

2022
2027

IOWA COUNTY

HAZARD MITIGATION PLAN

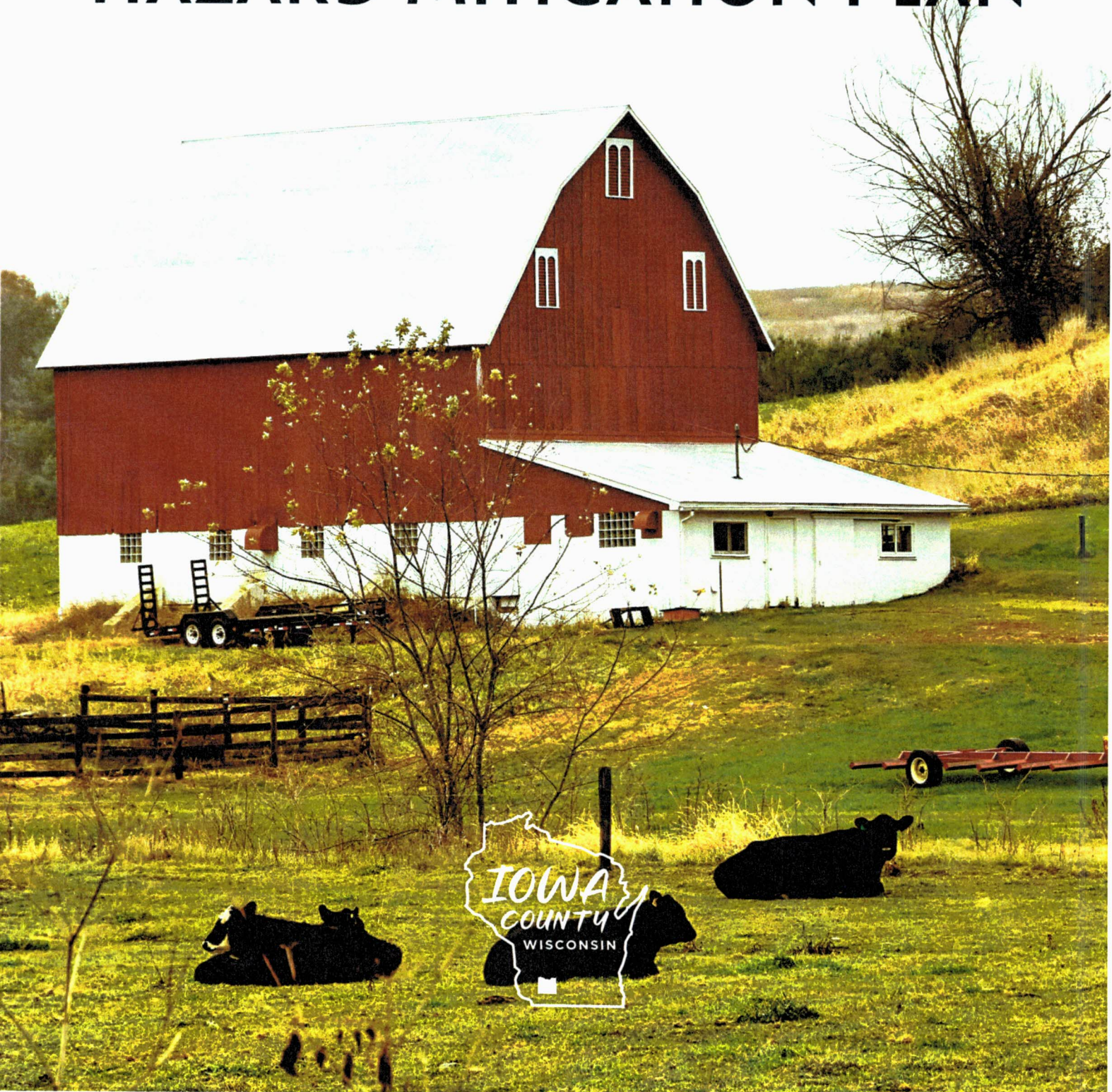


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This hazard mitigation plan is owned by Iowa County Emergency Management.
Plan support was provided by Southwestern Wisconsin Regional Planning Commission.

Executive Summary

What is Hazard Mitigation Planning?

A hazard is a situation that poses a threat to the life, health, prosperity, or the environment of a community. Hazard Mitigation is any sustained action taken to eliminate or reduce the long-term risk to human life and property from natural and technological hazards. The objective of this plan is to explore which hazards pose the greatest risk to Iowa County and recommend action to mitigate future risk.

According to the Disaster Mitigation Act of 2000, local governments must prepare, adopt, and update a Hazard Mitigation Plan in order to be eligible for post-disaster FEMA assistance. This plan works to assess risk, decrease impact, and prevent future damages. The organization and contents of this plan are driven by the requirements of the FEMA and the input of local residents.

Iowa County's Planning Process

The county prepared its original Hazard Mitigation Plan in 2012 and adopted an update in 2017. This plan is an update of the 2017 plan, incorporating all cities, villages, and towns of Iowa County. Iowa County Emergency Management (ICEM) and Southwestern Wisconsin Regional Planning Commission (SWWRPC) guided the development of this plan through existing knowledge of the communities and local input. Local input was gained through three public meetings and two stakeholder meetings. Chapter 1 outlines the methods, participants, and practices used to develop the plan.

Iowa County Hazard Mitigation Goals

The following goals describe the desired long-term outcomes from hazard mitigation planning:

- Protect human lives and ensure environmental health, both today and for future generations, and empower people to protect themselves.
- Protect utilities, infrastructure, and critical facilities, including police, fire, and EMS stations.
- Build resilience to long-term risks through collaboration and proactive planning and action.
- Maximize the use of state and federal funds and promote county-wide planning that invests in reduction of future risk, and which avoids transferring risk from one community to another.

Action Recommendation Development

Chapters 5 and 6 outline local and county-wide action recommendations. These actions were developed by the planning team with input from stakeholders, local officials, and local residents. The actions intend to reduce or avoid long-term vulnerabilities to the people, economy, infrastructure, and environment of Iowa County. Each action was developed with a brief description of priority, expense, responsibility, and timeline to accomplish.

Approval and Implementation

The completed plan was sent to Wisconsin Emergency Management (WEM) on August 22, 2022. Following approval by WEM and FEMA, the plan was adopted at the county level. After the county adopted the plan, cities and villages within the county had one year to adopt the plan. Adoption of this plan provides Iowa County a framework of actions to prioritize hazard mitigation. Using the plan, the county and local communities will coordinate to undertake the identified actions.

Chapter 1: Plan Goals and Process

Purpose of the Plan

Every natural disaster takes a toll on the social, environmental, and economic well-being of local communities and residents. Many natural disasters have occurred in Iowa County, including heavy snows in 1973, 1990, 2007-2008; droughts in 1976 and 1988; a crippling ice storm in 1976; heavy rains and flooding conditions in 1978, 1990, 1993, 2000, 2007, 2008, and 2017; the COVID-19 pandemic beginning in 2020; and one of the worst tornadoes in Wisconsin's history, experienced by the Barneveld and Brigham communities in 1984. This plan works to address the many hazards Iowa County is susceptible to and mitigate the potential damages from those hazards.

Hazard Mitigation Goals

The following goals describe the desired long-term outcomes from hazard mitigation planning:

- Protect human lives and ensure environmental health, both today and for future generations, and empower people to protect themselves.
- Protect utilities, infrastructure, and critical facilities, including police, fire, and EMS stations.
- Build resilience to long-term risks through collaboration and proactive planning and action.
- Maximize the use of state and federal funds and promote county-wide planning that invests in reduction of future risk, and which avoids transferring risk from one community to another.

Disaster Mitigation Act of 2000

The development and update of the Iowa County Hazard Mitigation Plan is a response to the passage of the Disaster Mitigation Act of 2000 (DMA), which was signed into law on October 30, 2000, with the **goal of reducing losses and future public and private expenditures and improving 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 portions of the DMA that relate to local governments:

- Local governments and tribal organizations must prepare a multi-hazard mitigation plan in order to be eligible for funding from the FEMA Pre-Disaster Mitigation Assistance Program and Hazard Mitigation Program.
- Natural hazards need to be addressed in a risk assessment and vulnerability analysis sections of the multi-hazard mitigation plan. Assessment of human-caused hazards such as hazardous waste spills is encouraged but not required.
- Authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state following a federal disaster declaration to be used for development of state, local, and tribal organization multi-hazard mitigation plans.
- Without an up-to-date multi-hazard mitigation plan, local governments and tribal organizations cannot obtain funds from the Pre-Disaster Mitigation Grant Program.

Local Context

In order to comply with Section 322 of the Disaster Mitigation Act of 2000 and qualify for future hazard mitigation grant awards, Iowa County must develop a county-wide hazard mitigation plan. ICEM received a Building Resilient Infrastructure and Communities (BRIC) program planning grant from WEM

in February of 2022. In March of 2022, ICEM partnered with SWWRPC to complete the update to the Iowa County Hazard Mitigation Plan.

Per FEMA requirements, this hazard mitigation plan includes a description of the following:

Planning Process: A general description of the purpose of the plan and what is included in the plan. This section includes an identification of the county and municipalities included in the plan, a description of plan development, public involvement and input process, and coordination with other plans.

Planning Area: A description of the geography of the planning area. This section documents the demographic and economic characteristics of the planning area.

Risk Assessment: Includes a hazard identification and a risk/vulnerability assessment. Each of the hazards affecting the planning area are addressed in the risk assessment. The risk assessment documents the history and impact of the hazard's occurrence in the planning area, the vulnerability of the planning area to each risk, and the probability and potential cost associated with future occurrences.

Mitigation Strategy: Incorporates the mitigation goals, actions, and projects into the local communities and county-wide. Strategies identify how the mitigation goals identified will be prioritized, implemented, and administered by the local jurisdictions in Iowa County.

Plan Maintenance Process and Adoption: Describes the method and schedule that will be used to monitor, evaluate, review progress, make revisions and update the Mitigation Plan within a five-year cycle and how public participation will be sought in this plan maintenance process. The plan approval process describes and documents how the plan was formally adopted by the governing bodies within the planning area.

Work on the Iowa County Multi-Hazard Mitigation Plan began in March 2022. FEMA and WEM determined the plan met requirements on **DATE TBD, 2022**. The plan was adopted by the Iowa County Board on **October 18th, 2022**.

Planning Process

Planning Team

The first step in the planning process was to identify and organize a planning team made up of professional staff and county officials with expertise related to effective planning and hazard mitigation. See Table 1 for a list of planning team members and their organizational affiliation. Planning team members met throughout the planning process to review the previous plan, prepare and review outreach efforts, and work on developing strategies for the updated 2022 Plan.

Table 1 - Hazard Mitigation Planning Team	
Name	Title
Keith Hurlbert	Director, ICEM
Amanda Gardener	Assistant, ICEM
Troy Maggied	Executive Director, SWWRPC
Ellen Tyler	Community Resiliency Planner, SWWRPC
Matt Honer	Senior Planner, SWWRPC

Outreach

The planning team prioritized the need for community outreach in creating a successful hazard mitigation plan. In order to create plans that result in useful action, a planning process should involve both those with knowledge about needed actions, as well as those who have agency to implement those actions. To accomplish this, the planning team convened a stakeholder group for two workshop sessions and gathered input from local representatives and residents during three public meetings, as described in the following paragraphs. See Appendix A for dates, attendance, and content of the stakeholder group and public meetings.

Stakeholder Group

A stakeholder group was convened by the planning team to gather an informed perspective on the many facets of community life in Iowa County. This group was comprised of interdisciplinary community leaders with a variety of knowledge domains, ranging from school district superintendents to local non-profit leaders. See Table 2 for a list of stakeholder group members and their organizational affiliation. Members of this group met for two workshop sessions, once before and once after the public meetings, and they each attended one of the public meetings.

Table 2 - Hazard Mitigation Stakeholder Group	
Name	Organization
Ben Gruber	WI Dept of Natural Resources
Craig Hardy	Iowa County Highway Department
David Vobora	Southwestern Wisconsin Community Action Program
Debbie Siegenthaler	Iowa County Health Department
Greg Lee	City of Dodgeville
Jeff Halverson	Dodgeville Fire Department
Katie Abbott	Iowa County Land Conservation Department
Kurt Hoeper	Upland Hills Health
Mitch Wainwright	Mineral Point Unified School District
Patricia Johnson	Alliant Energy
Paul A. Weber	Dodgeville School District
Paul Dietmann	Compeer Financial
Scott Godfrey	Iowa County Planning & Development
Stan McGraw	Retired, Previously Emergency Planning Committee
Steve Braun	Grant County Emergency Management
Thomas C. Slaney	Iowa County Social Services
Troy Moris	Health Department

Municipal Representatives

Each municipality participating in the plan was required to send at least one representative to a hazard mitigation public meeting. At the public meetings, representatives completed an evaluation of the strategies identified for their community in the 2017 Iowa County Hazard Mitigation Plan (see Appendix C for completed evaluations). Next, representatives moved through five stations where they learned about and provided input related to the following topics: previous hazard events in the county, future hazard risk, identification of local assets and risks based on community-specific maps, vulnerable populations, flooding, tornadoes and severe storms, strategies for action, and climate change.

Table 3 – Participating Jurisdictions and Community Representatives

Community	Name, Title	Meeting Attended
Town of Arena	Andrea Joo, Supervisor	June 23 rd , Wyoming
Village of Arena	Kate Reimann, President	June 23 rd , Wyoming
Village of Avoca	Susie Ziebarth, Clerk/Treasurer	June 23 rd , Wyoming
Village of Avoca	Liz Wilkinson, Deputy Clerk	June 23 rd , Wyoming
Village of Barneveld	Jeremy Oyen, Police Chief	July 7 th , Dodgeville
Town of Brigham	Jerry Davis, Supervisor	June 23 rd , Wyoming
Town of Clyde	Rebecca Sadler, Supervisor	July 7 th , Dodgeville
Village of Cobb	Lisa Riley, Clerk/Treasurer	June 30 th , Mineral Point
Village of Cobb	Arnold Fritsch, Trustee	June 30 th , Mineral Point
City of Dodgeville	Lauree Aulik, Clerk/Treasurer	July 7 th , Dodgeville
Town of Dodgeville	Sara Olson, Clerk/Treasurer	July 7 th , Dodgeville
Town of Dodgeville	Peter Vanderloo, Supervisor	July 7 th , Dodgeville
Town of Dodgeville	Pam Johnson-Loy, Supervisor	July 7 th , Dodgeville
Town of Eden	Andrew Bishop, Clerk	June 30 th , Mineral Point
Town of Highland	Lois Nankee, Clerk	July 7 th , Dodgeville
Village of Highland	Tom Cody, Trustee	July 7 th , Dodgeville
Village of Hollandale	Holly DeWitt, Clerk/Treasurer	June 30 th , Mineral Point
Village of Hollandale	Bob Hittesdorf, Trustee	June 30 th , Mineral Point
Town of Linden	Jeff Lindner, Supervisor	July 7 th , Dodgeville
Village of Linden	Robert Spurley, President	July 7 th , Dodgeville
Town of Mifflin	Tammy Menning, Treasurer	June 30 th , Mineral Point
City of Mineral Point	Christy Skelding, Clerk/Treasurer	June 30 th , Mineral Point
Town of Mineral Point	Debi Heisner, Clerk/Treasurer	June 30 th , Mineral Point
Town of Moscow	Gary Langfoss, Supervisor	June 30 th , Mineral Point
Town of Moscow	Joe Hendrickson, Chairman	June 30 th , Mineral Point
Town of Moscow	Mary Kolb, Clerk/Treasurer	June 30 th , Mineral Point
Town of Pulaski	Bill Whitmore, Supervisor	June 23 rd , Wyoming
Village of Rewey	Colleen Ingwell, Clerk/Treasurer	June 30 th , Mineral Point
Town of Ridgeway	Joe Thomas, Chairman	July 7 th , Dodgeville
Village of Ridgeway	Hailey Roessler, Clerk/Treasurer	July 7 th , Dodgeville
Village of Ridgeway	Michele Casper, President	July 7 th , Dodgeville
Village of Ridgeway	Michael Gorham, Marshal	July 7 th , Dodgeville
Town of Waldwick	Mike Doyle, Clerk	June 30 th , Mineral Point
Town of Wyoming	John Hess, Chairman	June 23 rd , Wyoming
Town of Wyoming	Richard Cates, Supervisor	June 23 rd , Wyoming

Public Outreach

In addition to the municipal representatives and stakeholder group members, the general public was invited to participate in the public meetings. Flyers for the public meetings were distributed by planning team members, stakeholder group members, and every municipal clerk in the county (Appendix A). In addition, press releases about the meetings were run in local newspapers and radio announcements were broadcasted by a local station. All attendees followed the same exercises as the municipal representatives (described above), with exception of the evaluation of previous plan strategies, which were completed only by municipal representatives. Attendance over the three public meetings of municipal representatives, stakeholder group members, and the general public totaled 71 people.

Public Comment

The plan was made available to the public via the ICEM website on August 22nd, 2022. Municipal clerks were notified of the opportunity to send proposed revisions and comments, and were encouraged to review the sections of the plan most relevant to them, at a minimum. All edit suggestions were reviewed by the planning team and incorporated into the plan as appropriate. The plan was presented for public comment and official adoption at the Iowa County Board Meeting on **October 18th, 2022**.

Incorporated Plans

The following is a list of references used to determine planning area characteristics, identify risk, and develop strategies for this plan.

- Wisconsin State Hazard Mitigation Plan (2021)
- State of Wisconsin Threat and Hazard Identification and Risk Assessment (2021)
- Iowa County Hazard Mitigation Plan (2017)
- Iowa County Emergency Response Plan
- Hazardous Material Strategic Plan
- Monroe County Climate Readiness and Rural Economic Opportunity Assessment – Wisconsin's Green Fire (2022)
- Wisconsin's Changing Climate: Impacts and Solutions for a Warmer Climate – WICCI (2021)

Current Mitigation Efforts

Assistance Programs: According to ICEM, the county coordinates state and federal disaster relief assistance to victims in affected areas. This assistance could include the Individual and Households Program, the Small Business Administration's loan programs, FEMA Public Assistance, Wisconsin Disaster Fund and various other disaster relief programs available for both presidential declared and non-presidential declared disasters.

Education and Outreach: Since the early 1990s, an annual state-wide Tornado and Severe Weather Awareness Week is practiced in March or April. Among other events, this week includes extensive public education through the media, as well as a tornado safety drill in all county facilities. Media information packets and social media posts re-emphasize and alert the public to tornado warning procedures. ICEM regularly meets with local governments to educate and inform residents about emergency response and hazard mitigation.

Emergency Response and Mutual Aid: Initial emergency response in Iowa County is the responsibility of the full-time sheriff and police agencies. However, these agencies have a limited number of personnel on duty at any given time and are spread over a wide land-area. Local community fire and EMS services are often initial responders. Emergency services, including fire and EMS manned by volunteers, are located in every area throughout the county as well as neighboring communities that provide services to areas within Iowa County. Currently, all local fire departments within Iowa County maintain a formal mutual aid agreement through the Mutual Aid Box Alarm System (MABAS), as does ICEM through the Wisconsin Statewide Mutual Aid Compact for Emergency Management (WiSMAC) agreement with surrounding county emergency management departments. ICEM also has access to incident management teams through WEM and WIDNR. Police have access to the Emergency Police Services (EPS) system through WEM.

Warning Systems: An effective warning system is the single most important method for alerting the public of severe weather hazards. In addition to the use of local radio stations and National Oceanic and Atmospheric Administration (NOAA) weather radio warnings, ICEM uses warning sirens and Emergency Mass Notification Systems to broadcast warnings. Below are more detailed explanations of each:

Local Two-Way Radio: Radio is used to link all police, fire, and EMS agencies within the county to one another and the Sheriff's Communications Center. The communications center provided by the county is the core to the county's public safety two-way communications and paging system on multiple channels.

The county-hosted two-way radio communication system links all highway vehicles and is available to interested towns and villages, while Iowa County cities also have individual two-way radio systems for local use.

National Oceanic and Atmospheric Administration: NOAA Weather Radio continuously broadcasts National Weather Service (NWS) forecasts, warnings, and other critical weather information. NOAA Weather Radio also provides direct warnings to the public for natural, man-made, or technological hazards, and it is the primary trigger for activating the national Emergency Alert System on commercial radio, television, and cable systems.

Mass Notification: Iowa County uses a mass notification. It is free of charge and can send email, voice, and/or text messaging emergency notifications. This public safety alert system provides notices regarding weather safety, road safety, or other notices pertaining to keeping the public informed and safe.

Sirens: Warning sirens are located in every city and village in Iowa County. Some have more than one. Significant development in townships and unincorporated areas means that much of the recent development in Iowa County is being done outside of the reach of warning sirens. Warning sirens are tested and maintained by individual municipalities.

Integrated Public Alert & Warning System (IPAWS): This system is a federal text alerting system that uses geo fencing of cell towers to determine who receives messages. There is no subscription for this service as all cellular phones are programmed to receive the alerts if within the geo fence area. This system is also used to broadcast presidential messages.

National Flood Insurance Program Participation (NFIP): Table 4 lists the jurisdictions that participate in NFIP. Participating in this program requires the jurisdiction to follow state and federal floodplain zoning requirements and undertake substantial damage analysis following natural hazard events. Communities not participating in NFIP do not have established floodplains within their jurisdiction. Townships participate through the county.

Table 4 - National Flood Insurance Program Participating Jurisdictions

Community	Participation
Iowa County	Yes
City of Dodgeville	Yes
City of Mineral Point	Yes
Village of Arena	Yes
Village of Avoca	Yes
Village of Barneveld	No*
Village of Cobb	Yes
Village of Highland	No*
Village of Hollandale	Yes
Village of Linden	Yes
Village of Rewey	No*
Village of Ridgeway	Yes

Source: FEMA Community Status Book Report for Wisconsin, 7/11/2022

*Reason for non-participation: Municipality has no land or structures in the floodplain

Existing Policies, Procedures, and Ordinances: Iowa County has a Floodplain Zoning Ordinance that regulates floodplain development throughout the townships and is administered by the county planning and zoning department. All cities and villages have their own floodplain zoning ordinances that are administered at the municipal level. Additional ordinances regarding shore land protection at the county level mitigate potential flooding risks. Iowa County and the municipalities within the county also follow the Wisconsin Uniform Dwelling Code which requires all buildings be built to coded specifications. No municipality in Iowa County is required to utilize a Municipal Storm water system permit and no municipalities currently have an ordinance or permit.

The following communities currently have Emergency Operations Plans in place to mitigate the potential effects of natural and man-made hazards:

- Town of Brigham
- Town of Moscow
- Town of Ridgeway
- Village of Arena
- Village of Avoca
- Village of Barneveld
- Village of Ridgeway
- Village of Highland
- Village of Hollandale
- City of Dodgeville

These plans identify local government official roles and responsibilities before, during, and after hazard events.

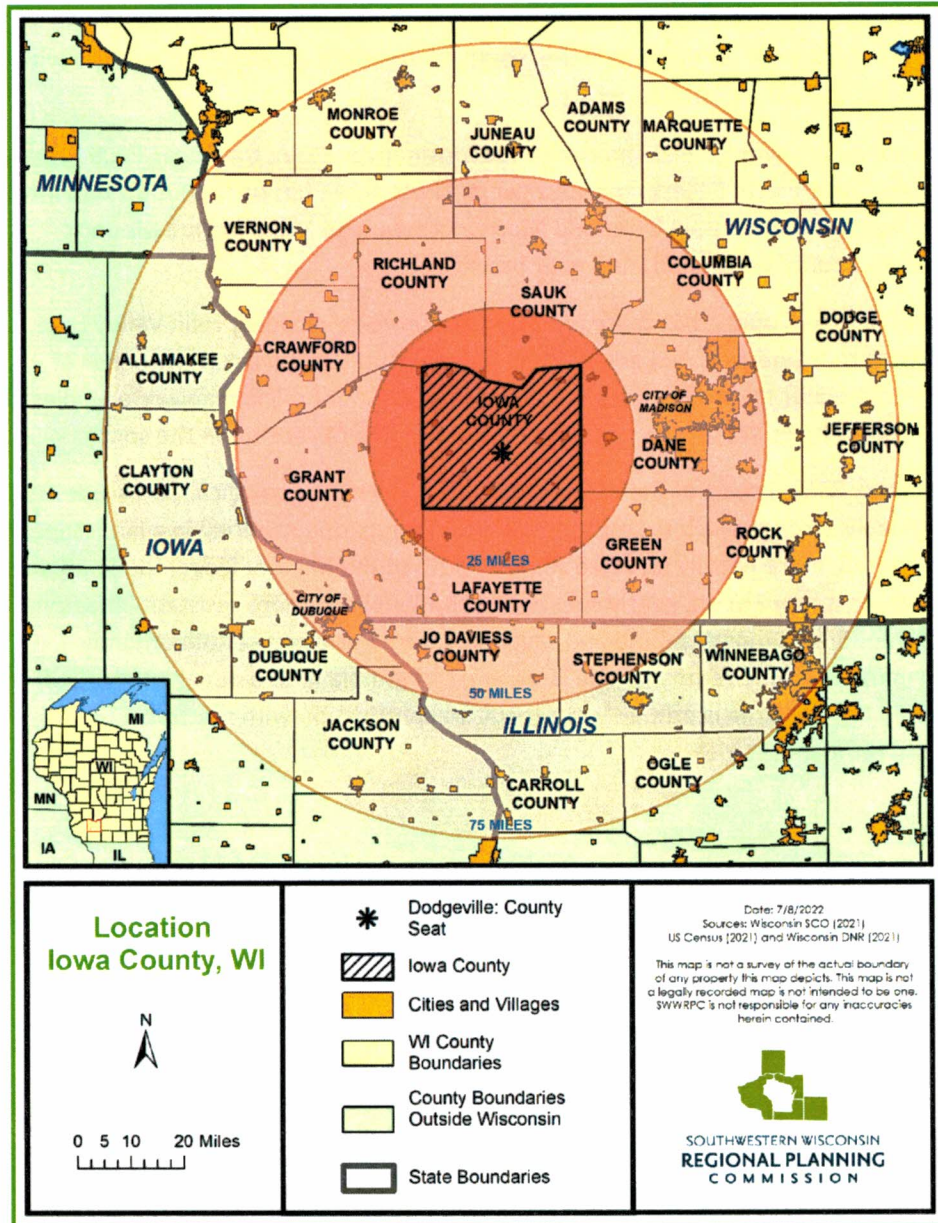
According to the Wisconsin Comprehensive Planning Law, all communities in Iowa County that wish to adopt land use regulation are required to have comprehensive plans that address issues related to the following list of elements. Within these elements, communities are able to create and implement policies, procedures, and ordinances on hazard mitigation.

1. Issues and Opportunities
2. Housing
3. Transportation
4. Utilities and Community Facilities
5. Agricultural, Natural and Cultural Resources
6. Economic Development
7. Intergovernmental Cooperation
8. Land Use
9. Implementation

Chapter 2: Planning Area

Iowa County is a rural county located in southwestern Wisconsin. It is 762.67 square miles, of which approximately five square miles are water (lakes, streams, or rivers). By land area, the county is the 35th largest in the state. It is bordered by Dane, Green, Grant, Lafayette, Richland, and Sauk Counties, and to the north, the Wisconsin River. Figure 1 shows the location of Iowa County in the context of surrounding states, counties, and large cities. The 2021 estimated population based on the 2020 census was 23,709¹.

Figure 1: Iowa County Location



¹ U.S. Census Bureau (2021). *2020 Decennial Census*. <https://data.census.gov/cedsci/>

Physical Geography

Iowa County is located in a portion of Wisconsin called the “Driftless Area” because it was not covered by glaciers during the last glaciation. Without glaciers, many hills and valleys remain intact in the area when they were eroded to the north and east of the region. The resulting topography has some of the most diverse and distinct elevation changes in the state. The highest point in Iowa County is West Blue Mound with an elevation of 1719 feet.²

The most prominent topographical feature in Iowa County is Military Ridge, a steep escarpment that divides the county between the Lower Wisconsin River Basin and the Sugar-Pecatonica and Grant-Platte River Basins. Military Ridge runs through the towns of Eden, Linden, Dodgeville, and Brigham. The northern descent into the Wisconsin River valley is steep, south of the Ridge is a long gentle slope with a gradual elevation drop of about six feet per mile.

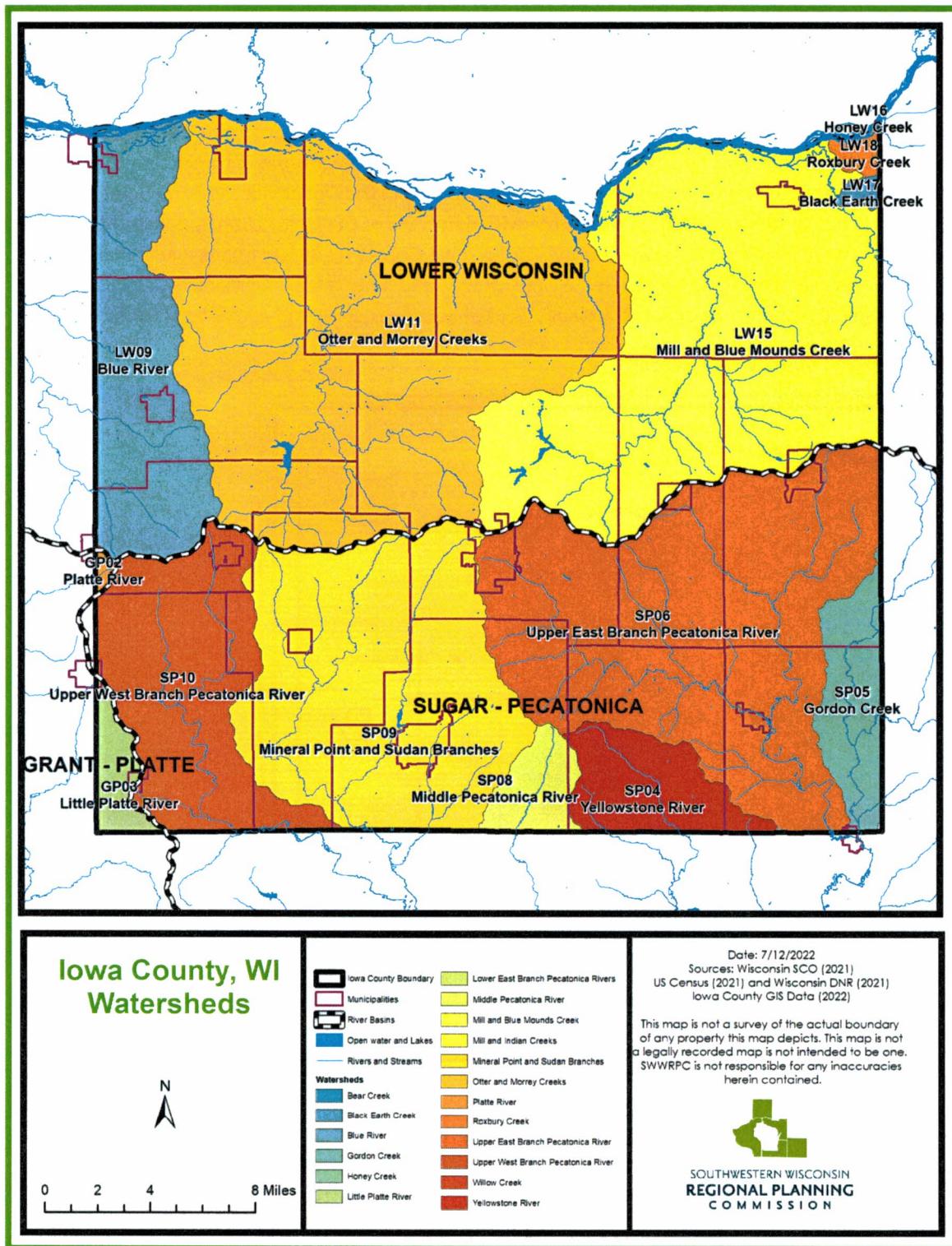
Iowa County overlaps three major river basins: The Lower Wisconsin River Basin, the Sugar-Pecatonica Basin in the South, and the Grant-Platte Basin in the southwest. These three basins are subdivided into smaller watersheds such as ones that contain Otter and Morrey Creeks, and Mill and Blue Mounds Creek. See Figure 2 for Iowa County watersheds and river basins.

There are no natural lakes in Iowa County, but there are several reservoirs including Twin Valley Lake and Cox Hollow Lake in Governor Dodge State Park, Blackhawk Lake, and Ludden Lake. A number of streams, including many cold-water trout streams, are located in Iowa County. The main waterbodies in Iowa County are the Wisconsin River in the north and the Pecatonica River branches in the south.

Iowa County north of Military Ridge is part of the Western Coulee and Ridges Ecological Landscape. Here, streams have cut deeply through the less resistant Cambrian sandstone resulting in a landscape of steep-sided valleys and rugged, more heavily forested slopes. South of the Military Ridge, the Southwest Savanna Ecological Landscape is more open, gently sloping, and underlain by more resistant limestone. The southern half of the county was mostly prairie and savanna before European settlement and through time has retained many prairie remnants and large areas of grassland to a degree not found elsewhere in Wisconsin. Today, this area is primarily in agricultural production with scattered woodlands, savannas, and remnant prairies.

² State Cartographer’s Office. *Wisconsin High Points*. <https://www.sco.wisc.edu/wisconsin/high-points/>

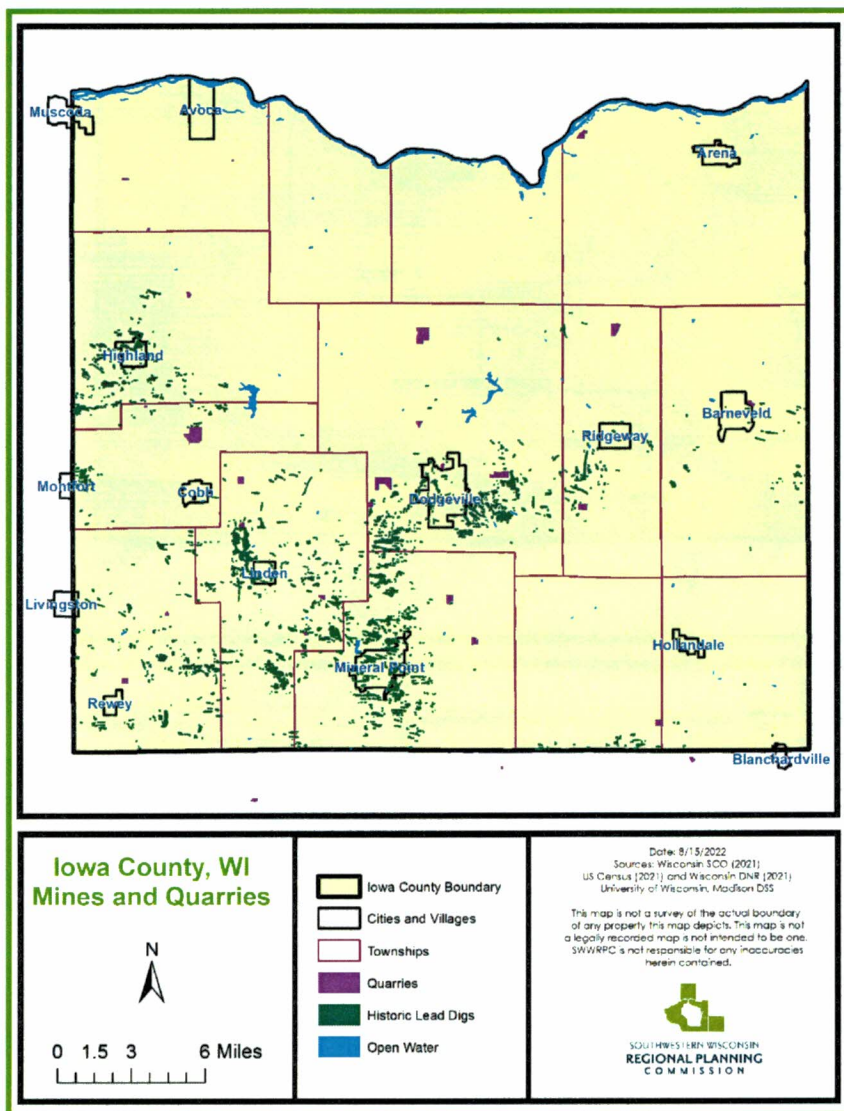
Figure 2: Iowa County Watersheds and River Basins



Geology

Iowa County's land surface elevations range from 630 to 1,719 feet above mean sea level. The north half of the county's bedrock is predominantly sedimentary and consists of Cambrian and Ordovician sandstone and shale or limestone. Pleistocene deposits are absent except for thin layers of loess and/or hill slope sediments on the ridge tops and valley sides, and stream sediment in valley bottoms. South of Dodgeville, the county's bedrock is predominantly Galena and Platteville dolomite. Metallic resources in the region include lead and zinc. Both metals have played an important role in the history of the county. Early settlers came to what is now Iowa County to mine lead in the Dodgeville, Mineral Point, and Barneveld areas. In the late 1820's, this area provided for 75% of the United States demand for lead. See Figure 3 for the mining areas of Iowa County. Today, Iowa County no longer mines lead or zinc. Presently, non-metallic mines actively mine sand, gravel, and limestone. Limestone is one of the most significant geological resources in the area and is used in construction and agricultural operations.

Figure 3: Iowa County Mining Areas

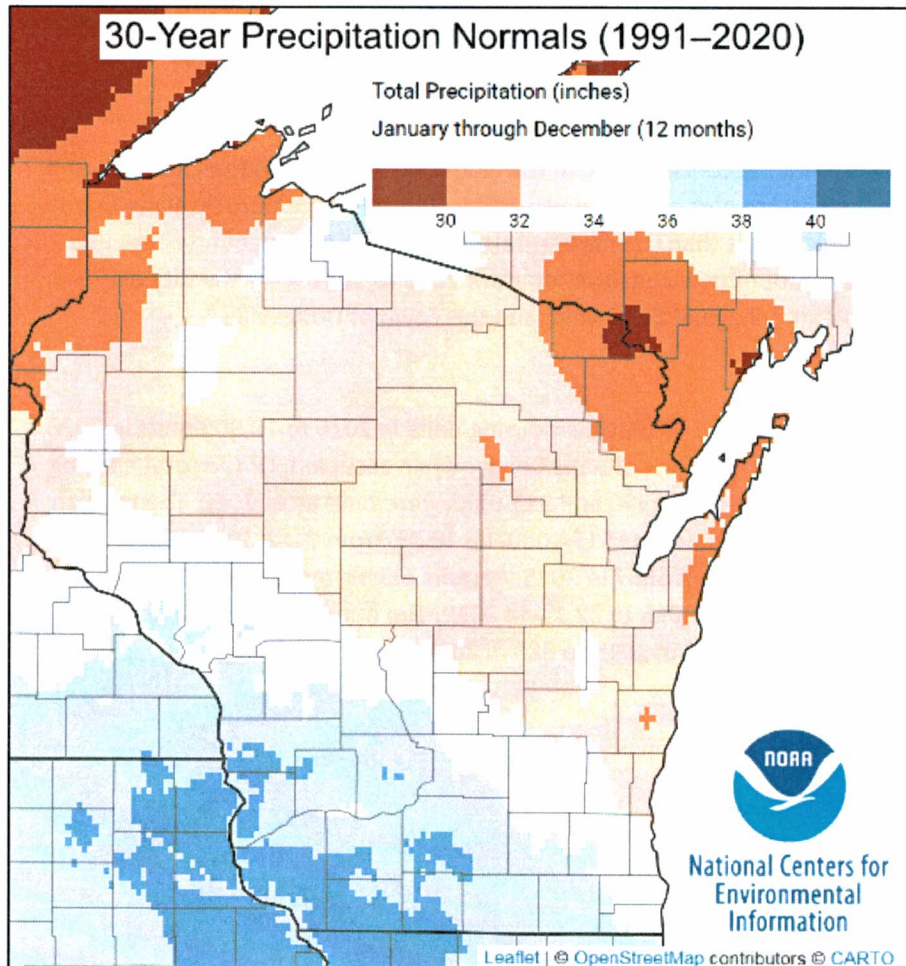


Climate

The climate of Iowa County is considered continental. This means Iowa County has cold enough winters to have fixed periods of snow and moderate precipitation in the summers. The county experiences wide changes of temperature in all seasons, with at least three months of temperatures above 50 degrees Fahrenheit and winters with at least one full month below 32 degrees Fahrenheit.

Precipitation is distributed evenly throughout the county, approximately two-thirds of which falls during the growing season. Iowa County's 30-year average annual precipitation, 1981- 2010, ranges from 36 to 42 inches, higher than that of most other counties in the state. 2019 was the wettest year ever recorded for the state of Wisconsin, totaling 44.55 inches. The anticipated trend toward wetter years is further discussed in Chapter 3: Climate Change. On average, annual snowfall for Iowa County has been under 40 inches.³ Figure 4 shows the 30-year average annual precipitation throughout the state of Wisconsin.

Figure 4: Wisconsin 30-Year Average Annual Precipitation 1991 - 2020⁴



³ National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service. *Average Seasonal Snowfall Across Wisconsin and Average Yearly Precipitation Across Wisconsin* (2010). <http://www.weather.gov/>

⁴ National Oceanic and Atmospheric Administration. *U.S. Climate Normals (1991-2020)*. <https://ncei-normals-mapper.rcc-acis.org/>

Political Jurisdictions

Government units within the county include two cities, nine villages, and fourteen townships. The county seat is at Dodgeville, located near the center of the county. Dodgeville is the largest city, with a 2020 population of 4,984. Dodgeville is located half-way between Madison, WI and Dubuque, IA.

Demographics

The overall population of Iowa County grew by 0.09% percent between 2010 and 2020, from 23,687 to 23,709. In the same decade, the percentage of the population younger than 18 decreased from 25% to 22.7%, and the percentage of the population over the age of 65 increased from 13.3% to 18.5%. Iowa County is very homogenous, with 94.2% of the County's population being white.

Communities with the highest growth rate, excluding municipalities split across multiple counties, between 2010- 2020, include the Village of Barneveld (8.12%), Village of Hollandale (6.25%), and the City of Dodgeville (6.2%). Communities with the greatest decrease in population 2010-2020, include the Village of Avoca (13.19%), the Village of Rewey (11.64%), and the Town of Linden (10.86%).⁵

Development Trends

Development in Iowa County is primarily concentrated in the cities and villages and their surrounding townships. The townships in the eastern part of the county, particularly where it borders Dane County, generally experienced more development than the more rural western part of the county. The municipalities with the largest amount of new construction from 2016 to 2021 were the City of Dodgeville, the City of Mineral Point, Village of Barneveld, and the Town of Dodgeville.⁶

Housing

Housing stock in the county increased from 10,764 total housing units in 2015 to 10,905 units in 2020. The occupancy rate in 2020 was 90.8%, with 74% of units being owner-occupied. Of the total housing units in Iowa County, 26.6% were built prior to 1940 and 211 units were built after 2010. The median value of owner-occupied housing units in 2020 was \$194,600, up 19.2% from \$163,300 in 2015. The median rent in 2020 was \$784, up 14.1% from \$687 in 2015. Renters paying more than 35% of their household income decreased from 25.9% in 2015 to 22.1% in 2020. The number of mobile homes in Iowa County has decreased by 32%, from 568 in 2015 to 385 in 2020.⁵

⁵ U.S. Census Bureau (2021). *2020 Decennial Census P.L. 94-171 Redistricting Data*.

U.S. Census Bureau (2011). *2010 Decennial Census Summary File 1*.

U.S. Census Bureau (2022). *2020 American Community Survey 5-year estimates (2016-2020)*.

U.S. Census Bureau (2016). *2015 American Community Survey 5-year estimates (2011-2015)*.

Retrieved from <https://data.census.gov/cedsci/>

⁶ Wisconsin Department of Revenue (2017, 2021). *Net New Construction Reports*. Retrieved from <https://www.revenue.wi.gov/SLFReportsassessor/>

Education and Employment

According to the American Community Survey, 25.3% of Iowa County's population had a bachelor's degree or higher in 2020, up slightly from 22.9% in 2015, but still lower than the state as a whole with 30.8%. The percentage of the population with a high school degree, equivalent, or higher was 95.4% in 2020, up slightly from 93.1% in 2015.

The per capita income of Iowa County in 2020 was \$36,035, up 30.3% from \$27,664 in 2015, actually surpassing the state per capita income of \$34,450 in 2020. Unemployment in 2020 was at historic lows, estimated to be 2.1%. While that has fallen slightly from 4.7% in 2015, the percentage of the population 16 and older in the labor force has increased slightly from 69.5% in 2015 to 69.9% in 2020.⁵

Utilities

Communication, water and sewer, natural gas, and electricity infrastructure are critical functions of everyday life and critical to emergency response operations. Yet, these utilities are vulnerable to a variety of hazards creating a risk if the utilities were to be restricted or damaged by natural or man-made hazards.

Cell phone reception in the county is reliable but can be limited in the deeper valleys in the northern section of the county. Broadband coverage generally provides high-speed internet to most villages and cities, but it was cited as an issue during the public meetings in more rural areas of the county, which poses significant challenges for emergency services to those areas.

Iowa County has one 138-volt power line through the county. A high-voltage transmission line has been ordered going east-west across the county, however the status of this line remains pending and is not guaranteed to be implemented, and is therefore represented by a dashed line in Figure 5. A natural gas pipeline travels north-south through the county. There are numerous electric stations throughout the county and windfarms located in the Town of Eden (Figure 5). Iowa County is served by both public and private water systems (Figure 6).

Figure 5: Iowa County Gas and Electric Infrastructure

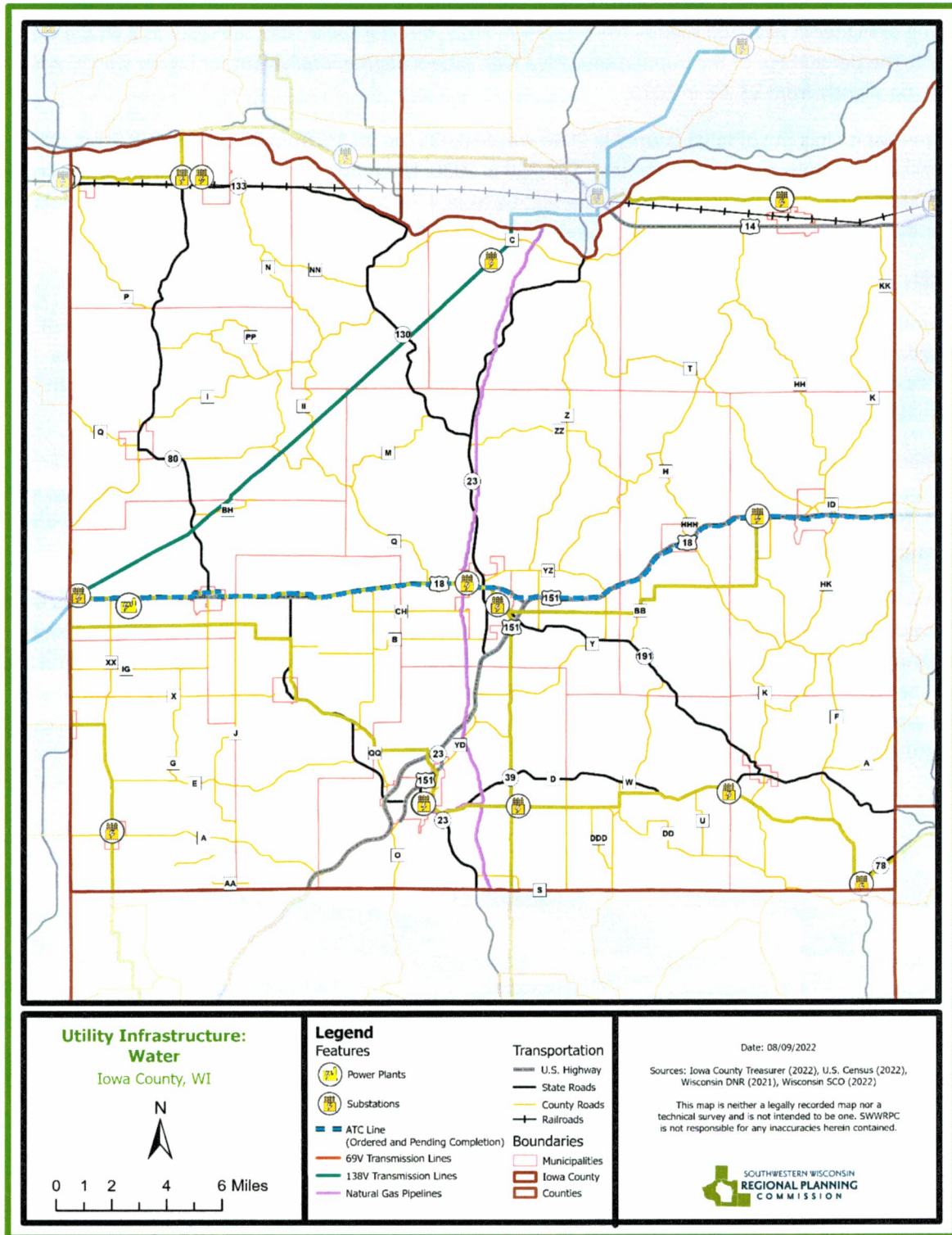
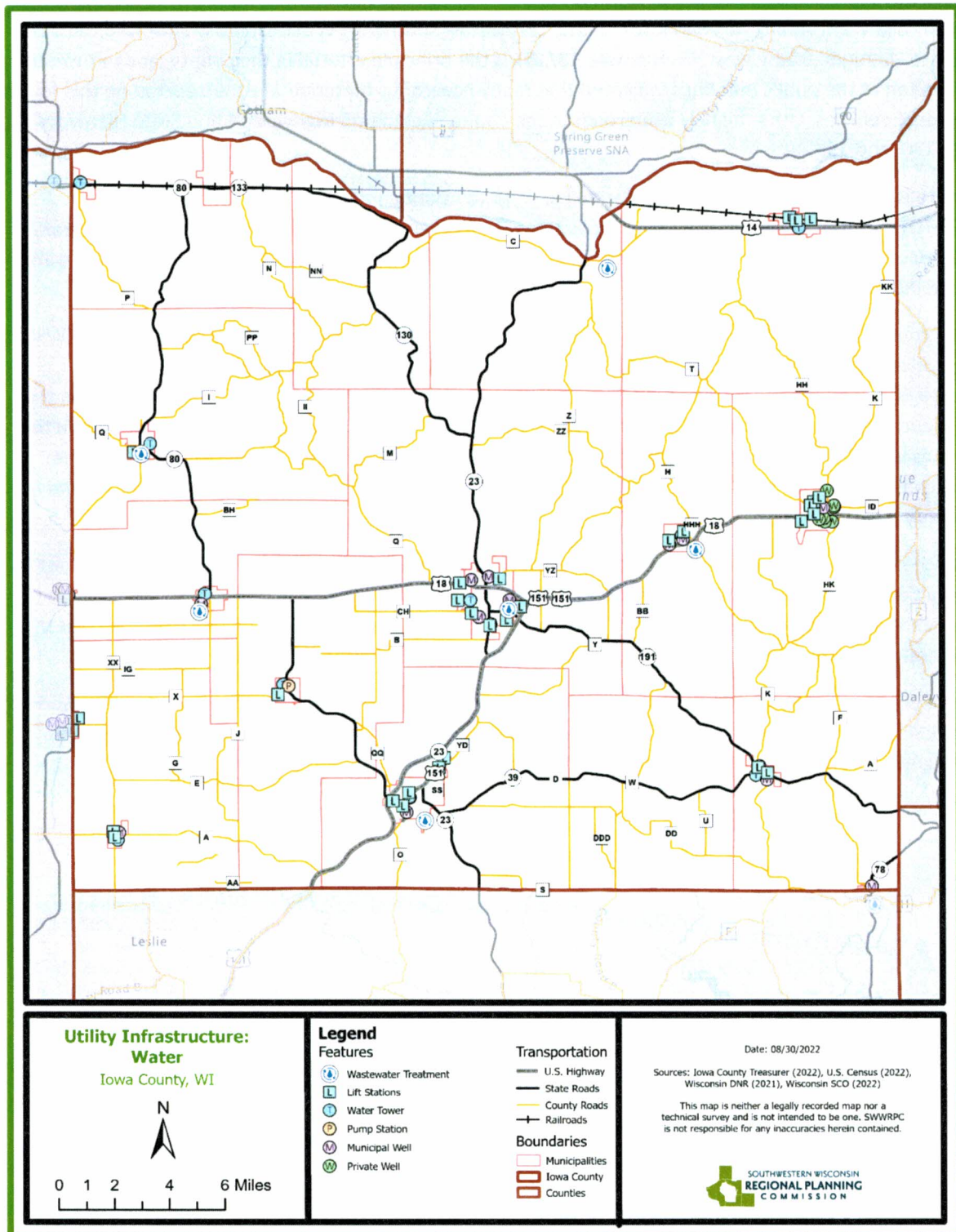


Figure 6: Iowa County Water Utilities



Transportation Infrastructure

Iowa County has 1,151.54 miles of roads maintained by local governments.⁷ US Highway 18/151 is a major highway running through Iowa County connecting southwest Wisconsin to Madison to the east, and to Dubuque to the west. US Highway 18/151 is the principle arterial in the county, and information collected at the public meetings indicated that many hazardous materials are transported on this route by large vehicles. Other heavily used roads in the county include US Highway 14 and State Highways 23, 39, 130, and 191.

There is active recreational transportation use in Iowa County, indicated on the map both by the ATV/UTV routes, as well as the many recreational trails available in the county. There are some traffic safety concerns for mixed-vehicle use of the roads, which is relevant for designing signage, policy, and road infrastructure.

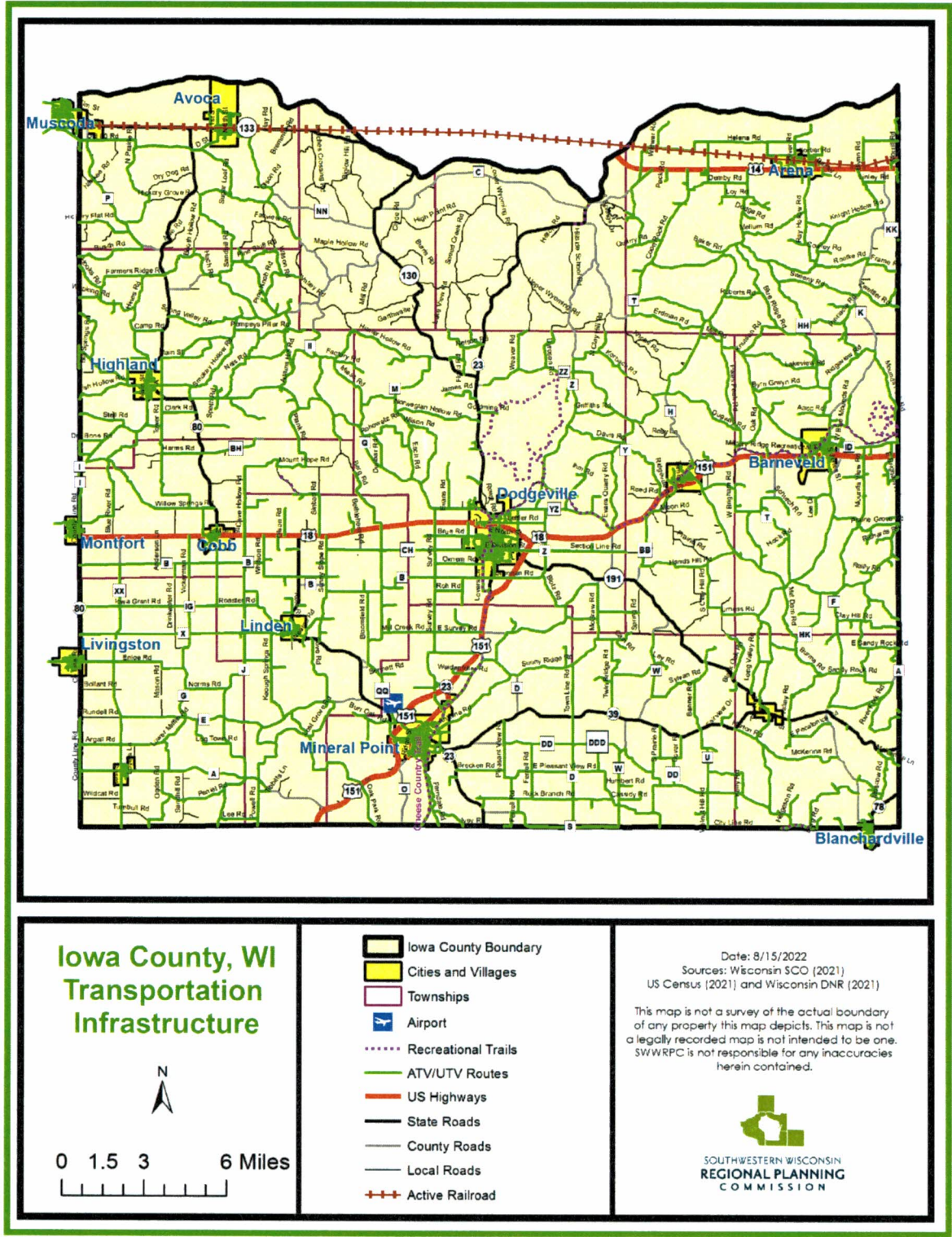
The county has an active rail line along its northern boundary. Wisconsin and Southern Railroad (WSOR) provides freight rail services on this line. Products moved on this line consist of grain, sand and aggregate, lumber, and fertilizer products. Although these are the majority of items that travel on the line currently, there is the possibility that other potentially hazardous materials can be shipped on the line as well. The rail corridor is actively managed through a public private partnership between the Wisconsin Department of Transportation, the Wisconsin River Rail Transit Commission (which Iowa County is a member of), and WSOR.

Another rail corridor in Iowa County runs from Mineral Point to Monroe. The portion of the corridor in Iowa County is not an active rail corridor, currently the corridor is “rail-banked” and serves as a recreational trail known as the Cheese Country Trail. The corridor is maintained and preserved for the potential return of freight rail services by the Pecatonica Rail Transit Commission.

Iowa County is served by two county airports: the Iowa County Airport in Mineral Point, and the Lone Rock Airport in Sauk County. The Dane County International Airport is approximately 60 miles from Dodgeville. See Figure 7 for transportation infrastructure.

⁷ Iowa County Highway Department. *DOT Wisconsin Information System for Local Roads*. January 1, 2022.

Figure 7: Iowa County Transportation Infrastructure



Emergency Services

The Sheriff's Office, Emergency Management and Coroner's Office all operate out of the Iowa County Law Enforcement Center (LEC) in Dodgeville.

Iowa County's Emergency Management Office is staffed by a full-time director and a ¾-time department assistant. The agency concentrates its efforts on the planning, preparedness, response, recovery, and mitigation areas of Emergency Management. The county Emergency Operations Center (EOC) is operated by the agency as well and is located in the LEC.

The Iowa County Sheriff's Office provides 24-hour dispatch services for law, fire, and EMS. They provide primary law enforcement for all rural areas of the county, providing service to those communities that do not have a police department. They have contracted with small communities for more direct coverage at times. The Sheriff's Office also staffs and manages the county jail.

Iowa County is serviced by 17 fire departments and 11 EMS departments. Five communities have first responder agencies (communities with medically trained personnel, but without an ambulance): Ridgeway, Hollandale, Linden, Rewey, Cobb. The fire and EMS agencies of Iowa County have an established mutual aid agreement with MABAS-WI, forming Mutual Aid Box Alarm System (MABAS) Division 124, giving access to mutual aid resources from across the state. The county uses the MABAS to coordinate fire and EMS response to incidents that require more resources than the primary response agency has. Every municipality in Iowa County has fire and emergency medical services coverage (see Figures 8 and 9).

Additionally, the county contracts with Vernon County Emergency Management for hazardous material response through a four-county consortium agreement. This agreement has established a response trailer in Iowa County with a full complement of response equipment. There are a number of volunteer firefighters in the county trained as hazardous materials technicians and operate on a paid, on-call status. The team is a Level III response unit. Additionally, Iowa County has provided training for Wide Area Search and Technical Rescue Response.

Figure 8: Iowa County Fire Department Service Areas

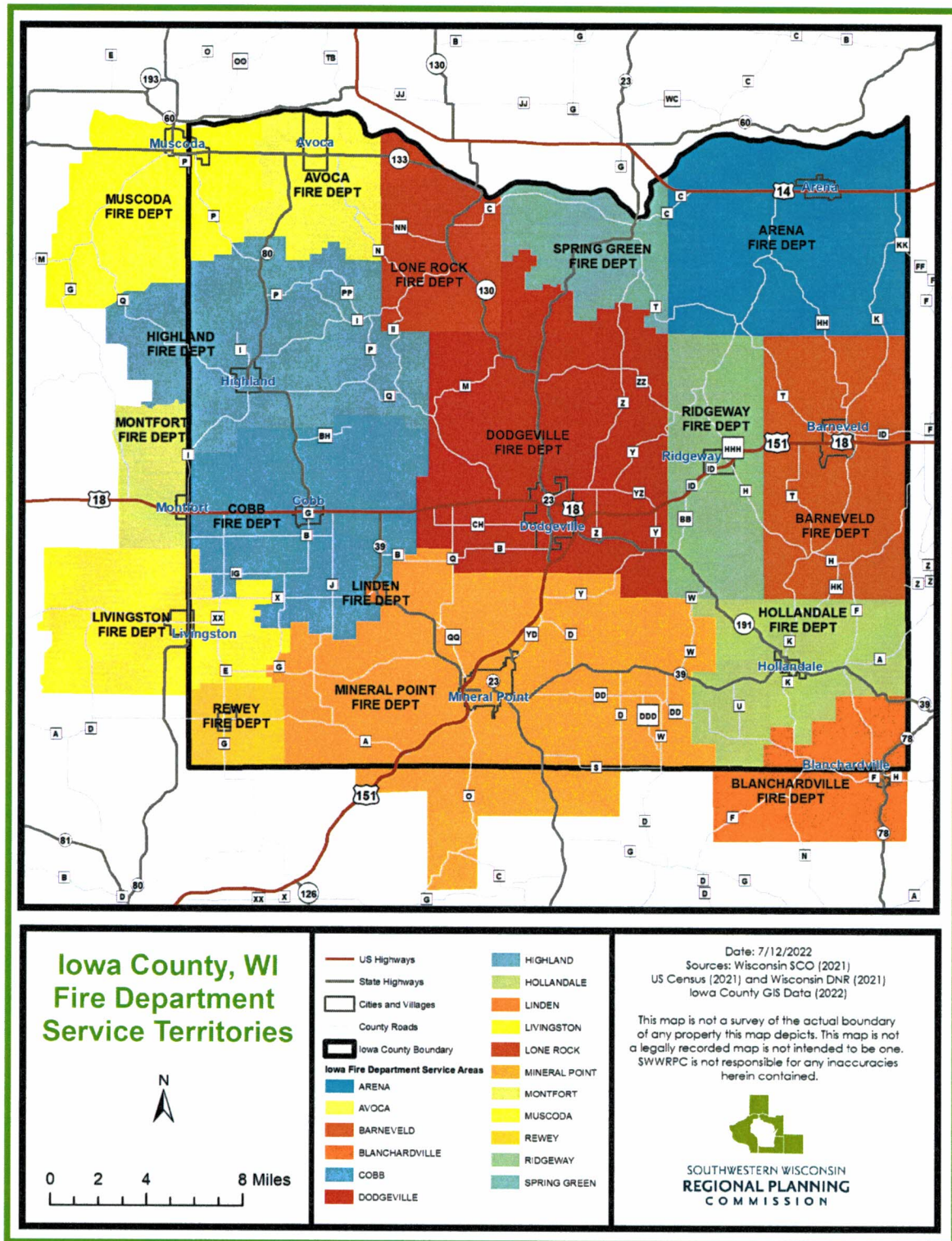
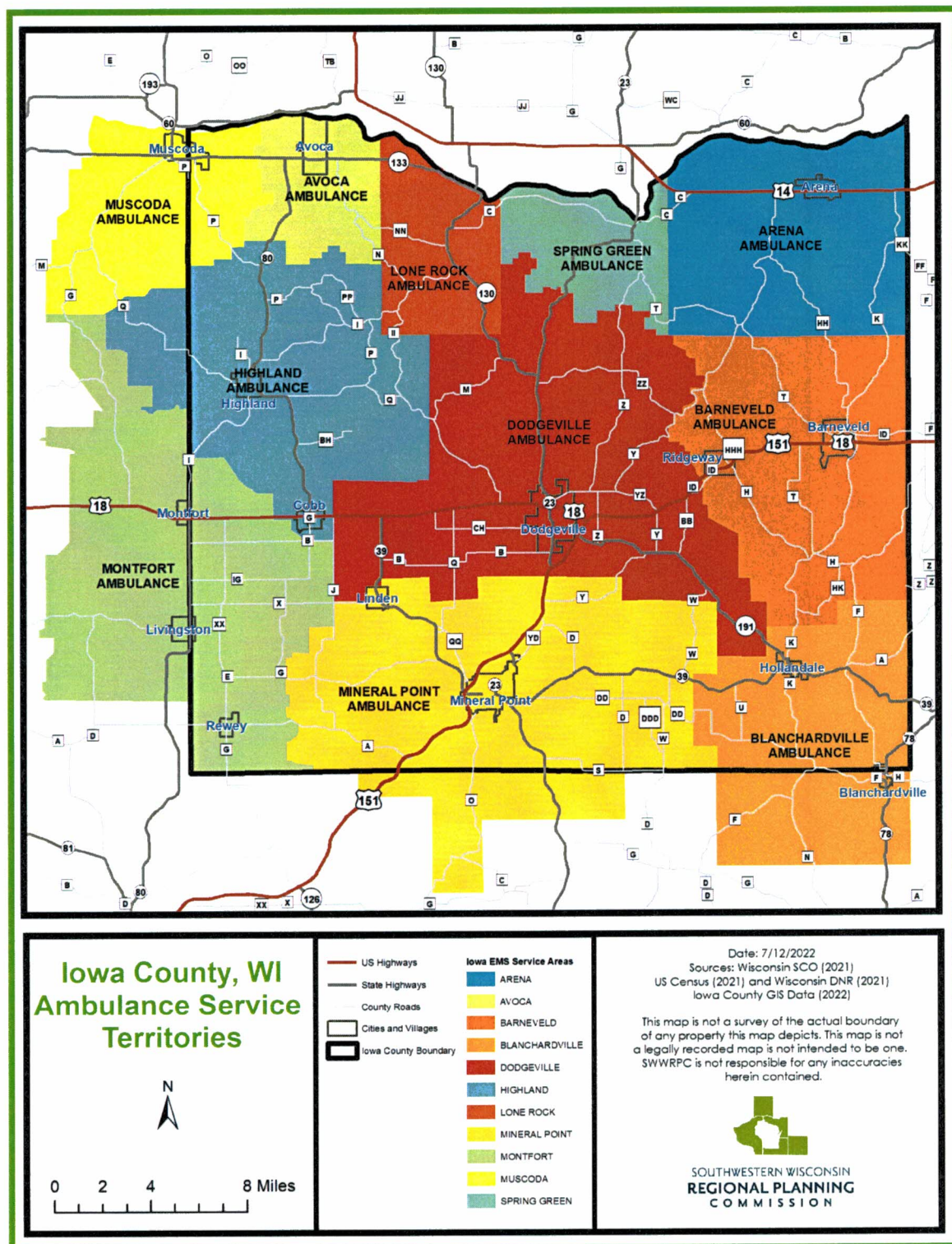


Figure 9: Iowa County Emergency Medical Service Areas



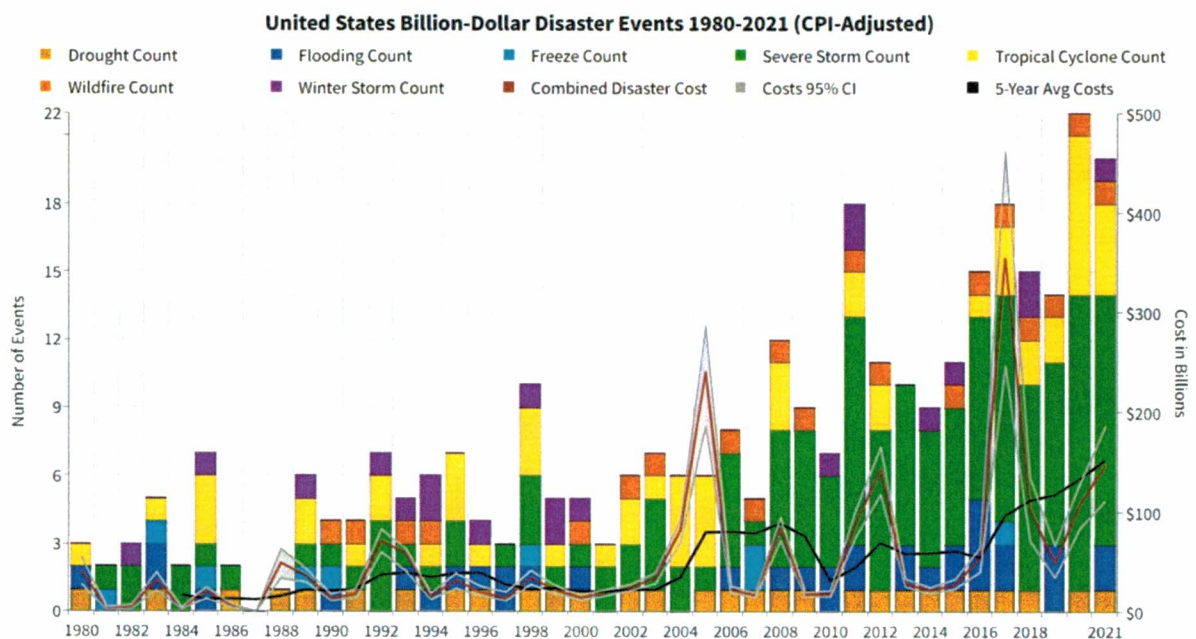
Chapter 3: Climate Change

Background

Proficient preparation for future hazard events requires an informed understanding of climate change and analysis of climate change impacts, as evidenced by historic climate trends and scientific research. Climate change has altered the severity, frequency, and types of hazard events experienced globally and in Iowa County. Research indicates that climate change will have an even greater impact in the future.

Already, the U.S. has been majorly impacted by climate change. Disaster events are becoming more severe and costly (Figure 10), and communities across the world have struggled to adapt to changing weather patterns and storm occurrences.

Figure 10: U.S. Billion-Dollar Disaster Events, Adjusted for Inflation⁸



In Iowa County, the average temperature has risen by an average of 0.5°F per decade over the last 50 years (Figure 11), and precipitation has increased by an average of 1.12 inches per decade (Figure 12). Research from the Wisconsin Initiative on Climate Change Impacts (WICCI) has found that southern Wisconsin experienced a dramatic increase in precipitation over the last decade, and very extreme precipitation events will become more frequent in the future.⁹ This is recognizable locally by the many flooding incidents experienced in Iowa County in recent years (see Table 13 for previous flooding events). Nationally, the cost of the National Floodplain Insurance Program (NFIP) has become unsustainable, as payouts from the program have exceeded the premiums paid in. The NFIP lost an

⁸ NOAA National Centers for Environmental Information (2022). *U.S. Billion-Dollar Weather and Climate Disasters*. <https://www.test.ncei.noaa.gov/access/billions>

⁹ WICCI (2021). *Wisconsin's Changing Climate: Impacts and Solutions for a Warmer Climate*.

estimated \$50 billion since its inception as of March, which lead to an overhaul of the program in 2022 in an effort to more accurately, equitably, and sustainably maintain NFIP.¹⁰

Figure 11: Iowa County Annual Average Temperature, 1895-2022, with 50-Year Trendline (1973-2021)

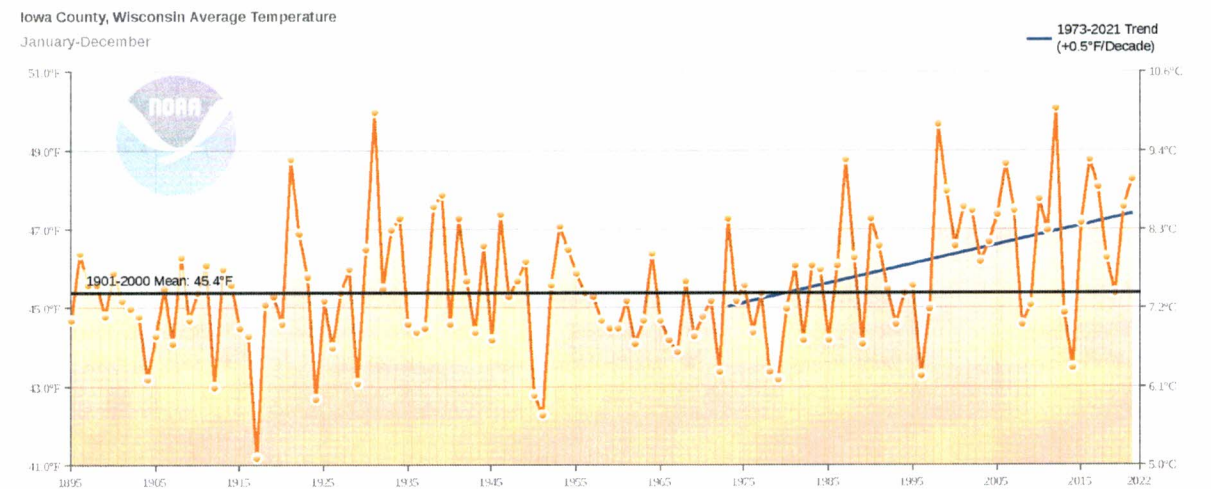
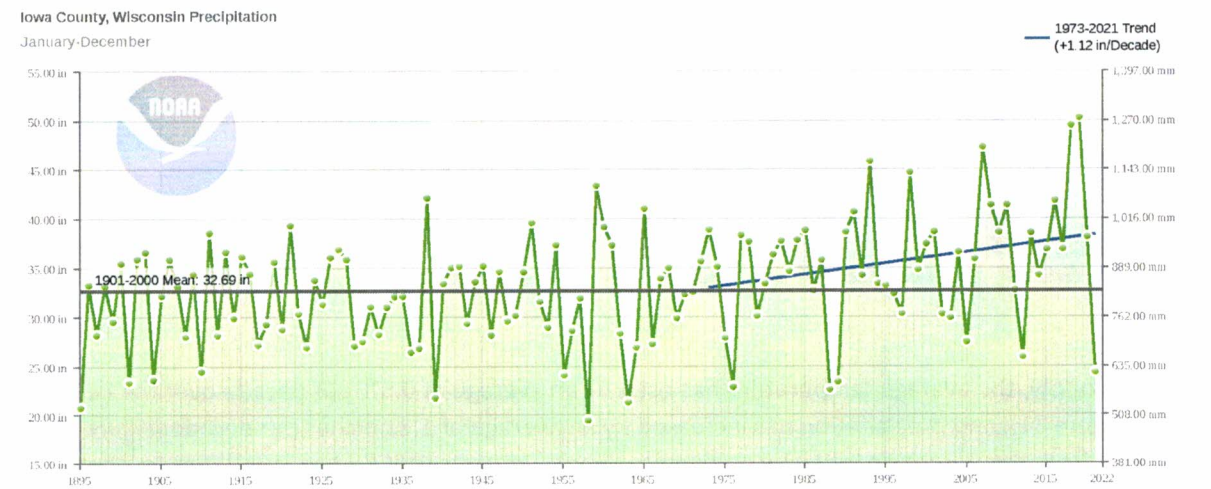


Figure 12: Iowa County Annual Precipitation, 1895-2022, with 50-Year Trendline (1973-2021)



¹⁰ Forbes (2021). *FEMA's Upcoming Changes Could Cause Flood Insurance to Soar at the Shore.*

Anticipated Impacts

In order to effectively plan for future hazard events, some of the anticipated impacts of climate change identified by WICCI are listed below.¹¹ These impacts inform expectations of the future, which in turn inform recommended actions for hazard mitigation:

- More frequent and severe weather events
- More flooding
- More frequent and severe heat days
- More freeze/thaw cycles, posing issues for existing infrastructure
- Changing habitat for plants and animals, potentially resulting in loss of native species and introduction of new pests
- Water quality degradation from flooding runoff

In addition to direct local impacts, Iowa County should also anticipate the global knock-on effects from climate change. For example, though a hurricane in Savannah, Georgia may not have local direct impacts to Wisconsin, it is a major trade port location, and could result in supply chain issues that would affect Iowa County residents. Other potential knock-on effects from climate change could include:

- Climate refugees relocating to Wisconsin
- Less stable power grid
- Global supply chain issues
- Economic volatility
- Changing federal environmental regulation
- Changing FEMA funding as national disaster events increase

Vulnerable Populations

Hazard events tend to have disproportionately negative impacts on vulnerable populations, and climate change is anticipated to worsen this by way of making hazard impacts more frequent and severe.

Vulnerable populations include those with less access to financial resources; those with limited mobility and access to transportation such as rural populations, elderly populations, disabled populations, and children; those experiencing communication barriers with local resources such as non-English speakers; stigmatized communities such as undocumented immigrants and previously-incarcerated populations; and those who are more exposed to weather elements, such as populations who are recreating outdoors, unhoused populations, and populations residing in mobile homes, tents, or other vulnerable housing.

The Iowa County community is home to many vulnerable populations, and one way that the county can prepare for worsening impacts of climate change is by putting emphasis on protecting and serving those who will likely be most severely affected. During the hazard mitigation public meetings, attendees were asked to consider the unique needs and risks of several vulnerable populations, and share their ideas for how to address those needs. Table 5 shows attendees' responses to this exercise.

¹¹ WICCI (2021). *Wisconsin's Changing Climate: Impacts and Solutions for a Warmer Climate*.

Table 5 – Responses to Public Meeting “Vulnerable Populations” Grid

Vulnerable Population	Unique Needs or Risks	Ideas for Addressing Unique Needs/Risks
Elderly	Mobility limitations, medical needs, communication issues, no one to check on them, no social media, low access to transportation, no way to get food/resources	Cooling stations, service to check on them during emergencies, ADRC expansion, classes at community center, Meals on Wheels service expansion
Children	Lack of experience and understanding, lack of access to critical resources, reliant on adult support	Disaster drills in schools, more internet access in remote areas, development and support of daycare
Non-English Speakers	Difficulty communicating with EMS, fears about contacting EMS, unknown cultural differences	Targeted outreach to these populations during emergencies, liaison/connector/education/outreach
Medically or Chemically Dependent	Facility care, medications, mobility issues, low access to transportation	Address this population in Emergency Operations Plans, have medical facilities/caregivers involved in planning
Low-Income	Lack of resources/transport/shelter, limited form of transport, low/no stockpile, renters and trailers don't have basements, Bit-O-Green Trailer Park hit by tornadoes/weather, eviction, unable to escape and/or sustain themselves while awaiting help	Communicate/maintain school gym as shelter, fire departments should warn trailer residents of emergencies, resources to assist, pursue grants, pursue eligible low-income loans, educate on available shelter and resources, utilize mass texts, free emergency kits
New Residents to the Area	Unaware of warnings and storm/winter prep and procedures, difficulty navigating ATV traffic and tractors, unfamiliar with area, don't know resources, no network locally, disconnected feeling	Include information in community welcome basket, provide call contact resource list, send information flyer, welcome kit
Physically or Mentally Disabled	Lack of transportation or may need medical equipment, confusion/scaredness, adult care facility near highway, issues summoning help	Possible list of addresses or groups that work with them, assessment of needs, make sure EMS knows where these populations live, make communications between agencies (i.e. Health Dept and EMS) easier, less red tape
Recreating Outdoors	Need safe roadside parking, not in touch with local news or contacts, no cell service, susceptible to storm damage	Extensive signage, storm shelters, sirens, education
Other vulnerable populations identified by attendees were incarcerated populations and tourists.		

Perspectives from Iowa County

During the public meetings, attendees were presented with information about climate change and asked to share their expectations for how climate change will impact them. Of the 61 attendees who answered the prompt “In the next ten years, I expect that climate change...”, 28 attendees selected “will majorly impact my life,” 32 attendees selected “will have some impact on my life,” and 1 attendee selected “will not affect my life at all.” Attendees were then asked to explain why they chose the corresponding statement. Tables 6, 7, 8, and 9 summarize the responses of public meeting attendees.

Table 6 – Responses to Public Meeting Climate Change Expectations Exercise

“In the next ten years, I expect that climate change...”		
...will not affect my life at all	...will have some impact on my life	...will majorly impact my life
1 vote	32 votes	28 votes

Table 7 – Climate Change Will Not Affect My Life at All

“In the next ten years, I expect that climate change will not affect my life at all.”
“Wisconsin is pretty isolated/safe”

Table 8 – Climate Change Will Have Some Impact on My Life

“In the next ten years, I expect that climate change will have some impact on my life.”
“Thanks to increase in government regulation” “Already feeling it” “- Hard on outdoor workers such as construction [illegible text]. May change working hours. - More storms, require more labor for response to storms. Clean up, repair” “More people moving to Wisconsin” “Hard on cattle, heat mostly, crop damage” “Climate change, more extreme events (drier, windier)” “Changing crop yields” “More floods, windstorms, damage to personal property” “Hot/dry weather” “Increased demand for energy (heating/cooling) and more severe storms to respond to” “Midwest less impacted (Dodgeville City)” “More severe weather events will impact our elderly and have more needs” “Heat production ag will hurt income” “Population issues w/rising numbers. Creating housing and economic challenges.” “Coastal impact on crops” “Economic impact”

Table 9 – Climate Change Will Majorly Impact My Life

"In the next ten years, I expect that climate change will majorly impact my life."

"The changes in business, environmental, and life styles will create much more day-to-day stress"

"From a realtor's view: - Floodplains are always expanding, causing difficulty to utilizing land for building and increase holder costs for owners such as FP insurance. - Crop yields and prices are driving price per acre to record highs. - Flooding in villages create challenges for resale of houses."

"Wisconsin now gets as hot as Florida, where I lived. Also, in Orlando, which historically doesn't get hurricanes much, I went through 3 in 4.5 years."

"Others moving to Wisconsin"

"Negative attitude toward life"

"Changing weather patterns affecting agriculture"

"Water + food scarcity for children + grandchildren"

"Food insecurity & larger natural disasters"

"Issue weaves a vulnerability thru many things (weather events, disease) the economic cost will have to affect policy"

"Food supply for family as temps change crops"

"Health imports → financial"

"Loss of critical natural resources, including habitat & lands"

"Costs of materials, food, fuel, etc."

"So many things will need to change, electric vehicles, etc."

"Increase in severe events/flooding/storms, also increase in demand for land for Ag as large farms want to move here"

"Population change"

" - Food and supply chain disruptions - Climate refuge moving in, privileged migration will happen first
 - Recreation impacts (ice/snow/etc.) - Energy costs (heat/AC) - Damage from storms/floods - Ag impacts from drought and flooding - Wildfire impacts - Increase in invasive species, new ones - Climate anxiety (kids especially) - Ecological grief"

By anticipating the impact of climate change, Iowa County officials and residents can be more prepared for future hazard events and the context in which hazard events will occur. In the next section, hazards that threaten Iowa County are explored, many of which are expected to worsen due to climate change.

Chapter 4: County-Wide Risk Assessment

Hazard Identification

Iowa County is susceptible to many hazards due to its climate, unique geography, and population. This chapter identifies the natural and man-made hazards most likely to occur or most likely to have severe impacts in the county. Identifying these hazards is an important and necessary step to informing and developing the mitigation strategies and priorities.

One way to identify potential hazards is to review past FEMA disaster declarations. These are important indicators of future high-hazard susceptibility. Iowa County has experienced 15 Federal Disaster Declarations since 1953 (Table 10), most of which relate to severe storms and flooding.

Table 10 - Iowa County Federal Disaster Declarations¹²

Declaration Date	Description
March 23 rd , 1976	Severe Storms, Icing, Wind, Flooding
June 17 th , 1976	Drought
June 7 th , 1978	Severe Storms, Hail, Flooding, Tornadoes
June 12 th , 1984	Severe Storms and Tornadoes
July 13 th , 1990	Flooding, Severe Storm, Tornadoes
June 2 nd , 1993	Flooding, Severe Storm, Tornadoes
June 24 th , 2000	Flooding, Severe Storms, Tornadoes
June 18 th , 2004	Severe Storms and Flooding
August 26 th , 2007	Severe Storms and Flooding
June 14 th , 2008	Severe Storms, Icing, Wind, Flooding
April 5 th , 2011	Severe Winter Storm and Snowstorm
August 8 th , 2013	Severe Storms, Flooding, and Mudslides
October 7 th , 2017	Severe Storms, Straight-line Winds, Flooding, Landslides, and Mud
March 13 th , 2020	COVID-19 Pandemic
April 4 th , 2020	COVID-19 Pandemic

While Federal Disaster Declarations highlight the most severe disasters in Iowa County, they do not capture all of the natural hazards to which Iowa County is exposed. In exploration of these hazards the following sources were consulted:

- NOAA National Climatic Data Center
- National Weather Service
- Iowa County Emergency Management
- Wisconsin Department of Natural Resources
- U.S. Geological Survey
- Participation from local government officials, key stakeholders, and the public

Hazard events are generally unpredictable. Any number of events can occur in any given year. Climate research indicates that natural hazard events will become more severe, longer in duration, and more

¹² Federal Emergency Management Agency (FEMA) (2022). *List of Federal Disaster Declarations*.
<https://www.fema.gov/disaster/declarations>

unpredictable in the foreseeable future due to climate change (see Chapter 4 for further discussion of climate change).¹³ Given these challenges, understanding the frequency and severity of past natural events is a first step in assessing future hazards. Table 11 shows the history of hazards in Iowa County as collected by the NOAA and WIDNR during the years 1950-2021. This is the largest and best available collection of hazard event data. Not all hazards were collected until recent decades, so the data may only reflect a recent history of hazards.

Hazard	Years Collected	# of Past Events	Deaths	Injuries	Property Damage (\$)	Crop Damage (\$)	# of Events per Year
Wild/Forest Fires (minor incidents included)	1982-7/2022	592	Unknown	Unknown	Unknown	Unknown	14.8
Thunderstorm Winds	1955-7/2022	180	0	0	\$3.64M	\$460K	2.69
Blizzard/ Winter Storms/ Heavy Snow	1996-7/2022	177	0	0	\$10K	\$0	6.81
Fog	1999-7/2022	73	0	0	\$0	\$0	3.17
Hail	1955-7/2022	76	0	0	\$22.73M	\$305K	1.13
Tornado	1954-7/2022	30	9	206	\$6.12M	\$55K	0.44
Extreme Heat	1998-7/2022	36	0	0	\$0	\$0	1.5
Extreme Cold/ Wind Chill	1996-7/2022	34	0	1	\$3k	\$0	1.31
Drought	2002-7/2022	18	0	0	\$0	\$150K	0.9
Flood /Flash Flood	1998-7/2022	21	0	0	\$1.55M	\$7.1M	0.88
Lightning	1996-7/2022	4	0	0	\$375K	\$10K	0.15
Earthquake	-	0	0	0	0	0	0

¹³ WICCI (2021). *Wisconsin's Changing Climate: Impacts and Solutions for a Warmer Climate*.

¹⁴ Wisconsin Department of Natural Resources (WIDNR). (2022). *Wildfire Dashboard*. https://dnrm.wisconsin.gov/WAB/WildfireOccurrence_Dashboard/; NOAA. (July 2022). *Storm Events Database*. <https://www.ncdc.noaa.gov/stormevents/>

Hazard Assessment in Public Meetings

During the public meetings, attendees were asked to vote for three hazards they believe will pose the biggest risk to Iowa County in the next ten years. The results, shown in Table 12 below, provide a snapshot of the concerns of public officials and residents in Iowa County. These concerns may be influenced by recency bias, as nearly all selections of “Domestic Terrorism” were made on the July 7th public meeting, following the July 4th 2022 Highland Park, IL parade shooting incident. Overall, the most frequently chosen hazards were “High Winds and Tornadoes” and “Flooding.”

Table 12 - Public Meeting Vote Responses: “Which three hazards do you believe will pose the biggest risk to Iowa County in the next ten years?”

Hazard	Public Meeting			
	Wyoming 6/23/22	Mineral Point 6/30/22	Dodgeville 7/7/22	Total
High Winds and Tornadoes	7	16	13	36
Flooding (including due to precipitation, water table increase, and other)	7	12	8	27
Disruption of Life Lines (electric, fuels, water, wastewater)	1	4	18	23
Cyber-Attack	3	4	15	22
Domestic Terrorism (including active shooter incidents and anti-government movements)	2	0	19	21
Drought and Extreme Heat	1	5	14	20
Lightning, Thunderstorms, and Hail	5	10	2	17
Climate Change	4	5	4	13
Emerging Infectious Diseases (including pandemics)	2	3	3	8
Winter Storms and Extreme Cold	1	3	2	6
Food and Agriculture Emergencies	3	1	1	5
Hazardous Materials Incident and Radiological Release	0	0	3	3
Dam Failure and Other Infrastructure Failure	1	0	2	3
Wildfires	1	0	0	1
Landslides and Land Subsidence	0	0	0	0

Vulnerability Assessment

The following section provides a more detailed assessment of risk associated with each of the natural and man-made hazards that have historically affected, or may affect, Iowa County. The vulnerability assessment includes the following for each hazard:

- A description of the hazard
- An overview of the historical occurrences of the hazard in Iowa County
- An assessment of vulnerability to the hazard throughout Iowa County
- A projection of the future probability and potential damages of the hazard in Iowa County

Flooding

Flooding is defined as “a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area.”¹⁵ Flood events are the most common natural hazard in the U.S. and frequently occur in Iowa County. Several types of flooding affect/may affect Iowa County, including:

- Dam or Levee Failure: Dam failure causes flooding downstream of the dam. Prolonged rainfall is the most common cause of dam failure. See Figure 14 for a map of dam vulnerability in the county.
- Flash Flooding: Flash floods are defined as rapid and extreme flow of water into a normally dry area, or a rapid rise in water-level, above a predetermined flood level, in a stream or creek. Flash floods define the rate of flooding and can be caused by other flood types, such as intense rainfall, dam failure, or an ice jam. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Flash flood vulnerability is not perfectly indicated by FEMA floodplain maps (see Figure 13 for Iowa County flood zones), as data gathered at the public meetings indicated that residents have experienced flooding in areas outside of the current maps.
- Local Drainage Floods: This type of flood occurs outside of recognized drainage channels or delineated flood plains and is caused when water has no place to travel. Heavy precipitation, a lack of infiltration, inadequate facilities for drainage and storm-water conveyance, and increased surface runoff can result in this flood type. These events frequently occur in flat areas and particularly during winter and spring in areas with frozen ground. They also occur in urbanized areas with large impermeable surface.
- Riverine: Also known as overbank flooding, riverine flooding is caused by a flooding river. In steep valleys, riverine flooding is usually rapid and deep, but short in duration. In flat areas, riverine flooding is typically slow, relatively shallow, and may last for long periods. Riverine flooding is typically caused by prolonged periods of rainfall that saturate the ground and overload streams and reservoirs.
- Storm-water: Storm-water flooding occurs when water from a storm event exceeds the capacity of local drainage systems, either man-made or natural.
- Groundwater Flooding: Flooding due to increased recharge causing the water table to rapidly rise, either forcing water to flood above the ground surface or forcing water by hydraulic pressure through cracks and crevices and into basements.¹⁶ See Figure 15 for a water table map of Iowa County.

The heaviest flooding in Iowa County occurs during spring due to snow melt and heavy rains, and occasionally in the summer and fall. Streams in the county that occasionally produce flooding include the Morrey, Otter, Lower, Mill, and Blue Mounds Creeks, which all drain north into the Wisconsin River. Additionally, the Mineral Point, Dodge and Blue Mounds branches of the Pecatonica River can cause flooding. These drain south into the Rock River. See Figure 13 for floodplains located in Iowa County.

¹⁵ FEMA (2022). *National Flood Insurance Program Terminology Index*. <https://www.fema.gov/flood-insurance/terminology-index>

¹⁶ WDHS (2014). *Wisconsin Flood Toolkit*. <http://www.co.grant.wi.gov/docview.asp?docid=18516&locid=147>

Figure 13: Iowa County Floodplain

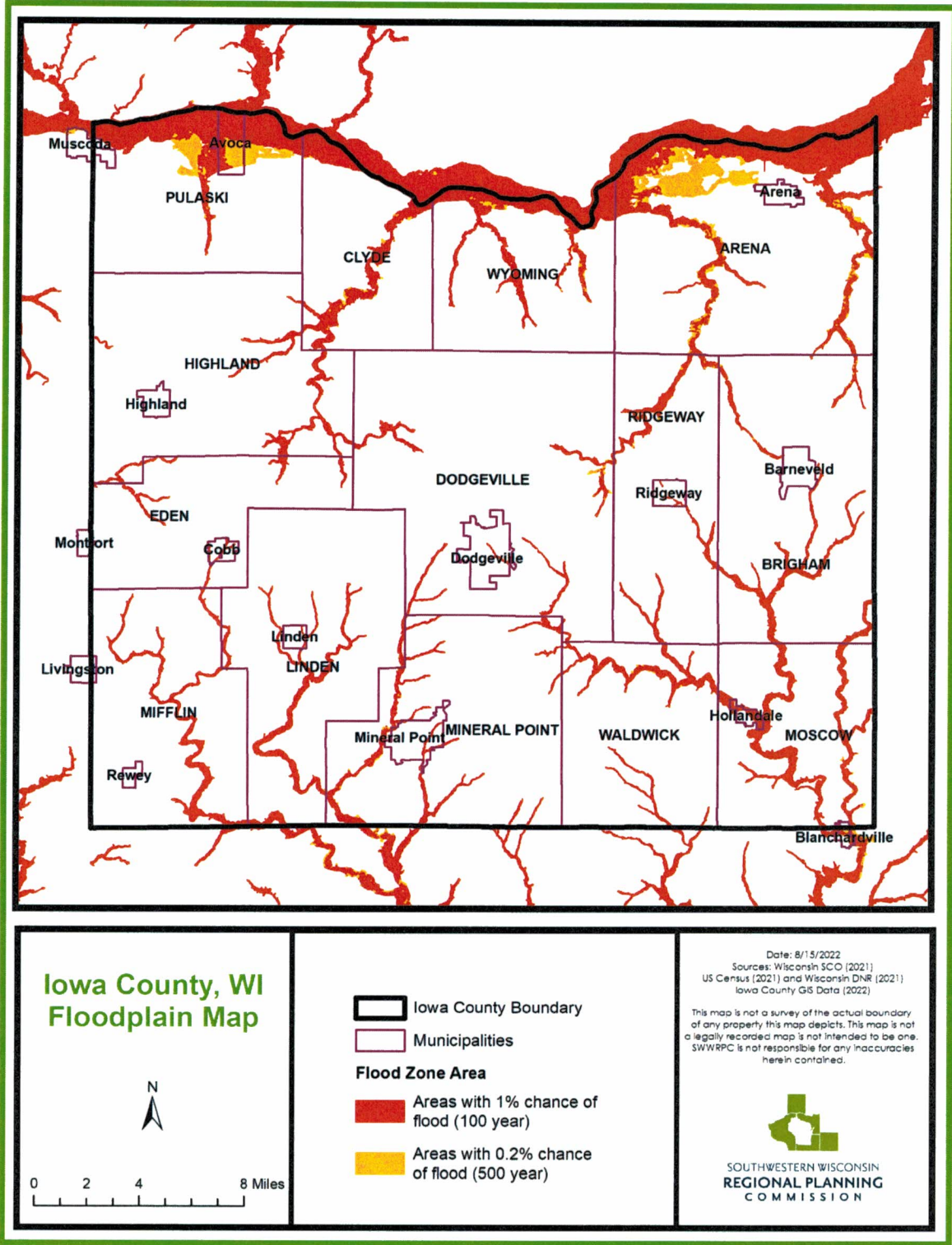


Figure 14: Dam Vulnerability in Iowa County

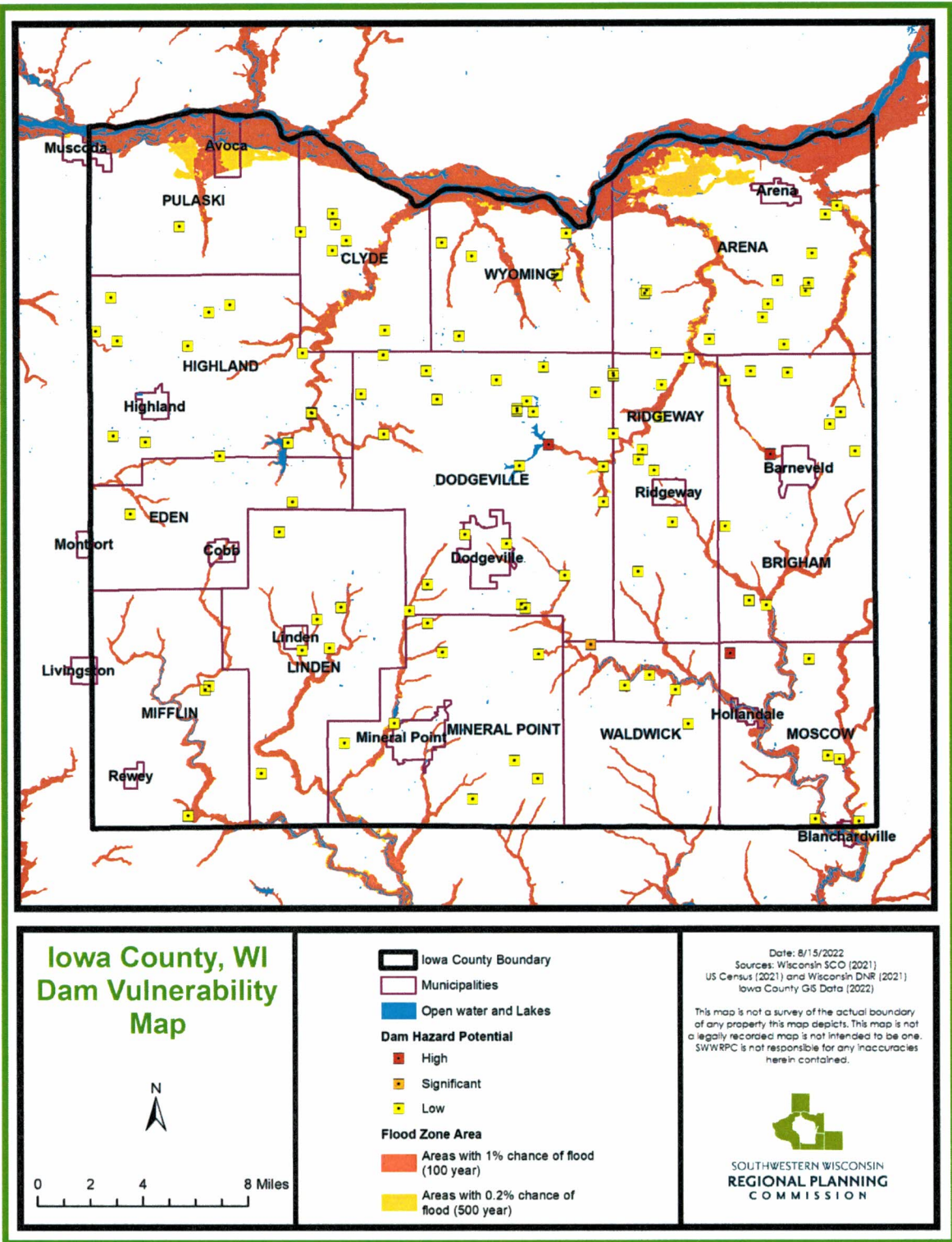
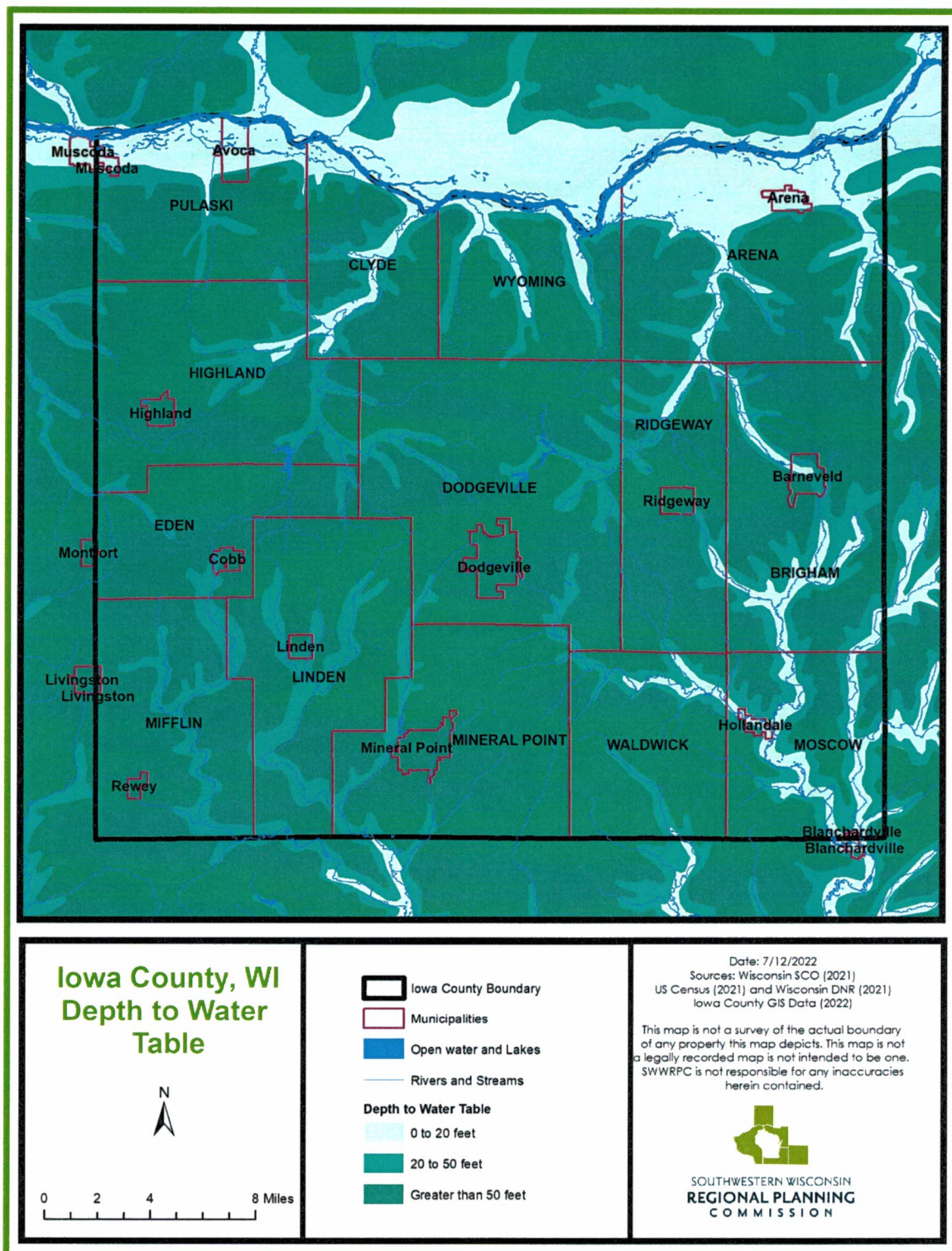


Figure 15: Depth to Water Table in Iowa County



Historic Flooding Events

According to NOAA, FEMA, and local records, Iowa County experienced 21 major flood events between 1998 and 2021 (see Table 13). The total damages caused by these flooding events were \$1.552M in property damage and \$7.1M in crop loss/damage. On average, that is approximately \$412,000 in damages per flooding event in the county.

Table 13 - Iowa County NOAA Recorded Flood Events 1998 – 2021¹⁷

Location	Date	Flood Type	Property Damage (\$)	Crop Damage (\$)
Dodgeville	March 30 th , 1998	Flood	\$10K	\$0
Countywide	May 16 th , 1999	Flash Flood	\$50K	\$0
Northern Portion	June 1 st , 2000	Flash Flood	\$200K	\$1.56M
Northern Portion	June 1 st , 2000	Flash Flood	\$583K	\$2M
Avoca	June 13 th , 2000	Flood	\$0	\$0
Countywide	August 2 nd , 2001	Flood	\$0	\$0
Highland	May 23 rd , 2004	Flash Flood	\$100K	\$300K
Multiple Counties	June 1 st , 2004	Flood	\$0	\$2M
Arena	August 5 th , 2007	Flash Flood	\$50K	\$0
Avoca	August 19 th , 2007	Flash Flood	\$200K	\$500K
Mineral Point	August 22 nd , 2007	Flash Flood	\$100K	\$100K
Avoca/ Cobb	June 12 th , 2008	Flash Flood	\$3K	\$500K
Avoca	July 27 th , 2009	Flash Flood	\$75K	\$0
Arena	June 21 st , 2013	Flash Flood	\$70K	\$100K
Blanchardville	June 22 nd , 2013	Flash Flood	\$10K	\$20K
Mineral Point	June 22 nd , 2013	Flash Flood	\$60K	\$20K
Rewey	February 20 th , 2018	Flood	\$0	\$0
Arena	August 21 st , 2018	Flood	\$30K	\$0
Jonesdale	March 13 th , 2019	Flood	\$5K	\$0
Rewey	September 12 th , 2019	Flash Flood	\$5K	\$0
Avoca	October 22 nd , 2020	Flash Flood	\$1K	\$0
TOTAL			\$1.552M	\$7.1M

*NOAA estimates do not reflect actual FEMA damages due to these events.

Vulnerability Assessment

The most common type of flooding in Iowa County is flash flooding due to the steep and rugged terrain north of Military Ridge. Flooding at or near the Wisconsin River is also a regular occurrence. Storm-water flooding is an additional likely occurrence in cities and villages without a dedicated storm-water system. Iowa County has a large number of dams and retention structures, these create an additional vulnerability to flooding from dam failure. Aspects of Iowa County infrastructure and services most vulnerable to floods include:

- Agricultural Industry – Loss of crop, livestock illness and possible death, soil erosion
- Business/Industry Infrastructure – Property damage, loss of income

¹⁷ NOAA. (July 2022). *Storm Events Database*. <https://www.ncdc.noaa.gov/stormevents/>

- Emergency Services – Warning systems; access to vulnerable populations such as older, low-income, children, disabled, recreational park users, and visitors
- Environmental – Soil erosion, water contamination, loss of wildlife habitat, wildlife illness, and possible death
- Residential Infrastructure – Flooded basements, collapsed foundations, damaged septic systems, collapsed wells, and destroyed/severely damaged homes
- Public Health – Harmful molds, water contamination
- Public Infrastructure (including utilities) – Property damage, downed transmission lines and poles, damaged transformers and telecommunication networks, damaged water treatment systems, diminished water quality from overflow and backup of sanitary sewer, roadway infrastructure including culvert and bridge damage which can impact commutes and school bussing capability

Future probability and potential loss

On average there were 0.88 major flooding events per year in Iowa County between 1998 and July of 2022. The majority of those events were flash floods, due to large rainfall events. Climate trends and research suggest that the frequency of future large rain events will increase and become more severe.¹⁸ Since flash-flooding is localized in nature, risk will vary throughout the county, with locations of lower elevations being more vulnerable.

The average cost of a flooding event in Iowa County between 1998 and July of 2022 was approximately \$412K. With increased frequency and severity of flooding events, this expense is likely to increase. There is one repetitive loss structure in Iowa County in the City of Mineral Point that is residential, and no severe repetitive loss structures in the county.

Property damage and potential loss are likely to be higher than the previous average cost in the event of a dam failure. Three dams in the county are considered “High Hazard.” See Figure 14 for a dam vulnerability map of Iowa County. The hazard ratings are not based on physical attributes, quality, or strength of the dam itself, but instead that the failure of these dams would likely result in the loss of life and significant property damage.

¹⁸ WICCI (2021). *Wisconsin’s Changing Climate: Impacts and Solutions for a Warmer Climate*.