictions for Action 27:***

Lead agency will be Adams County Emergency Management in conjunction with WisDNR. Adams County will be the only directly participating jurisdiction.

**Action 28\*:**

Communities within Adams County currently participating in the National Flood Insurance Program (NFIP) should work to ensure continued compliance. Compliance primarily entails adopting and enforcing floodplain management regulations that meet minimum criteria. Adams County, the City of Adams and the Village of Friendship are in the program. All towns are included under the umbrella of the County through the state mandated county shoreland zoning.

***Participating Jurisdictions for Action 28:***

Lead agencies include Adams County Zoning, the City of Adams and the Village of Friendship. The only directly participating jurisdictions are Adams County, City of Adams and the Village of Friendship.

**Action 29:**

Do public education and information regarding dam function and operations in Adams County. Many people do not realize that the dams play a role in stabilizing flow across the overall river system, and water levels may fluctuate and change rapidly posing a potentially hazardous situation for someone caught off-guard in a dam danger zone.

***Participating Jurisdictions for Action 29:***

Lead agency will be individual dam owners and Adams County Land & Water Conservation. Adams County will be the only directly participating jurisdiction.

**Hazard: Severe Thunderstorms / Hail / Lightning / Wind**

**Goal:**

Minimize the threat to human life and property damages caused by severe storms and associated hail, lightning and high winds.

**Action 30:**

The County should continue to promote the planting of windbreaks to protect farmsteads, buildings, and open fields from high winds. Established trees and shrubs can slow wind on the downwind side of a windbreak for a distance of 10 times the height of the trees. The windbreaks can also reduce soil erosion, act as snow fences, provide wildlife food and cover, and offer a number of other benefits.

There are a number of resources area landowners use to help install and pay for windbreaks. Both the Central Wisconsin Windshed Partnership and the County Land and Water Conservation Department provide assistance to help establish

windbreaks. Windbreaks can also be established through the Conservation Reserve Program (CRP), Conservation Enhancement Reserve Program (CREP), Conservation Security Program (CSP), and Environmental Quality Incentive Program (EQIP) from the USDA Natural Resource Conservation Service (NRCS).

***Participating Jurisdictions for Action 30:***

Lead agency will be Adams County Land & Water Conservation. Adams County works cooperatively with NRCS on this activity.

**Action 31:**

Continue to enforce local building codes to improve new buildings and renovations ability to withstand greater wind velocities. The State of Wisconsin Uniform Dwelling Code (UDC) used by Adams County was recently updated, and there is some concern that this area of the code was actually weakened.

Adams County should conduct a review of these building codes to determine if the County should "add back" provisions to improve the structures ability to withstand greater wind velocities. The building code should include requirements for construction methods that employ cross-bracing, anchoring of walls to foundation, and anchoring roof rafters to walls (also mitigates tornado risk) and measures to provide wind protection and retrofits for vulnerable features (windows, garage doors, patio doors, double-wide entry doors, siding, and bracing for walls and rafters). A document was created by FEMA and WEM to help provide adequate and inexpensive wind mitigation measures to local officials, residents, and business owners. This document (provided on the WEM website) should be referenced when making changes to buildings codes. See also Action 13.

***Participating Jurisdictions for Action 31:***

Lead agencies will be Adams County Planning & Zoning, City of Adams, and the Towns of Dell Prairie, Lincoln and Rome. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns including: Adams, Big Flats, Colburn, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville and Strongs Prairie.

**Action 32:**

Since the County, particularly the Town of Rome, provides a variety of recreation activities, public awareness of proven lightning safety guidelines to reduce risk should be promoted. Such measures as constructing signs to inform people when to get out of the water or off a golf course when there is lightning can be taken.



***Participating Jurisdictions for Action 32:***

Lead agency will be Adams County Emergency Management. Participating jurisdictions will include: Adams County, City of Adams, Village of Friendship and all Towns including: Adams, Big Flats, Colburn, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville and Strongs Prairie.

**Hazard: Hazardous Materials Incidents**

**Goal:**

Protect people and natural resources from adverse effects of hazardous material incidents.

**Action 33:**

Implement recommendations within Hazardous Materials Commodity Flow Study regarding precautions and planning to address the presence of acutely hazardous materials moving through Adams County. The study characterizes Adams County as "a thoroughfare for freight movement" with about 4,000 car loads of hazardous materials via rail per year and 1.5 million barrels of crude oil and light hydrocarbons via pipeline per day.

Research reveals that there are occasional shipments of very dangerous materials through Adams County. The study recommends, "Precautions still need to be taken and planning should be done to address its presence on state and county roads in Adams County."

***Participating Jurisdictions for Action 33:***

Lead agencies will be Adams County Emergency Management. Other participating jurisdictions will include: Adams County, City of Adams, Village of Friendship, all Towns and the fire districts serving the County.

**Action 34:**

Do preplanning and training exercise for local fire depts to deal w/ special situations including the hospital bulk oxygen (O<sub>2</sub>) tanks, the Allied CO-OP with its shipment and storage of things like anhydrous ammonia, chlorine gas, and hydrogen peroxide, etc. It is important to note that not only do these fixed facilities pose a serious concern, but also the movement of these hazardous chemicals through the County via truck and train. The need for further development of action plans for these types of facilities/substances along with on-going training and exercises in responding to incidents involving them is needed. This includes multiple county departments, the City, the Village and

virtually all towns due to the reach of rail and truck routes that may transport these materials.

***Participating Jurisdictions for Action 34:***

Lead agencies will be Adams County Emergency Management. Other participating jurisdictions will include: Adams County, City of Adams, Village of Friendship, all Towns and the fire districts serving the County.

**Table 18 - Summary of Mitigation Strategies**

Mitigation Measures (See Expanded Text in Plan)	Cost Estimate	Existing and Potential Resources to Implement	Responsible Units	Project** Timeframe	Priority Level
<b>ALL HAZARDS</b>					
1 Continue to promote the increased use of National Oceanic and Atmospheric Administration (NOAA) weather radios.	Staff Time	Dept Budget	County EM Dept	On-going	High
2 Continue to maintain Emergency Management Department Page - linked from County web site.	Staff Time	Dept Budget	County EM Dept	On-going	High
3 Maintain County Emergency Response Zone Atlas - update, reprint and distribute.	\$20,000	WisDNR / WEM Funding	County EM Dept	2017	High
4 Develop County-wide evacuation and shelter plans including public education component, needs of special populations and facilities such as campgrounds, elderly housing, etc.	\$40,000	General Funds Dept Budgets	County / City / Village / All Towns	2019	Medium
5 Continue development of county-wide early warning systems including utilization of current & emerging technologies such as EAS and IPAWS. Coordinate siren testing. Expand utilization of the Nixle System. Include public education element.	Cost to be determined	General Funds Dept Budgets	County / City / Village / All Towns	On-going	High
6 Develop action plans and training for areawide cooperation and coordination during major incidents. Issues include: energy companies, health concerns, vulnerable populations, fuel supplies, equipment and manpower, public awareness, etc.	Costs to be determined	Dept Budgets	County / City / Village / All Towns	2018	High
7 Review Chula Vista emergency response plan and work with company representatives to develop cooperation & coordination.	Staff Time	Dept Budget	County EM Dept	2015	Medium
8 Assist municipalities with review and update of local emergency response plans.	Staff Time	Dept Budget	County EM Dept	On-going	High
9 The Town of Dell Prairie should install emergency backup generator at Town Hall.	\$20,000	Town funds / Assistance to Firefighters Grant	Town of Dell Prairie	2016	Medium
10 The City of Adams and Village of Friendship should establish drill/exercise programs to help evaluate if they are prepared for any given hazard, including public awareness.	Staff Time	General Funds Dept Budgets	City of Adams / Village of Friendship / County EM Dept	On-going	High
<b>TORNADO</b>					
11 Identify buildings that will provide protection to the public in the event of a tornado warning	Staff Time	Dept. Budget	County / City / Village / All Towns	2018	Medium
12 Identify and construct tornado shelters in areas where deficient	Cost to be determined	CDBG Program	County / City / Village / All Towns	On-going	Medium
13 Require and promote construction standards and techniques	Staff Time	Dept. Budget	County P&Z Dept	On-going	Medium
14 Establish shelters in the Towns of New Haven and Strong's Prairie.	\$100,000 ea.	CDBG Program / Mitigation Grants / Local budgets	New Haven and Strong's Prairie	2019	Medium

Mitigation Measures (See Expanded Text in Plan)	Cost Estimate	Existing and Potential Resources to Implement	Responsible Units	Project Timeframe	Priority Level
<b>WINTER STORMS / EXTREME COLD</b>					
15 Encourage the development of snow fences.	Costs vary	NRCS funding programs	Hwy Dept / LWCD	On-going	Medium
16 Promote winter hazards awareness, including home and travel safety measures.	Staff Time	Dept. Budget	County EM Dept	On-going	Medium
<b>FOREST FIRE</b>					
17 Continue to provide outreach efforts to home owners on protecting homes and structures from wildfires.	Staff Time	Dept. Budget	Co. EM Dept / WDNR	On-going	Medium
18 Provide ample training for volunteer fire fighters for larger fires.	Staff Time	Dept. Budget	Local Fire Depts / WDNR	On-going	Medium
19 Support establishment of Firewise Communities across the County.	Staff Time	Dept. Budget	County / All Towns	On-going	Medium
20 Develop Community Wildfire Protection Plans in high risk Towns.	\$20,000 ea.	WDNR National Fire Plan funding	County / City / Village / All Towns	2019	Medium
<b>DROUGHT / EXTREME HEAT</b>					
21 Promote heat hazards awareness, including protecting oneself and watching out for others.	Staff Time	Dept. Budget	County EM Dept.	On-going	Medium
22 Encourage farmers that irrigate to use irrigation scheduling programs and drip/misting systems	Staff Time	Dept. Budget	UW-Ext Dept / LWCD	On-going	Medium
23 County should be prepared on how to inform farmers during time of drought.	Staff Time	Dept. Budget	UW-Ext. Dept.	On-going	Low
24 Inform farmers on purchasing crop insurance.	Staff Time	Dept. Budget	UW-Ext. Dept./FSA	On-going	Low
<b>FLOOD / DAM FAILURE</b>					
25 Mitigate impacts of flooding through acquisition/demolition of homes in the floodplain when flood damaged.*	Costs to be determined	Mitigation Grants	EM Dept. P&Z Dept.	On-going	Medium
26 Continue development of Emergency Action Plans (EAP) for all county owned dams.	Costs to be determined	Dept. Budget / NRCS Funding Programs	LWCD	On-going	High
27 Address Friendship Dam situation and develop emergency action plan.	Costs to be determined	To be determined	Co. EM / LWCD Dept City / Village	TBD	Medium
28 County/City/Village continued compliance in the National Flood Insurance Program - NFIP.*	Staff Time	Dept. Budget	County / City / Village	On-going	Medium
29 Do public education and information regarding dam function and operations in Adams County.	Staff Time	Dept. Budget	Dam Owners / County LWCD Dept.	On-going	Low
<b>SEVERE THUNDERSTORM / HAIL / LIGHTNING / WIND</b>					
30 Promote the planting of windbreaks to protect farmsteads, buildings & open fields from high winds	Staff Time	NRCS funding programs	LWCD and NRCS	On-going	Medium
31 Enforce local building codes to improve structures' ability to withstand greater wind velocities	Staff Time	Dept. Budget	County P&Z Dept	On-going	Medium
32 Promote public awareness of proven lightning safety guidelines to reduce risk	Staff Time	Dept. Budget	County EM Dept	On-going	Low

Mitigation Measures (See Expanded Text in Plan)	Cost Estimate	Existing and Potential Resources to Implement	Responsible Units	Project Timeframe	Priority Level
<b>HAZARDOUS MATERIALS INCIDENTS</b>					
33 Implement recommendations within Hazardous Materials Commodity Flow Study regarding precautions and planning to address the presence of acutely hazardous materials moving through Adams County.	Costs to be determined	General Fund and HMEP/ Mitigation Grants	County EM Dept	2017	Medium
34 Do preplanning and training exercise for local fire depts to deal w/ special situations: hospital O2 tanks, COOP anhydrous ammonia, etc. * Denotes actions related to compliance with NFIP. ** Actual project implementation depends on funding and staff availability.	Costs to be determined	WEM Training Funds and HMEP	County / City / Village / All Towns	2016	High

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**INTRODUCTION**

Part V of the Adams County All Hazards Mitigation Plan Update describes the plan adoption, implementation, and evaluation and maintenance.

**PLAN UPDATE ADOPTION**

The adoption of the Adams County All Hazards Mitigation Plan Update lends itself to serve as a guiding document for all local government officials. It also certifies to program and grant administrators from the FEMA and WEM that the plan's recommendations have been properly considered and approved by the governing authority and the jurisdiction's citizens. Finally, it helps to ensure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Before adoption of the Plan Update by the incorporated areas, the update must be sent to the state and federal level to verify that all DMA2K requirements are met. Once a draft of the updated Plan has been completed, it is submitted to the State Hazard Mitigation Officer (SHMO) at the state level at WEM. Previous drafts of the update have already been reviewed prior to this submittal. The SHMO will determine if the updated Plan meets DMA2K and/or other state program requirements. Upon approval of the draft by WEM, the SHMO is responsible for showing the update to the FEMA Region V Office for review.

Prior to final approval by WEM and FEMA, the update must be formally adopted by Adams County and its incorporated areas by resolution. Incorporated communities that do not adopt the Plan Update cannot apply for mitigation grant funds unless they opt to prepare, adopt, and submit their own plan. Adoption of the Plan Update gives the jurisdiction a legal basis to enact ordinances, policies, or programs to reduce hazard losses and to implement other mitigation actions.

All general purpose units of government (i.e. city, village, towns) within Adams County were offered one or more avenues to participate in the development of this Plan Update. Adoption of the Plan by a local unit of government certifies their participation. The Adams County Board has adopted this Update. Resolutions of adoption are contained in APPENDIX B.

**PLAN UPDATE IMPLEMENTATION****Administrative Responsibilities**

Once the Plan Update has been approved, stakeholders must be informed. The County Emergency Management Director will distribute copies to stakeholders. The County will make the Plan Update available to the public by linking the report on the Internet.

Along with monitoring the progress of the action projects, the County Emergency Management Director and Public Safety and Judiciary Committee should also work to secure funding to implement the Plan Update. State and federal agencies, nonprofit organizations, and foundations continually make grants available. Emergency Management should research these grant opportunities to determine eligibility for the County and its local units of government.

When implementing this Plan Update, the County Public Safety and Judiciary Committee and staff team should consider innovative ways to involve active participation from nonprofit organizations, businesses, and citizens to implement the Update. The relationship between these groups will result in greater exposure of the Plan Update and provide greater probability of implementation of the action projects listed.

The role of department administrators, elected officials, and local administrators are to ensure that adopted actions from Part IV are considered in their budgets. It is understood that projects may not be carried out as they are scheduled in Part IV due to budget constraints. However, since many of these action projects are considered an investment in safeguarding the publics' health, safety, and property, they should be carefully considered as a priority.

**Promote Success Of Identified Projects**

Upon implementing a project covered by this Plan Update, it is important to promote the accomplishment to the stakeholders and to the communities. This will help inform people that the update is being implemented and is effective.

**Incorporation Into Other Local Planning Mechanisms**

FEMA requires a process by which the mitigation plan is incorporated into other planning mechanisms where appropriate. When undergoing any planning process, County departments, local units of government and/or any professional staff assisting them, typically review and incorporate any related pre-existing plans as a matter of course. However, to help ensure this outcome, Adams County has established a two-part process to



incorporate the All Hazards Mitigation Plan into other County and local planning efforts as follows:

- Notification of County Departments and Local Units of Government - Upon adoption of the All Hazards Mitigation Plan, the County EM Director will distribute a letter that explains how the Plan applies to other planning efforts they might undertake and how to obtain copies of the Mitigation Plan.
- Promotion by EM Director - The EM Department will promote incorporation of the All Hazards Mitigation Plan as the EM Director is made aware of or becomes a participant in any new planning process.

The upcoming County Comprehensive Plan Update has been identified for incorporation of the All Hazards Mitigation Plan, as follows:

#### ***Adams County Comprehensive Plan***

The following concepts will be considered when developing the Adams County Comprehensive Plan Update, based on the nine elements of the Wisconsin comprehensive planning law:

- *Issues and Opportunities Element* – a summary of major hazards local government is vulnerable to, and what is proposed to be done to mitigate future losses from the hazards.
- *Housing Element* – an inventory of the properties that are in the floodplain boundaries, the location of mobile homes, recommendation on building codes, shelter opportunities, and a survey of homeowners that may be interested in a voluntary buyout and relocation program.
- *Utilities and Community Facilities Element* – identify critical facilities such as shelter, schools, medical, water infrastructure, etc. and make recommendations on how to mitigate specific risks factors
- *Transportation Element* – identify any transportation routes or facilities that are more at risk during flooding, winter storms, or hazardous material spills.
- *Agricultural, Natural Resources, and Cultural Resources Element* – identify the floodplains and agricultural areas that are at risk to hazardous events. Incorporate recommendations on how to mitigate future losses to agricultural areas.
- *Economic Development Element* – describe the impact past hazards have had on County and municipal business.
- *Intergovernmental Cooperation Element* – identify intergovernmental police, fire, and rescue service sharing

- agreements that are in effect, or which may merit further investigation, consider cost-sharing and resource pooling on government services and facilities.
- *Land Use Element* - describe how flooding have impacted land uses and what is being done to mitigate negative land use impacts from flooding; map and identify hazard areas such as floodplains, hazardous materials areas, and soils with limitations.
  - *Implementation Element* – have action plans from this Plan implemented into comprehensive plans.

### **PLAN UPDATE EVALUATION AND MAINTENANCE**

Planning is an ongoing process. Because of this, this document should grow and adapt in order to keep pace with growth and change of the County and its local jurisdictions. DMA2K requires that local plans be evaluated and updated at least every five years to remain eligible for assistance.

The Plan will be reviewed and evaluated on an annual basis as needed by Emergency Management. The Adams County Emergency Management Director will evaluate incoming information against the contents of the Plan to determine possible need for revisions; and bring that information to the County Public Safety and Judiciary Committee to discuss the evaluation and potential revisions to the Plan as needed. The Emergency Management Director is encouraged to consult/coordinate with the NCWRPC in the event of any revision.

The Plan must also be evaluated and revised following disaster events to determine if the recommended actions are appropriate given the impact of the event. The risk assessment (Part III) should also be reviewed to see if any changes are necessary based on the pattern of disaster damages.

Full updates are required every five years. As a result, every fifth year, the review will be expanded to an overall plan update to meet FEMA requirements. All stakeholders and the public will again be involved in the update process. The County will conduct a survey and open comment meeting. This also provides an opportunity to inform on the progress of any projects.

The County Public Safety and Judiciary Committee and County Board must approve all changes and updates to the Plan.

## **Appendix A – Meeting Notices**

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# Letters & Opinions

## NOTICE: PLEASE LIMIT LENGTH OF LETTERS

In an effort to leave space for more news and additional opinions, we ask that you please limit your letters to the editor to 250 words. Thank you.

# Be Informed

• Stuff the Bus! School supplies will be collected at local businesses and organizations from July 20-August 14. Children who need school supplies can complete an application at the Adams County Health and Human Services office from July 27-August 14. To become a drop-off location or to volunteer to collect and sort donations, please call (608) 339-4544.



• The Adams County Public Safety and Judiciary Committee will conduct a public hearing on the updated draft of the Adams County All Hazards Mitigation Plan. The plan is intended to reduce or eliminate long-term risk to people and property from natural disasters. Hazards covered in the plan include flooding, tornadoes, extreme temperatures, wildfire and others. The plan maintains a County eligibility for federal mitigation grants.

The final draft of the updated plan is available for review and comments at either the Emergency Management or the County Clerk's office.

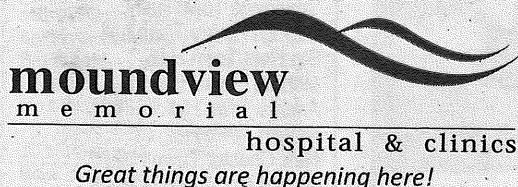
The public hearing will be held at 9:00 a.m., Wednesday, August 12, 2015, in the Adams County Courthouse, Room A260, 400 Main Street, Friendship.

# Save Your Life!

Get Cancer Awareness Month!

There are many things a woman can do to help ensure her health. One of the most important is a mammogram. The earlier we catch a problem, the easier it is to treat.

The American Cancer Society recommends yearly mammograms for women starting at age 40. You can receive the latest in digital mammography technology right at Moundview. Self referrals are accepted for screening mammograms. Call today!



Women who receive a **mammogram in October** receive a free prize drawing. No matter where you see a family doctor, you can choose Moundview for your care. Your test results are sent directly to your provider.

Results within 24 hours! • Call (608) 339-8494

No matter how cool she feels in the fast lane, she can't reverse the effects of sunlight.

According to the American Cancer Society, 80 percent of skin damage occurs before the age of 18.

Prevent premature aging and even skin cancer.

Cover up and use sunscreen, or your skin will be totaled.

New & Rebuilt Driveways  
Limestone • Sand • Top Soil  
Gravel • Fill • Black Dirt

available now from



Jim White



OXFORD TRUCKING

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## Adams County HAZARD MITIGATION PLAN Public Informational Meeting

Notice is hereby given by the Adams County Public Safety Committee that there will be a public informational meeting at the Adams County Courthouse - Board Room, 400 North Main St., Friendship on Monday, October 27, 2014 from 4 to 6 p.m. to discuss the County's draft All Hazards Mitigation Plan. Note: after hours use back entrance on east side of building.

The meeting will be an open house format and provide information about the natural hazards that can affect the County and the strategies being developed to mitigate against future losses and reduce public expenditure for response and recovery. A copy of the draft plan can be reviewed on the web at <http://www.ncwrpc.org/counties/Adams/AdamsHzdPlan.html>

All interested parties are encouraged to attend. Contact Adams County Emergency Management Director Jane Gervais at 608-339-4248 for more information.

**ADAMS COUNTY  
HAZARD MITIGATION PLAN  
PUBLIC INFORMATIONAL MEETING**

Notice is hereby given by the Adams County Public Safety Committee that there will be a public informational meeting at the Adams County Courthouse – Board Room, 400 North Main St., Friendship on Monday, October 27, 2014 from 4 to 6 pm to discuss the County’s draft All Hazards Mitigation Plan. Note: after hours use back entrance on east side of building.

The meeting will be an open house format and provide information about the natural hazards that can affect the County and the strategies being developed to mitigate against future loses and reduce public expenditure for response and recovery. A copy of the draft plan can be reviewed on the web at <http://www.ncwrpc.org/counties/Adams/AdamsHzdPlan.html>

All interested parties are encouraged to attend. Contact Adams County Emergency Management Director Jane Gervais at 608-339-4248 for more information.

10/06/14

# NORTH CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION



210 McClellan Street, Suite 210, Wausau, Wisconsin 54403  
Telephone: (715) 849-5510 Fax: (715) 849-5110  
Web Page: [www.ncwrpc.org](http://www.ncwrpc.org) Email: [staff@ncwrpc.org](mailto:staff@ncwrpc.org)

SERVING ADAMS, FOREST, JUNEAU, ADAMS, LINCOLN, MARATHON, ONEIDA, PORTAGE, VILAS AND WOOD COUNTIES

## MEMORANDUM

**DATE:** October 6, 2014

**TO:** Town Clerks in Adams County

**FROM:** Darryl L. Landeau, AICP

**RE:** Adams County All Hazards Mitigation Planning Meeting

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Adams County Emergency Management and the NCWRPC will be hosting an open house / public informational meeting on strategies to mitigate the effects of future natural disasters in Adams County. The meeting will take place in an open house format between 4 and 6 pm on Monday, October 27 in the Adams County Board Room, 400 Main Street, Friendship. Note that if arriving "after hours" (i.e. 4:30 pm), please use back entrance on east side of courthouse.

This meeting will provide an update on the project and an opportunity to provide input on possible recommendations to protect life and property within the County. The draft will incorporate information from the survey sent to the towns. If possible, please share this information with your chairperson and other supervisors in case they are interested in attending this session.

These strategies will become part of the County's All Hazards Mitigation Plan update currently being developed. Counties are required to make such plans as a result of the federal Disaster Mitigation Act of 2000 (DMA2K). This Act put a national priority on hazard mitigation by requiring mitigation plans in order to be eligible for disaster mitigation grant programs from FEMA. Adams County is developing a multi-jurisdictional plan to establish eligibility for both the county and each municipality in the same way the county-wide outdoor recreation plan works with DNR grants. This in no way obligates or commits any local jurisdiction.

The meetings will provide information about the natural hazards that can affect Adams County, and copies of the draft plan material will be available for review. Public Comment will also be solicited, so we request that you post this notice at your primary posting location to help us encourage public attendance. We have already published legal notice in the newspaper, so that is not something we are asking any of you to do.

If you have any questions, please feel free to contact me at 715-849-5510 extension 308 or email to [dlandeau@ncwrpc.org](mailto:dlandeau@ncwrpc.org).

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## Adams County Emergency Management

400 Main Street PO Box 144  
Friendship WI 53934-0144

[emmgmt@co.adams.wi.us](mailto:emmgmt@co.adams.wi.us)

Telephone 608-339-4248  
FAX 608-339-4299

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### MEMORANDUM

**TO:** Government agencies, County department staff, and other private or non-profit organizations within Adams County

**FROM:** Jane Gervais, Director - Adams County Emergency Management *JG*

**DATE:** October 6, 2014

**RE:** Adams Co. All-Hazards Mitigation Plan Update Interest Group Meeting Notice

---

Adams County has received a grant through the Federal Emergency Management Agency (FEMA) to complete an update of its All-Hazards Mitigation Plan to protect the health and safety of residents from the impacts of natural hazards and to minimize and prevent damages caused by these events. The North Central Wisconsin Regional Planning Commission (NCWRPC) is assisting Adams County with this plan.

As a requirement of the planning process, an opportunity must be provided to local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as business, academia and private and non profit interests to be involved. To meet this requirement, an interest group meeting is scheduled for the following date and place:

**When:** Monday, October 27, 2014 at 1:00 p.m.  
**Where:** Adams County Courthouse - Adams County Board Room  
400 Main Street, Friendship, Wisconsin

In addition to meeting FEMA requirements, the interest group meeting will be a way to gather ideas on how to safeguard the residents and visitors of Adams County and protect property in the event of natural disasters. Since you live and/or do business in or around Adams County, your input in this process is very valuable.

Please call or email me if you have any questions regarding this meeting. My number is 715-849-5510 ext. 308, and my email is [dlandeau@ncwrpc.org](mailto:dlandeau@ncwrpc.org) . Or, contact Jane Gervais, the County's emergency management director at 608-339-4248 or [emmgmt@co.adams.wi.us](mailto:emmgmt@co.adams.wi.us) . I highly encourage at least one staff person from your department or agency with responsibilities relating to or potentially impacted by natural hazards / disaster to attend.

Thank you.

# Adams County All Hazards Mitigation Plan

## Agency & Interest Group Meeting SIGN-IN

October 27, 2014- 1:00 PM

	Name	Department	Email
1	Greg Pulver	Alliant Energy	gregpulver@alliantenergy.com
2	Don Harwisch	Alliant Energy	donharwisch@alliantenergy.com
3	Amy Lucbke	DNR	amy.lucbke@wisconsin.gov
4	Diane Anderson	DNR	diane.anderson@wi.gov
5	MARC SASS	DNR	marc.sass@wisconsin.gov
6	Lucas Killive	Chula Vista Resort	lucas@chulavistaresort.com
7	Phil Wenzel	Chula Vista Resort	Philw@chulavistaresort.com
8	Sarah Grosshuesch	HHS - Public Health	Sarah.grosshuesch@co.adams.wi. US
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# Adams County All Hazards Mitigation Plan

## Agency & Interest Group Meeting SIGN-IN

October 27, 2014- 1:00 PM

	Name	Department	Email
1	Brady Heck	Safety & Compliance Allied Corp	bheck@allied.coop
2	Jon Gessner	Adams Columbia Ele	jgessner@acecwi.com
3	<del>Joel Turkilzen</del>	We-Energies	joel.turkilzen@we-energies.com
4	WALLY SEDLAR	ADAMS COUNTY LWCO	wally.sedlar@co.adam.wi.us
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# Adams County All Hazards Mitigation Plan

## City-Village Planning Meeting SIGN-IN

October 27, 2014- 9:00 AM

	Name	Department	Email
1	Bob Berry /	City of Friendship	adams.water@frndshp.com
2	Mike ZANT /	Village of Friendship	mzant@maqs.net
3	Tony Sleeman /	Village	Sleeman.tony@yahoo.com
4	Bret Anderson /	City	banderson@cityofadamswi.gov
5	Jane Gervais /	Adams Cty. EM	emmgmt@co.adams.wi.us
6	Jan Baumgartner /	City of Adams	jbaumgartner@cityofadams.wi.gov
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**Appendix B – Resolutions of Plan Update Adoption**

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**RESOLUTION # 48 -2015**  
**RESOLUTION ADOPTING THE**  
**ADAMS COUNTY ALL HAZARDS MITIGATION PLAN UPDATE**

**INTRODUCED BY:** Public Safety and Judiciary Committee.

**INTENT & SYNOPSIS:** To adopt the Adams County All Hazards Mitigation Plan Update as an official plan and forward to Wisconsin Emergency Management and Federal Emergency Management officials for final review and approval.

**FISCAL NOTE:** None.

**WHEREAS:** Adams County recognizes the threat that natural hazards pose to people and property; and

**WHEREAS:** undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

**WHEREAS:** an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

**WHEREAS:** Adams County participated jointly in the planning process with the other local units of government within the County to prepare an update to its All Hazards Mitigation Plan.

**NOW, THEREFORE, BE IT RESOLVED:** that the Adams County Board of Supervisors, hereby adopts the attached Adams County All Hazards Mitigation Plan Update as an official plan; and

**BE IT FURTHER RESOLVED:** that the Adams County Emergency Management Department will submit, on behalf of the participating municipalities, the adopted All Hazards Mitigation Plan Update to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval.

Recommended for adoption by the Public Safety & Judiciary Committee this <sup>18<sup>th</sup></sup>~~12<sup>th</sup>~~ day of August, 2015.

Jack E. Allen  
Marge Edwards  
W. P. Eggert

Jung Kattowski

Adopted X  
Defeated \_\_\_\_\_  
Tabled \_\_\_\_\_

by the Adams County Board of Supervisors this 18<sup>th</sup> day of August, 2015.

John West  
County Board Chair

Cindy Philippe  
County Clerk

State of Wisconsin  
County of Adams  
This document is a full, true and correct copy of the original on file and of record in my office and has been compared by me  
Attest: Paul W. Wiegman 30 15  
County Clerk

- Reviewed by Corporation Counsel
- Reviewed by Interim Administrative Coordinator/Director of Finance

RESOLUTION NO 2015-24R

ADOPTING THE ADAMS COUNTY ALL HAZARDS MITIGATION PLAN UPDATE

Whereas the City of Adams recognizes the threat that natural hazards pose to people and property; and

Whereas, under taking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save tax payer dollars; and

Whereas, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

Whereas, the City of Adams adopted the last update of the All Hazards Mitigation Plan on September 8, 2009; and

Whereas, the City of Adams participated jointly in the planning process with Adams County and the other local units of government within the County to prepare an update to the county-wide All Hazards Mitigation Plan;

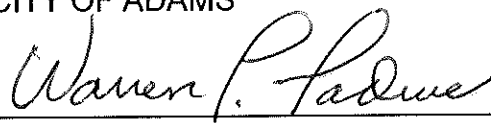
NOW, THEREFORE, BE IT RESOLVED, that The City of Adams common Council, hereby adopts the Adams County All Hazards Mitigation Plan Update as an official city plan; and

BE IT FURTHER RESOLVED, that the Adams County Emergency Management Department will submit, on behalf of the City of Adams, the adopted All Hazards Mitigation Plan Update to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval.

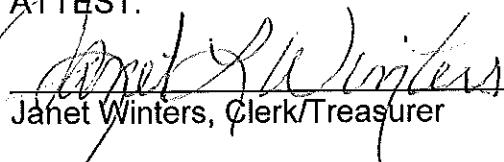
BE IT FURTHER RESOLVED that this resolution be effective October 19, 2015.

CITY OF ADAMS

By:

  
Warren L. LaQueue, Mayor

ATTEST:

  
Janet Winters, Clerk/Treasurer

The above Resolution was passed at a  
Regular Session of the Adams City Council  
on the 19 day of October, 2015  
by a vote of 5 for, 0 against, and 1 absent.

Motion to adopt Resolution No. 2015-24R

By Marti, second by Hilson.



**RESOLUTION NO. 2015-11-2**

**ADOPTING THE ADAMS COUNTY ALL HAZARDS MITIGATION PLAN UPDATE**

**WHEREAS**, the Village of Friendship recognizes the threat that natural hazards pose to people and property; and

**WHEREAS**, under taking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save tax payer dollars; and

**WHEREAS**, an adopted all hazards mitigation plan update is required as a condition of future grant funding for mitigation projects; and

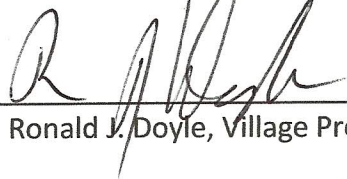
**WHEREAS**, the Village of Friendship adopted the last update of the All Hazards Mitigation Plan on September 8, 2009; and

**WHEREAS**, the Village of Friendship participated jointly in the planning process with Adams County and the other local units of government within the County to prepare an All Hazards Mitigation Plan Update;

**NOW, THEREFORE, BE IT RESOLVED**, that the Village of Friendship Board of Trustees hereby adopts the Adams County All Hazards Mitigation Plan Update as an official plan; and

**BE IT FURTHER RESOLVED**, that the Adams County Emergency Management Department will submit on behalf of the Village of Friendship, the adopted All Hazards Mitigation Plan Update to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval.

Adopted this 2<sup>nd</sup> day of November, 2015 by a vote of \_\_\_ for, \_\_\_ against, \_\_\_ absent.

  
\_\_\_\_\_

Ronald J. Doyle, Village President

**ATTEST:**

  
\_\_\_\_\_  
Kathleen M. Pierce, Clerk/Treasurer

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## **Appendix C – EMSI Job Loss Analysis**

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# Adams County Hazard Mitigation job loss

## North Central Wisconsin Regional Planning Commission



210 McClellan Street, Suite 210  
Wausau, Wisconsin 54403

## Changes to Crop Production

**\$-41,138,951**

Change in Earnings  
1.20 Multiplier


**-1,208**

Change in Jobs  
1.29 Multiplier

**\$34,042**

Average Earnings Per Job (2013)

















## Scenario Results - Industry

NAICS	Industry	Change in Jobs
11	Crop and Animal Production	-1,012 
21	Mining, Quarrying, and Oil and Gas Extraction	0
22	Utilities	0
23	Construction	-22 ■
31	Manufacturing	-1
42	Wholesale Trade	-3
44	Retail Trade	-17 ■
48	Transportation and Warehousing	-9
51	Information	0
52	Finance and Insurance	-13 ■
53	Real Estate and Rental and Leasing	-32 ■
54	Professional, Scientific, and Technical Services	-8
55	Management of Companies and Enterprises	0
56	Administrative and Support and Waste Management and Remediation Services	-11
61	Educational Services	-1
62	Health Care and Social Assistance	-19 ■
71	Arts, Entertainment, and Recreation	-5
72	Accommodation and Food Services	-13
81	Other Services (except Public Administration)	-18 ■
90	Government	-25 ■

## Scenario Results - Occupation

SOC	Occupation	Change in Jobs
11-0000	Management Occupations	-545 
13-0000	Business and Financial Operations Occupations	-19 
15-0000	Computer and Mathematical Occupations	-3 
17-0000	Architecture and Engineering Occupations	-2 
19-0000	Life, Physical, and Social Science Occupations	-5 
21-0000	Community and Social Service Occupations	-3 
23-0000	Legal Occupations	-1 
25-0000	Education, Training, and Library Occupations	-10 
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	-8 
29-0000	Healthcare Practitioners and Technical Occupations	-6 
31-0000	Healthcare Support Occupations	-6 
33-0000	Protective Service Occupations	-5 
35-0000	Food Preparation and Serving Related Occupations	-12 
37-0000	Building and Grounds Cleaning and Maintenance Occupations	-29 
39-0000	Personal Care and Service Occupations	-34 
41-0000	Sales and Related Occupations	-51 
43-0000	Office and Administrative Support Occupations	-52 
45-0000	Farming, Fishing, and Forestry Occupations	-313 
47-0000	Construction and Extraction Occupations	-24 
49-0000	Installation, Maintenance, and Repair Occupations	-19 
51-0000	Production Occupations	-11 
53-0000	Transportation and Material Moving Occupations	-49 
55-0000	Military occupations	0 
99-0000	Unclassified Occupation	-1 

## Scenario Results - Demographics

Demographics	Change in Jobs
Male 14-18	-19 
Female 14-18	-4 
Male 19-21	-21 
Female 19-21	-7 
Male 22-24	-34 
Female 22-24	-15 
Male 25-34	-127 
Female 25-34	-30 
Male 35-44	-144 
Female 35-44	-47 
Male 45-54	-231 
Female 45-54	-65 
Male 55-64	-195 
Female 55-64	-52 
Male 65-99	-173 
Female 65-99	-45 

## Changes to Hotels (except Casino Hotels) and Motels

**-\$19,213,446**

Change in Earnings  
1.19 Multiplier

**-775**


Change in Jobs  
1.17 Multiplier

**\$24,779**



Average Earnings Per Job (2013)



















## Scenario Results - Industry

NAICS	Industry	Change in Jobs
11	Crop and Animal Production	0
21	Mining, Quarrying, and Oil and Gas Extraction	0
22	Utilities	0
23	Construction	-9
31	Manufacturing	-1
42	Wholesale Trade	-1
44	Retail Trade	-8
48	Transportation and Warehousing	-2
51	Information	0
52	Finance and Insurance	-5
53	Real Estate and Rental and Leasing	-6
54	Professional, Scientific, and Technical Services	-7
55	Management of Companies and Enterprises	0
56	Administrative and Support and Waste Management and Remediation Services	-11
61	Educational Services	0
62	Health Care and Social Assistance	-7
71	Arts, Entertainment, and Recreation	-4
72	Accommodation and Food Services	-673 
81	Other Services (except Public Administration)	-8
90	Government	-33 ■

## Scenario Results - Occupation

SOC	Occupation	Change in Jobs
11-0000	Management Occupations	-45 
13-0000	Business and Financial Operations Occupations	-16 
15-0000	Computer and Mathematical Occupations	-1
17-0000	Architecture and Engineering Occupations	-1
19-0000	Life, Physical, and Social Science Occupations	-1
21-0000	Community and Social Service Occupations	-2
23-0000	Legal Occupations	-1
25-0000	Education, Training, and Library Occupations	-11 
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	-8 
29-0000	Healthcare Practitioners and Technical Occupations	-3
31-0000	Healthcare Support Occupations	-5 
33-0000	Protective Service Occupations	-18 
35-0000	Food Preparation and Serving Related Occupations	-217 
37-0000	Building and Grounds Cleaning and Maintenance Occupations	-222 
39-0000	Personal Care and Service Occupations	-31 
41-0000	Sales and Related Occupations	-29 
43-0000	Office and Administrative Support Occupations	-85 
45-0000	Farming, Fishing, and Forestry Occupations	0
47-0000	Construction and Extraction Occupations	-9 
49-0000	Installation, Maintenance, and Repair Occupations	-38 
51-0000	Production Occupations	-20 
53-0000	Transportation and Material Moving Occupations	-12 
55-0000	Military occupations	0
99-0000	Unclassified Occupation	0


## Scenario Results - Demographics

Demographics	Change in Jobs
Male 14-18	-30 
Female 14-18	-41 
Male 19-21	-27 
Female 19-21	-44 
Male 22-24	-22 
Female 22-24	-33 
Male 25-34	-79 
Female 25-34	-78 
Male 35-44	-62 
Female 35-44	-68 
Male 45-54	-61 
Female 45-54	-80 
Male 55-64	-56 
Female 55-64	-36 
Male 65-99	-24 
Female 65-99	-32 

## Changes to Gasoline Stations with Convenience Stores




<p><b>-\$2,933,519</b></p> <p>Change in Earnings 1.16 Multiplier</p>	<p><b>-153</b></p> <p>Change in Jobs 1.11 Multiplier</p>	<p><b>\$19,112</b></p> <p>Average Earnings Per Job (2013)</p>
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## Scenario Results - Industry

NAICS	Industry	Change in Jobs
11	Crop and Animal Production	0
21	Mining, Quarrying, and Oil and Gas Extraction	0
22	Utilities	0
23	Construction	-1
31	Manufacturing	0
42	Wholesale Trade	0
44	Retail Trade	-139 
48	Transportation and Warehousing	-1
51	Information	0
52	Finance and Insurance	-1
53	Real Estate and Rental and Leasing	-2
54	Professional, Scientific, and Technical Services	-2
55	Management of Companies and Enterprises	0
56	Administrative and Support and Waste Management and Remediation Services	-1
61	Educational Services	0
62	Health Care and Social Assistance	-1
71	Arts, Entertainment, and Recreation	0
72	Accommodation and Food Services	-1
81	Other Services (except Public Administration)	-1
90	Government	-4 ■



## Scenario Results - Demographics

Demographics	Change in Jobs
Male 14-18	-6 
Female 14-18	-9 
Male 19-21	-5 
Female 19-21	-7 
Male 22-24	-2 
Female 22-24	-5 
Male 25-34	-10 
Female 25-34	-12 
Male 35-44	-11 
Female 35-44	-11 
Male 45-54	-10 
Female 45-54	-28 
Male 55-64	-11 
Female 55-64	-15 
Male 65-99	-3 
Female 65-99	-9 

## Changes to Corrugated and Solid Fiber Box Manufacturing

**\$-19,378,418**

Change in Earnings  
1.12 Multiplier


**-336**

Change in Jobs  
1.32 Multiplier



**\$57,751**

Average Earnings Per Job (2013)

## Scenario Results - Industry

NAICS	Industry	Change in Jobs
11	Crop and Animal Production	0
21	Mining, Quarrying, and Oil and Gas Extraction	0
22	Utilities	0
23	Construction	-4
31	Manufacturing	-255 
42	Wholesale Trade	-2
44	Retail Trade	-7 ■
48	Transportation and Warehousing	-8 ■
51	Information	0
52	Finance and Insurance	-3
53	Real Estate and Rental and Leasing	-2
54	Professional, Scientific, and Technical Services	-6 ■
55	Management of Companies and Enterprises	0
56	Administrative and Support and Waste Management and Remediation Services	-9 ■
61	Educational Services	0
62	Health Care and Social Assistance	-7 ■
71	Arts, Entertainment, and Recreation	-3
72	Accommodation and Food Services	-7 ■
81	Other Services (except Public Administration)	-10 ■
90	Government	-10 ■

## Scenario Results - Occupation

SOC	Occupation	Change in Jobs
11-0000	Management Occupations	-21 
13-0000	Business and Financial Operations Occupations	-12 
15-0000	Computer and Mathematical Occupations	-2 
17-0000	Architecture and Engineering Occupations	-4 
19-0000	Life, Physical, and Social Science Occupations	-1 
21-0000	Community and Social Service Occupations	-1 
23-0000	Legal Occupations	0 
25-0000	Education, Training, and Library Occupations	-4 
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	-10 
29-0000	Healthcare Practitioners and Technical Occupations	-3 
31-0000	Healthcare Support Occupations	-2 
33-0000	Protective Service Occupations	-2 
35-0000	Food Preparation and Serving Related Occupations	-5 
37-0000	Building and Grounds Cleaning and Maintenance Occupations	-11 
39-0000	Personal Care and Service Occupations	-6 
41-0000	Sales and Related Occupations	-16 
43-0000	Office and Administrative Support Occupations	-35 
45-0000	Farming, Fishing, and Forestry Occupations	0 
47-0000	Construction and Extraction Occupations	-5 
49-0000	Installation, Maintenance, and Repair Occupations	-23 
51-0000	Production Occupations	-121 
53-0000	Transportation and Material Moving Occupations	-50 
55-0000	Military occupations	0 
99-0000	Unclassified Occupation	0 



## Scenario Results - Demographics

Demographics	Change in Jobs
Male 14-18	-2
Female 14-18	-1
Male 19-21	-8
Female 19-21	-3
Male 22-24	-12
Female 22-24	-4
Male 25-34	-39
Female 25-34	-10
Male 35-44	-52
Female 35-44	-9
Male 45-54	-68
Female 45-54	-36
Male 55-64	-64
Female 55-64	-13
Male 65-99	-10
Female 65-99	-5

# Appendix A - Data Sources and Calculations

## Input-Output Data

The input-output model in this report is EMSI's gravitational flows multi-regional social account matrix model (MR-SAM). It is based on data from the Census Bureau's Current Population Survey and American Community Survey; as well as the Bureau of Economic Analysis' National Income and Product Accounts, Input-Output Make and Use Tables, and Gross State Product data. In addition, several EMSI in-house data sets are used, as well as data from Oak Ridge National Labs on the cost of transportation between counties.

## State Data Sources

This report uses state data from the following agencies: Wisconsin Department of Workforce Development, Bureau of Workforce Information