FAIRFIELD
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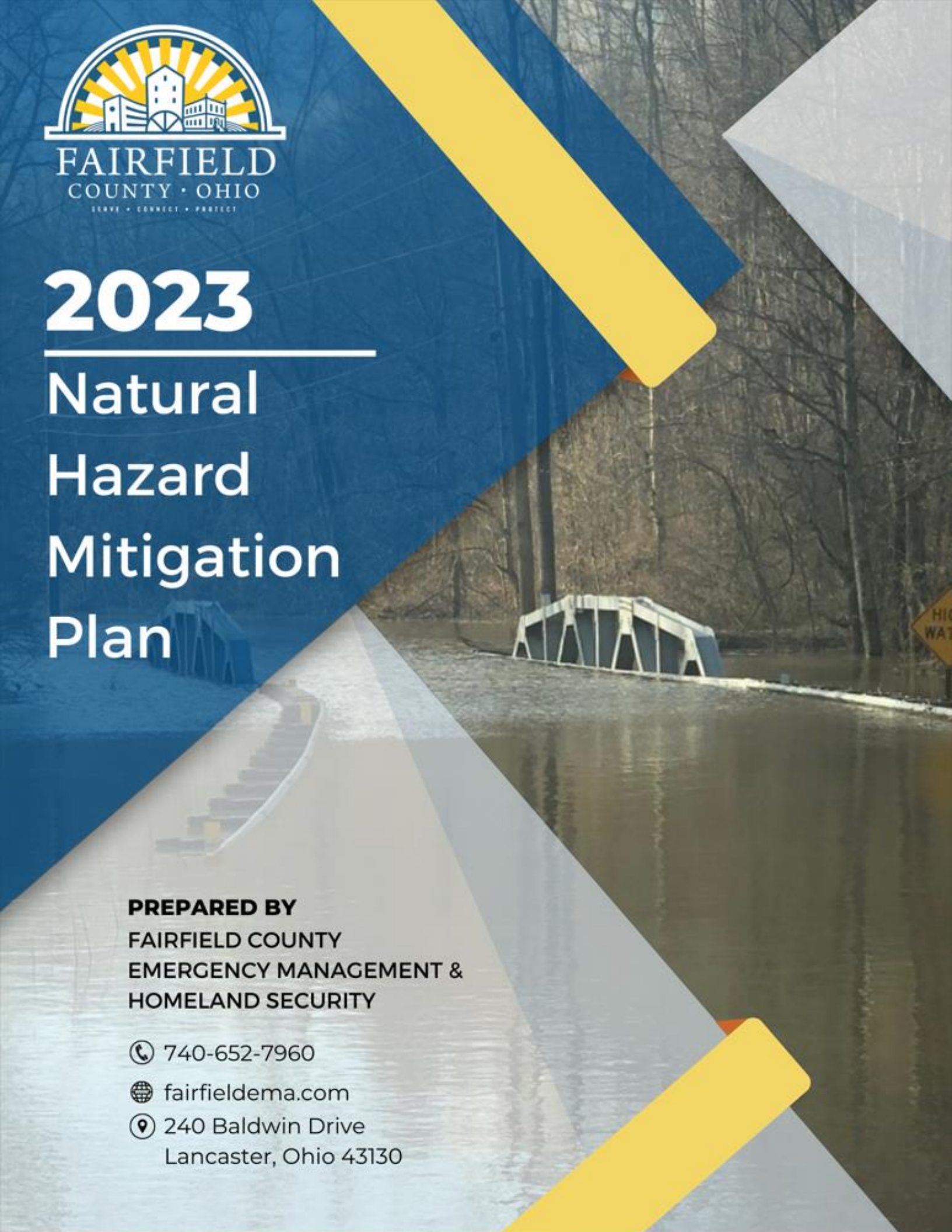
2023

Natural Hazard Mitigation Plan



PREPARED BY
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Executive Summary

The *Fairfield County 2023 Natural Hazard Mitigation Plan* (NHMP) is a local plan that covers the severe weather events that can affect the county, their impact, and ways to reduce risk to life, property, and the environment. While this plan covers the entire county, each jurisdiction, stakeholders, and the public had the opportunity to contribute to the planning of this document, outline weather impacts and resulting problems, as well as develop a list of projects to reduce the risk and impact from these events. Areas that are impacted by a hazard more than other areas are also identified in this plan to promote targeted planning and mitigation strategies.

Participation in the development process of this plan facilitates jurisdiction eligibility for certain grants through the Federal Emergency Management Agency (FEMA). These grants can make the mitigation projects more of a reality as all can attest grant funding is critical, especially for jurisdictions on tight budgets who would otherwise not be able to fund these important projects.

This document is broken into several sections including the planning process, risk assessment of each weather hazard including high hazard dams, and strategies to reduce the risk. At the end of the document are attachments showing the planning process, jurisdiction participation, adoption resolutions, and the data compiled as required by FEMA.

There are many jurisdictions, community partners, and other individuals that worked together for the planning and development of this document. The list of participating organizations can be seen on the next page. By adopting this plan, the jurisdictions of Fairfield County commit to make Fairfield County safer for residents, businesses, and those who visit.

Fairfield County Emergency Management & Homeland Security (EMA) greatly appreciates the time and efforts of all those that participated in the *Fairfield County 2023 Natural Hazard Mitigation Plan*.

Mitigation Plan Participant List

ADAMH Board	Greenfield Township Fire Department*
Amanda Township†*	Hocking Township†*
Amanda Village†*	Hunters Run Conservancy District†*
Amanda-Clearcreek School District	Information & Referral, 2-1-1
American Red Cross*	Lancaster Fire Department*
Baltimore Village†*	Lancaster Police Department*
Basil Joint Fire District	Lancaster Stormwater Management t†*
Berne Township†*	Lancaster Water Division*
Berne Union School District	Lancaster-Fairfield Public Transit*
Bloom Carroll School District	Liberty Township† *
Bloom Township†*	Lithopolis Village†*
Bloom Township Fire Department*	Local Emergency Planning Committee*
Bremen Village†*	Madison Township†*
Buckeye Lake State Park	Mid-Ohio Regional Planning Commission
Carroll Village†*	Millersport Village†*
City of Lancaster†*	Ohio Environmental Protection Agency
City of Pickerington†*	OSU Extension Office
Clearcreek Township†*	Pleasant Township† *
Cyril Scott Industries	Pleasantville Village†*
Diley Ridge Medical Center	Richland Township†*
Fairfield County Auditor's Office	Rushcreek Conservancy District†*
Fairfield County Commissioner's Office†*	Rushcreek Township†*
Fairfield County Emergency Management Agency*	Rushville Village† *
Fairfield County Engineer's Office*	South Licking Watershed Conservancy District†*
Fairfield County GIS Department*	Southeastern Correctional Institution
Fairfield County Health Department*	Stoutsville Village†*
Fairfield County Prosecutor's Office*	Sugar Grove Village†*
Fairfield County Regional Planning*	Thurston Village† *
Fairfield County Sheriff's Office*	Violet Township†*
Fairfield County Soil & Water Conservancy District*	Walnut Creek Sewer District*
Fairfield County Utilities' Office*	Walnut School District*
Fairfield Medical Center‡	Walnut Township†*
Fairfield Union School District	West Rushville Village†*
Greenfield Township†*	

†Jurisdictions participating in the plan that seek approval.
‡Organizations submitting projects through an eligible entity.
*Core Group Member

Note: Agencies under larger jurisdictions (*i.e.*, Fairfield County, City of Lancaster, or City of Pickerington) fold up under that jurisdiction. These agencies are included in the jurisdiction's process and approval.

Fairfield County
Natural Hazard Mitigation Plan

Community Lifelines

The concept of community lifelines was developed by FEMA in 2017 after the hurricane season. Community lifelines enable the continuous operation of government and critical services that are essential to the safety and security of people, health, and the economy. They also promote the community's return to a pre-disaster status as quickly as possible. Lifelines are used to focus response actions and stabilize the incident while ensuring critical services are restored as quickly as possible.

While used primarily for response efforts, lifelines may be used for planning and mitigation as another layer to focus response efforts. Some lifelines may apply more than others depending on the hazard, area affected, and the impact. All seven community lifelines and are considered during the planning for the *Fairfield County 2023 Natural Hazard Mitigation Plan* and the protection of life, property, and environment.

Introduction

Mitigation plans are implemented across the United States as a plan to reduce the risk and impact of severe weather events. These severe weather events can be devastating affecting lives and destroying infrastructure. Even if events are not on an extreme scale, weather events can affect people and property and cost large sums of money to recover. Planning for these events and implementing projects to reduce the risk and impact can put the community in a much better place when it comes to recovery and getting back to a pre-disaster state.

The county *Natural Hazard Mitigation Plan* (hereafter referred to as the Mitigation Plan), was first written in 2003. FEMA requires the Mitigation Plan be updated every five years incorporating changes in hazards, impact, susceptible areas, and projects to minimize the risk and impact from severe weather events since the last plan. The 2023 Mitigation Plan is an update to the last version published in 2018.

Changes to this plan include modifications posed by FEMA starting April 2023 such as changes in the climate trends, vulnerable populations, and a whole community approach. In addition to these changes, data on weather events was also updated. Feedback was requested from elected officials, stakeholders, and residents on how they perceive the weather compared to the last Mitigation Plan in 2018 as well as hazards that concerned them most. Additionally, the concept of community lifelines was also added to this version of the plan.

This plan is written with the first concern for life followed by property and the environment. Mitigation methods are prioritized following this model and is agreed upon by all jurisdictions.

Section 1: Community Profile

Fairfield County was established on December 9, 1800, in the Northwest Territory. The location was chosen because Zane's Trace crossed the Hocking River making it easier for German settlers to come west from Pennsylvania. Most of the settlers traveling Zane's Trace settled in Fairfield County. Lancaster was established as the county seat and became a commercial center for craftsmen and businesses. This section looks at Fairfield County, Ohio and the factors that may affect vulnerability and resilience.

1.1 Location

Figure 1: Location of Fairfield County, Ohio

Fairfield County, Ohio is located in Central Ohio, United States (see Figure 1) (Western Reserve Land Conservancy, 2022). The contiguous counties are Franklin, Licking, Perry, Hocking, and Pickaway. Fairfield County is unique in that the northern portion of the county is flat and composed of primarily farmland. The southern part of the county is made of hills and the Appalachian foothills and is primarily wooded area.

The two largest cities are Lancaster and Pickerington. Canal Winchester, Columbus, and Reynoldsburg are also metropolitan areas that cross over the Fairfield – Franklin County line and are covered in Franklin County planning materials. In addition to the cities, there are also 12 villages, 22 unincorporated communities, and 13 townships that make up the rest of the county.

1.2 Geography

As discussed above, the northern portion of the county is flat and used as farmland. This is largely due to glaciers that once traveled from the north and down through the county. Where the glaciers stopped created a change in topography that left the southern portion of the county as rolling hills and the foothills of the Appalachian Mountains.

Figure 2 shows the physiographic subdivisions of Fairfield County (NRCS, n.d.). The northern portion is made up of till plains. The middle is glaciated Allegheny Plateau. And the southeastern corner is unglaciated Allegheny Plateau.

There are several surface mines in Fairfield County. These mines are for sand and gravel and do not tunnel down into the earth. The largest mines in size and quantity are located in Berne Township in the

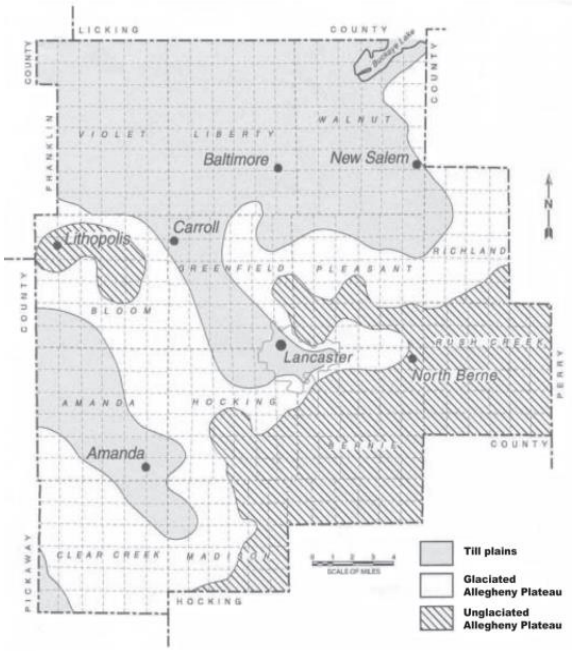


Figure 2: Physiographic Subdivisions of Fairfield County

southeastern part of the county. There are two historic coal mines further east in Rushcreek Township, but these are also surface mines.

1.3 Climate

Fairfield County is in a temperate zone. The average temperature in the winter is 29° Fahrenheit (F). The county sits in the United States Department of Agriculture (USDA) hardiness zone 6. This means that the average minimum temperature is -10° to -5° F (USDA, 2012). The average summer temperature is 73° F (CustomWeather, 2021).

1.4 Demographics

Fairfield County has historically been a homogenous population consisting largely of white and non-Hispanic residents. The American Consumer Survey (ACS) is different than the decennial census count. The ACS is used to show changes in social and economic characteristics of a population rather than just provide a count. The data below is all data reported through ACS for comparison (U.S. Census Bureau, 2022).

Fairfield County, Ohio	**2017**	**2020**	**2021**
Total Population	154,733	158,921	161,064
Age			
Persons Under 18 Years of Age	24.0%	24.3%	24.1%
Persons 65 Years and Older	15.5%	15.1%	15.7%
Race & Ethnicity			
White	86.5%	87.9%	82.3%
Black of African American	7.9%	7.1%	6.6%
Asian	2.0%	1.5%	2.4%
American Indian and Alaskan Native	0.1%	0.3%	0.1%
Native Hawaiian or Other Pacific Islander	0.0%	0.0%	0.2%
Hispanic or Latino	2.1%	2.1%	2.2%
Two or More Races	2.4%	2.8%	7.0%

Table 1: Fairfield County demographics from ACS

As seen in the data above, the population has become more diverse since the last Mitigation Plan. The composition of the population is fluid as people come and go, economic situations change, and the community evolves. Fairfield County has been seeing a growth in population. Large businesses are popping up in the county and in nearby counties. More homes are being built as people move to live in Fairfield County and may work here or commute to a nearby county. This growth has really caused the county to boom and expand.

Demographics	**2017**	**2021**
Population 16+ Years in Labor Force	63.1%	62.7%
Unemployment Rate	4.2%	4.3%
Median Household Income – Inflation-Adjusted Dollars	$63,310	$81,226
Mean Household Income – Inflation-Adjusted Dollars	$81,579	$95,316
With Cash Public Assistance Income	3.1%	1.8%

Table 2: Economic demographics from ACS

When comparing the demographic data from 2017 to 2021, the labor force was slightly higher, but the annual income was lower. The cash assistance was also greater in 2017, likely due to the median and

average income being lower. In 2021, the labor force was lower but the median and mean (average) household income was higher. This could be because of the effects of COVID-19 on the economy and the large number of people that retired creating an employment gap. To fill the gap, many employers are increasing salaries to be competitive and to encourage people to work.

The effects of COVID-19 are not fully recognized at the writing of this report. Much of the data needed for after the pandemic is not available to truly show the impact.

1.5 Critical Infrastructure

Fairfield County has a lot of critical infrastructure that can help with resilience or make it more vulnerable. Critical infrastructure can be helpful when executing a response and trying to get the community back to recovery. On the flip side, critical infrastructure can also be affected by a hazard and make recovery difficult if resources are needed to fix the infrastructure first.

An example would be if a fire department is built to better serve a community. The new department can help the community be more resilient by responding to emergencies and helping people by reducing the impact of a hazard (fire) and getting them back to normal faster. On the other hand, if a fire department is destroyed in a severe weather event, resources are needed to get the staff to a point that they can get back to responding and helping others.

The chart below lists some of the critical infrastructure identified by the Core Group. These numbers are approximate as some infrastructure may change either through building, businesses moving, or development changes. This list represents infrastructure across the county.

Fairfield County Critical Infrastructure			
Type of Infrastructure	**Number**	**Type of Infrastructure**	**Number**
Hospitals	4	**Red Cross Shelters**	10
Fire Stations	19	**Police Stations**	9
Dialysis Centers	2	**Nursing Homes**	25
Assisted Living Facilities	16	**Independent Senior Living**	11
School Districts	13	**School Buildings**	51
Public Libraries	7	**Correctional Facilities**	3
Water Treatment Plants	8	**Wastewater Treatment**	6
Class I Dams	13	**Electrical Substations**	1
Transportation Services	2	**Daycares**	20

Table 3: Critical infrastructure

Section 2: Planning Process

The planning process for this plan was inclusive of agencies, organizations, and jurisdictions in Fairfield County. The process was implemented using a whole community approach to gather information and perspectives not only from jurisdictional entities, but from the general population as well.

2.1 Plan Preparation

The development of the plan's timeline and overall process was started in July 2022 after receiving a Hazard Mitigation Grant Program (HMGP) grant from FEMA, facilitated by Ohio Emergency Management Agency (OEMA). This grant allowed a Fairfield County EMA staff member to oversee, coordinate, and write the plan rather than contracting it out. The grant also paid for advertisement of the public survey in the Lancaster Eagle Gazette.

After being awarded the HMGP grant, Fairfield County EMA prepared for the kickoff with key partners, planned a timeline of events, and prepared methods to collect data. During this time, data on severe weather events, maps, and other supporting documentation were also collected for the report.

A Core Group was identified that consisted of members from EMA as well as representative from each township, village, city, and Fairfield County government. Subject matter experts (SME) from various disciplines were also included in the Core Group such as Soil and Water Conservation District, Regional Planning, Fairfield County Health Department, Fairfield County Engineer's Office, and Fairfield County Utilities. There were many other agencies invited as well that have expertise in topics such as water, developments, land use, environmental, and infrastructure. Page 6 includes a list of participants. Those marked with an (*) indicate members of the Core Group. Appendix C also contains a list of members of the Core Group along with their title and organization.

Mitigation kickoff meetings for jurisdictional leaders started on August 15, 2022. In total, four kickoff meetings were held – August 15, 17, 18, and 22. The target audience of these meetings were the Core Group, jurisdictional leaders, SME, and community stakeholders. The meeting covered the purpose and overview of the NHMP, objectives, goals, and next steps. Also, during these meetings, jurisdictions were encouraged to meet and collaborate with other jurisdictions, SME, and others who may be able to share mitigation project ideas, strategies, and ideas to address problem areas. The goal here was for jurisdictions and the other members to connect, network, and share ideas.

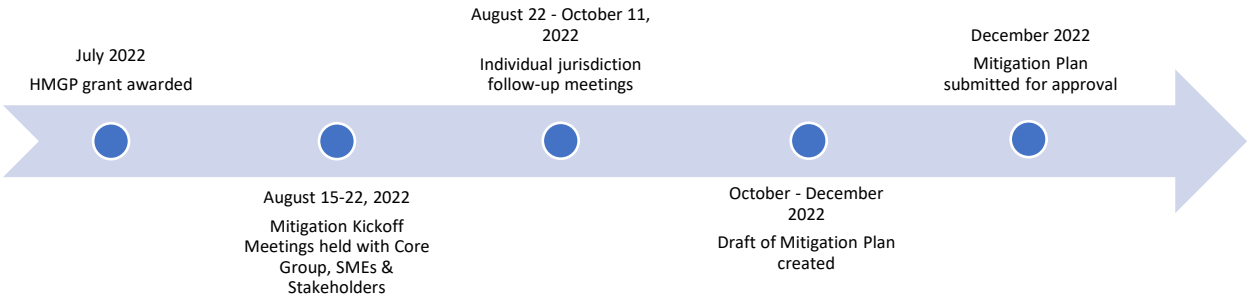


Figure 3: Timeline of Fairfield County Mitigation Plan development.

After the kickoff meetings, follow-up meetings with individual jurisdictions began with the first as early as August and continued through early October. Some of these meetings took place virtually while others were one-on-one or during the jurisdictions' standing business meetings. Individual meetings focused specifically on the jurisdiction, problems from natural events, updates from projects previously listed in the Mitigation Plan, and new projects jurisdictions wanted to add. During these meetings, some jurisdictions identified the need for subject matter expertise and those connections were made. For example, a jurisdiction with roadway flooding was referred to the Fairfield County Engineer's Office to find an appropriate mitigation project that would be effective. Sign-in sheets and meeting minutes can be found in Appendix D showing jurisdiction participation.

The Fairfield County Commissioner's office, all townships, villages, and cities participated in the 2023 Mitigation Plan and provided updates and new projects where applicable. Some past projects were carried over into the 2023 Mitigation Plan. Jurisdictions and stakeholders were also given the opportunity to review and provide feedback and comments on the draft Mitigation Plan. Their

comments were factored into the final version of the Mitigation Plan. These jurisdictions all plan to adopt the federally approved plan. (See Appendix V for adoption resolutions.) Cities such as Canal Winchester and Reynoldsburg that cross the county line are addressed in the Franklin County Mitigation Plan.

2.2 Stakeholder Involvement

Fairfield County is fortunate to have numerous stakeholders that are involved in planning and preparedness. Stakeholders from across several different categories were invited to the last mitigation kickoff meeting. The same topics were covered in this meeting as the previous meetings as there were jurisdictional leaders and other SME in the room. There was focus on the role of the stakeholders including the request for input and encouraging residents to participate in the public survey.

Stakeholders were asked to provide information on impacts from natural hazards they experienced personally and professionally. They were also asked if they thought of any mitigation projects that would help jurisdictions reduce the risk from natural hazards.

Stakeholders shared the public survey with their clientele and assisted EMA in spreading information. Lancaster-Fairfield Public Transit posted the QR code to the public survey on their buses with the hope that riders would take the survey while riding the bus. Fairfield County District Library shared the electronic survey on social media and had hard copies available in each branch covering the county. School districts were also encouraged to share information with families of their students and staff. These efforts were effective as can be seen in Section 2.3 below.

2.3 Public Involvement

In addition to the efforts made by stakeholders to get the public survey out, jurisdictions worked to get their residents to take the survey and provide their perspective as well. For example, the villages of Bremen and Baltimore put a paper survey in the utility bills of residents and had hard copies available in their office. Residents could mail back the surveys or drop them off at an office for delivery to EMA.

Additional efforts to reach the public was made through social media, a push through the Fairfield County Sheriff's app, an ad in the Lancaster Eagle Gazette, posts on Fairfield County and Fairfield County EMA's websites, and various announcements through different public meetings (Appendix E).

The survey asked residents questions about hazards they have experienced in Fairfield County, whether they are concerned about each natural hazard, and questions on personal preparedness for extreme weather or emergency situations. Questions were allowed to be skipped if the resident was not comfortable answering. Additionally, the questions were anonymous asking only what jurisdiction they resided in. A blank copy of the survey can be found in Appendix F.

Through all these methods, 251 surveys were received from Fairfield County, Ohio residents. Three surveys were excluded because they were from people residing outside the county leaving 248 surveys. Question types included Likert Scales, open-ended questions, or where multiple answers could be selected.

After the draft Mitigation Plan was completed, it was posted for public review and comment. Due to the size of the plan, the plan itself was posted on the EMA website with survey link to provide comment through EmailMeForm. The notices and advertisements for public review were posted on social media, the EMA website, and announced in public meetings with a few reminders directing the public to the

plan and survey. The public review period was open from November 21st to December 5th. No feedback was received from the public on the draft Mitigation Plan.

2.4 Review of Current Plans, Information & Reports

When preparing to update the Mitigation Plan, the first step is usually to review the previous plan and identify changes. Since the 2018 plan, additional hazards were added in line with OEMA's *2019 State of Ohio Hazard Mitigation Plan* (SOHMP) such as invasive species, land subsidence, wildfires, etc. Some of these hazards may not be as pertinent to Fairfield County but are addressed in this document. The SOHMP was reviewed and used for data and technical information (Ohio Emergency Management Agency, 2019).

There were many data sources used in this update. The National Centers for Environmental Information (NCEI) was accessed for historical climatic and disaster data. This system contains storm event information from January 1950 through July 2022 (NCEI, 2022). Data is fed into this database from several sources such as county, state, and federal EMA agencies, law enforcement, SKYWARN® spotters, damage surveys, and more through the National Weather Service (NWS). NWS then sends the information to NCEI. Of note, events such as tornados versus a straight-line wind incident are determined by the NWS. Data from the locals are fed to NWS who makes the final decision on the cause.

There is a time lag between weather events and uploading to NCEI. Due to this time lag, data collected stops in July 2022. Any events from July 2022 to December 2022 will be captured in the next version of the Mitigation Plan.

Along this same vein of weather data, The Climate Explorer and Neighborhoods at Risk, Climate Mapping and Resilience Assessment (CMRA), and the Midwestern Regional Climate Center (MRCC) were used for climate data and projections.

The Fairfield County Geographic Information System (GIS) Department is a wealth of information that can be displayed graphically. The GIS Department assisted with maps for flood zones, land use, new developments, and dams. This information was collected and analyzed to update the data in the plan and dovetail it with the concerns of residents and jurisdictions.

Additional data gathered for Fairfield County includes the list of disaster declarations, repetitive flood loss properties, community demographics, and more. Sources utilized includes the U.S. Census, Ohio Office of Research's County Profiles, FEMA, Ohio Watershed Network, Ohio Department of Natural Resources (ODNR), and many more. References used to compile data can be found in Appendix A.

In addition to updated climate and development data, there were several reports examined to understand the effects of disasters on people, the environment, and society. These reports include the financial cost in the change of climate, the *Natural Hazard Mitigation Saves: 2019 Report*, and *Building Codes Save: A Nationwide Study* published in 2020. References to these reports are made throughout the plan and may also be found in Appendix A.

Section 3: Risk Assessment

3.1 Natural Hazards Overview

The Mitigation Plan addresses natural hazards in Fairfield County and does not address man-made disasters. The one exception are high-hazard potential dams (HHPD). Dams are built by man but can be

affected by natural disasters causing potential risk to life through flooding. Other man-made disasters are addressed in the *Fairfield County Hazard Identification & Risk Assessment* (HIRA) but will not be addressed in this document.

The hazards assessed in this plan are outlined below in Table 4. All hazards listed were assessed in the SOHMP plan. There are three hazards not assessed in the Fairfield County plan due to no history or risk factors for the hazard. "Coastal erosion" was assessed in the SOHMP, but Fairfield County broadened that category to just "erosion" due to the lack of coastline.

Regardless of history, it is important to point out that while the risk and probability of all these events are low, it is possible that they could happen in the future. Preparedness through building codes, mitigation efforts, and planning is essential to protect people, property, and the environment.

Event	SOHMP	Fairfield County Plan	Comment
Dam/Levee Failure	X	X	
Drought/Excessive Heat	X	X	
Earthquake	X	X	
Erosion	X	X	In SOHMP, category is "Coastal Erosion". Fairfield County just assessed "Erosion".
Flood	X	X	
Invasive Species	X	X	
Land Subsidence	X		No history or risk factor
Landslide	X		No history or risk factor
Seiche/Coastal Flooding	X		No history or risk factor
Severe Summer Storms	X	X	
Tornado/Funnel Cloud	X	X	
Wildfire	X	X	
Winter Storm/Weather	X	X	

Table 4: Hazards Assessed in this Plan

Natural hazards do occur in Fairfield County. Table 5 shows the number of significant weather events recorded since 2017 (when the last data was collected for the 2018 Mitigation Plan) through July 2022. The table also includes information on injuries, deaths resulting from the event, property, and crop damage. Events without numbers indicate there is no data available. Windstorms and straight-line winds are included in the Severe Summer Storms category along with heavy rain, thunderstorm wind, lightning, and hail.

Table 6 shows the hazards that the public are most concerned about. This table is based on their perception and experiences alone. There were 248 responses from the public regarding these hazards. Residents were allowed to skip questions since the survey was completely voluntary. The percentages listed as percentages of respondents that answered the question.

The responses in Table 6 reveal that most residents (that responded) are concerned about tornados/funnel clouds, winter storms, and severe summer storms (in yellow). Interestingly, the majority of responding residents stated they were not concerned about flooding. There has already

been a lot of mitigation projects executed for flooding in the past and some jurisdictions continue to look at flooding and stormwater management projects to further mitigate trouble areas for flooding.

Event	Number of Incidents	Number Killed	Number Injured	Property Damage	Crop Damage
Dam/Levee Failure	4	0	0	0	0
Drought/Excessive Heat	2	0	0	0	0
Earthquake	-	-	-	-	-
Erosion	-	-	-	-	-
Flood	26	0	0	$1,000	0
Invasive Species	-	-	-	-	-
Land Subsidence	-	-	-	-	-
Landslide	-	-	-	-	-
Seiche/Coastal Flooding	0	0	0	0	0
Severe Summer Storms	78	0	1	$610,750	$20,000
Tornado/Funnel Cloud	2	-	-	-	-
Wildfire*	-	-	-	-	-
Winter Storm/Weather	36	0	0	0	0

Table 5: Significant Weather Events (January 2017 – July 2022)

*The data for Wildfires was from 2007 to 2017 and not broken down further. See Section 3.13 for this data.

Hazard	Extremely Concerned	Very Concerned	Somewhat Concerned	Total Concerned	Not Concerned	No Answer
Dam/Levee Breach or Failure	1.63%	0.41%	4.49%	6.53%	75.10%	18.37%
Drought	2.45%	7.35%	21.63%	31.43%	48.98%	19.59%
Earthquakes	1.22%	1.22%	13.47%	15.91%	64.80%	19.18%
Erosion	0.41%	0%	2.04%	2.45%	78.37%	19.18%
Flooding	2.45%	8.16%	27.76%	38.37%	42.86%	18.78%
Invasive Species	1.63%	9.80%	25.31%	36.74	43.67%	19.59%
Land Subsidence	0.41%	1.22%	6.53%	8.16%	72.65%	19.18%
Landslides	0.41%	0.41%	5.71%	6.53%	74.69%	18.78%
Seiche/Coastal Flooding	0%	0.41%	2.04%	2.45%	78.67%	19.18%
Severe Summer Storms	7.76%	24.49%	24.49%	56.74%	24.08%	19.18%
Tornado/Funnel Clouds	9.39%	15.92%	32.24%	57.56%	23.67%	18.78%
Wildfire	0.82%	3.27%	17.55%	21.64%	59.59%	18.78%
Winter Storms	9.39%	23.67%	26.12%	59.18%	22.04%	18.78%

Table 6: Natural hazard perception of risk by the public

In Table 7, the community's perception of the hazards and the log of real events is shown side by side. The highlights represent the higher number of incidents as well as whether the community is concerned or not concerned about the hazard. As hinted before, residents are not as concerned about flooding with more events but are concerned about tornados and funnel clouds even though the historical events since 2017 are fewer than other hazards. This could be because of the areas that residents live in. If they live in safer areas, they naturally perceive the risk of flooding to be lower than someone who lives in a floodplain and is frequently flooded.

Tornados may be seen as more concerning because of the damage, unpredictability, and frequency they come to the county. A hazard that people have limited exposure to can be seen as scary and concerning. For example, someone who lives on the coast may have frequent exposure to hurricanes and not be too concerned. However, a tourist coming to the coast may have never experienced a hurricane and may be frightened or perceive the hurricane as a bigger risk due to lack of exposure.

Event	Number of Incidents (2017 – 2022)	Total Concerned	Not Concerned
Dam/Levee Failure	2	6.53%	75.10%
Drought/Excessive Heat	2	31.43%	48.98%
Earthquake	-	15.91%	64.80%
Erosion	-	2.45%	78.37%
Flood	26	38.37%	42.86%
Invasive Species	-	36.74	43.67%
Land Subsidence	-	8.16%	72.65%
Landslide	-	6.53%	74.69%
Seiche/Coastal Flooding	0	2.45%	78.67%
Severe Summer Storms	78	56.74%	24.08%
Tornado/Funnel Cloud	1	57.56%	23.67%
Wildfire*	-	21.64%	59.59%
Winter Storm/Weather	36	59.18%	22.04%

Table 7: Historical events versus perception of risk

*The data for Wildfires was from 2007 to 2017 and not broken down further. See Section 3.13 for this data.

There are no right or wrong answers here. The survey information the public sent back is just one way to gather peoples' thoughts and perspectives related to hazards and potential damage. Additionally, the data does not prove certain events cannot happen here, it just shows that the risk of some events may be lower.

Disaster Declaration Number	Date Declared	Incident Type
DR- 167	March 24, 1964	Heavy rains and flooding
DR-243	June 5, 1968	Heavy rains and flooding
DR-3055-EM	January 26, 1978	Severe blizzard conditions†
DR 870	June 6, 1990	Severe storm, tornadoes, and flooding
DR-951	August 4, 1992 (IA) August 14, 1992 (PA/HMGP)	Severe storms, tornadoes, flooding
DR-1580*	February 15, 2005	Severe winter storms, ice, and mudslides
EM-3250	September 13, 2005	Hurricane Katrina Emergency Shelter Operations†
EM-3286	April 24, 2008	Snow
DR-1805	October 24, 2008	Wind Event
EM-3346	June 30, 2012	Severe storms, straight-line winds (derecho)†
DR-4077	August 20, 2012	Severe storms, straight-line winds (derecho)
DR-4507	April 30, 2020	Ohio COVID-19 Pandemic†

Table 8: Disaster Declarations that include Fairfield County, Ohio

When a disaster strikes that causes extensive damage or loss of life, a Disaster Declaration may be declared. A declaration is a formal statement that starts local if local resources are not enough to deal with the disaster. The Governor may then make a Disaster Declaration to receive resources from the federal level to assist. There have been several disaster declarations in Fairfield County (see Table 8). Four of these declarations were for all 88 counties in the State of Ohio†.

These disasters came with different types of assistance. Some came with Individual Assistance (IA) for government entities and businesses to help get the community stabilized. Public Assistance (PA) is for families that were severely impacted by the disaster. Assistance programs are separate from insurance claims and payouts. Each hazard is explored in more detail below. They are addressed in alphabetical order and not by the greatest risk.

3.2 Dam/Levee Failure

A dam is a barrier designed to restrict the flow of water from upstream. Some dams hold back water and raise the water level creating a reservoir. There are about 100 dams in Fairfield County, which is significant. Of these, 15 are Class I dams and 16 are Class II. Dams are classified based on the height, storage volume, and potential hazards downstream from the dam. Dams can be classified as a Class I, II, III, or IV. Class I has the most potential for loss of life and most significant impact if the dam fails or breaches.

	Height	Storage	Potential Hazard
Class I	>60 Feet	>5,000 acre-feet	Probable loss of life
Class II	>40 Feet	>500 acre-feet	Health hazard, damage to homes, businesses, and infrastructure, only access to residential areas
Class III	>25 Feet	>50 acre-feet	Damage to low value non-residential structure and local roads
Class IV	≤25 Feet	≤50 acre-feet	Losses restricted mainly to the dam

Table 9: Dam classification from ODNR

There are about 32 dams in Fairfield that are privately owned and exempt from safety inspections. Even exempt dams are required to have an annual "Liability Certification" form completed each year with the Division of Water Resources through ODNR (Ohio Department of Natural Resources, 2021a). Even with the certificate, there are some safety measures taken to ensure that the dam will not have a significant impact to people if there is an issue.

A levee is an artificial barrier that can divert or restrain the flow of water to protect an area from flooding. Levees can be classified as a Class I, II, or III with Class I being the most severe like in dams.

Levee Class	Description
Class I	Probable loss of human life, structural collapse of at least one residence or commercial/industrial business
Class II	Disruption of water supply or wastewater treatment facility, health hazard, damage to major roadways, only access to residential or critical resource, or damage to railroads or public utilities
Class III	Property loss, damage, or disruption of local roads

Table 10: Levee classification from ODNR

Figure 4: Levees in Fairfield County

Location

Dams are located throughout Fairfield County. A map of the dam structures can be found in Appendix G. In addition to the dams, there are two levees in Fairfield County located near Bremen.

Figure 4 shows the location of the levees in Fairfield County. These levees (red) are in Bremen on the east end of the county. (Photo credit USACE National Levee Database.)

The larger levee to the north is called the Rush Creek Part 4 Levee. Behind this levee there are 308 buildings and a population of about 712. The property value behind the levee is $181 million dollars (U.S. Army Corp of Engineers, 2022).

The smaller levee to the south is called Fairfield Levee 3. Behind it there are two buildings with four residents. The property value is $465K (U.S. Army Core of Engineering, 2022).

There are three conservancy districts that cover portions of Fairfield County in specific watersheds. These conservancy districts include Hunter's Run Conservancy District (HRCD), Rush Creek Conservancy District (RCCD), and South Licking Watershed Conservancy District (SLWCD).

There are also four watersheds that cover Fairfield County. A watershed is an area or ridge of land that separates waters from flowing into different rivers or basins. Here, the watersheds include Licking, Upper Scioto, Hocking, and Lower Scioto. (See Figure 5.)

History

There are three incidents/failures in high hazard dams (Class I) in Fairfield County. Two incidents have taken place since the data was collected for the 2018 plan. Most of the incidents have been related to a failure in the spillway.

Figure 5: Watershed map for Fairfield County

Probability of Future Events

From 1982 to 2021, there were 6 Class I dam incidents (see Table 11). These incidents were generally minor and resulted in very little damage. Based on these figures, there is a 15% annual chance (6 incidents/39 observed years) of a Class I or II dam incident or failure taking place in any given year.

Classification	Dam Name	Incident Year	Incident Description
I	Rushcreek Structure No. VI-A	1982	Abutment leakage was noted and repaired
I	Hunters Run R42	2000	Embankment erosion
I	Rushcreek Structure N. VC	2001	Inadequate spillway capacity
I	Pine Lake Estates Dam	2013	Spillway failure
II*	Windmiller Pond Dam	2015	Spillway failure
Exempt	Collins Lake Dam (Durant)	2017	Outlet pipe failure
III	Hunters Run R65	2019	Primary spillway obstructed/frozen
I	Hunters Run 9	2019	Debris removal from low flow ports
I	Hunters Run R42	2021	Rusting through of exposed outlet pipe

Table 11: Dam incidents

*Windmiller Pond Dam was a Class II at the time of the failure. It is now a Class III.

There are no documented incidents occurring with the two levees in Fairfield County. Even with no incidents involving levees, the probability of such an event is very low but still possible.

Impacts

The impacts from a dam incident can be catastrophic, particularly for the Class I dams. Class I dams by nature can lead to a loss of life due to their size and storage capacity as well as residential structures downstream and in the inundation area. Businesses and critical infrastructure in an inundation area are also at risk and can be impacted should there be a breach or failure.

Not all dams have an inundation map available for this plan. One project is to update any dam Emergency Action Plans (EAP) that are outdated. Another project is to digitize the inundation maps so that they can be seen on one map or sorted based on the topic of discussion. As can be seen in Appendix H with the maps that are available, there is significant inundation areas around Lancaster and Buckeye Lake. These inundation areas, if a dam is breached, would impact large residential areas, commercial businesses, Interstate 70, and portions of U.S. Route 22 and 33, and Ohio State Route 188. Inundation around Buckeye Lake would also impact the southern part of Licking County.

Vulnerability Assessment

Strictly looking at the inundation maps available in Appendix H, there are a lot of homes. Many of these homes are low-income areas through the south and west side of Lancaster as well as the northern part of Buckeye Lake. Typically, those residents who experience the greatest disparity are also the most vulnerable. These individuals lack resources others may have to recover from such an event so it would take them longer to return to normal.

With homes and businesses likely impacted during a dam incident, there is economic and social vulnerability of those affected. Homes and businesses could be flooded causing economic impact. People would lose their belongings and experience emotional trauma and distress.

3.3 Drought

Drought is the abnormally long period of time with low, or no, rainfall leading to a shortage of water. This can affect water tables, bodies of water, crops, and other aspects of the community. According to the National Aeronautics and Space Administration (NASA), drought is caused by such conditions as climate change, ocean temperatures, jet stream changes, and changes in the landscape (NASA, n.d.). Drought is often accompanied by excessive heat which contributes to the lack of rainfall and the impacts of already having less water.

Location

Such an event such as drought would likely affect the entire county at a time. There could be locations that would receive more rain or have a larger reserve than others and be impacted slightly less. Due to the nature of the hazard, a drought is likely to be a county-wide event.

History

Location	Date	Type	Injuries	Fatalities	Property Damage	Crop Damage
Fairfield County	7/19/2019	Excessive Heat	0	0	$0	$0
Fairfield County	7/20/2019	Excessive Heat	0	0	$0	$0
TOTALS	**2 Days**	**Excessive Heat**	**0**	**0**	**$0**	**$0**

Table 12: Excessive heat incidents

According to NCEI, there were no event days for drought. However, there were two events for excessive heat, both back-to-back in 2019. There was no damage associated with these events. For this system, both days had highs in the upper 90°'s F with added humidity creating a heat index that exceeded 105° F. This is the only data available related to excessive heat and drought.

Past Declarations

There are no past declarations for heat or drought events.

Probability of Future Events

There is no data for a drought event in Fairfield County, however, the risk is still present. Therefore, no probability is available to calculate, but the probability is not zero.

Vulnerability Assessment

Vulnerabilities associated with extreme drought and heat include the agricultural community in the county. There is a strong farming presence with corn, soybean, and wheat being the main crops. Drought and heat will damage crops and impact farmers' lives as well as the economy. A shortage of food and product drives prices.

Not only plant crops, but livestock can also be affected by drought and heat. They are more prone to heat-related illnesses and death and if the crops are affected, so is their food source. Drought is a decrease in water and there would be less drinking water available for animals and humans.

The elderly and those who live in conditions without temperature control are also prone to heat-related illness and potential death. These individuals are ones that benefit from cooling stations and temporary sheltering, especially during the day.

Impacts

Drought can impact the community through dry plants that die and low water levels. As touched on above, heat and drought can impact crops and livestock as well as humans. Emergency room visits can increase during extreme heat and drought days because people need treatment for illnesses and injuries such as heat exhaustion, heat stroke, and dehydration.

These situations can also create brownouts as people use more electricity to run pumps for what little water is left or air conditioning. The electrical grid can be impacted and without water, some systems cannot be cooled down.

Lack of water will also increase the cost of materials. Less water, less plants, decreased power, and economic impacts are inevitable if the drought is sustained long enough.

3.4 Earthquake

An earthquake is defined as the sudden shaking of the ground which can cause serious damage. This shaking is usually due to volcanic activity or the movement of the earth's crust such as tectonic plates. Fairfield County has seen a little earthquake activity. The county does not sit on a fault line or fracking lines; however, it can be affected by the New Madrid fault line in Missouri. Ohio sits on the edge of the New Madrid Seismic Zone.

Location

The entire county is at risk for earthquakes, although that risk is low. None of the county has open mines under the surface. There is nothing about the county that makes it more prone or vulnerable to earthquakes. Table 13 below shows that there have been earthquakes measured in the county in the past.

History

The data below is from the ODNR Ohio Earthquake Epicenters database. This data shows the earthquake epicenters that have been registered in Fairfield County. As seen by the data below and the Modified Mercalli Intensity (MMI) scale on the right, these events did not do much damage. Half of them, including the more recent ones, were not even felt by residents.

The two listed in 2021 were on the same day, but at different locations in close proximity and different depths. They were not felt by residents.

Date	Location	Magnitude	Calculated Depth	Modified Mercalli Intensity (MMI)
4/6/1848	Carpenter Rd, Berne Twp	3.7	0 kilometers	IV – Felt by many
1/16/1870	Porter & High St, Lancaster	2.9	0 kilometers	II – Felt by a few
4/8/1967	Horns Mill Rd, Berne Twp	3.7	0 kilometers	V – Felt by nearly all, frightens a few
11/24/2016	Marietta Rd, Pleasant Twp	1.5	2 kilometers	I – Not Felt
11/7/2021	West of Route 159, Clearcreek Twp	1	7 kilometers	I – Not Felt
11/7/2021	West of Route 159, south of above event, Clearcreek Twp	2	4.32 kilometers	I – Not Felt

Table 13: Fairfield County, Ohio Earthquakes.

Past Declarations

There are no past declarations for Fairfield County around earthquakes.

Probability of Future Events

Looking at the events in Table 13, there were 6 events in 173 years. This equates to 3.5% probability for an earthquake each year. The probability is low, but not zero. Again, these events were where Fairfield County was the epicenter, not where earthquakes were felt with an epicenter far away. There is always a possibility as well that an earthquake may have an epicenter outside of Fairfield County but be strong enough to be felt here.

Vulnerability Assessment

The vulnerability with an earthquake in Fairfield County is extremely limited. The vulnerability greatly depends on the strength, magnitude, and location of the earthquake. Smaller ones that are not felt, located in isolated areas, or do not last long do not affect many. There is potential for large earthquakes, but based on history, this is extremely minimal.

Appendix I shows a HAZUS model for a magnitude 5.0 earthquake that could affect Fairfield County. This model shows a worst-case earthquake scenario and the potential impact that this event would have on the county. The information fed into the HAZUS model is stock data from FEMA so it may not have the most updated critical infrastructure assets, population, or building detail. However, this model serves as a great source of information for planning purposes and a more comprehensive set of data in what would otherwise be near impossible for jurisdictions to obtain.

The data in the model shows that the county has a population of 158,921 people and over 58,000 households (FEMA, 2022b). Countywide, there is approximately 60 thousand buildings with a total building replacement value estimated at $29,693 million. Of those buildings, about 91% (and 69% of the value) are residential housing. The remaining are commercial buildings. In HAZUS, transportation is defined as systems such as highway, railroad, bus, ports, ferry, and airports. Utilities are defined as potable (drinking) water, wastewater, natural gas, electricity, communications, and crude and refined oil. The full replacement value of transportation means is about $1,901 million and the replacement of utility lifelines is valued at $3,685 million. These numbers are blanket values and countywide before there is a damage-causing event.

The model was run with a 5.0 magnitude earthquake at 5 kilometers depth on the southeast end of Lancaster between High Street, Porter Street, and Perry Street. (This is the same area as the event on January 16, 1870, seen in Table 13.) The estimate shows that about 8,854 buildings are at least moderately damaged (over 15% of buildings in the county), and 582 buildings are damaged beyond repair (FEMA, 2022b). Most of the damaged structures are single family residences with commercial and other residential structures largely affected. Critical infrastructure affected with moderate (greater than 50% damage) include 9 schools, the Emergency Operations Center (EOC), 2 police stations, and 2 fire stations. None of the critical infrastructure sites saw complete damage. Transportation and utilities were also affected in the event. At 90 days from the event, there were still households estimated without electricity. Page 13 of the HAZUS earthquake report (Appendix I) has details about the damage to transportation and utilities.

Impacts

As with the vulnerability assessment, the impacts to the community are minimal with the current trend of earthquakes. Small earthquakes that are not felt or do not cause damage, cause very little impact except some excitement.

There is always the potential for larger earthquakes, however. In such an event that a larger and stronger earthquake takes place in Fairfield County, the impact could be devastating. Thinking worst case scenario, impacts would include damaged or destroyed buildings, fires from ruptured gas lines, and damaged roadways. There would be economic impact as well as financial and emotional. The estimated economic impact from a 5.0 magnitude earthquake in Lancaster is estimated at $3,016.82 million (FEMA, 2022b). Again, this is worst case scenario and an extremely rare event. The damage amounts and impacts vary on the location of the event such as urban versus rural and more.

In the 5.0 magnitude earthquake scenario, the estimate showed a lot of debris. The HAZUS estimate is that there will be 575,000 tons of debris. 47% would be composed of brick and wood while the remainder is reinforced concrete and steel (FEMA, 2022b). Using trucks that can carry 25 tons each, it is estimated to take 23,000 truckloads to move the debris generated by the earthquake.

3.5 Erosion

Erosion is the process of being diminished by removing surface material such as rock or soil. Fairfield County experiences bank erosion along rivers and streams which causes issues. The SOHMP discusses coastal erosion. Fairfield County is landlocked and does not see costal erosion but does experience bank erosion along lakes, rivers, and streams. Bank erosion is discussed here rather than coastal.

Location

Anywhere there are bodies of water, there is a risk of bank erosion. There are isolated sections across the county that experience erosion with some areas worse than others. Fetter's Run by Ohio University Lancaster has recently experienced some bank erosion as seen in Figure 6. The sign states that the bank collapse was caused by flooding.

History

There is no documented data regarding the number of erosion incidents in the county. There are, however, a few current incidents that are of concern. The largest example is the bank erosion along Little Rush Creek, particularly by Gun Barrell Road in Richland Township. The bank has continued to erode so much that the watershed has moved. From maps and measurements, the bank moved on Gun Barrell Road 10 feet between 2015 to 2022. There are three properties along this stretch that are at risk of falling into the water. One property lost a septic tank due to bank erosion.

Past Declarations

There have not been any disaster declarations regarding erosion in Fairfield County.

Probability of Future Events

Erosion has continued over the years and will continue without intervention. Full understanding as well as accurate data collection is needed to measure the magnitude and impact rain has on the bodies of water and banks.

Vulnerability Assessment

There are several vulnerable areas in the county. Along Fetter's Run there is a bike path and a sensory playground. There is also an outdoor amphitheater used for the Lancaster Festival and sporting events like cross country as well as a road bridge that crosses the Run right next to the bank collapse. There are a few agencies on the other side of the bridge as well as some barns used for storage and Ohio University Lancaster. If the bridge was impacted, these businesses would have an extremely hard time getting across the Run to evacuate and it would be next to impossible to get vehicles and equipment across. The back of the property behind these businesses and the amphitheater are wooded with a few homes up on the hill.

Along Gun Barrell Road, there are three houses that the creek is encroaching upon. If this continues, these homes are at risk of falling into the water. The homes were inhabited but are not any longer. A project in this plan is to purchase the land and remove the homes and future development from risk.

Figure 6: Bank collapse at Fetter's Run 2022

Impacts

There are several impacts that erosion could have on Fairfield County. As seen by Gun Barrell Road, houses can be encroached upon and destroyed due to falling into the water. The land is eaten away so much that the structure on the bank is no longer supported and collapses. This could also be true of any roadways that are close to bodies to or cross waterways. As the land supporting the structure becomes unstable or is no longer there, neither is the roadway affecting transportation.

Housing and transportation that is affected directly affects community lifelines such as housing and transportation. People are directly affected when it is homes, businesses, or access routes are destroyed. Affected access routes are inconvenient but can have bigger implications such as affecting rescue time during an emergency, evacuation, and getting to essential services for the public.

Ensuring the bank is stabilized and that structures and infrastructure do not fail is critical to keeping people safe.

3.6 Flood

Flooding is one of the biggest concerns for residents and jurisdictions in the county. When asked about hazards and weather events, flooding and stormwater issues are usually discussed first. This is true for residents and jurisdiction leaders.

Flooding is defined as an overflow of water that submerges or covers dry land. It can be caused by too much water in too short a time span that processes in place cannot handle the water.

Location

FEMA flood zones are shown in Appendix J. The location of flooding is shown in Figure 7. This figure shows the number of events from January 2017 to July 2022 for each jurisdiction through a symbol. The bigger the symbol, the more events have taken place there. For example, Richland Township had the most flood events for this period at 11. Greenfield and Rushcreek Township did not report any flooding events during this period. Data for these events comes from NCEI. The raw data can be found in Table 14 listed by reporting locations. Seen on the left of the table are the property and crop damage amounts for each location by event.

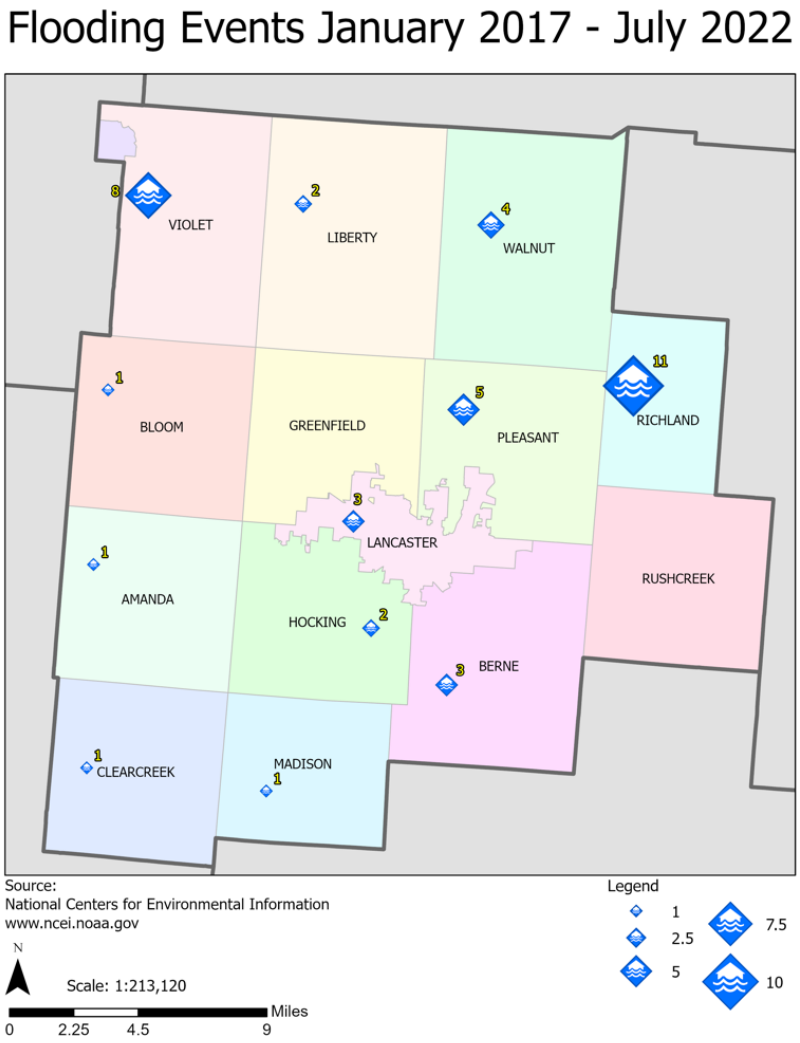


Figure 7: Number of events reported for jurisdictions

Location	Date	Type	Injuries	Fatalities	Property Damage	Crop Damage
Lancaster	7/10/2017	Flash Flood	0	0	$0	$0
Amanda	7/10/2017	Flash Flood	0	0	$0	$0
Stoudertown	7/13/2017	Flash Flood	0	0	$0	$0
Beals	7/13/2017	Flash Flood	0	0	$0	$0
Beals	7/13/2017	Flash Flood	0	0	$0	$0
Lancaster	7/22/2017	Flood	0	0	$0	$0
Bremen	4/3/2018	Flood	0	0	$0	$0
Beals	4/15/2018	Flood	0	0	$0	$0
Revenge	5/27/2018	Flood	0	0	$0	$0
Bremen	2/6/2019	Flood	0	0	$1,000	$0
Lancaster	2/6/2019	Flood	0	0	$0	$0
Lithopolis	2/7/2019	Flood	0	0	$0	$0

Stoutsville	5/28/2019	Flood	0	0	$0	$0
Beals	7/6/2019	Flood	0	0	$0	$0
Reynoldsburg	7/6/2019	Flood	0	0	$0	$0
Reynoldsburg	7/6/2019	Flood	0	0	$0	$0
Millersport	7/7/2019	Flood	0	0	$0	$0
Stoudertown	7/7/2019	Flood	0	0	$0	$0
Millersport	7/7/2019	Flood	0	0	$0	$0
Beals	3/20/2020	Flash Flood	0	0	$0	$0
Beals	3/20/2020	Flash Flood	0	0	$0	$0
Lakeside	3/21/2020	Flood	0	0	$0	$0
Bremen	6/13/2021	Flood	0	0	$0	$0
Hamburg	2/17/2022	Flood	0	0	$0	$0
Lakeside	2/18/2022	Flood	0	0	$0	$0
Delmont	2/18/2022	Flood	0	0	$0	$0
TOTALS	**16 Days**	**2 Types**	**0**	**0**	**$1,000**	**$0**

Table 14: Number of flood events reported for areas of Fairfield County, Ohio

History

The *2018 Fairfield County Natural Hazard Mitigation Plan* referenced 40 flood events from 1959 to 2017 (Fairfield County EMA, 2018). Those events resulted in over $2.6 million in damages to property and an additional $3,000 in damages to crops (NCEI, 2022). Most of the events take place during the rainy season from April to July. Early spring where the winter snow is melting, and spring rains are coming in can be an especially difficult time with flooding. Seven of the days in Table 14 are in the early spring.

Disaster Declaration #	Date Declared	Incident Type
DR- 167	March 24, 1964	Heavy rains and flooding
DR-243	June 5, 1968	Heavy rains and flooding
DR 870	June 6, 1990	Severe storm, tornadoes, and flooding
DR-951	August 4, 1992 (IA) August 14, 1992 (PA/HMGP)	Severe storms, tornadoes, flooding

Table 15: Flood Disaster Declarations for Fairfield County, Ohio.

Past Declarations

Of the Disaster Declarations identified, four of them dealt with flooding (see Table 15). It is important to note that none of these declarations have been made since 2017 when data collection started for this plan.

The lack of a Disaster Declaration does not mean that the hazard has not happened. Since 2017, 26 flooding events have been reported through NCEI and the local Significant Event Log (NCEI, 2022). It could be that these events did not produce enough damage to warrant a local official requesting assistance from the State of Ohio or a Disaster Declaration being necessary.

Probability of Future Events

The probability of a flooding occurrence is the likelihood that a specific flood event will happen. Looking at the data from 2017 to 2022, there were 26 events in 5.5 years. This equates to an average of 4.73 events per year.

Vulnerability Assessment

There were several vulnerabilities identified by the Core Group with flooding. The Core Group had significant concerns about residents that may be severely impacted through sustaining damage to their home or being isolated and having their road access cut off. There are several households in Bloom and Richland Township that experience flooding that cuts off resident road access. This makes it difficult for the residents to evacuate or rescuers to get to them which can affect life safety.

A HAZUS model report was run for a 100-year flood run in Fairfield County to look at countywide risk (Appendix K). The model shows that in this scenario, about 447 buildings are at least moderately damaged and 3 completely destroyed (FEMA, 2022c). This is over 82% of the total number of buildings affected in the scenario. The types of structures affected are residential, commercial, industrial, religious, and government buildings. In this scenario, medical facilities are still fully operational. The estimated number of debris is 6,514 tons consisting of items such as dry wall, insulation, wood, brick, concrete slab, concrete block, rebar, and more. It would take about 261 trucks taking 25 tons of debris per truck to remove the debris generated from this 100-year flood event.

In an event that causes this much damage and debris, people will be displaced. The estimate is that 1,374 households would be displaced or 4,121 people based on the average household size (FEMA, 2022c). Most individuals stay with friends or family if they can help it, or their insurance will put them in a hotel for a period. Some however, are not able to do this and will need assistance to stay somewhere like a shelter. Out of 4,121 people, about 655 are estimated to need temporary sheltering at a public shelter site.

Impacts

The potential impacts to a severe flooding event include damage to homes, businesses, and other structures as well as decreasing access to critical infrastructure. Roads could become blocked with water or resulting debris making it difficult for residents and first responders to access areas. When there is flooding, water and wastewater plants may be impacted and must shut down to prevent contamination of the water supply.

Crops may be lost due to excessive water and be flooded out. With heavy spring rains and summer storms, this is a real possibility and does take place. This crop loss can be devastating for farmers and impact the economy.

In the 100-year flood scenario, building-related loss is examined through structure loss and business interruption. Business interruption loss also includes temporary living expenses for those displaced from their home. Total building-related losses were estimated at $522.49 million (FEMA, 2022c). Of that, 57% were estimated to be business interruption costs and 11.98% were residential occupancies.

NFIP Repetitive Loss

The National Flood Insurance Program (NFIP) was created in 1968. This program allows communities to purchase federally backed flood insurance if the communities adopt floodplain management ordinances to reduce damage from floods in the future (FEMA, 2022). The Privacy Act of 1974, as amended, prohibits certain information from being released so the data on flood claims paid is left in general terms and excludes personal or identifying information.

Jurisdiction (Claim Years)	Number of Residential Structures	Number of Non-Residential Structures
Buckeye Lake (2012)	1	0
Columbus, City of (2020)	2	0
Fairfield County, Unincorporated (1992, 1997, 2005, 2014, 2017)	6	0
Lancaster, City of (1985, 2005, 2011, 2018)	8	2
Pickerington, City of (1986, 1992)	2	0

Table 16: Repetitive loss structures

Table 16 shows the flood claims that have been made on structures that repeatedly flood, called Repetitive Loss Structures. A Repetitive Loss Structure is defined as a NFIP-insured structure that has had at least two paid flood claims more than $1,000 each in any 10-year period. That time period must be since 1978.

Since 2017, there have been eight claims on residence and one business totaling almost $800,000 in claims paid on repetitive loss structures. Two of those residential claims were in the City of Columbus on the Fairfield County side.

Jurisdiction	Number of Residential Structure	Number of Non-Residential Structures
Columbus, City of (2020)	2	0
Fairfield County, Unincorporated (2017)	1	0
Lancaster, City of (2018)	5	1

Table 17: Repetitive loss since 2017

A Severe Repetitive Loss (SRL) is a structure that is covered by a Standard Flood Insurance Policy and has had damage with four or more separate claim payments, each exceeding $5,000 and the cumulative payout has exceeded $20,000; or has had two claims with insurance that the total payment exceeded the fair market value the day before the loss of the structure (FEMA, 2022a).

The non-residential structure identified in the City of Lancaster (in Table 17) is an SRL structure. An additional SRL structure is in an unincorporated section Fairfield County. This structure is a residential building. The last claim paid on it was in 2014 and has not had a claim listed since.

3.7 Invasive Species

Invasive species are defined as plants and animals that are not natively from an area but have been brought to the area. These species have no natural predators or limiting factors in the new area, so they grow exponentially causing issues with the ecosystem and economy. Fairfield County does have invasive species as identified by partners in Soil & Water Conservation District and the Ohio State University (OSU) Extension Agriculture and Natural Resources division.

The data on these invasive species is limited regarding where, how much, history, and the impact from them. However, a list of species is available from community partners (see Table 18).

Past Declarations

There are no past declarations related to invasive species.

Invasive Species in Fairfield County, Ohio	
Invasive Plants	**Prohibited Noxious Weeds**
Ailanthus altissima, tree-of-heaven	*Sorghum halepense*, Johnsongrass
Alliaria petiolata, garlic mustard	*Pastinaca sativa*, wild parsnip
Celastrus orbiculatus, oriental bittersweet	*Cirsium arvense*, Canada thistle
Dipsacus fullonum, common teasel	*Conium maculatum*, poison hemlock
Elaeagnus angustifolia, Russian olive	*Senecio glabellus*, cressleaf groundsel
Elaeagnus umbellata, autumn olive	*Carduus nutans*, musk thistle
Frangula alnus, glossy buckthorn	*Polygonum perfoliatum*, mile-a-minute weed
Hesperis matronlis, dame's rocket	*Conyza canadensis*, Marestail
Hydrilla verticillata, hydrilla	*Amaranthus palmeri*, Palmer amaranth
Lonicera japonica, Japanese honeysuckle	*Polygonum cuspidatum*, Japanese knotweed
Lonicera maackii, amur honeysuckle	*Phyllostachys aureasculata*, Yellow Groove Bamboo*
Lonicera morrowii, morrow's honeysuckle	
Lonicera tatarica, Tatarian honeysuckle	**Other Invasive Species**
Lythrum salicaria, purple loosestrife	European Starling
Microstegium vimineum, Japanese stiltgrass	Eurasian House Sparrow
Myriophyllum spicatum, Eurasian water-milfoil	Emerald Ash Borer
Phragmites australis, common reed	Hemlock Woolly Adelgid
Potamogeton crispus, curly-leaved pondweed	
Pyrus calleryana, callery pear	
Rosa multiflora, multiflora rose	
Typha angustifolia, narrow-leaved cattail	*When the plant has spread from its original premise of planting and is not being maintained.
Typha x glauca, hybrid cattail	

Table 18: Invasive species in Fairfield County

Probability of Future Events

As the species listed in Table 18 are already identified in Fairfield County, the likelihood of future events is 100%. Constant vigilance and prevention is necessary both on species already identified and those not here yet but we are watching out for.

Figure 8: Asian Longhorned Tick

There are several species on the watch list as they have been identified close to Fairfield County, but not in the county yet. One of those species is the Asian Longhorned Tick. It has been confirmed in southern Ohio and poses a risk to livestock. The females of this insect can produce without a male, so populations can grow and spread quickly. A picture of this tick is in Figure 8 (photo credit OSU College of Food, Agricultural, and Environmental Sciences, 2022).

Another species being watched for is the Spotted Lanternfly (*Lycorma delicatula).* This winged insect has not been confirmed in Fairfield County but has been seen in several counties in Ohio. The Spotted Lanternfly is expected to continue spreading. It poses a risk to special agricultural crops such as vineyards and orchards.

The Spongy Moth (*Lymantria dispa*r, formally known as a gypsy moth), in its caterpillar stage, feeds on the leaves of over 300 different tree and shrub species. It is known to be especially fond of oak. It has

been around for a while and the Ohio Department of Agriculture has a three-pronged management program to control the spread. Fairfield County is in the quarantine area according to the Ohio Department of Agriculture (2022).

The Asian Longhorn Beetle is another species not yet confirmed in Fairfield County. This inset is a wood-boring beetle native to China and Korea. They pose a great risk to the hardwood forests as well as the large nursery industry in Ohio and Fairfield County.

Vulnerability Assessment

With invasive species, the vulnerabilities lie with the native species that are choked out or impacted. By nature of the label, invasive species take over and their numbers increase rapidly. There are no other species or natural barriers to keep the numbers checked and in balance. Crops, agriculture, and native animals are at risk of being destroyed or greatly reduced.

Impacts

The impacts of invasive species include economic impact to agriculture, forestry, and nursery industries. Crops can be destroyed decreasing the farming revenue and impacting the farmers personally and then expanding that to the large farming economy in the county.

Natural products such as trees and shrubs that are food for these species can be destroyed impacting wood products (such as the ash tree) and the hardwood industry. Efforts to decrease the spread of invasive species can also affect the economy and production. There was such an effort to prevent the Emerald Ash Borer from spreading that ash trees could not be transported to other areas for fear of taking the borer with it. Containment or treatment methods can be costly as well which can further impact the economy.

3.8 Land Subsidence

Land subsidence is the sudden vertical sinking or settling of the ground. This can be caused from human activity or natural processes. In Ohio, many of the land subsidence issues are related to underground mines that have been abandoned. Mining done in Fairfield County is done on the Earth's surface. There are several sand and gravel surface mines in the county, particularly south of Lancaster.

There is no documented hazard of land subsidence in Fairfield County, Ohio. Since there is no history, land subsidence will not be assessed in this plan.

3.9 Landslide

A landslide is defined as the sliding of a mass of ground or a rock from a mountain or cliff. There are hills and the foothills of the Appalachian Mountains in the southeastern portion of Fairfield County but no mountain chain.

Figure 9: ODNR map of Ohio areas prone to landslides

ODNR has a map of Ohio and the areas prone to landslides (see Figure 9). Fairfield County is circled in red and is not within any of the zones prone to landslides. There are no documented incidents of landslides in the county available for analysis. There are areas likely to experience rocks falling where roads have been cut into hills. These are minor and infrequent.

Since there are no documented cases and Fairfield County is not in the risk zones, landslides will not be assessed in this plan.

3.10 Seiche/Coastal Flooding

A seiche is a wave or oscillation in a body of water that is partially or completely enclosed. Examples would be a lake, swimming pool, bay, or reservoir. According to the NCEI, there are no reported incidents of seiche in Fairfield County (NCEI, 2022).

Since there is no history or risk factors, seiche/coastal flooding will not be assessed in this plan.

3.11 Severe Summer Storms

Severe summer storms are defined in this document as including hail, heavy rain, high wind, strong wind, and thunderstorm wind as classified by NCEI. These events usually have more than one weather element like wind and rain. These storms can happen any time of year, but typically happen in the spring and summer.

In recent years, these severe storms have dropped an excessive amount of rain in a short period of time. While the total rainfall is not larger quantity, the rate at which it falls causes issues with the stormwater systems. The large amount of water in a short period is too much for the older stormwater systems to handle causing flooding and other issues.

Location

These events can happen anywhere in the county. As seen in Figure 10, they do. The size of the symbol on the map is related to the number of events in that jurisdiction. The larger the green storm symbol, the more events were experienced there. The data for this graphic can be found in Appendix L.

Madison and Richland did not have any weather events reported during this period. They may have had events, but it may not have been severe enough to be reported. On the other hand, Lancaster has the most with 12 events during this period. This

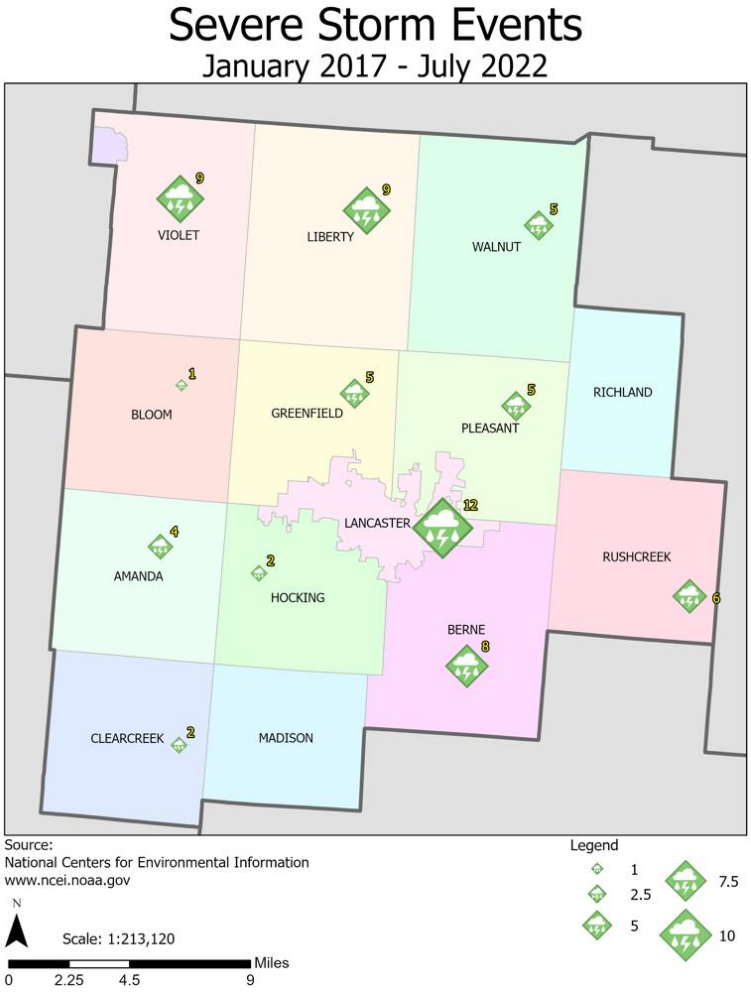


Figure 10: Map of severe summer storm incidents

could be because Lancaster is in a valley. Air in a valley can get funneled like wind flowing between two buildings, making the wind stronger.

History

As stated before, these events include elements such as hail, heavy rain, lightning, high wind, strong wind, and thunderstorm wind. Storms may have more than one element, but only one is selected in the "Type" column in Appendix L as the cause of the damage listed on the right.

There are two straight-line wind events included in this data. These events took place on October 16, 2021, and May 3, 2022. The damage from these events was examined to determine whether it was from a tornado or straight-line winds. The NWS determined both events were from straight-line winds.

There are some event days with multiple locations listed for the same system. These are broken out because the damage figures on the right may be different for each location. As storms move through, they may strengthen or weaken and can cause different levels of damage. The geography and environment can have an impact on the progression of the storm as well as the damage it inflicts. Hills can create a wind tunnel but can also weaken the system. Trees can provide a windbreak but can also cause damage if the wind breaks limbs or uproots tree trunks.

Past Declarations

There have been several declarations in the past for severe summer storms and wind events as seen in Table 19 below. It should be noted that none of these events took place since the last Mitigation Plan. While there have been some significant weather events, such as October 16, 2021, and May 3, 2022, that resulted in $52,250 and $373,000 worth of damage respectively, there was no declaration made (NCEI, 2022).

Disaster Declaration Number	Date Declared	Incident Type
DR 870	June 6, 1990	Severe storm, tornadoes, and flooding
DR-951	August 4, 1992 (IA) August 14, 1992 (PA/HMGP)	Severe storms, tornadoes, flooding
DR-1805	October 24, 2008	Wind Event
EM-3346	June 30, 2012	Severe storms, straight-line winds (derecho)†
DR-4077	August 20, 2012	Severe storms, straight-line winds (derecho)

Table 19: Disaster declarations for severe summer storm events

Probability of Future Events

The last Mitigation Plan stated that from 1968 to 2016, there was 219 severe thunderstorm events (Fairfield County EMA, 2018). From the period of January 1, 2017, to July 31, 2022, there was 78 severe summer storm events in 34 days. The average number of severe summer storms from 1968 to 2016 was 4.5 storms a year. From 2017 to 2022, the average was 14 storms a year, all things equal. While the data from 2017 to 2022 is a smaller dataset, the average has more than doubled in the number of severe storms per year. If one takes the data set and combines them, the average number of storms per year from 1968 to 2022 is 5.5, which is still greater than the average number from 1968 to 2016. All this means, is that the average number of severe summer storms a year is increasing.

Vulnerability Assessment

Based on historical data, Fairfield County had a total of $630,750 in damages from 2017 to 2022 (NCEI, 2022). $350,000 of that damage total is from a hail event on May 3, 2022. The remaining $280,750 is due to wind. There were no events associated with heavy rain. There was one lightning event on July 22, 2017, with one injury but no other damages reported.

Impacts

Fairfield County is not immune from severe summer storms. Increased capabilities in public notification and warning, weather radar, and weather spotters can increase the warning time for residents to seek shelter and protect their homes, businesses, and critical infrastructure.

Severe summer storms can cause power outages, interrupt communication systems, block roads and access points with debris, and damage structures. With different aspects of these storms such as high wind, hail, lightning, and heavy rains, there is a lot of potential for damage. This damage can be to personal property, infrastructure, and businesses therefore upsetting the community and economy.

The storm on May 3, 2022, caused significant hail damage to homes. There were also down trees that required road crews to go out and open roadways. This was during a time when supplies and building materials were in short supply after the COVID-19 pandemic, so it took a while for some homes to be repaired. These repairs were also very expensive due to the post-pandemic state of the economy.

In a worst-case scenario, these storms have significant winds that can destroy homes and other structures that are poorly built or are already damaged. Blocked roads will make it difficult for emergency crews and first responders to work. Downed communications slow response and makes efforts less efficient. An interruption in the power grid affects everyone, but particularly residents who rely on electricity for survival. These residents include those in the hospital, dependent on oxygen, ventilators, infusions, and more. These residents will need moved to a site with electricity such as a shelter or sister facility to continue lifesaving care they need. Moving people can be disruptive and logistically challenging.

3.12 Tornado

Tornados are short in duration but can cause a significant amount of damage. Tornados are defined as a moving vortex of violent air having a funnel cloud shape that touches the ground. A funnel cloud is a rotating cloud that forms the core of a tornado but has not touched the ground.

This section does not include straight-lined winds which were covered in section 3.11 above.

The Fujita (F) scale was originally used and based tornado strength on damage, not wind speed. The EF scale was implemented to rate tornados based on wind speed and related damage. Winds are estimates and not actual measurements. It is based on a three second wind gust at the point of damage and not transitional wind observations. Table 20 shows the F and EF Scale as given by NWS (2019). Fairfield County does experience tornados and funnel clouds. Historically, these events are not high on the Enhanced Fujita (EF) scale and do not happen frequently.

FUJITA AND ENHANCED FUJITA SCALE			
F Rating	**Estimated Wind (MPH)**	**EF Rating**	**3 Second Gust (MPH)**
0	40-72	0	65-85
1	73-112	1	86-110
2	113-157	2	111-135
3	158-206	3	136-65
4	207-260	4	166-200
5	261-318	5	Over 200

Table 20: Fujita and Enhanced Fujita Scale

Location

Tornados are a county-wide hazard and can happen in any given location. In 2015, there were two tornado events reported. These can be found in the 2018 Fairfield County Natural Hazard Mitigation Plan. Since then, there was one reported tornado event in Stoutsville, Ohio. Stoutsville is located in the southwestern corner of the county as seen in Figure 11. It is almost on the Fairfield-Pickaway County line which is where several severe storms have been reported. The rest of the county did not have any NWS confirmed tornados or funnel clouds reported from January 2017 to July 2022.

The storm event that took place on July 17, 2022, resulted in $10,000 in property damage (NCEI, 2022). NCEI states that the tornado initially touched down in Pickaway County and then moved northeast into Fairfield County. There was sporadic and minor damage that took place, mostly from tree damage. There was additional tree damage associated with the storm but was classified as straight-line winds and not related to the tornado. The tornado was classified as an EF0. There were no injuries or deaths associated with the storm.

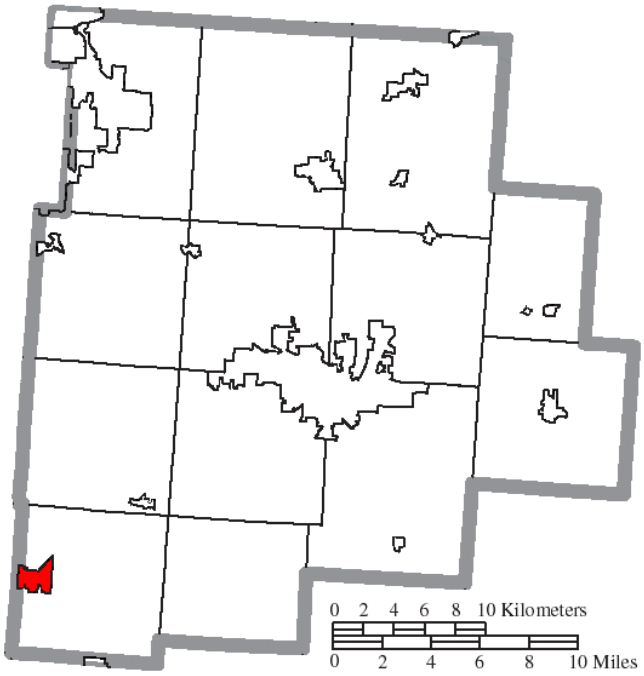


Figure 11: Stoutsville, Ohio

History

From 1963 through 2015, there were 21 tornado and funnel cloud events in 18 days. Some of these storms produced multiple tornados or funnel clouds in one day. Table 21 is the data from the 2018 Mitigation Plan as well as the Stoutsville event in 2022.

The table holds a longer timeline than the data above and reports information from 1963 to 2015. There were no storms reported in 2016 or 2017. The storms ranged all over the county. Data reported before 1990 states the location is Fairfield County. The reporting changed in 1990 to have more specific location information. A deeper dive in the data prior to 1990 shows that some tornados were in Pickerington, Bremen, Lancaster, or did not list a specific location. Table 21 has been updated to reflect more specific locations listed prior to 1990. As reporting criteria expands and improves, more specific

information may be available with newer storms. The entire county is at risk for tornados and no area is immune.

Location	Date	Event Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
FAIRFIELD COUNTY	9/12/1963	Tornado	F1	0	9	$25K	$0
FAIRFIELD COUNTY	4/11/1965	Tornado	F1	0	2	$250K	$0
FAIRFIELD COUNTY	6/24/1969	Tornado	F1	0	0	$2.5K	$0
CANAL WINCHESTER	5/16/1971	Tornado	F2	0	0	$2.5K	$0
FAIRFIELD COUNTY	5/10/1973	Tornado	F3	0	0	$2.5K	$0
BALTIMORE	12/26/1973	Tornado	F1	0	4	$250K	$0
FAIRFIELD COUNTY	9/14/1978	Tornado	F1	0	0	$250K	$0
PICKERINGTON	7/9/1980	Tornado	F1	0	0	$25K	$0
LANCASTER	3/13/1982	Tornado	F1	0	0	$250K	$0
SUGAR GROVE	6/22/1990	Tornado	F1	0	1	$250K	$0
BREMEN	5/23/2000	Tornado	F0	0	0	$50K	$0
LANCASTER	9/23/2000	Tornado	F0	0	0	$30K	$0
BREMEN	9/23/2000	Tornado	F1	0	0	$150K	$0
DRINKLE	6/2/2009	Tornado	EF0	0	0	0	$1K
WEST RUSHVILLE	9/16/2010	Tornado	EF0	0	0	$10K	$0
STOUTSVILLE	9/16/2010	Tornado	EF1	0	0	$60K	$2K
THURSTON	2/28/2011	Tornado	EF1	0	0	$100K	$0
BALTIMORE	4/20/2011	Tornado	EF1	0	0	$45K	$0
CAMPGROUND	12/24/2014	Tornado	EF0	0	0	$15K	$0
CAMPGROUND	6/23/2015	Funnel Cloud		0	0	$0	$0
LANCASTER	6/23/2015	Tornado	EF0	0	0	$3K	$5K
STOUTSVILLE	7/17/2022	Tornado	EF0	0	0	$10K	$0
Totals	**22 Events**			**0**	**16**	**$1.780M**	**$8K**

Table 21: 2018 Mitigation Plan tornado data

The Fujita (F) scale was used to classify tornados prior to 2007 and is based on damage inflicted. In 2007, the EF scale was introduced to classify tornados with better correlation between damage and estimated wind speed (National Weather Service, 2019). The classifications are included in Table 21.

As shown in Table 21, there were 16 reported injuries and no deaths associated with the storms. There was also over $1.7 million in property damage and $3,000 in crop damages (NCEI, 2022).

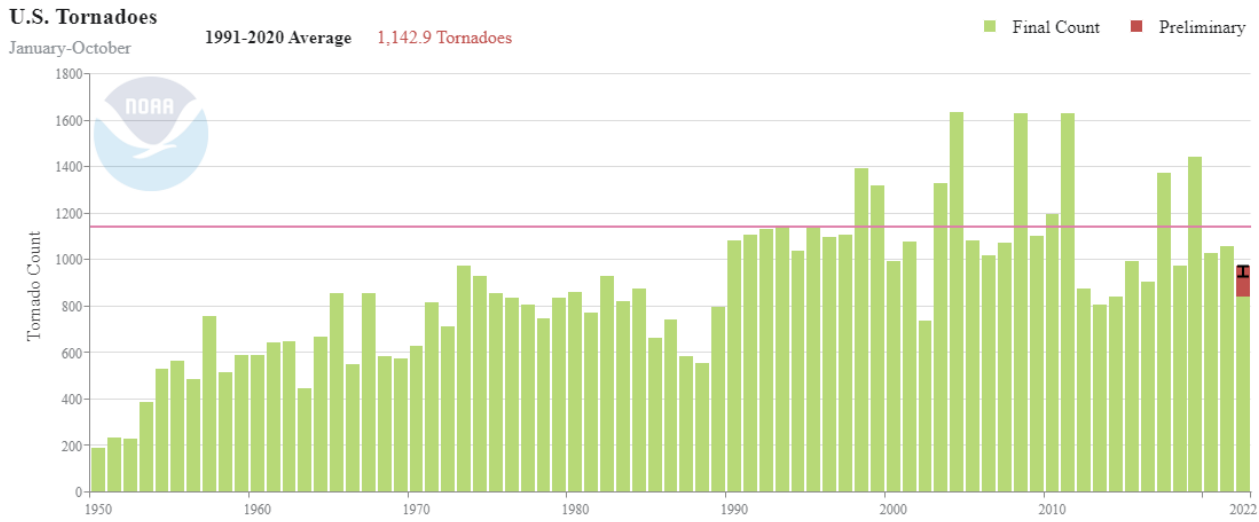


Figure 12: U.S. average tornado data

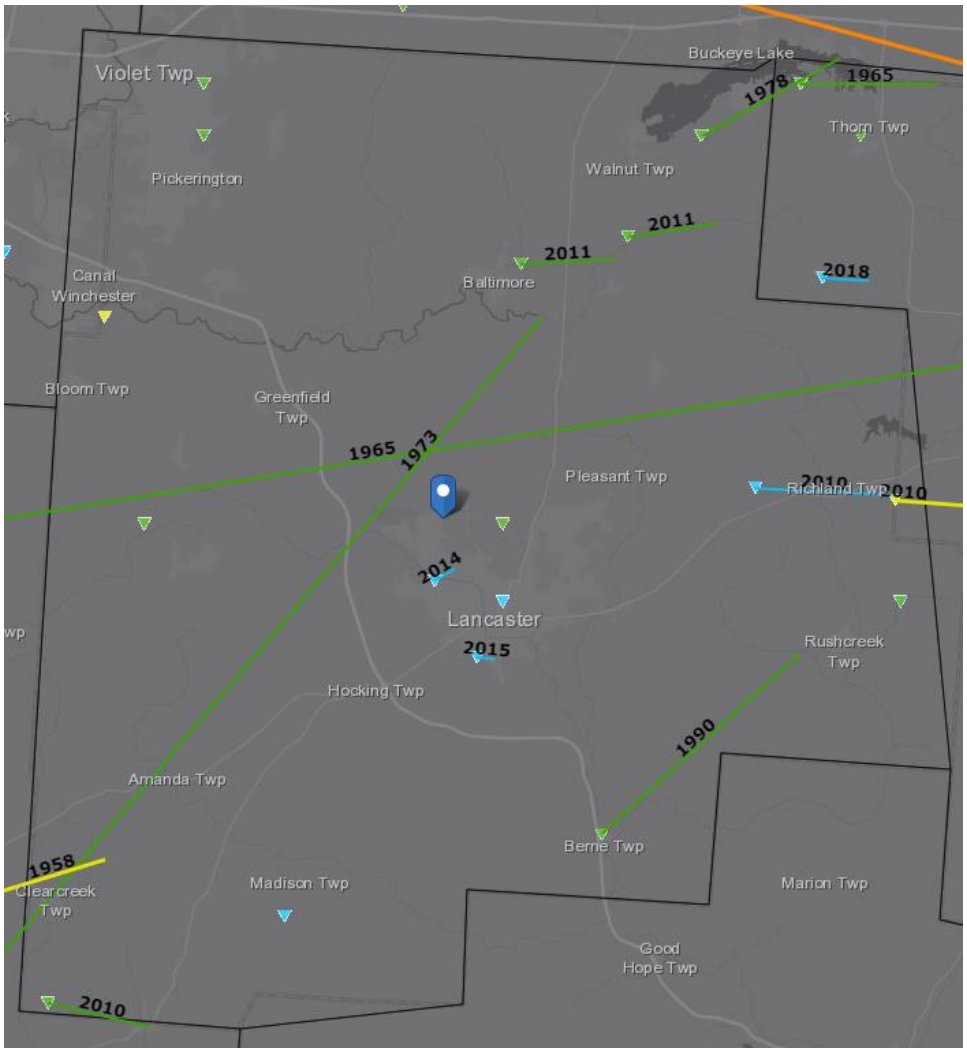
Figure 12 shows the data trends for tornados in the United States (Storm Prediction Center, 2018). The data takes an average of tornados reported from 1991 to 2020. As seen from the graph, the average frequency in tornados across the U.S. is greatly increasing.

Past Declarations

Table 22: Disaster declarations for tornados

Disaster Declaration Number	Date Declared	Incident Type
DR 870	June 6, 1990	Severe storm, tornadoes, and flooding
DR-951	August 4, 1992 (IA) August 14, 1992 (PA/HMGP)	Severe storms, tornadoes, flooding

There were a couple of disaster declarations in the past related to tornado events. These are shown in Table 22 and go back to 1990 and two events in 1992. These storms were also accompanied by flooding. There have been no disaster declarations for tornados since 1992, and therefore not since the 2018 Mitigation Plan.



The Midwestern Regional Climate Center (MRCC) produces a tracking map showing the tracks tornados take as well as their F/EF scales. Figure 13 shows the tornado tracks from 1950 to 2021 (MRCC, 2021). The 2022 storm in Stoutsville is not represented on this map.

Triangles indicate touchdown points.

Figure 13: MRCC Tornado tracking

The map is a visual representation that the entire county is at risk of a tornado or funnel cloud.

Probability of Future Events

The probability of a future tornado event is low, but not zero. As seen in the historical data (Table 21), tornado events can occur in Fairfield County. While the average number of tornados across the United States is increasing, the number in Fairfield County has been decreasing. From 2015 to July 2022, there was one NWS confirmed tornado. Extrapolating the data, the average probability of a tornado in any given year is 37% (22 storms in 59 years). The likely average of a tornado event is less than one a year. The probability that these storms will be an EF0 or EF1 is 86%.

Vulnerability Assessment

Looking at historical and expected tornados and damages, Fairfield County looks as follows:

Total # of Tornados 1963 - 2022	Total Damages	Average Damage per Event	Estimated Annual Tornados	Estimated Future Annual Losses
22	$1,788,000	$81,273	0.37	$30,071

Table 23: Estimated future loss with tornados

Table 23 looks at the estimated annual tornados and estimated future loss are calculations based on historical data with all things equal. Calculations look at past number of events and damages compared to the probability of future events. Damages and probability are then used to calculate estimated future losses a year. These calculations do not consider the location a tornado may impact such as home values, population density, and infrastructure affected. Compared to the SOHMP in 2019, the estimated annual tornados have increased, while the estimated future losses have decreased. This could simply be due to past damage reports where smaller damage totals affect the averages. Potential damages can increase quickly if the affected area has a greater population density, larger home, or business value with damage, and if critical infrastructure is impacted. Additionally, increased damages directly correlate to a stronger tornado. Fortunately, Fairfield County has not seen a lot of damage figures or stronger tornados, but it is possible.

Impacts

Impacts from tornados can be devastating. A strong storm that hits the wrong location can take out communications, electricity, block road access, a damage infrastructure. A worst-case scenario storm could level a village or part of a city as seen in Joplin, Missouri and Xenia, Ohio. An event of that magnitude would take a very long time to recover from and could leave thousands homeless. Impacted community lifelines could take a while to get back online and support residents.

Buildings and structures that are older and not maintained well could be severely impacted. Homes built before 1940 were not required to be attached to a frame per the building code. An EF3 tornado could move those structures off their foundations causing complete loss. Mobile homes are always of concern due to not being secured well and easily moved. Shelters or safe rooms are desirable for mobile home parks as an EF2 tornado can push a mobile home off its foundation or flip it over.

Areas that can be impacted include residential, business, utilities, electrical grids, critical infrastructure, and just about all the community lifelines. If a pipeline, railcar, or facility housing hazardous chemicals is damaged, there could be a hazmat situation as well as the destruction from the tornado event.

3.13 Wildfire

A wildfire is defined as a large fire that spreads quickly through woodland and brush. Wildfire hazard was not included in the 2018 Mitigation Plan. It was added to the 2023 Mitigation Plan as SOHMP identified it as a threat in Ohio. While the likelihood of a wildfire is minimal, the risk is not zero.

Location

The entire county is at risk for wildfires. The northern part of the county is flatter and field land. The southern half is wooded. Both conditions are at risk for wildfire. While writing this document, Southern Ohio is having wildfires in several counties including Perry County directly to the east.

Wildfires can be started by human activity or lightning during a severe storm. Warnings are issued during drought periods when fires are more of a risk. These warnings are issued through the NWS, FEMA, and the Fairfield County Sheriff's Office to warn people to use caution and avoid activities that can start a wildfire. There are additional public notification and warning methods through social media and text alerts available to mitigate risk.

History

Fairfield County was added to the Ohio Department of Natural Resources (ODNR) Division of Forestry's Expanded Forest Fire Protection Area (Figure 14).

Figure 14: ODNR Wildfire Protection Area

Inclusion in the wildfire protection area allows fire departments access to ODNR and their resources to mitigate and contain wildfires in their area. This partnership provides local fire departments with additional resources such as grants, training, assistance in an incident, and mutual aid (ODNR, 2021b).

The 2019 SOHMP reports that Fairfield County has had 103 fire events from January 2007 to December 2017. Additional data from 2017 to 2022 was not available. In the 103 events, there were 423 acres burned (SOHMP, 2019). Averaged out, this correlate to about 9 events per year. The SOHMP further breaks down the events and number of acres burned. 93 events had 1 to 9.99 acres affected with the remaining 10 events affecting 10 to 99.99 acres.

Past Declarations

There are no past disaster declarations for Fairfield County relating to wildfires.

Probability of Future Events

Using the data above, the probability of future wildfire events in Fairfield County is an average of 9 events per year. Also based on historical data, most of these events would impact less than 10 acres per event.

Vulnerability Assessment

Fairfield County is in Ohio Region 2 and classified as a generally low wildfire hazard risk (SOHMP, 2019). That low risk is for the county as a whole. According to ODNR Amanda Township, Hocking Township, Madison Township, and Berne Township are at moderate risk of wildfires (Ohio Department of Natural Resources, 2012). The rest of the townships are low risk, but the risk is still present. See Figure 15 (Appendix M) for a larger version of the township risk level map.

As discussed earlier, there were 103 wildfire events from 2007 to 2017 with 423 acres burned (SOHMP, 2019). Data was not available for the jurisdictions affected by the fires, but it shows that Fairfield County is not immune to wildfires.

Areas with higher value property such as homes, crops or other agriculture, and manufacturing in wildfire areas are more vulnerable to damage. Fairfield County has 13 fire departments and 19 fire stations in the county that can respond quickly to wildfire events. Rapid response and mitigation provide reassurance, safety, and quicker start of recovery when an event strikes.

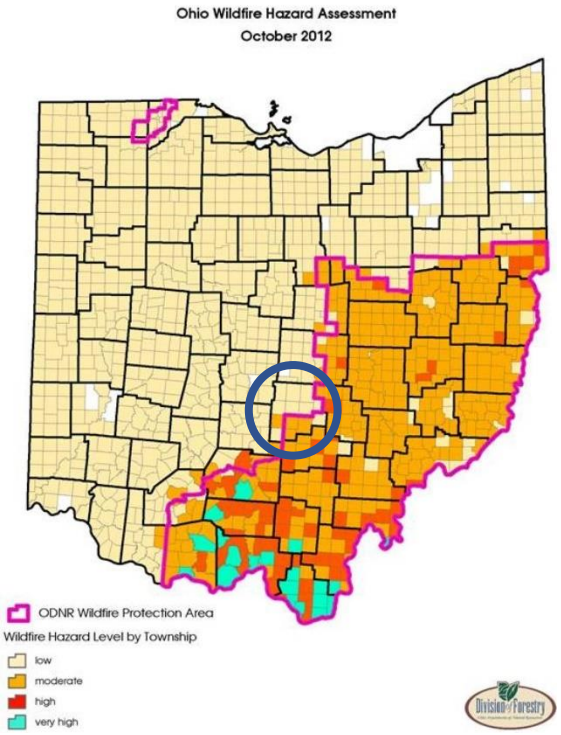


Figure 15: ODNR Wildfire Hazard Level by Township

Impacts

Aside from property destruction, impacts from wildfire hazards may include disruption in utilities, power, communications, and road access. If critical infrastructure is affected by a wildfire, community lifelines must be considered and prioritized to get residents to a place of safety and then back to normalcy as quickly as possible.

Depending on the location of the event, residents and businesses may need to be evacuated which then brings up sheltering and access to daily living items such as medication, clothing, and other necessities. When it comes to evacuation and sheltering, animals must also be considered. This applies to animals in the home as well as agricultural animals. People will not evacuate if there are animals left behind.

Wildfires are not all bad and devastating. Wildfires from natural processes have been occurring for thousands of years and help clear out invasive plant and animal species. These fires create a natural process for the environment to revert to its original composition and have a reset.

3.14 Winter Storm

Severe winter storms are always a given during the winter months in Ohio. Winter storms include heavy and possibly blowing snow causing a white out and low visibility. Dangerous wind chills along with the cold weather may also be present. Along with snow, Central Ohio is also prone to ice, especially south of Interstate 70. Between the snow, ice, low visibility, and cold temperatures, this creates a dangerous combination. The wind associated with blowing snow and wind chills adds to the danger as well. The event types used in this hazard are blizzard, ice storm, winter storm, and winter weather.

Location

All of Fairfield County is at risk of severe winter weather and storms. As seen in the history below, Fairfield County is indicated as a location of a severe weather event. The location is not broken down further. No one area is more or less at risk than another.

History

There were 36 event days from 2017 to 2022. Two events were listed for January 17, 2021. There was no damage, injuries, or deaths reported from these storm events. Looking back from 1996 to 2016, there were 64 winter weather events. No deaths or injuries were reported during that time either, however there was property damage totaling $500K (NCEI, 2022). The data table for winter weather events can be found in Appendix N.

Past Declarations

There were three disaster declarations made regarding winter weather that included Fairfield County (Table 24). Since the 2018 Mitigation Plan, no additional declarations have been made.

Disaster Declaration Number	Date Declared	Incident Type
DR-3055-EM	January 26, 1978	Severe blizzard conditions†
DR-1580*	February 15, 2005	Severe winter storms, ice, and mudslides
EM-3286	April 24, 2008	Snow

Table 24: Disaster declarations for winter weather events

Again, the lack of disaster declaration does not mean that the storms were not severe. The lack of damage reported shows that a declaration was not needed.

Probability of Future Events

The probability of a future winter weather or winter storm event to affect the county is 100% (95 events in 26 years). Extrapolating data from 1996 to July 2022, the estimated average number of severe winter events/days a year is 3.6.

Vulnerability Assessment

The last time damage from a winter storm was reported was in 1996 even though these storms take place every year. While the vulnerability assessment is low for winter storm damages Fairfield County, it is not zero. It is possible for extensive damage, as seen in 1996.

Looking at the SOHMP from 2019, there is estimated damage per capita based on the population numbers at that time. The percentage of estimated damage in the county was 0.00608% (SOHMP, 2019). This percentage was used in the following calculations by OEMA. The county-wide property estimates for damage for a population of 154,733 is $205,343.84. This corresponds to $1.33 per capita (SOHMP, 2019). Looking at state-owned and leased property resulted in estimated annual damage of $5,256.77 from winter storm for 78 facilities.

Impacts

Winter weather events are disruptive, as most hazards are. Severe winter events result in the shutdown of businesses, schools, and roadways. This disrupts the normal activities of residents and can impact the economy. Residents who live paycheck to paycheck may rely on going to work and if the business is

closed, they may not earn enough to pay their bills. This is similar for small businesses who need to be open and operating to clear expenses.

Extreme cold can affect residents who have no sheltering options and domestic animals that stay outside. This can result in serious injury or even death if it is cold enough and sustained long enough. Injuries such as hypothermia and frostbite can increase the number of acute medical care visits.

Section 4: High Hazard Potential Dams (HHPD)

Dams and levees as a hazard were explored in section 3.3 of this document. High Hazard Potential Dams (HHPD) are defined in this document as Class I and II dams due to the potential loss of life if the dams fail. A map of the HHPD in Fairfield County can be found in Appendix O. This section explores HHPD more in detail as well as integration into community planning.

4.1 Plan Incorporation

Two of the three conservancy districts as well as private dam owners in the county work closely with local and state agencies to ensure the safety of residents by the dam locations. (The South Licking Watershed Conservancy District has no infrastructure.) Dams that are required to have an inspection by the State of Ohio are inspected and the reports shared with local agencies that need to know, such as the Fairfield County EMA office. Dams that are not required to be inspected but require a liability certification must comply with the ODNR's requirements to ensure safety.

The Hunter's Run Conservancy District, Rush Creek Conservancy District, and South Licking Watershed Conservancy District all participated in the planning and development of this Mitigation Plan by attending kickoff meetings, individual planning meetings with SME and collaborative partners, and additional contributions to this plan.

4.2 Collaboration

Collaboration between districts is crucial to the success of mitigation. The conservancy districts have collaborative relationships with jurisdictions in which their dams are located as well as private and local government entities. The Rush Creek Conservancy District is collaborating with Richland Township regarding properties on Gun Barrell Road and mitigation efforts there. This relationship will allow mitigation efforts to take place that would be difficult for the jurisdictions to do on their own financially. The Fairfield County Soil and Water Conservation District is also vital in working with dam conservancy districts to provide subject matter expertise and guidance. The Soil and Water Conservation District also provided technical information and reports for the planning of this document.

Districts may also hire private contractors to identify gaps, create emergency plans, and strategies to strengthen dams and reduce the impact from a breech or incident. These reports were used in the planning process or to identify projects where newer studies are needed. Collaboration with private and governmental agencies allows for partnerships that identify and resolve issues which reduces the risk dams present and saves lives, property, and the environment aligning with the goals for this Mitigation Plan.

4.3 Risks/Vulnerabilities

There are numerous risks and vulnerabilities to dams. The information on risks and vulnerabilities comes from current reports, technical expertise, and studies done by SME and contractors. First, natural

hazards themselves can impact and otherwise weaken a dam structure. Many of the dams in the county are earthen structures that are at risk of erosion or breakdown. Severe storms cascading into landslides or wildfires can impact erosion and cause the land to slide. Exposed outlet pipes or clogged drains can also present a problem and negatively impact the integrity of a dam.

Further, storms that affect upstream of the dam can increase waterflow down to the dams and cause a breech or other erosion. Downstream from the dams, water may flow and inundate areas that the community does not want water to rush into. HHPD by nature of their classification, have a significant impact to life if they cannot withstand hazards.

Another natural process that can affect dams are animals. Burrowing rodents or animals like beavers that create logjams can impact the integrity of the dam and the waterways causing flooding. Burrowing decreases the integrity of the dam, especially earthen dams, and can create an access point for water to leak out of the dam or cause a full failure depending on the damage.

Besides natural processes, building in inundation areas of dams creates another vulnerability. Jurisdictions were encouraged to adopt zoning policies to prevent building in inundation areas of dams so that if there was a breech or failure, life and property would not be compromised. There are several Class I dams with homes in the inundation area. There are also dams that have homes built to the side of the dam or below an auxiliary spillway creating another element of danger.

To best mitigate these threats, conservancy districts are working with private contractors and ODNR to have evaluations and surveys done to identify weaknesses in the dams. From these surveys, strategies are/will be identified to strengthen the dams and prevent issues. Additionally, these surveys will allow for updated Emergency Action Plans (EAP) for the dams. An EAP identifies potential issues with dams and preplanned strategies and actions to help reduce the damage if those issues take place.

4.4 Limitations

While preplanning and evaluation of dams are critical for actions going forward, there are some current situations that impact the dams and make mitigation not as effective as the community would like. Most of the dams in Fairfield County are older, dating back to the 1960's. They were established after the 1948 flood when the community leaders found that dams would help prevent some of the flooding that took place in the early to mid-20th century. Because the dams are aging, they are more at risk for failure.

Another limitation is the building that has already happened around dams. No one is going to go back and remove people and homes from an area unless the homeowner agrees to do so through collaboration with the dam owner. As there are already homes built in an inundation area or near the structure of the dam, this can limit the protection of the dam. Having these homes and structures in an inundation area also makes it more expensive to maintain the dam. It would be costly to rebuild structures or remove structures from a site.

Increased frequency and impact of heavy rains is another limitation of some dams. As discussed in the severe summer storm hazard, storms that have increased rainfall in a shorter period create an issue with stormwater. The systems in place may not be able to handle the excessive water in a short time so the water sits. This can impact the dams either through erosion or by creating a breech.

The dam owners are aware of the limitations of their dams and work with SME and contractors to create the safest dams and environment possible.

4.5 Goals

Overall, the goals of the dam owners and conservancy districts is to maintain the integrity of the dams, reduce the classification where engineering supports, strengthen dams where engineering supports, and acquire land in inundation areas if it becomes available. A community-wide goal amongst the Core Group is to adopt zoning policies to prevent building in the inundation area of a dam, especially if those are HHPD structures.

Another goal identified during the planning process of this plan is to have all inundation maps of the dams digitized for easier analysis and planning. While writing this plan, it was discovered that many dams did not have digitized maps making it difficult to identify and display probable maximum flooding (PMF) during an event. This decreases the value of homes and property reported during a 100-year flood for planning.

These goals have been turned into projects and actions plans as identified in Section 5.6.

4.6 Mitigation Strategies

As shared above, there are several mitigation strategies that can be implemented for the dams in Fairfield County. One is to reduce the height of some of the dams. The dams were built very high because when they were built, no one knew how high the waters would get as engineering standards were still being developed. Height and size are some of the criteria for classification of the dams. As a result, some dams are classified higher because their height, even though the conservancy districts show that the height is not necessary. Reducing the height will lower the classification of the dam and reduce the cost of the dam. Reducing height is only done if the survey and engineering support this move, and it still maintains protection of the community.

Additionally, purchase or acquisition of property in inundation areas that comes available is another mitigation strategy. Purchase of this area and letting it revert to green space reduces the risk to those that live in that area by keeping people out of there.

Rehabilitating or restructuring existing dams is another strategy. Conservancy districts are in the process of having dams evaluated to update documentation on the dams' existing structure, risks, and strategies needed to maintain the integrity of the dam. As contractors, partners, and SME evaluate these dams and the results, options for rehabilitating dams become apparent and then a decision is made. One dam in Fairfield County was recently declassified due to such an analysis.

4.7 Prioritization Criteria

The conservancy districts and local partners have agreed during the planning process that the dams that should be evaluated and assessed first are those that are HHPD (Class I and Class II) with a severe impact to life. The districts are in the process of evaluating and have already done some dams to date. As additional funding is made available, the next set of dams are analyzed, and it continues through the inventory of dams.

4.8 Responsibilities

The responsibility of the dam lies on the owner. This may be the conservancy district or a private owner. While the conservancy districts are working feverishly to reevaluate their dams, they are also looking for partnerships and collaboration, especially with the jurisdiction in which the dam sits. In the mitigation projects, the owner is listed as the primary responsible party, however, there is room for modification through partnerships and collaborative efforts.

Section 5: Mitigation Strategies

The Core Group and designees from each jurisdiction identified strategies to reduce the risk to residents and community. In this section, those strategies will be identified as well as the capabilities the jurisdictions already have in place.

5.1 Existing Capabilities

The jurisdictions in Fairfield County have capabilities and regulatory guidance. See Table 25 below for a comparison of the capabilties possessed by the jurisdictions. These capabilities include planning, ordinances, codes, and other regulations implemented for protection and mitigation.

Below Table 25, the capabilities for the South Licking Watershed Conservancy District, Rush Creek Conservancy District, and Hunters Run Conservancy District are covered.

Jurisdiction	Zoning Ordinance	Subdivision Regulation	Floodplain Management Regulations	Stormwater Management Regulations	Building Codes	Historic Preservation Ordinance
COUNTY						
Fairfield	X	X	X	X	X	X
CITIES						
Lancaster	X	X	X	X	X	X
Pickerington	X	X	X	X	X	X
VILLAGES						
Amanda	X	X	X	X	X	X
Baltimore	X	X	X	X	X	X
Bremen	X	X	X	X	X	X
Carroll	X	X	X	X	X	X
Lithopolis	X	X	X	X	X	X
Millersport	X	X	X	X	X	X
Pleasantville	X	X	X		X	
Rushville	X	X	X	X	X	
Stoutsville		X	X		X	
Sugar Grove	X	X	X	X	X	
Thurston		X	X	X	X	
West Rushville		X	X	X	X	X
TOWNSHIPS						
Amanda	X	X	X	X	X	X
Berne		X	X	X	X	X
Bloom	X	X	X	X	X	X
Clearcreek		X	X	X	X	X
Greenfield	X	X	X	X	X	X
Hocking	X	X	X	X	X	X
Liberty	X	X	X	X	X	X
Madison		X	X	X	X	
Pleasant		X	X	X	X	
Richland	X	X	X	X	X	
Rushcreek		X	X	X	X	
Violet	X	X	X	X	X	X
Walnut	X	X	X	X	X	X

Table 25: Jurisdiction capabilities

Hunter's Run Conservancy District (HRCD)

Hunter's Run Conservancy District was incorporated in 1952 as a political subdivision. It was created as a response to the frequent flooding in the Hunter's Run and Upper Hocking Watershed. The flood of 1948 opened the community's eyes to the need for dams to help stop the flow of water and flooding the area. Most people do not realize the effect the dams have in the community since the flooding has greatly decreased since the dams went in. Without the dams, it is likely that the flooding that took place in the early 1900s would continue today.

The watershed is on the north/northwest end of Lancaster and then runs down the west side of Lancaster and curves to the south. Figure 16 below shows the watershed (photo credit Hunters Run Conservancy District, 2022). The City of Lancaster is in the center of the picture. The district currently

consists of eight flood control dams and twenty sediment control structures. These structures protect farms, homes, businesses, bridges, and several miles of roadway in the floodplain.

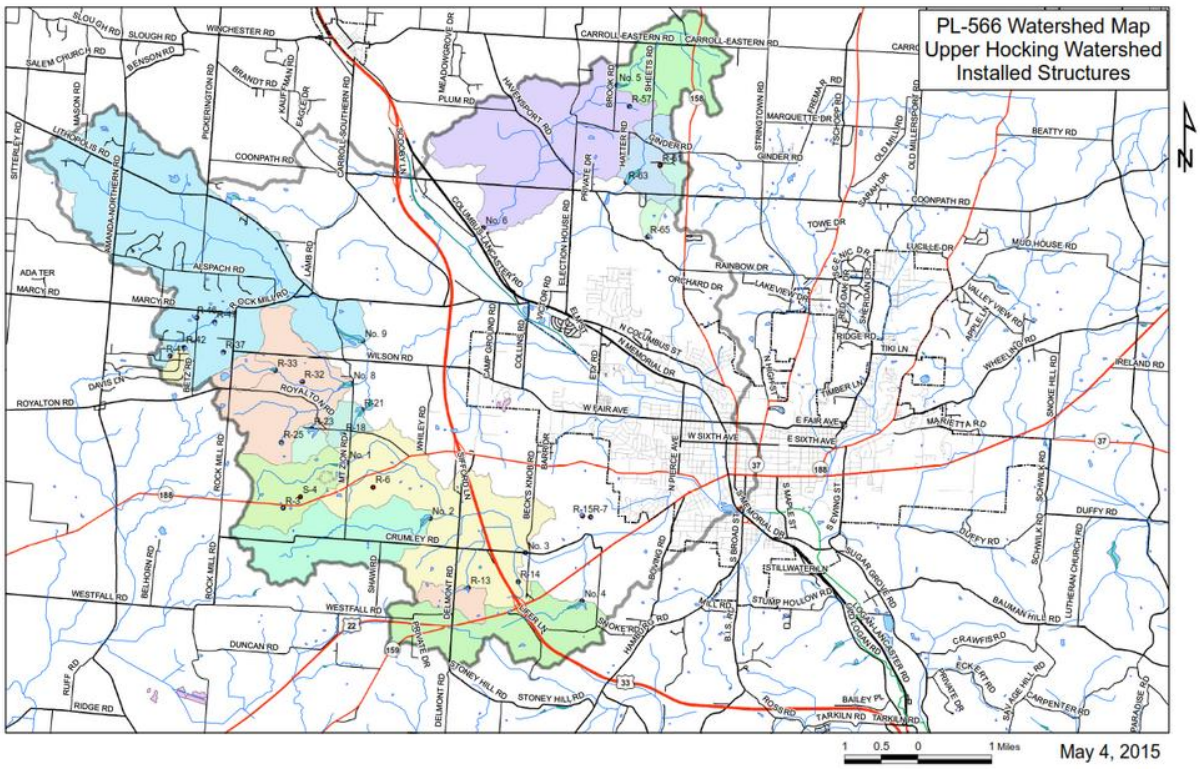


Figure 16: HRCD Watershed

The Hunters Run Conservancy District has several capabilities that allows them to manage the dams and the district they are responsible for. Their capabilities in the technical realm include engineering resources under a service agreement that the district uses regularly. Administrative capabilities include management and oversite in the projects they are implementing. Currently, HRCD is successfully completing its required pre-disaster mitigation (PDM) project and is overseeing their reevaluation process. Lastly, HRCD is managing the finances of their district to complete projects. They have the match funds available as required for some grants.

As stated, HRCD has eight flood control dams and twenty sediment control structures. Of these critical facilities and structures, 14 of the 28 that are under the ODNR Dam Safety program. The 14 structures hold back larger quantities of storm water while also providing sediment control. The 14 remaining smaller sediment control structures provide flood control but are not critical with respect to catastrophic failure or any impact to the FEMA flood plain.

The dams named with No. and a number are flood control dams. The sediment control structures are designated with an “R”. Table 26 lists some of the structures under HRCD. The larger dams that post the

most risk are No. 9, No. 4, and R-42. If No. 9 breeches, it would create a huge inundation area through a large portion of Lancaster within the Upper Hocking and Hunter's Run flood plain. (See Appendix P.)

HRCD Structures			
HRCD No. 1	HRCD No. 5	HRCD No. R-13	HRCD No. R-42
HRCD No. 2	HRCD No. 6	HRCD No. R-21	HRCD No. R-61
HRCD No. 3	HRCD No. 8	HRCD No. R-23	HRCD No. R-63
HRCD No. 4	HRCD No. 9	HRCD No. R-33	HRCD No. R-65

Table 26: HRCD structures

Dam R-42 is an earthen dam, one of 28 dams maintained by the Hunter's Run Conservancy District. This dam is located at approximately 39°44'19.55"N, 82°44'42.91"W in Bloom Township, Fairfield County, Ohio, and is a Class I HHPD as classified by ODNR Dam Safety Regulations. It was originally constructed to provide erosion control and protection of downstream road crossings. This structure is now surrounded by homes within the College View Acres development. One of those homes is located directly below the dam and an adjacent property was modified during construction years ago, that impacted design of the auxiliary spillway placing that home at risk. The dam currently does not meet ODNR Dam Safety regulations. An assessment by Hull Inc. in November 2021 showed that R-42 needed a spillway replaced and erosion control.

The vulnerabilities that HRCD sees in the dams is flooding and debris. The debris can block the flow before or after the dam causing a backup. Many of the dams are built taller than necessary since engineering of dams was still being developed and they did not know how high to build the dams. As a safety measure, they built the dams taller instead of shorter, so overtopping is not an issue. However, flooding can put pressure on the dam and cause it to breech. Previous dam incidents have been related to the outlet pipe or emergency spillway. A failure of either of these outlets causes water to be released from behind the dam. The pressure behind the dam from flooding upstream can weaken these elements and cause them to fail.

The projects that HRCD wants to implement include acquiring property that is in the inundation area therefore reducing the risk of people building there, public education, studies on the dams and their vulnerabilities, and lowering the classification or decommissioning the dams where engineering and studies supports those actions. These efforts will reduce the risk to the public and ensure sound engineering and structures to prevent flooding.

Rush Creek Conservancy District (RCCD)

The Rush Creek Conservancy District was formed in 1961 and then constructed from 1967 to 1984 (Fairfield Soil & Water Conservation District, 2022). The district is made of 18 structures with 10 of those in Fairfield County (see Table 27). All the structures in the RCCD are Class I or Class II dams and therefore HHPD. A map of the overall RCCD system can be found in Figure 17.

RCCD Fairfield County Structures	
Structure No. V-A	Structure No. VI-A
Structure No. VI-D	Structure No. VII-A
Structure No. VII-E	Structure No. VII-C
Structure No. V-B	Structure No. VI-F
Structure No. VII-D	Structure No. V-C

Table 27: Rush Creek Conservancy District Fairfield County structures

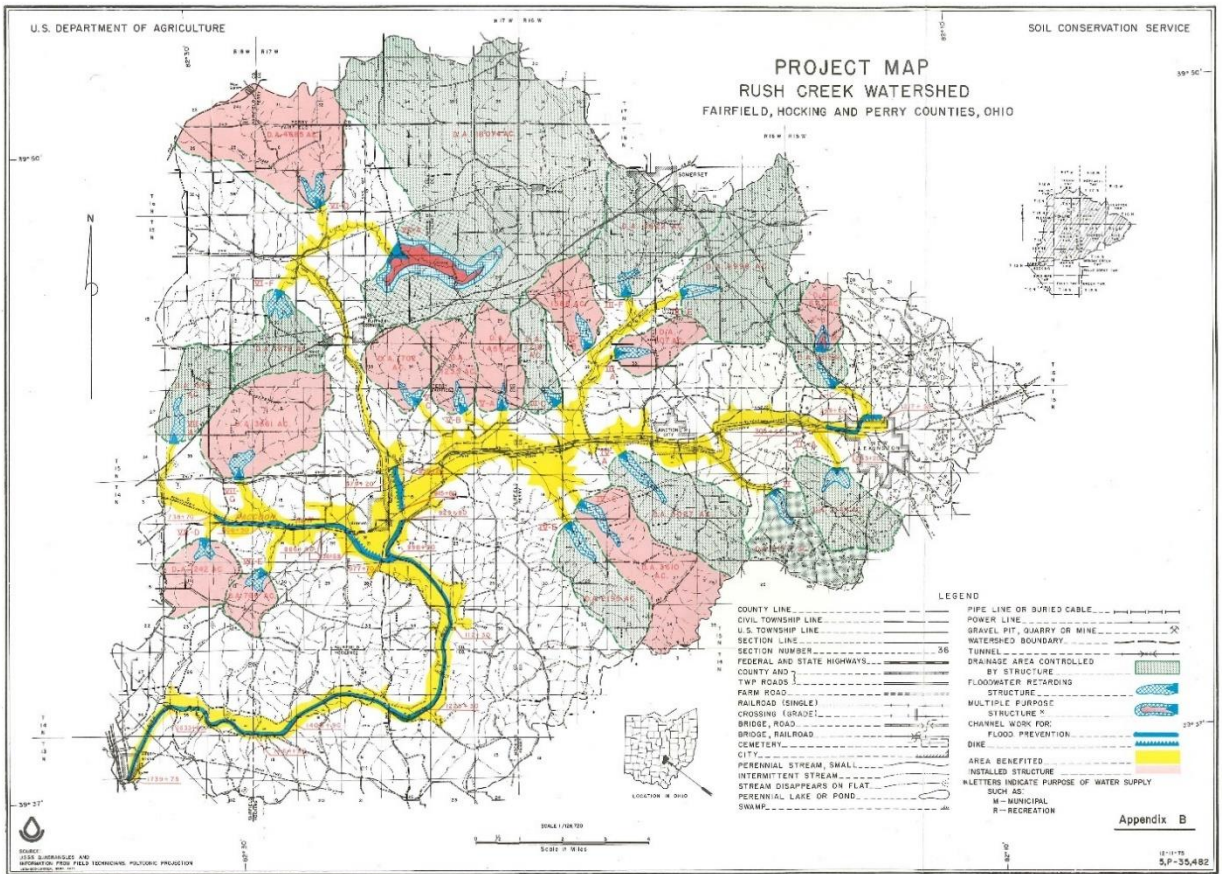


Figure 17: Rush Creek Conservancy District System

When it comes to capabilities, RCCD has technical, administrative, and financial capabilities. RCCD has most of the architecture in place to function technically. In addition to the Board of Realtors and access to legal counsel, RCCD has partners in place such as the Fairfield, Perry, and Hocking County Soil and Water Conservation Districts; ODNR Division of Soil & Water; United States Department of Agriculture (USDA); and Natural Resources Conservation Service (NRCS). The NRCS has been a technical advisor throughout RCCD's sixty-year existence and continues to assist with engineering, planning, and construction. These partnerships are historic, continuous, and a key to the existence of the RCCD.

Administratively, RCCD is governed by three directors, each representing one of the RCCD's constituent counties and appointed by that County's Common Pleas Court Judge. The Board of Directors then appoints a clerk/treasurer to carry out day-to-day operations. The current board is composed of a retired banker, engineer, and educator which are all long-time residents of the Watershed. This group has been through many administrative processes, ranging from a reimagining property assessment to securing land rights through outright purchases and right-of-way easements, acquisitions, and other smaller administrative tasks.

Financial capabilities can be seen as RCCD has operated rather frugally during its existence. Consequently, RCCD has developed financial resources and access to some that may cover the local

shares of future projects. There is flexibility to front or access resources as part of a reimbursement process. The RCCD has also developed relationships with local, county, and state governments and have a proven track record of augmenting assessment dollars with local and state dollars to satisfy federal match requirements.

RCCD faces some of the same challenges with flooding as HRCD. Flooding is the greatest concern for the dams. While these dams were built after the dams at HRCD and much of the engineering had been worked out prior to development, the dams are still aging. Studies are needed to update the vulnerabilities of the dams and appropriate action steps. Flooding can wash sediment downstream which can clog outlet pipes. This increases the water behind the dam as well as the pressure. Heavy rainfall in a short amount of time can also put pressure on the dams as water flows downstream and backs up.

RCCD has added projects to this mitigation plan to reduce the risk of future disasters including land acquisition in areas that repeatedly flood, upgrade zoning in inundation areas, and update Emergency Action Plans (EAP) for Class I dams.

South Licking Watershed Conservancy District (SLWCD)

The SLWCD runs through three counties: Licking, Perry, and the northern portion of Fairfield County. The district was first established in 1968 with the original watershed plan authorized in 1984. This group deals with a lot of the flooding up by Buckeye Lake, Interstate 70, Millersport, and the area in the northeastern part of the county.

The map in Figure 18 shows the region of the SLWCD (map courtesy of SLWCD, 2022). The blue shape is the area of the SLWCD. The bright red rectangle is the northeastern corner of Fairfield County that is within the SLWCD area.

The SLWCD also has capabilities to operate like HRCD and RCCD. The Directors of the Conservancy District are appointed by the Conservancy Court and volunteer their time, expertise, and talents. There are no staff through the SLWCD. The Licking County Commissioners and Licking County Soil & Water Conservation District (SWCD) assist by allowing the Watershed Specialist employed through them to give part of his time to SLWCD. Fairfield and Perry SWCD also assist. Fairfield SWCD is completing a drainage study of Walnut Township. SLWCD has a grant through the Muskingum Watershed for engineering to update the watershed plan for the Southfork Licking Watershed. SLWCD is working with the Ohio Silver Jackets on a project to prioritize logjams in the Racoon Creek/Lobdell Watershed. The Temporary Buckeye Lake Watershed Specialist completed two 9-element plans and Ohio University-Voinovich School completes one for the Bellrun Hydrologic Unit Code (HUC) as a class project.

Financially, SLWCD receives funding annually from Licking and Fairfield Counties. Perry County has contributed before and received a grant through ODA to hire the first Watershed Specialist for a few years. The three counties currently split the cost of the Specialist.

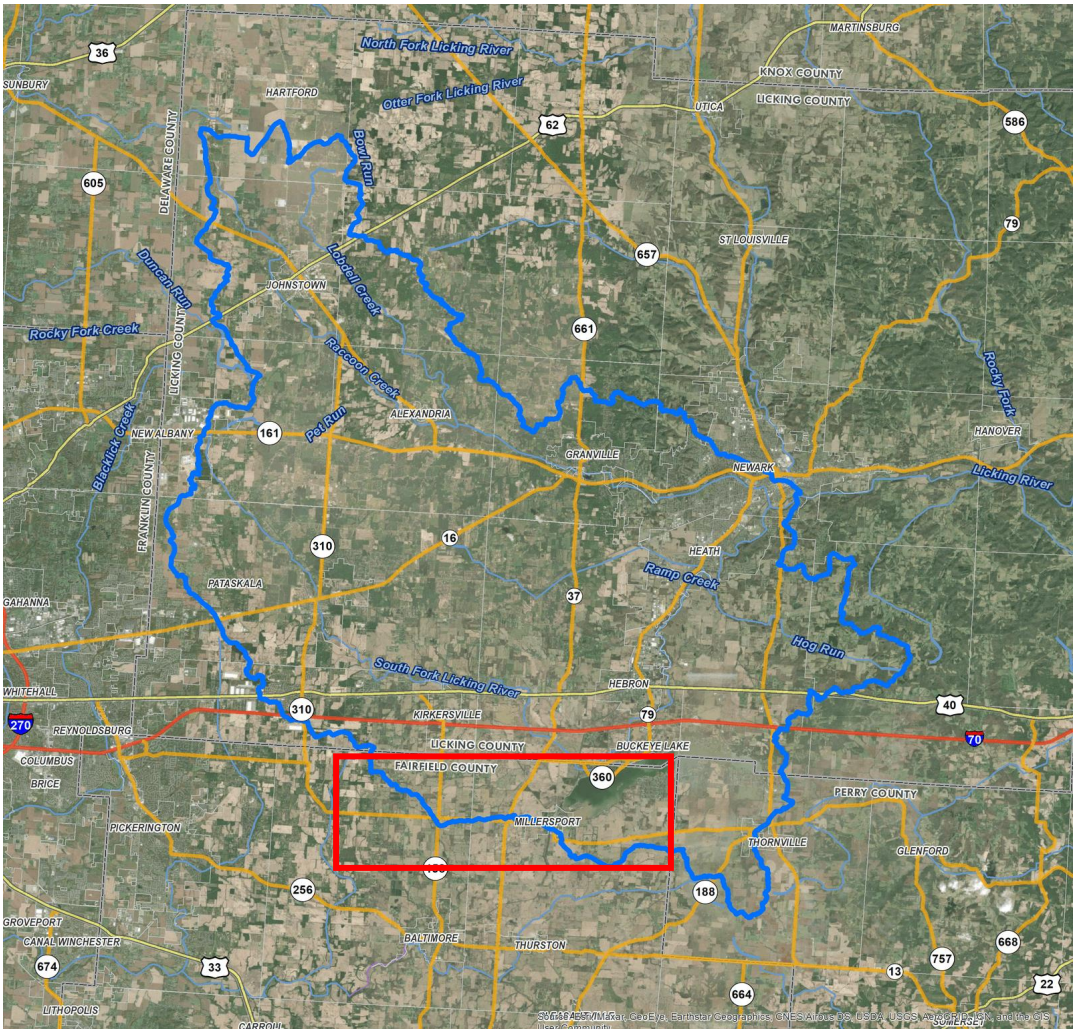


Figure 18: SLWCD area with Fairfield County highlighted

Administratively, SLWCD receives support from the governments of the three counties served as well as each Soil & Water Conservation District. The support from these agencies allows SLWCD to oversee projects and the watershed.

SLWCD experiences issues with bank erosion, flooding, and summer storms. These problems present vulnerabilities to the system. Summer storms can carry excessive rain causing a rush of water as it travels downstream. This rainfall can further bank erosion and issues with sediment. If the water has no place to go, it can back up and flood roadways and other areas. Depending on the location, homes and businesses may also be flooded. Mitigation projects to reduce flooding, increase water retention, and bank stabilization are some of the projects SLWCD has added to this plan to reduce the risk of future events.

5.2 Building Codes

As shown in Table 25 above, all local jurisdictions have implemented building codes. Some townships require separate zoning certificates (Fairfield County Regional Planning Commission, n.d.). Violet Township operates from a separate building department and so permits must be obtained through the Township Building Department. There are two villages, Baltimore and Millersport that are under the

Fairfield County office. While arrangements and agreements are made for the jurisdictions to manage the work, all jurisdictions use building and zoning codes to keep residents safe and protect the jurisdiction.

5.3 Land Use

Since the last Mitigation Plan in 2018, the land use map has changed significantly. The 2018 Land Use Map in Appendix Q shows yellow blotches around the metropolitan areas that indicate residential areas. The 2021 map in Appendix R, the map shows residential areas in pink. The pink sections are much larger and not just blotches. They have grown out and stretch into the previously agricultural areas indicating growth and development. Violet Township, the northern third of Bloom Township, Greenfield Township, the Village of Baltimore, Stoutsville, and Tarlton have all grown in residential area. Bloom, Violet, Lancaster, Greenfield, and Baltimore are all seeing a large increase in housing developments and new structures going up.

As the use of the land changes, the vulnerabilities also change. What was once agricultural, or resource area may now be developed neighborhoods and urban areas. Where field land was, there was little for hazards to impact. Now that buildings are there, the land has more at risk of being damaged from hazards and more to protect. New developments or land changes modify the efforts jurisdictions need to take to protect their communities.

5.4 Participation in NFIP

Communities Participating in NFIP					
CID #	**Location**	**Initial FHBM† Identified**	**Initial FIRM‡ Identified**	**Currently Effective Map Date**	**Re-Emer Date**
390159	Baltimore	6/21/1974	12/17/1991	01/06/2012	12/17/1991
390160	Bremen	06/21/1974	09/02/1982	04/17/2020	09/02/1982
390882	Buckeye Lake		08/15/1984	03/16/2015	08/15/1984
390169	Canal Winchester	02/01/1974	06/04/1980	06/17/2008	06/04/1980
390170	Columbus	08/09/1974	07/05/1983	06/16/2011	07/05/1983
390038	Fairfield County	02/10/1978	04/17/1989	04/17/2020	04/17/1989
390161	Lancaster	05/17/1974	05/01/1980	07/19/2018	05/01/1980
390689	Millersport	01/31/1975	02/01/1991	01/06/2012	02/01/1991
390162	Pickerington	06/28/1974	08/05/1991	07/19/2018	05/08/1991
390177	Reynoldsburg	11/23/1973	09/01/1978	03/16/2015	09/01/1978
390163	Sugar Grove	08/30/1974	09/02/1982	01/06/2012	09/02/1982
390690	Thurston	01/31/1975	11/23/1984	01/06/2012	11/23/1984
390817	Carroll	09/22/1978	01/06/2012	01/06/2012	09/22/1979
Communities that DO NOT Participate in NFIP					
N/A	Amanda Village	N/A	N/A	N/A	N/A
N/A	Lithopolis	N/A	N/A	N/A	N/A
N/A	Pleasantville	N/A	N/A	N/A	N/A
N/A	Rushville	N/A	N/A	N/A	N/A
N/A	Stoutsville	N/A	N/A	N/A	N/A
N/A	West Rushville	N/A	N/A	N/A	N/A

Table 28: NFIP Participation

†FHBM – Flood Hazard Boundary Map ‡FIRM – Flood Insurance Rate Map

NFIP was introduced in Section 3.6 for flooding. This program is managed by FEMA and makes flood insurance available to anyone living in a participating NFIP community. Most of the jurisdictions in Fairfield County participate in the NFIP program (Table 28). Jurisdictions that do not participate in NFIP are not covered by the Fairfield County regulations and do not have a 100-year floodplain within their boundaries. The cities of Columbus, Reynoldsburg, Buckeye Lake, and Canal Winchester cross county lines and therefore are covered by more than one county.

The Core Group and other jurisdiction leaders acknowledge that flooding is a major, and probably largest, concern in the county. Having local jurisdictions participate in the NFIP program is critical to reduce the potential damage and effects of flooding within the county. The short and long-term action items as well as action from the individual jurisdictions support the identification of flooding and compliance with NFIP regulations.

The FIRM is the official map produced by FEMA indicating the NFIP areas. The Regional Planning Commission in Fairfield County maintains the FIRM issued by FEMA for a large portion of the county including unincorporated areas, cities, villages, and townships.

In some communities, floodplain management criteria and regulations may be stricter than the minimum federal requirements. In this case, the more restrictive criteria take precedence.

The Community Rating System (CRS) is another FEMA program whose goal is to reduce flood losses and promote awareness of flood insurance. This is a voluntary program that can further reduce the cost of flood insurance for residents and assist with grant applications. Fairfield County does not participate in the CRS program.

5.5 Goals to Reduce Risk

The goals in this section are broad statements with a comprehensive view of the natural hazards presented here that protect residents, property, and the environment from those hazards. In 2018, the goal statements were as follows:

- *Manage Development* – Integrate goals and action items from the Fairfield County Natural Hazards Mitigation Plan into existing and future land use planning documents and existing regulatory program.
- *Maintain Public and Private Infrastructure* – Develop inventories of at-risk infrastructure.
- *Manage Debris Along Streams and Waterways* – Involve watershed and natural resource management and all other interested parties in natural hazards mitigation planning to rehabilitate and maintain streams and waterways.
- *Minimize Damage to Public and Private Property* – Strengthen partnerships between government agencies and private sector businesses to develop public awareness and involvement in natural hazards mitigation strategies.
- *Minimize Loss of Life from Severe Weather Hazards* – Develop and implement public education programs to increase public awareness and understanding of the risks associated with natural hazards.
- *Reduce the Number of Repetitively Damaged Existing Structures* – Protect buildings in repetitive loss areas through acquisition, elevation, or other mitigation activity.

These goals were presented during the Kickoff Meetings to the Core Group. The consensus among the group and all four meetings was to keep the goals the same. Projects from the 2018 Mitigation Plan and earlier are listed in Appendix S along with status updates. As seen in the new projects in Appendix T, action items for these goals are reflected as projects for individual jurisdictions.

5.6 Mitigation Projects

In order to reduce the risk of natural hazard events and their future impacts, elected officials identified projects they would like to implement to protect their jurisdictions. These projects were identified through the mitigation kickoff meetings and individual jurisdiction meetings. Once a list of projects was created for this plan, projects were shared with the other jurisdictions to generate ideas.

Projects Considered

The jurisdictions considered a wide scope of projects to incorporate into the Mitigation Plan. Besides natural disaster and weather-related incidents, the jurisdictions also considered projects that are a result of incidents and make it difficult for residents to lead productive lives. Examples of such projects are sidewalks along busy roads, particularly leading to popular businesses and schools.

Other projects included implementing weather stations in various points of the county to capture additional weather data. There was a lot of discussion among the jurisdictions that the weather patterns have changed causing excessive rainfall that would normally be handled through the stormwater system that are now falling at such a high rate (in less time) that most of the stormwater systems are not able to handle that volume of water in such a short amount of time.

While these projects may not fit under the natural hazard mitigation umbrella, jurisdictions were encouraged to include them in the plan anyway. The projects considered are broad, creating room for flexibility and creativity to mitigate the risk at the core.

List of Approved Projects

Through all the discussion regarding mitigation projects, the jurisdictions were encouraged to list multiple projects. The list of approved projects for this plan can be found in Appendix T. 205 new or carryover projects are listed in this update. Previous projects from 2003 forward can also be found in this Appendix S and include status updates.

The list is sorted by jurisdiction and then the year the project was identified. Villages are listed as “Village of…” to eliminate confusion between townships and villages with similar names.

5.7 Action Plan & Priority

Criteria for prioritization of projects and an action plan was discussed in a larger group at the kickoff meetings and then with the individual jurisdictions. All jurisdictions stated that life safety is the number one priority. Things are replaceable. Life is not. Therefore, projects that increase life safety should be implemented first if there are funds available to do so. Most of the jurisdictions are extremely tight on funding and would not be able to execute any of these projects without substantial financial assistance and partnership. The second prioritization criteria are the funding of these projects.

Based on the prioritization criteria established above, each individual jurisdiction prioritized their projects based on life safety, financial resources, and feasibility. After life safety and resources, other driving forces for prioritization were resident issues and complaints as well as issues affecting critical infrastructure. Prioritization took place in a discussion format with jurisdictional leaders, EMA, SMEs,

and any other staff that the jurisdictions felt should be present. Most of these discussions took place during the individual jurisdiction mitigation planning meetings or public meetings.

The prioritization rankings are seen in Appendix T. The rankings are numbers based on importance and the criteria above for each individual jurisdiction. The rankings are the order that projects should be implemented in based on criteria discussed. Each jurisdiction identified their own project rankings. As assets and resources vary by community, each community had different ideas on how to implement the projects and the order they should be prioritized.

All jurisdictions discussed opportunities for funding these projects including other public and private grants and cost sharing with local partner organizations. Collaborations are being discussed, particularly with conservancy districts and elected officials who share responsibility and cost since both parties benefit from the projects identified. Projects listed in the plan include a priority rating. This rating is for planning purposes and does not exclude jurisdictions from implementing projects out of order should funding opportunities arise. Those jurisdictions with multiple projects in the same rank means that actions are tied in terms of priority. Jurisdictions felt that these projects met the same prioritization criteria and held equal importance, so the ranking remains the same for those projects.

For the purposes of the plan, the jurisdiction that identified the project is taking the lead and administration of the project. Room is allowed for new opportunities between agencies, both public and private, making implementation of a project more realistic and achievable. As opportunities arise, the project leader may be amended in this plan. Potential cost is also identified in the project list. Cost is typically fluid as the economy fluctuates. The costs represent approximates based on information at the time the list was developed. Those projects with “TBD” indicate that a cost has not been identified at the time of development.

The funding through FEMA Hazard Mitigation Assistance (HMA) and its host of grants provides the largest opportunity of funding for the local jurisdictions. FEMA HMA grants include Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA) grants. While making projects eligible for FEMA funding, additional funding streams were identified in the planning process. Some of these funding sources include private utility and electric grants like South Central Power. Other funding opportunities have been identified such as the Ohio Public Works Commission (OPWC), which has funded projects in Fairfield County in the past.

Jurisdictions generally agreed that they would like to implement projects that affect life safety within one to two years after the Mitigation Plan is adopted. This is pending funding opportunities and being able to access the resources and skilled labor needed to implement the project. Some projects listed are from as far back as 2003 because opportunities have not presented themselves.

Priority	Description
A	Project in Planning or Design
B	Project on Capital Improvement List
C	Long Term Project
D	Annual Department Function or Training
E	As Needed

Table 29: Lancaster prioritization classification

The City of Lancaster prioritized their projects differently due to the many internal departments that are involved and responsible for projects. This prioritization is more of a classification system that allows internal departments to identify where their projects should be when prioritizing. The classification and prioritization system for the City of Lancaster is listed in Table 29.

Section 6: Plan Maintenance

The Mitigation Plan is not one that sits on a shelf and is only reviewed once every five years. This plan is a living document that requires a periodic check-in for updates and review of data. This section describes how this plan will be maintained and updated.

6.1 Continued Participation

From the beginning of the planning period, jurisdictions were advised that they would need to be involved in continued participation for updates, new projects, and any information that needed to be amended into the plan.

Many jurisdictions may have had a complete changeover in staff since projects were identified in past plans, so they were not aware of work previously done. By continuing to engage in the plan, a transfer of knowledge is expected, even if it is by the person managing the plan updates.

Not only is participation from the jurisdictions, stakeholders, and SME important, but continued public participation is also essential. Jurisdiction meetings are open to the public where public comment can be collected. Periodic brief surveys may be used as a quick method to gather public input and comment. These surveys may be done annually or as needed. Data anticipated to be collected include perceptions on hazards and risk, comments on projects, changes in the community that affect impacts from hazards, *etc*. Once collected, this information will be provided in updates and amendments to the Mitigation Plan.

6.2 Progress Updates

Fairfield County EMA manages the Mitigation Plan for the county. This includes writing, collecting information, and updating, and amending the plan. EMA will keep a schedule for updating projects and any needed amendments. The updates may take place quarterly but will occur at least annually. To gather this information, EMA will reach out to other agencies involved in the plan. The status updates may be as simple as a quarterly survey or a brief discussion during jurisdiction or agency standing meetings. Information sought includes whether projects have been implemented, status, who is responsible for the execution of the project (project leader), any partnerships or collaborations, cost, and timeframe to completion.

EMA will continue to collect data from weather events and the damage associated with them. This data is crucial to show the importance of projects and impacts before and after projects are implemented. As data becomes more available for specific jurisdictions affected, this information will be provided to improve jurisdictional planning. When the next Mitigation Plan update is due, EMA, under Fairfield County entity, will initiate and lead the review and update.

6.3 Integration

The Mitigation Plan is a public-facing document that can be used for future planning and guidance in each jurisdiction. When community planning occurs, this plan should be used for reference and

guidance to mitigate natural hazards. The information regarding natural hazard threats, past impacts, and future estimated impacts will help guide mitigation efforts and steer dollars to the "most good for the most people". This method ensures that dollars are spent in an efficient and effective manner. Each jurisdiction can utilize this plan for planning efforts and take the content into consideration. As individual jurisdiction data is further built out, the detail will assist the jurisdictions in making individual decisions and planning efforts. One jurisdiction may have different hazards or severity of hazards than another. This coupled with vulnerabilities may change mitigation tactics.

It is hoped that this plan will assist with development of the county and local emergency operations planning, zoning, and land use efforts. This plan is currently used in the planning for the *Hazard Identification & Risk Assessment* (HIRA) for Fairfield County which includes natural hazards as well as human-caused disasters.

Planning mechanisms for each jurisdiction will guide how those jurisdictions use and implement the plan such as budgets, capital improvement plans, development, and long-range plans. The purpose of this is to improve mitigation efforts pre-disaster or from lessons learned to increase community resiliency. Areas that benefit from integrating mitigation planning include comprehensive land use plans, local regulations, subdivision regulations, building codes, and zoning. These plans benefit from adding in mitigation efforts as building and land use can change the vulnerabilities of a community to a severe weather event. Attention to these details can increase the community's resilience and decrease risk rather than increase them.

Stormwater and floodplain management are also crucial plans that integrate with mitigation planning. As most of the concerns revolve around water and flooding, stormwater and floodplain management are essential for water retention, flood prevention, and mitigation efforts. Marrying floodplain and stormwater plans with mitigation efforts can create more effective strategies to prevent and reduce flooding in communities.

Capital improvement plans identify projects and purchasing for plans and projects. Mitigation efforts cost money and may need equipment or supplies to implement those projects. Having a plan that outlines the equipment needed for mitigation efforts, including type, quantity, special features, acquisition plans, etc., can be helpful to mitigate pre-disaster or in a response when an event does happen. Budgeting and purchasing this equipment is most effective when done before a disaster, not during.

Along similar lines, historic preservation ordinances can help keep the history intact in communities. Including hazard mitigation in the planning for these landmarks is essential to protect them from severe weather events. As these landmarks age, they can become fragile and more susceptible to destruction. Planning efforts to prevent destruction whether it is stabilizing, inspecting for deficiencies, having sandbags on hand, or reducing debris around the site can protect the landmark and reduce damage from impending weather. History is important to a community and may not be replaceable once destroyed.

Lastly, Emergency Operations Plans (EOP) integrate with mitigation planning through actions pre- and post-disaster. These actions are a collection of roles and responsibilities from different agencies in the county for a specific type of response. This planning brings partners together prior to an event to

establish goals and any considerations that need to be made or implemented. Pre-event planning is effective in decreasing response time and increasing community resilience.

Section 7: Plan Update

There have been several changes in the community since the last Mitigation Plan. Fairfield County has experienced a lot of growth in development such as housing and businesses. The population has increased and additional businesses, some quite large, have come to the county as well. This section describes the changes in Fairfield County since the 2018 Mitigation Plan.

7.1 Changes in Development

In 2018, the estimated census of Fairfield County was 155,782 souls. In 2021, the estimated census was 161,064 (U.S. Census Bureau, 2018; U.S. Census Bureau, 2021). No additional data was available after 2021 when this report was written. Since the last plan, the population has grown about 5,250 people which is an average of 1,760 additional people a year. Fairfield County is contiguous to Franklin County and there are several large employers coming to the Central Ohio area. As people and their families come to Central Ohio for work, many are looking at Fairfield County as a place to live.

To accommodate the extra residents, housing is also taking off. Since 2018, there have been several annexations into villages and cities including Canal Winchester, Lancaster, Lithopolis, Millersport, and Pickerington. Most of the growth is taking place in the northern part of the county, closer to Franklin and Licking County. (See Appendix U for a map of the annexations.)

While the population is changing, so is the land use. The Fairfield County Regional Planning Commission created a report called the *Fairfield County Comprehensive Land Use Plan 2018.* From this plan comes the 2018 and 2021 maps. The 2021 map shows future planning but was confirmed as the latest map from Regional Planning. Appendices Q and R show the 2018 and 2021 land use maps respectively. It should be noted that the pink in the 2021 map are the growth areas. Growth is extremely large from the Lancaster area up through the State Route 33 corridor into Carroll, Lithopolis, Pickerington, and Canal Winchester area. Large growth can also be seen in Baltimore. There are still smaller areas of growth in Millersport, Amanda, Tarlton, Bremen, and Sugar Grove. This growth is likely due to businesses and population moving into the area.

A large change to the county since the last Mitigation Plan is the addition of pipelines that run most of the area. When the 2018 Mitigation Plan was being developed, pipeline companies were just coming to the area and installing a large network of lines that carry natural gas from larger collection sites and then on to their destination. Every township in Fairfield County has been affected by the pipelines. The addition of these pipelines creates another vulnerability during a severe weather event. If damaged, these pipelines can create a hazmat incident which is explored more in the HIRA.

7.2 Weather Changes

Weather change is a new topic to the county Mitigation Plan. FEMA started requiring the topic in 2023 and is reflected in this version of the plan.

The term “Climate Change” sparks a lot of political controversy in Fairfield County. The public survey conducted captured several public comments regarding climate change ranging from a political controversy with leading questions to looking at the natural cyclical pattern of weather to residents

noticing a change in weather patterns. All perspectives are appreciated and noted. A summary of public response is shown to the left in Table 30. Of note, the percentages may not equal 100% as respondents were allowed to list more than one answer.

What do you think is causing the change in Frequency or Intensity of severe weather?
No Answer – 54.4%
Climate Change/ Global Warming – 20.8%
Normal Weather Cycle – 10.4%
Human Activity/Population – 3.2%
Community Infrastructure – 2.4%
Pollution – 1.6%
Land Use / Building & Development – 1.6%
Commerce – 1.2%
Unsure – 1.2%
N/A or No Change – 1.2%
Bible Prophecy – 0.8%
Volcanic Deposits – 0.4%
Increased Rain – 0.4%
Many Reasons – 0.4%

Table 30: Public response to reasons for change in weather

Answers were grouped based on response so that percentages did not appear artificial. Those without answer make up the majority of the responses.

This plan does not consider the political ramifications of the term "climate change" and will therefore refer to "weather changes" instead.

There are several methods to look at data and draw trends. The method in this plan is to look at the historical data listed in the 2018 Mitigation Plan and compare to the data from January 2017 to July 2022 as this is the data currently available. Looking back through the hazards discussed in Section 3, the following conclusions on changes in weather can be drawn:

- **Dams** – incidents are increasing to about every two years, likely due to age of the structures.
- **Earthquake** – may be increasing in frequency, but not a lot of data to know for sure. Recent incidents were not felt by residents and did not rate high in magnitude.
- **Flood** – 40 events in 58 years (0.689) during the period of 1959 to 2017. 26 events in 5.5 years (4.72) from 2017 to mid-2022.
- **Summer Storms** – 219 events in 48 years (4.56) during period from 1968 to 2016. 78 events in 5.5 years (14.182) from 2017 to mid-2022.
- **Tornado** – 21 events in 52 years (0.404) from 1963 to 2015. 1 event in 6 years (0.167) from 2016 to mid-2022.
- **Winter Storms** – 64 events in 20 years (3.20) from 1996 to 2016. 36 events in 5.5 years (6.545) from 2017 to mid-2022.

The ratios above indicate that flood events, summer storms, and winter storms are increasing in frequency. Tornados appear to be decreasing even though there is a general increase across the nation.

The Climate Explorer is a beneficial tool that can show past trends in weather events as well as future projections. The Climate Explorer shows data on weather trends in Table 31 (U.S. Federal Government, 2021).

Most of the observed numbers are lower than the projections in the 2090's. This indicates that the average daily minimum and maximum temperatures as well as the total precipitation will likely increase as time moves on. Implementing weather stations across the county with a long history of data would further show trends in the weather and if it is indeed cyclical or a continual upward trend. Short term data may not accurately show trends as anomalies can throw in outlier data.

	1961-1990 Average	2090's Projection – Lower Emission	2090's Projection – Higher Emission
Daily Average Maximum Temperature (°F)			
Annual	62	68.2	73
Spring	62.5	69.4	72
Summer	84.4	91.5	97
Fall	65.4	72.5	76
Winter	35.8	40.3	46
Daily Average Minimum Temperature (°F)			
Annual	40.3	45.9	50
Spring	38.6	44.5	48
Summer	61.6	67.5	72
Fall	40.8	46.2	51
Winter	18.5	24.9	30
Total Precipitation (inches)			
Annual	37.6	39.5	41
Spring	3.49	3.51	4
Summer	4.36	4.02	4
Fall	2.44	2.28	3
Winter	2.7	2.97	3

Table 31: Climate Explorer data for Fairfield County

7.2 Community Priorities

Collectively, Fairfield County jurisdictions agree that the goal of the 2023 Mitigation Plan is to "reduce the risks from natural hazards through public education and outreach, new and enhanced partnerships, and implementation of preventative activities" (Fairfield County 2018 Mitigation Plan, 2018). The Core Group decided that this goal should be carried over into the 2023 plan.

With a common goal in mind, the jurisdictions also agreed that life safety should be the number one priority. This is the first priority of public service actions as well. Property and environment follow life safety in priorities. The jurisdictions used this framework when prioritizing mitigation projects.

Ultimately, finances and paying for mitigation projects is a critical factor. When prioritizing projects and how the jurisdictions would implement mitigation actions, life safety was number one followed by cost. If the responsible parties cannot find a way to fund the projects, no matter how critical they are, the projects will have to wait until creative funding opportunities can be found. During the planning phase for this plan, there was a lot of conversation within jurisdictions to find creative funding opportunities.

7.3 Mitigation Projects

The first version of the Fairfield County Mitigation Plan was in 2003. Since then, many projects have been completed or have a status. Appendix S shows the list of past projects and their current status as of the writing of this plan. Appendix T shows new projects added to the plan. New projects identified in 2022 have a status of "New Project".

Projects listed are the responsibility of the agency that identified the projects. This does not mean that the agency is solely responsible for the implementation of the project, however, they are the lead unless

other collaborations and arrangements are made. It is up to the jurisdiction to identify collaborations or delegate the action item to another entity.

Potential funding sources for these projects are also identified in the list. As this is a plan, there is flexibility for new partnerships, funding sources, and ideas. Identification of projects is one step for a jurisdiction to be eligible for FEMA grant funding but is not a guarantee. Jurisdictions are encouraged to creatively seek funding for these projects through federal, state, local, and private grants; cost sharing through collaborations and partnerships; and any other appropriate means.

The timeframes for these projects are best estimates and goals. There are several factors at play when planning and implementing a project such as cost, supply availability, workers, and timeframe of any additional parties (contractors, financers, *etc*.). Again, as this is a plan, these timeframes are goals but allow for flexibility of the real world.

Section 8: Plan Adoption

8.1 Adoption Process

The Fairfield County Commissioner's and individual townships, cities, and villages are responsible for adopting the latest version of the Mitigation Plan upon approval from FEMA. These jurisdictions have adopted the federally approved Mitigation Plan per FEMA requirements. Portions of Canal Winchester and the City of Reynoldsburg that cross the Fairfield County border are under the Franklin County Hazard Mitigation Plan and are not covered under this plan.

Resolutions and adoption documentation can be found in Appendix V.

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Appendix S – Previous Mitigation Projects & Status
Appendix T – New & Carryover Projects to 2023 Mitigation Plan
Appendix U – Annexation Maps
Appendix V – Jurisdiction Resolutions

Appendix A – References

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Appendix B – Abbreviations

Acronym	Definition	Acronym	Definition
ACS	American Community Survey	MMI	Modified Mercalli Intensity
ADAMH	Alcohol, Drug, and Mental Health	MRCC	Midwestern Regional Climate Center
BRIC	Building Resilient Infrastructure & Communities	N.D.	No Date
CRMA	Climate Mapping and Resilience Assessment	NASA	National Aeronautics and Space Administration
CRS	Community Rating System	NCEI	National Centers for Environmental Information
EAP	Emergency Action Plan	NFIP	National Flood Insurance Program
EF	Enhanced Fujitsu	NHMP	Natural Hazard Mitigation Plan
EMA	Emergency Management Agency	NRCS	Natural Resources Conservation Service
EOC	Emergency Operations Center	NWS	National Weather Service
EOP	Emergency Operations Plan	ODNR	Ohio Department of Natural Resources
F	Fahrenheit	OEMA	Ohio Emergency Management Agency
F	Fujitsu	OPWC	Ohio Public Works Commission
FEMA	Federal Emergency Management Agency	OSU	Ohio State University
FHBM	Flood Hazard Boundary Map	PA	Public Assistance
FIRM	Flood Insurance Rate Map	PDM	Pre-Disaster Mitigation
FMA	Flood Mitigation Assistance	RCCD	Rush Creek Conservancy District
GIS	Geographic Information System	SLWCD	South Licking Watershed Conservancy District
HHPD	High Hazard Potential Dam	SME	Subject Matter Expert
HIRA	Hazard Identification & Risk Assessment	SOHMP	State of Ohio Mitigation Plan
HMA	Hazard Mitigation Assistance	SRL	Severe Repetitive Loss
HMGP	Hazard Mitigation Grant Program	SWCD	Soil & Water Conservation District
HRCD	Hunter's Run Conservancy District	TBD	To Be Determined
HUC	Hydrologic Unit Code	USACE	United States Army Core of Engineering
IA	Individual Assistance	USDA	United States Department of Agriculture

Appendix C – Participant List / Core Group Members

PARTICIPATING MEMBERS & POINTS OF CONTACT		
NAME	**AGENCY**	**TITLE/POSITION**
FAIRFIELD COUNTY EMERGENCY MANAGEMENT AGENCY		
Tiffany Nash	Emergency Management Agency	Planning
Kochis, Jon	Emergency Management Agency	Director
Garrett Blevins	Emergency Management Agency	Operations
FAIRFIELD COUNTY		
Aundrea Cordle	Fairfield County	County Administrator
Jason Grubb	FC Engineer	Engineering
Jeremiah Upp	FC Engineer	Engineering
James Mako	FC Regional Planning	Regional Planning Committee
Tony Vogel	FC Utility Works	Public Works
Chad Lucht	FC Soil and Water	Floodplain Admin
Jonathan Ferbrache	FC Soil and Water	Floodplain Admin
Jared Collins	FC Sheriff	Law Enforcement
Dave Burgei	FC GIS/Auditor	GIS/Auditor
Amy Brown-Thompson	Prosecuting Attorney	Asst. Pros Attorney
Kasey Farmer	Local Planning Commission	LEPC President
Carri Brown	FC Auditor	Tax assessment/real estate
CITIES		
Denise Crews	City of Lancaster	Environmental Engineer
David Scheffler	City of Lancaster	Mayor
Mitch Noland	City of Lancaster	Engineer/Zoning
Steve Maffin	City of Lancaster	Fire Chief
Nick Snyder	City of Lancaster	Police Chief
William Tolly	City of Lancaster	Assistant Police Chief
Chasilyn Carter	City of Lancaster	Transit Authority
Darren Drumm	City of Lancaster	Water Division
Paul Martin	City of Lancaster	Service Safety Director
Kevin Ross	City of Pickerington	Service Foreman
Don Rector	City of Pickerington	Service Director
VILLAGES		
Carrie Ayers	Village of Amanda	Fiscal Officer
Charlena Fisher	Village of Amanda	Mayor
Teri Wise	Village of Baltimore	Administrator
Lydia Coakley	Village of Bremen	Fiscal Officer
Anthony Taylor	Village of Bremen	Mayor
Edward Drobina	Village of Carroll	Mayor
Eric Sandine	Village of Lithopolis	Mayor
Vince Popo	Village of Millersport	Administrator
Tim Morris	Village of Millersport	Grant Writer
Bill Vance	Village of Pleasantville	Pleasantville Management Consultant
Cynthia Lewis	Village of Rushville	Clerk/Treasurer
Barb Goodwin	Village of Stoutsville	Fiscal Officer

Carly Sparrow	Village of Thurston	Administrator
Tyson Nye	Village of Sugar Grove	Mayor
Jennifer Effinger	Village of W. Rushville	Fiscal Officer
TOWNSHIPS		
Melissa Tremblay	Amanda Township	Fiscal Officer
James Uhl	Berne Township	Trustee
Thomas Williams	Bloom Township	Fire Chief
Jason Smith	Bloom Township	Trustee
Jerry Dobbie	Clearcreek Township	Trustee
Chief Brad Smith	Greenfield Township	Fire Chief
Gail Ellinger	Hocking Township	Trustee
Robert Alt	Liberty Township	Trustee
Shawn Strosnider	Madison Township	Trustee
Jason Miller	Pleasant Township	Trustee
Scott Baker	Richland Township	Trustee
Lisa Burnworth	Rushcreek Township	Fiscal Officer
Vince Utterback	Violet Township	Administrator
Terry Horn	Walnut Township	Trustee
OTHER JURISDICTIONS		
Bill Vance	Walnut Creek Sewer District	Sewage Expert
Lindel Jackson	Hunters Run Conservancy District	Dam Expert
David Snider	Rushcreek Conservancy District	Dam Expert
Kevin Elder	South Licking Watershed Conservancy District	Dam Expert - Director - Chairman
PARTNERS / STAKEHOLDERS		
David Bradley	American Red Cross	Disaster Services
Stan Smith	OSU Extension	Agriculture Expert
Megan Stein	MORPC	Regional Planning - Econ Development
Mark Hoffhines	State of Ohio/ODNR	Buckeye Lake ODNR
Trevor Irwin	Ohio EPA	Environmental Protection
Eric Brandt	Fairfield Medical Center	Medical
Tracy Kelly	Fairfield Medical Center	Medical
Devon Marshall	Fairfield Medical Center	Medical
Stacey Collins	Diley Ridge Medical Center	Medical
Rachel Morsea	Fairfield County Health Department	Environmental Health
Baylie Karmie	Fairfield County Health Department	Public Health Emergency Preparedness
Joe Ebel	Fairfield County Health Department	Health Commissioner
Chad Belville	Fairfield Union Schools	Superintendent
John Parker	Berne Union School District	Superintendent
Kim Radulovich	Walnut School District	Superintendent
Shawn Haughn	Bloom Carroll School District	Superintendent
Timothy Edwards	Amanda-Clearcreek School District	Superintendent
Jeanette Curtis	Information & Referral 2-1-1	Community Liaison
Miranda Gray	ADAMH	Community Liaison

Howard Long	YMCA	Community Liaison
Louis Vamos	Southeastern Correctional Institution	Community Liaison
Laramie Pierce	Cyril Scott Industries	Electrical Supervisor / EHSC

Appendix D – Participant Sign-In Sheets & Meeting Minutes

Below are sign-in sheets from the Mitigation Kickoff Meetings as well as some of the larger jurisdiction meetings. Sheets are organized from oldest (date) to most recent.

Information Redacted

Appendix E – Public Engagement

Public notice that ran in the Lancaster Eagle Gazette on September 1, 2022.

Lancaster Eagle Gazette.

Public Notice

Originally published at lancastereaglegazette.com on 09/01/2022

Fairfield County Emergency Management Agency is looking for public feedback regarding severe weather events and personal preparation. Information gathered from this survey is anonymous and will be included in the Fairfield County Natural Hazard Mitigation Plan. This plan is required by FEMA and lists the natural weather events that affect Fairfield County as well as their impact. The plan goes further to outline strategies and projects jurisdictions within the county would like to take to reduce the impact and risk from these events. We understand we may not be able to stop the threat entirely, but reducing the impact is a win for everyone. We appreciate the feedback from anyone that lives in Fairfield County. Feedback will be accepted through October 31st. If you have any questions, please contact Tiffany Nash at 740-652-7966 or tiffany.nash@fairfieldcountyohio.gov. Survey Link: https://bit.ly/3Af4FoP. Hard copies of the survey are available at the Fairfield County Main Library or by contacting our office. (LEG,Aug28,Sept1,'22#5387675)

Multiple attempts were made to reach the public regarding a survey on severe weather hazards and the impact in Fairfield County, Ohio. An electronic survey was developed using EmailMeForm and pushed out to stakeholders within the county such as the public library system, public transit, Fairfield Medical Center, Diley Ridge Medical Center, Fairfield County Health Department, Information & Referral 2-1-1, local jurisdiction leaders, and more. These partners were asked to share the survey link and description with their residents and clientele. The electronic version was posted on EMA and Fairfield County's website and shared on social media. Public transit posted the QR code for the survey on the buses with the hopes that riders would complete the survey during their trip. Hard copies of the survey were available through EMA, the county library system at all branches, and some of the local jurisdictions. The village of Baltimore posted the link in their residents' utility bills and had hard copies available in the office. Lastly, a legal notice was posted in the Eagle Gazette twice (Sunday and Thursday) to notify the public about the survey as well as directions to access it electronically and hard copy. At the end of the survey period, 248 public responses were received.

The survey link was active for about two months to allow jurisdictions time to get the link in utility bills and residents to access the survey.

Following are screenshots and photos of the notices made available to the public.

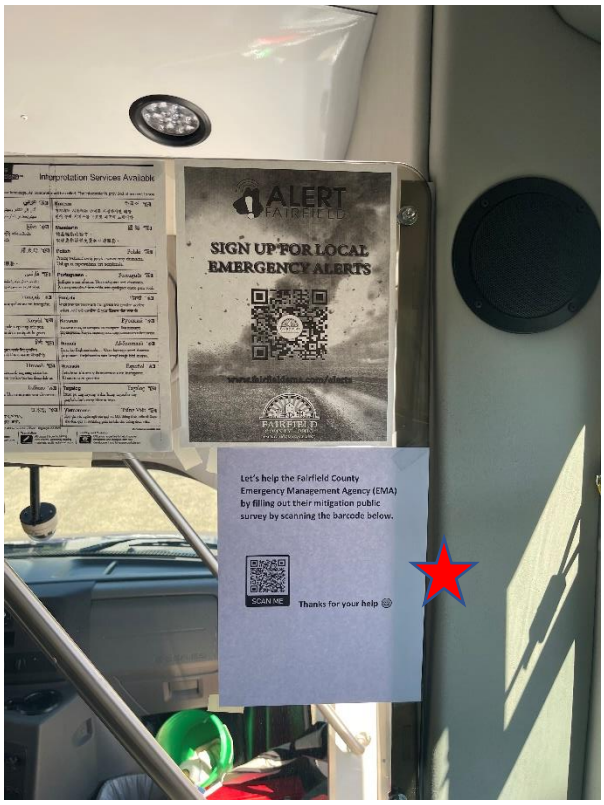

Figure 20: Picture of mitigation survey QR code in LFPT bus

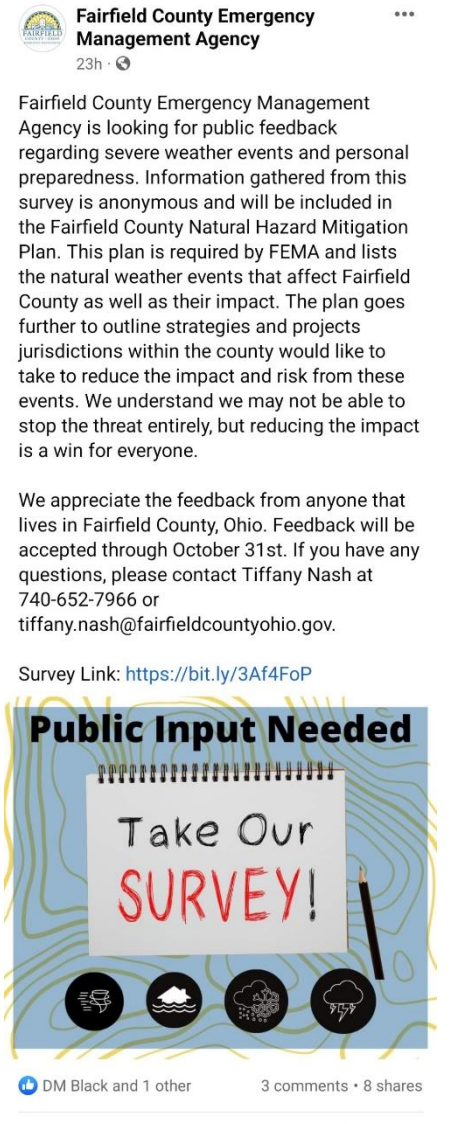

Figure 19: Survey Facebook post on August 23, 2022

Fairfield County
Emergency Management Agency

Figure 21: Public survey posting on EMA's website

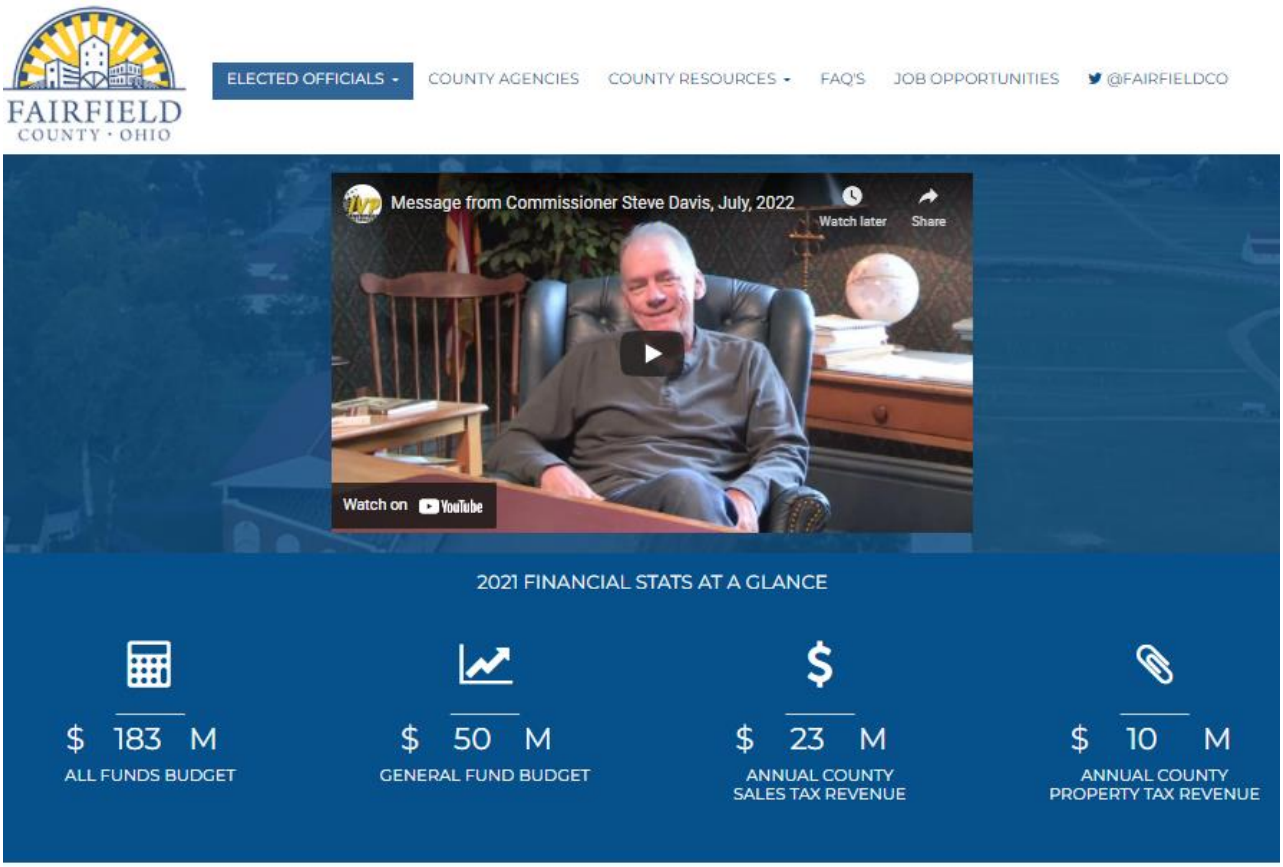

Figure 22: Public survey post on Fairfield County government's website

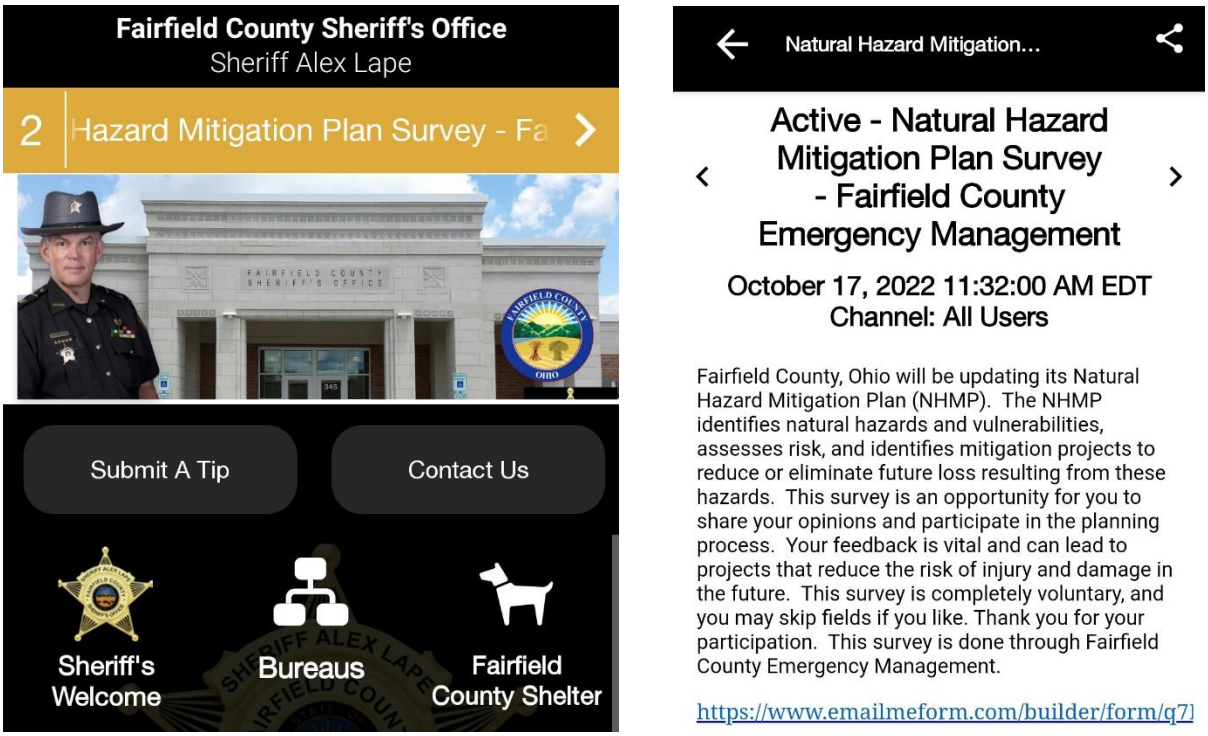

Figure 23: Screenshots from Fairfield County Sheriff's Office app of Mitigation Survey for the public.

Final push for the Mitigation Survey to the public through the Fairfield County Sheriff's Office app. This app is available for download to any resident. This method gained an additional 90 surveys taken.

Appendix F – Public Survey Questionnaire

Natural Hazard Mitigation Plan 2023 – Public Survey

Fairfield County, Ohio will be updating its Natural Hazard Mitigation Plan (NHMP). The NHMP identifies natural hazards and vulnerabilities, assesses risk, and identifies mitigation projects to reduce or eliminate future loss resulting from these hazards. This survey is an opportunity for you to share your opinions and participate in planning process. Your feedback is vital and can lead to projects that reduce the risk of injury and damage in the future. This survey is completely voluntary, and you may skip fields if you like. Thank you for your participation!

Demographics

How long have you lived in Fairfield County, Ohio?

☐ Less than 1 year ☐ 6 to 9 years
☐ 1 to 5 years ☐ 10 to 19 years ☐ 20 years or more

Are you responding on behalf of a residential or commercial property?

☐ Residential ☐ Commercial

Do you own or rent your place of residence / business?

☐ Own ☐ Rent

What city, township, or village do you live in? _____

Natural Hazards

Have you experienced the events below in **Fairfield County**? Please check the box that fits you best.

Event	Yes, I have experienced it.	No, I have not experienced it.
Flood		
Tornado		
Winter Storm		
Landslide		
Dam / Levee Failure		
Wildfire		
Seiche / Coastal Flooding		
Earthquake		
Coastal Erosion		
Drought		
Severe Summer Storms		
Invasive Species		
Land Subsidence (lowering of ground)		

How concerned are you about each hazard?

Event	I am concerned.	I am not concerned.
Flood		
Tornado		
Winter Storm		
Landslide		
Dam / Levee Failure		

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Event	I am concerned.	I am not concerned.
Wildfire		
Seiche / Coastal Flooding		
Earthquake		
Coastal Erosion		
Drought		
Severe Summer Storms		
Invasive Species		
Land Subsidence (lowering of ground)		

Over the last 10 years, have you noticed a change in the frequency or severity of the hazard?

Event	Decreasing	No Change	Increasing
Flood			
Tornado			
Winter Storm			
Landslide			
Dam / Levee Failure			
Wildfire			
Seiche / Coastal Flooding			
Earthquake			
Coastal Erosion			
Drought			
Severe Summer Storms			
Invasive Species			
Land Subsidence (lowering of ground)			

What do you think is causing the change in frequency or intensity (if you noticed a change)?

_____

Flood Hazard Information

To the best of your knowledge, is your property located in a flood zone?

☐ Yes ☐ No

Do you have flood insurance through the National Flood Insurance Program (NFIP)?

☐ Yes ☐ No

If you do not have flood insurance, please select the reasons that may apply.

☐ Cost
☐ Property is not in a flood hazard area
☐ Have never considered carrying flood insurance
☐ I feel my property is "high and dry"
☐ I have other coverage

How many times has your property flooded in the past? Please write a number. _____

Is your property about the same, less, or more prone to flooding now than it was five years ago?

☐ More ☐ Less ☐ About the same

What do you think is causing the change in frequency or intensity?

Preparedness

How prepared do you feel your household is for impacts of natural hazard events in Fairfield County?

- ☐ Not Prepared
- ☐ Slightly Prepared
- ☐ Somewhat Prepared
- ☐ Significantly Prepared
- ☐ Most Prepared

How did you get information on preparedness? (Select all that apply.)

- ☐ Emergency preparedness information from a government source (e.g., federal, state, local emergency management
- ☐ Locally provided news or other media information
- ☐ Social Media (Twitter, Facebook, Instagram, etc.)
- ☐ Schools and other academic institutions
- ☐ Attended meetings that have dealt with disaster preparedness
- ☐ Attended expos or community events that provided preparedness information
- ☐ Past experiences with natural hazards
- ☐ Other

If "other", please describe:

Information about natural disaster impacts and preparedness can be communicated to the public in various ways. Of the methods listed below, please identify the top three (3) methods that would be most effective in helping you prepare your home to withstand natural hazards.

- ☐ Newspaper
- ☐ Informational Brochures
- ☐ Television Advertisements
- ☐ Email
- ☐ Public Awareness Weeks
- ☐ Other
- ☐ Public Meetings
- ☐ Television News
- ☐ Radio
- ☐ Social Media
- ☐ Outdoor Advertisements

If "other", please describe:

Are there any specific risks in your community from natural hazards you think are important and should be addressed? Please be specific. Examples could include a specific street that keeps flooding when it rains heavily, building in a floodplain, significantly eroding banks, etc.

In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

Any other comments you would like to share?

Thank you for filling out this questionnaire. The information you provided is used for mitigation planning purposes. If you have questions regarding this questionnaire or about the county's mitigation efforts, please contact Tiffany Nash, Fairfield County Emergency Management Agency, at 740-652-7966 or tiffany.nash@fairfieldcountyohio.gov.

Appendix G – Map of Dams

The map below shows all dams in Fairfield County, Ohio.

Additional maps are included for Hunters Run Conservancy District (HRCD) Structure 4 and 9. The maps show the sunny day flooding and probable maximum flooding (PMF) for each of these structures separately. Inundation areas affect the City of Lancaster and some outlying areas of the city.

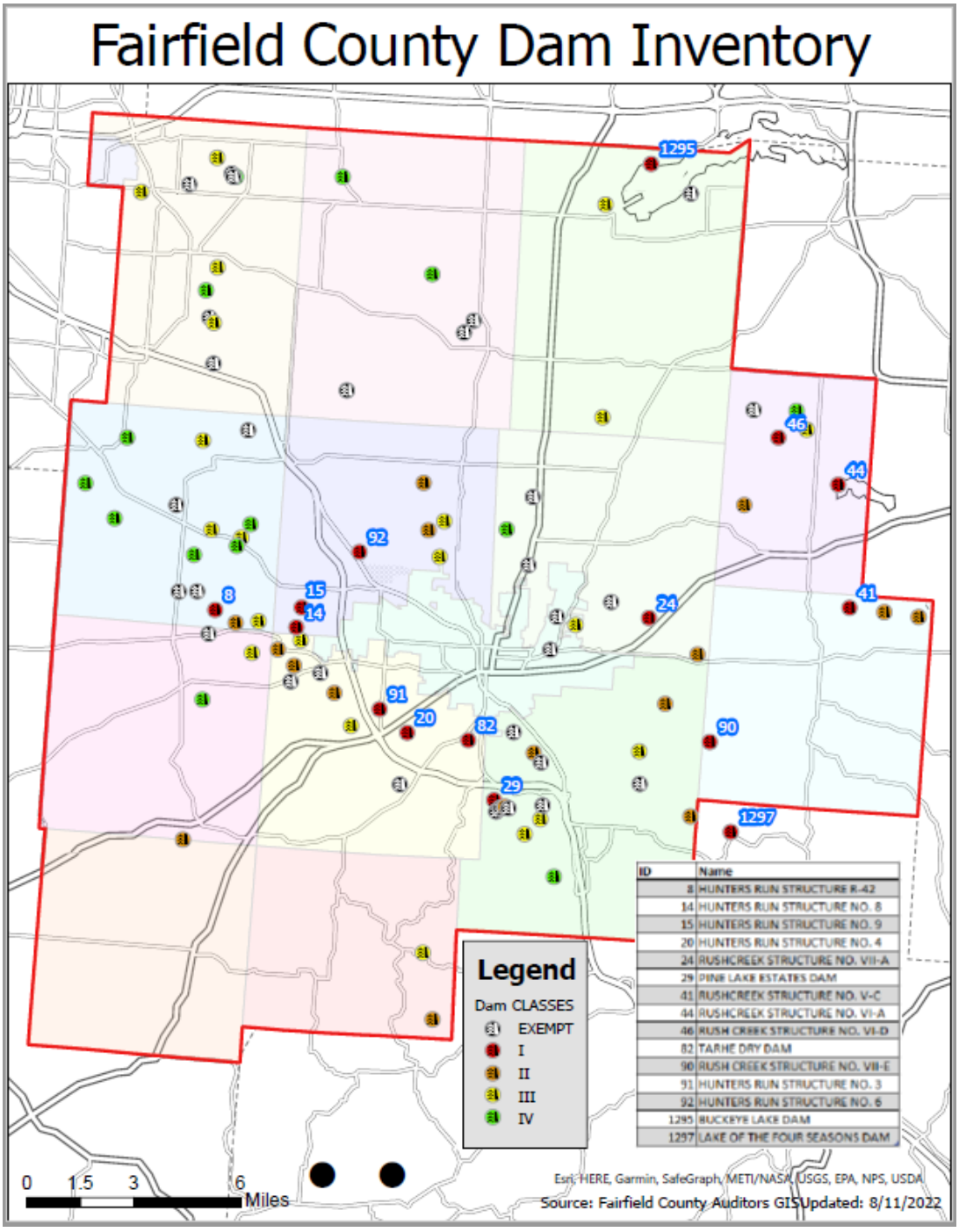


Figure 24: Map of all dams in Fairfield County, including private, public, and high hazard

Fairfield County Dam Inventory (Table)

This is a list presentation of the dams in Fairfield County. It is sorted by class and then alphabetical by name.

Dam Name	Class	Owner Type	Jurisdiction
Angel Pond Dam	Exempt	Private	Bloom
Bauman Lake Dam	Exempt	Private	Richland
Beall Pond Dam	Exempt	Private	Pleasant
Beck Lake Dam	Exempt	Private	Bloom
Benadum Pond Dam	Exempt	Private	Violet
Boka Woods Lake No. 2 Dam	Exempt	Private	Berne
Boka Woods Lake No. 4 Dam	Exempt	Private	Berne
Carpenter Lake Dam	Exempt	Private	Hocking
Collins Lake Dam	Exempt	Private	Pleasant
Deeds Lake Dam	Exempt	Private	Berne
Friel Pond Dam	Exempt	Private	Bloom
Haas Lake Dam	Exempt	Private	Violet
Held Lake Dam	Exempt	Private	Berne
Hickory Lakes Dam	Exempt	Private	Violet
Johnson Pond Dam	Exempt	Private	Berne
Lake Holly Dam	Exempt	Private	Berne
Moore Lake Dam	Exempt	Private	Violet
Nitawell Lake Dam	Exempt	Private	Pleasant
O'Brien Pond Dam	Exempt	Private	Hocking
Scott Pond Dam	Exempt	Private	Amanda Twp
Smith Lake Dam	Exempt	Private	Hocking
Smith Lake Dam	Exempt	Private	Lancaster
Vance Lake Dam	Exempt	Private	Bloom
Wolfe Lake Dam	Exempt	Private	Liberty
Wright Lake Dam	Exempt	Private	Lancaster
Buckeye Lake Dam	I	Public, State	Walnut
HRCD No. 3	I	Public C.D.	HRCD/Hocking
HRCD No. 4	I	Public C.D.	HRCD/Hocking
HRCD No. 6	I	Public C.D.	Greenfield
HRCD No. 8	I	Public C.D.	Greenfield
HRCD No. 9	I	Public C.D.	Greenfield
HRCD R-42	I	Public C.D.	Bloom
Pine Lake Estates Dam	I	Private	Berne
RCCD No. V-C	I	Public C.D.	Rushcreek
RCCD No. VII-A	I	Public C.D.	Pleasant
RCCD No. VII-E	I	Public C.D.	Rushcreek
RCCD VI-A	I	Public C.D.	Richland
RCCD VI-D	I	Public C.D.	Richland
Tarhe Dry Dam	I	Public, Local	Hocking
Anglers Paradise Lake Dam	II	Private	Berne

Dam Name	Class	Owner Type	Jurisdiction
Boka Woods Lake No. 1	II	Private	Berne
HRCD No. 1	II	Public C.D.	HRCD/Hocking
HRCD No. 2	II	Public C.D.	HRCD/Hocking
HRCD No. 5	II	Public C.D.	Greenfield
HRCD No. R-23	II	Public C.D.	HRCD/Hocking
HRCD No. R-63	II	Public C.D.	Greenfield
Lake Loretta Dam	II	Public, Local	Berne
Moe Pond Dam	II	Private	Bloom
RCCD No. 7D	II	Public C.D.	Berne
RCCD No. V-B	II	Public C.D.	Rushcreek
RCCD No. VII-C	II	Public C.D.	Pleasant
RCCD V-A	II	Public C.D.	Rushcreek
RCCD VI-F	II	Public, Federal	Richland
Snortin Ridge Farm Lake Dam	II	Private	Madison
Village of Amanda Dam	II	Public, Local	Amanda Twp
Allegheny West Conference Lake Dam	III	Private	Richland
Chestnut Ridge Metro Park Dam	III	Public, Local	Bloom
Crum Lake Dam	III	Private	Amanda Twp
Dogwood Lake Dam	III	Private	Berne
Donley Lake Dam	III	Private	Violet
Geneva Hills Lake Dam	III	Private	Berne
Harper Lake Dam	III	Private	Bloom
Hintz Lake Dam	III	Private	Berne
HRCD No. R-13	III	Public C.D.	HRCD/Hocking
HRCD No. R-21	III	Public C.D.	HRCD/Hocking
HRCD No. R-33	III	Public C.D.	Bloom
HRCD No. R-61	III	Public C.D.	Greenfield
HRCD No. R-65	III	Public C.D.	Greenfield
Lake Romona Dam	III	Public, Local	Madison
Lang Lake Dam	III	Private	Bloom
Pleasant Acres Dam	III	Private	Lancaster
Sycamore Park Lake Dam	III	Public, Local	Violet
Walden Lake Dam	III	Private, Assn	Walnut
Wetherall Lake Dam	III	Private	Violet
Whetstone Lake Dam	III	Private	Walnut
Coon Hunter Lake Dam	IV	Private, Assn	Bloom
Fairfield Fish and Game Lake Dam	IV	Private	Liberty
Heather Glen Subdivision Dam	IV	Private, Assn	Bloom
Herrmann Pond Dam	IV	Private	Amanda Twp
Jackson Lake Dam	IV	Private	Bloom
Kilbarger Lake Dam	IV	Private	Pleasant
Lake Wahkeena Dam	IV	Public, State	Berne
McGill Pond Dam	IV	Private	Violet
Meadowbrook Pond	IV	Private	Pleasant
Miller Lake Dam	IV	Private	Richland

Dam Name	Class	Owner Type	Jurisdiction
Schaad Lake Dam	IV	Private	Liberty
Waibel Lake Dam	IV	Private	Bloom
Wetzel Lake Dam	IV	Private	Bloom
Benua Lake Dam	Other	Public, Local	Madison

Appendix H – County Inundation Areas Combined

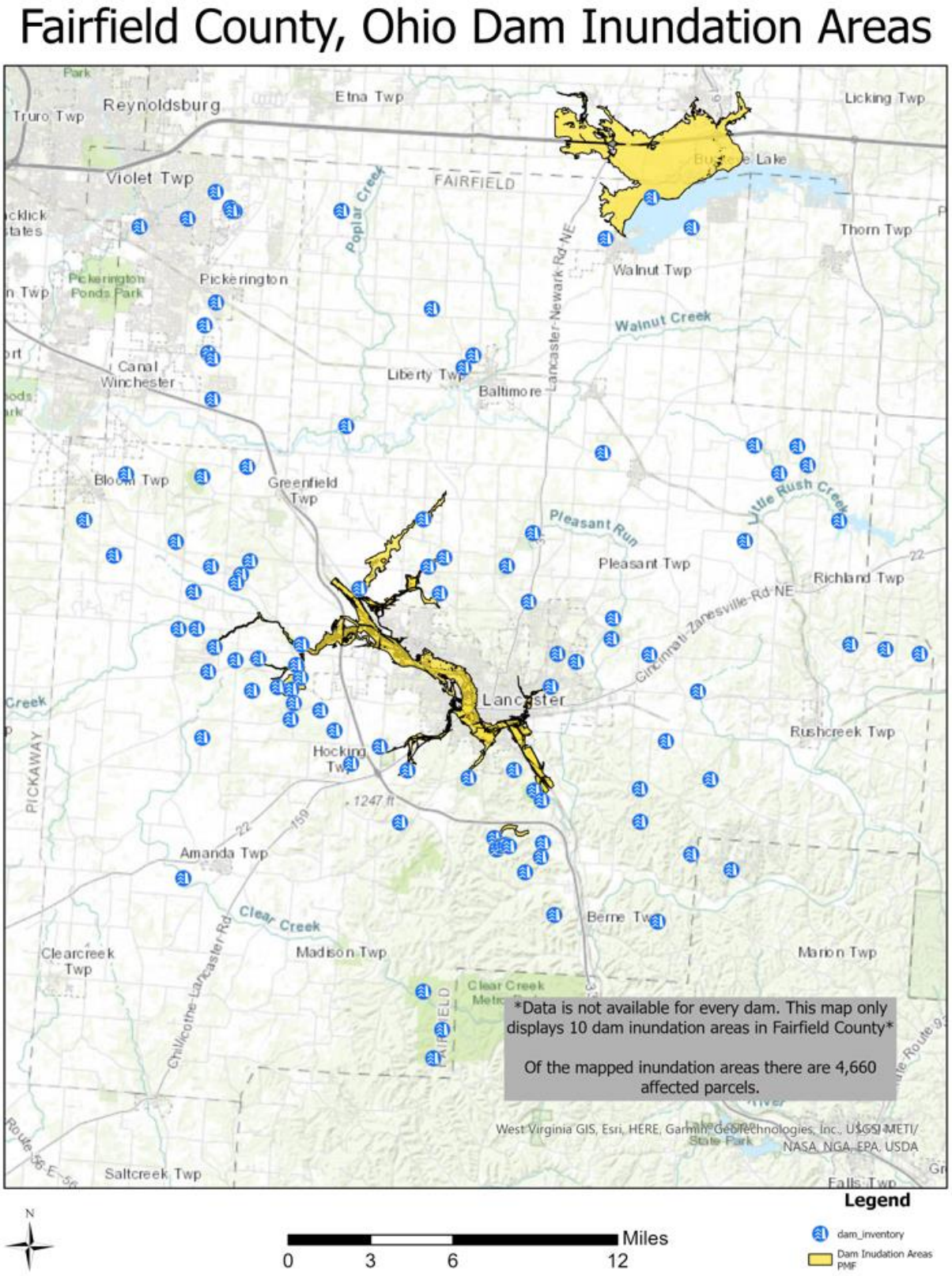


Figure 25: Inundation areas of dams in Fairfield County

Appendix I – HAZUS: Earthquake Global Risk Report

FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: FairfieldCo

Earthquake Scenario: Lancaster, 5 Mag, 5 Km Depth

Print Date: December 01, 2022

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

HAZUS EARTHQUAKE · WIND · FLOOD · TSUNAMI

FEMA

Table of Contents

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Ohio

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 508.27 square miles and contains 36 census tracts. There are over 58 thousand households in the region which has a total population of 158,921 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 60 thousand buildings in the region with a total building replacement value (excluding contents) of 29,693 (millions of dollars). Approximately 91.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,901 and 3,685 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 60 thousand buildings in the region which have an aggregate total replacement value of 29,693 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 4 hospitals in the region with a total bed capacity of 255 beds. There are 52 schools, 21 fire stations, 9 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 5,586.00 (millions of dollars). This inventory includes over 118.06 miles of highways, 327 bridges, 2,992.52 miles of pipes.

Table 1: Transportation System Lifeline Inventory

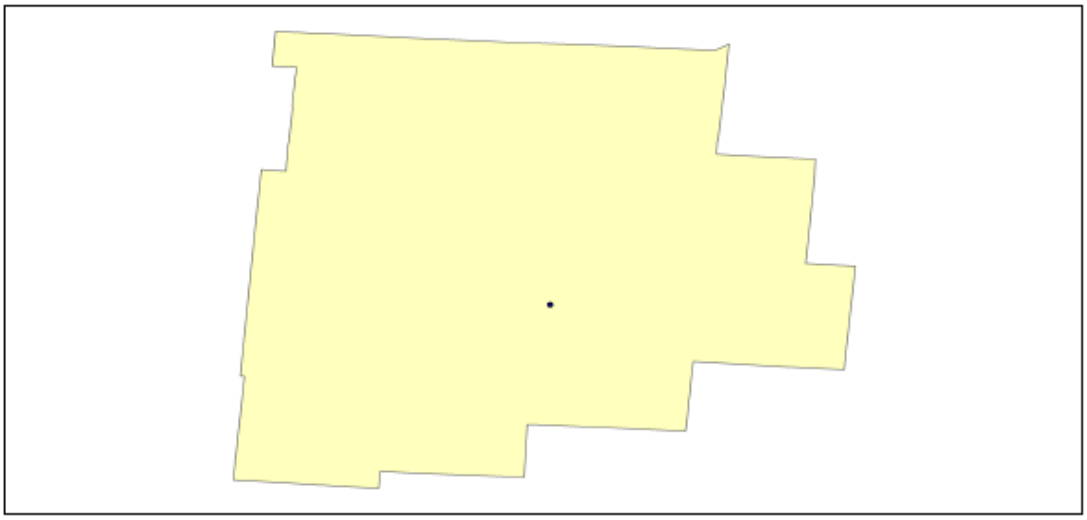
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	327	446.0651
	Segments	37	1111.6934
	Tunnels	0	0.0000
		Subtotal	**1557.7585**
Railways	Bridges	43	195.2200
	Facilities	0	0.0000
	Segments	26	136.6219
	Tunnels	0	0.0000
		Subtotal	**331.8419**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	1	1.8335
		Subtotal	**1.8335**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	1	5.3000
	Runways	1	4.8204
		Subtotal	**10.1204**
		Total	**1,901.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	56.9107
	Facilities	2	69.9300
	Pipelines	0	0.0000
		Subtotal	126.8407
Waste Water	Distribution Lines	NA	34.1464
	Facilities	16	2195.1808
	Pipelines	0	0.0000
		Subtotal	2229.3272
Natural Gas	Distribution Lines	NA	22.7643
	Facilities	1	122.7366
	Pipelines	31	1183.7182
		Subtotal	1329.2191
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	0	0.0000
		Subtotal	0.0000
Communication	Facilities	5	0.5250
		Subtotal	0.5250
		Total	3,685.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	Lancaster, 5 Mag, 5 Km Depth
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-82.60
Latitude of Epicenter	39.71
Earthquake Magnitude	5.00
Depth (km)	5.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Direct Earthquake Damage

Building Damage

Hazus estimates that about 8,854 buildings will be at least moderately damaged. This is over 15.00 % of the buildings in the region. There are an estimated 582 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

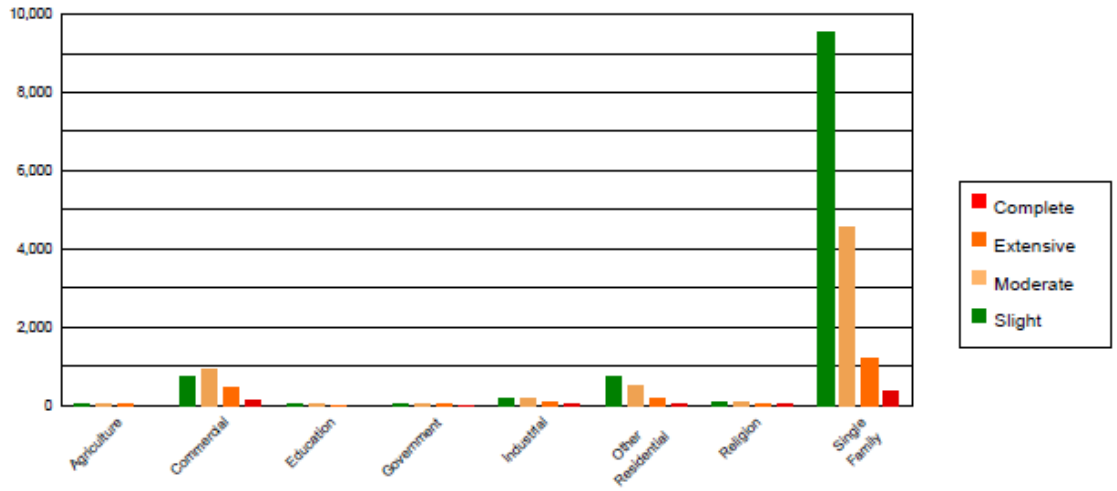


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	57.64	0.14	19.35	0.17	21.35	0.34	10.85	0.54	2.81	0.48
Commercial	1767.31	4.41	754.93	6.66	892.29	14.28	456.13	22.52	141.33	24.24
Education	46.55	0.12	16.67	0.15	18.21	0.29	8.05	0.40	2.53	0.43
Government	72.13	0.18	30.13	0.27	35.81	0.57	15.14	0.75	4.79	0.82
Industrial	388.01	0.97	154.02	1.36	185.18	2.96	100.55	4.96	29.23	5.01
Other Residential	1874.13	4.67	724.26	6.39	495.51	7.93	181.26	8.95	46.84	8.03
Religion	212.13	0.53	78.93	0.70	71.16	1.14	35.79	1.77	10.99	1.89
Single Family	35674.72	88.98	9552.45	84.31	4526.90	72.47	1217.48	60.12	344.44	59.08
Total	40,093		11,331		6,246		2,025		583	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	31192.25	77.80	7956.33	70.22	2838.03	45.43	356.71	17.61	26.12	4.48
Steel	638.81	1.59	221.00	1.95	398.22	6.38	279.53	13.80	89.09	15.28
Concrete	213.69	0.53	72.98	0.64	92.74	1.48	49.28	2.43	10.79	1.85
Precast	200.03	0.50	58.50	0.52	98.15	1.57	72.80	3.59	15.55	2.67
RM	90.24	0.23	21.96	0.19	38.59	0.62	27.90	1.38	4.12	0.71
URM	7505.44	18.72	2868.77	25.32	2600.61	41.63	1153.24	56.94	418.55	71.80
MH	252.15	0.63	131.21	1.16	180.09	2.88	85.81	4.24	18.74	3.21
Total	**40,093**		**11,331**		**6,246**		**2,025**		**583**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 255 hospital beds available for use. On the day of the earthquake, the model estimates that only 179 hospital beds (70.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 81.00% of the beds will be back in service. By 30 days, 95.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	4	0	0	3
Schools	52	9	0	36
EOCs	1	1	0	0
PoliceStations	9	2	0	6
FireStations	21	2	0	15

Transportation Lifeline Damage

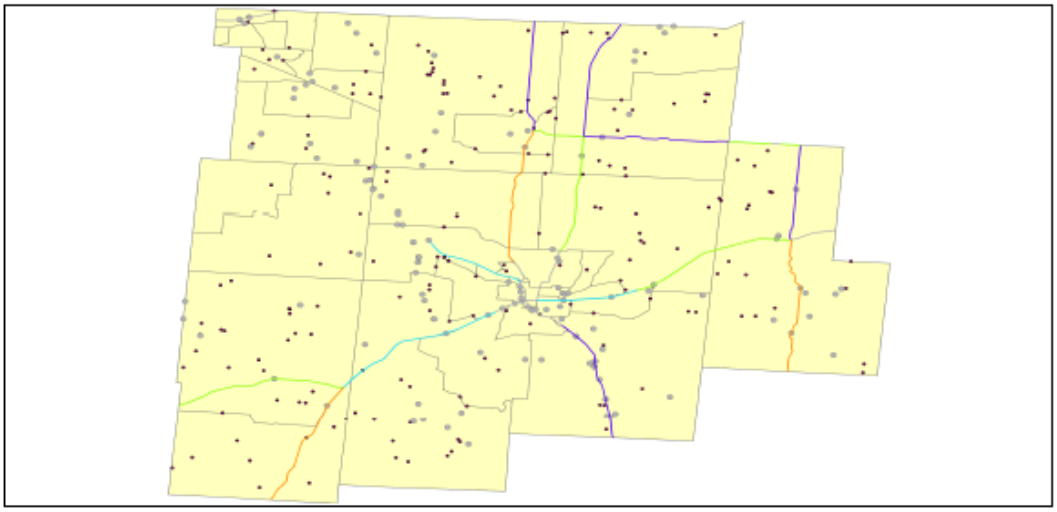


Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	37	0	0	37	37
	Bridges	327	1	0	326	327
	Tunnels	0	0	0	0	0
Railways	Segments	26	0	0	26	26
	Bridges	43	0	0	43	43
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	1	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	1	0	1	1
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	2	1	0	1	2
Waste Water	16	6	0	6	16
Natural Gas	1	1	0	0	1
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	5	3	0	4	5

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	1,768	238	60
Waste Water	1,061	120	30
Natural Gas	164	8	2
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	58,691	392	0	0	0	0
Electric Power		22,639	18,665	11,186	1,641	26

Induced Earthquake Damage

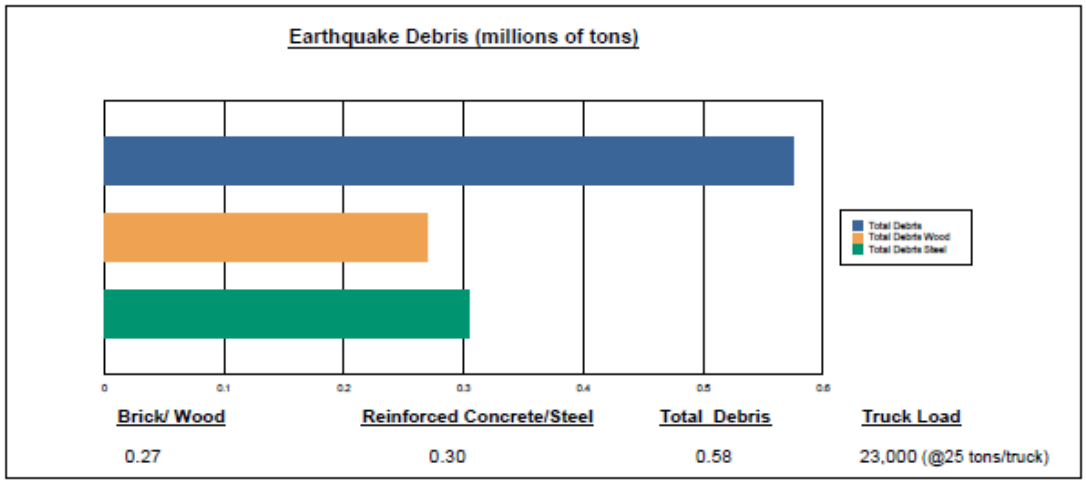
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 575,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 47.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 23,000 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



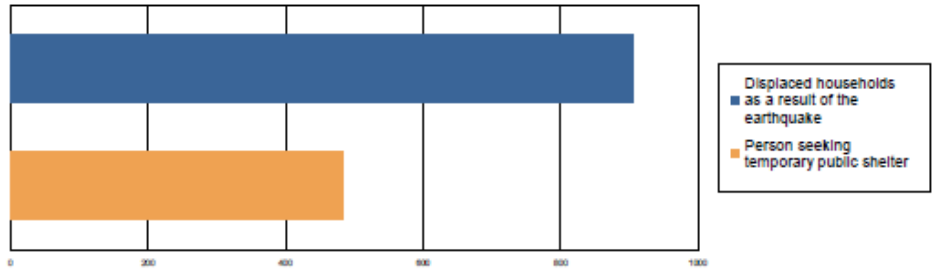
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.27	0.30	0.58	23,000 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 905 households to be displaced due to the earthquake. Of these, 484 people (out of a total population of 158,921) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
905	484

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	5.70	1.37	0.18	0.36
	Commuting	0.00	0.01	0.01	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.03	0.01	0.00	0.00
	Industrial	3.68	0.88	0.12	0.23
	Other-Residential	53.14	11.96	1.57	3.06
	Single Family	230.42	50.99	6.81	13.35
	Total	**293**	**65**	**9**	**17**
2 PM	Commercial	356.30	85.21	11.42	22.14
	Commuting	0.03	0.05	0.07	0.01
	Educational	101.86	24.85	3.58	6.94
	Hotels	0.01	0.00	0.00	0.00
	Industrial	27.16	6.49	0.86	1.67
	Other-Residential	18.03	4.18	0.57	1.07
	Single Family	76.20	17.49	2.45	4.58
	Total	**580**	**138**	**19**	**36**
5 PM	Commercial	231.47	55.25	7.44	14.27
	Commuting	0.51	0.86	1.23	0.25
	Educational	10.12	2.57	0.38	0.73
	Hotels	0.01	0.00	0.00	0.00
	Industrial	16.98	4.05	0.54	1.04
	Other-Residential	21.04	4.87	0.67	1.25
	Single Family	92.45	21.12	2.95	5.52
	Total	**373**	**89**	**13**	**23**

Economic Loss

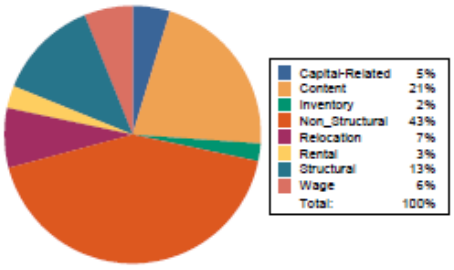
The total economic loss estimated for the earthquake is 3,016.82 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 2,645.64 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 35 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

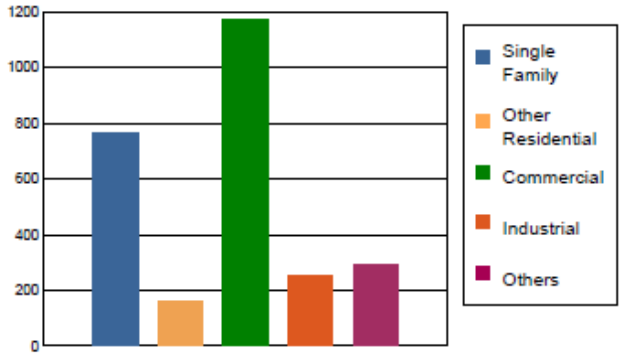


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.1073	138.7965	4.5636	12.6774	162.1448
	Capital-Related	0.0000	2.5981	115.0879	2.7633	2.2575	122.7068
	Rental	15.3792	10.0869	46.9821	2.3844	4.3223	79.1549
	Relocation	55.1811	6.3638	85.6097	10.3921	36.8426	194.3893
	Subtotal	**70.5603**	**25.1561**	**386.4762**	**20.1034**	**56.0998**	**558.3958**
Capital Stock Losses							
	Structural	109.5999	13.6832	138.6985	33.1979	39.4055	334.5850
	Non_Structural	418.3244	93.0226	383.7832	108.2389	124.1434	1,127.5125
	Content	167.2702	30.6955	218.9579	78.4184	71.4517	566.7937
	Inventory	0.0000	0.0000	43.0467	13.3777	1.9244	58.3488
	Subtotal	**695.1945**	**137.4013**	**784.4863**	**233.2329**	**236.9250**	**2087.2400**
	Total	**765.75**	**162.56**	**1170.96**	**253.34**	**293.02**	**2645.64**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1111.6934	0.0000	0.00
	Bridges	446.0651	5.2140	1.17
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1557.7585**	**5.2140**	
Railways	Segments	136.6219	0.0000	0.00
	Bridges	195.2200	0.5981	0.31
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**331.8419**	**0.5981**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	1.8335	0.6998	38.17
	Subtotal	**1.8335**	**0.6998**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	5.3000	2.0385	38.46
	Runways	4.8204	0.0000	0.00
	Subtotal	**10.1204**	**2.0385**	
	Total	**1,901.55**	**8.55**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	69.9300	13.5897	19.43
	Distribution Lines	56.9107	1.0725	1.88
	Subtotal	**126.8407**	**14.6622**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	2195.1808	315.0030	14.35
	Distribution Lines	34.1464	0.5387	1.58
	Subtotal	**2229.3272**	**315.5417**	
Natural Gas	Pipelines	1183.7182	0.0000	0.00
	Facilities	122.7366	32.0748	26.13
	Distribution Lines	22.7643	0.1846	0.81
	Subtotal	**1329.2191**	**32.2594**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.5250	0.1668	31.77
	Subtotal	**0.5250**	**0.1668**	
	Total	**3,685.91**	**362.63**	

Appendix A: County Listing for the Region

Fairfield,OH

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Ohio	Fairfield	158,921	20,390	9,303	29,693
Total Region		**158,921**	**20,390**	**9,303**	**29,693**

Appendix J – FEMA Flood Zones

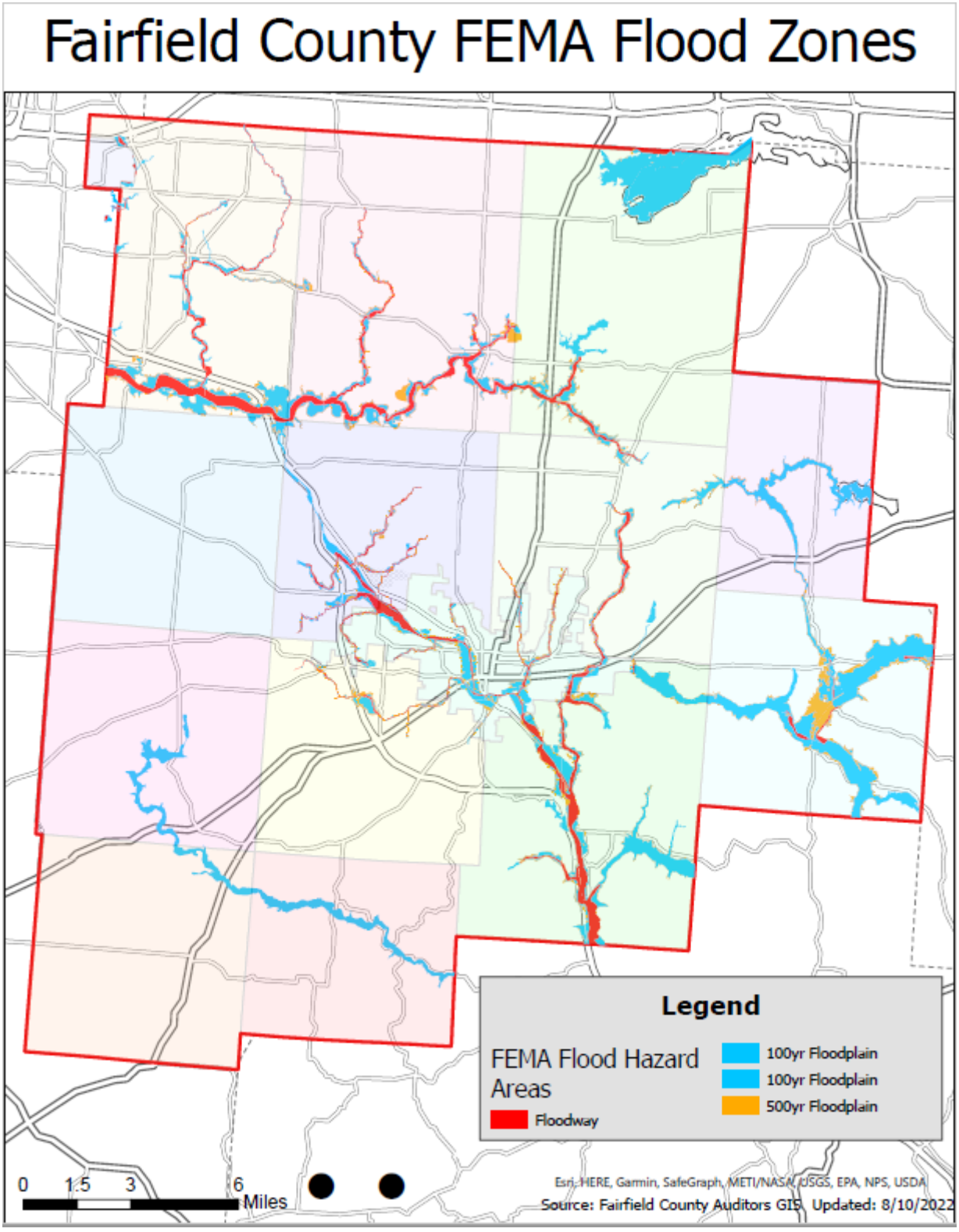


Figure 26: FEMA flood zones for the county under different flood years

Appendix K – HAZUS: Flood Global Risk Report

Hazus: Flood Global Risk Report

Region Name: FairfieldCo

Flood Scenario: Fairfield County 100 Year Flood Run

Print Date: Tuesday, November 29, 2022

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

FEMA

RiskMAP
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Table of Contents

RiskMAP
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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Ohio

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 49 square miles and contains 3,743 census blocks. The region contains over 59 thousand households and has a total population of 158,878 people. The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 60,278 buildings in the region with a total building replacement value (excluding contents) of 29,690 million dollars. Approximately 90.64% of the buildings (and 68.67% of the building value) are associated with residential housing.

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Building Inventory

General Building Stock

Hazus estimates that there are 60,278 buildings in the region which have an aggregate total replacement value of 29,690 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	20,387,854	68.7%
Commercial	5,645,721	19.0%
Industrial	1,461,397	4.9%
Agricultural	60,393	0.2%
Religion	603,001	2.0%
Government	339,159	1.1%
Education	1,192,064	4.0%
Total	**29,689,589**	**100%**

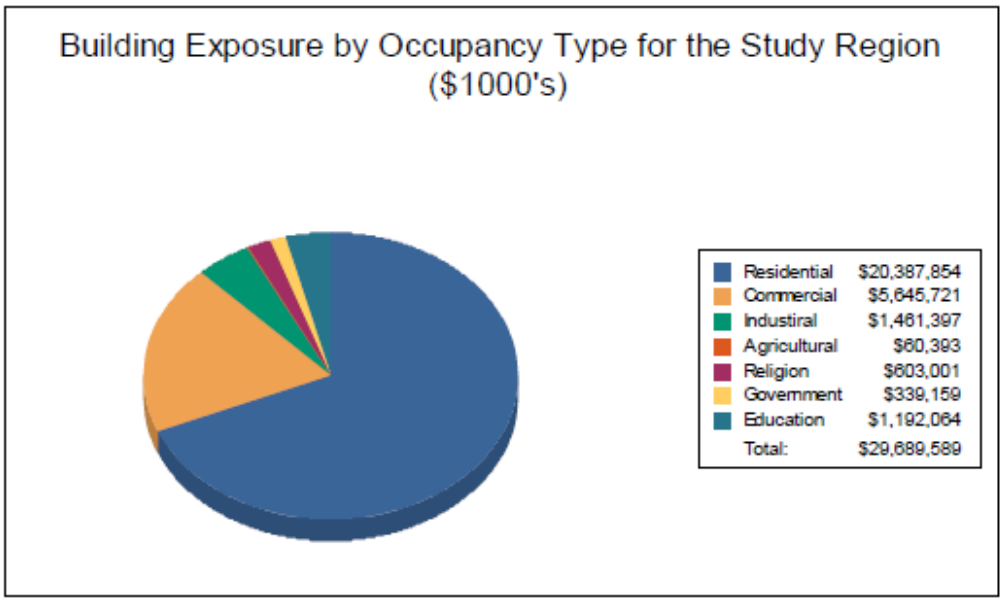
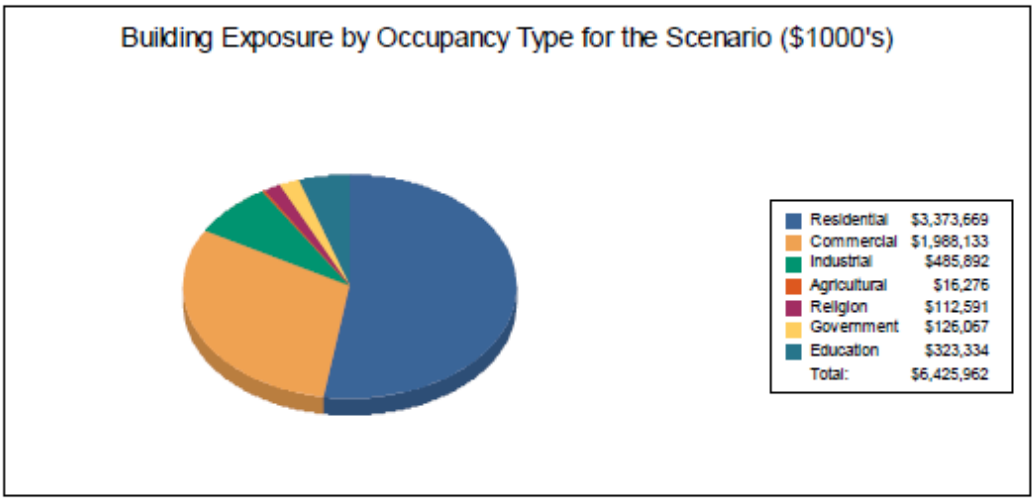


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,373,669	52.5%
Commercial	1,988,133	30.9%
Industrial	485,892	7.6%
Agricultural	16,276	0.3%
Religion	112,591	1.8%
Government	126,067	2.0%
Education	323,334	5.0%
Total	**6,425,962**	**100%**



Essential Facility Inventory

For essential facilities, there are 4 hospitals in the region with a total bed capacity of 255 beds.
There are 52 schools, 21 fire stations, 9 police stations and 1 emergency operation center.

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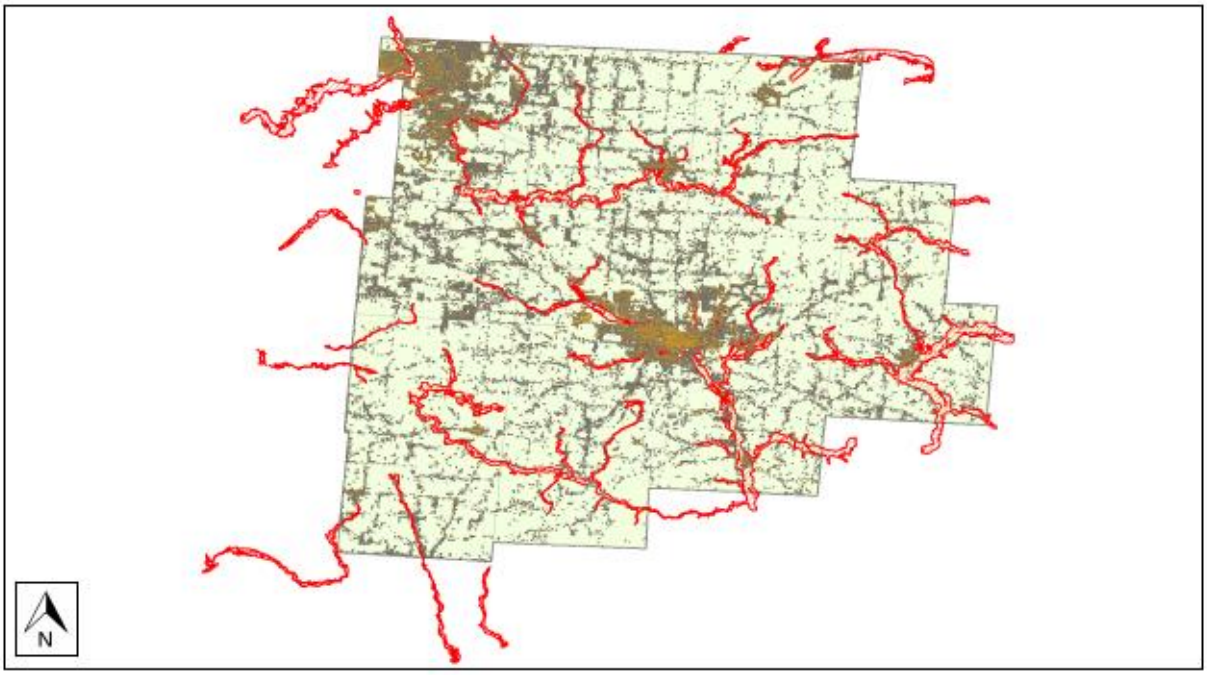
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	FairfieldCo
Scenario Name:	Fairfield County 100 Year Flood Run
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



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Building Damage

General Building Stock Damage

Hazus estimates that about 447 buildings will be at least moderately damaged. This is over 82% of the total number of buildings in the scenario. There are an estimated 3 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = $300K) Overview Map

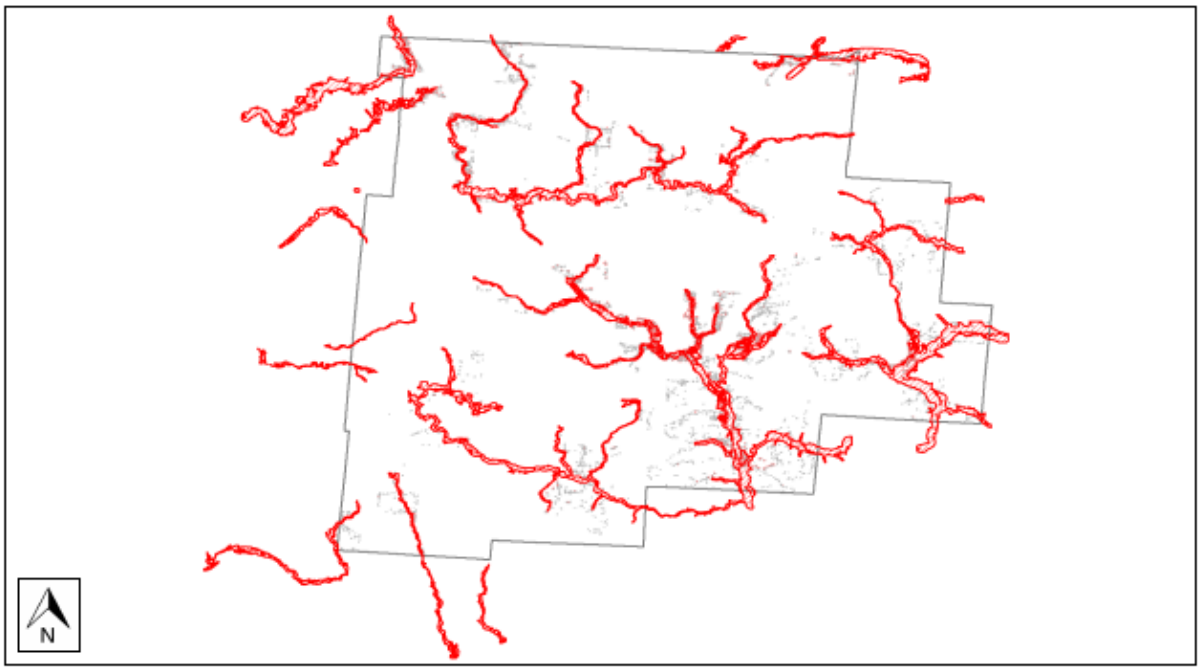

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Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	46	58	25	32	3	4	3	4	2	3	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	1	100	0	0	0	0	0	0	0	0
Industrial	0	0	3	60	2	40	0	0	0	0	0	0
Religion	0	0	1	100	0	0	0	0	0	0	0	0
Residential	176	30	246	42	111	19	34	6	13	2	3	1
Total	**222**		**276**		**116**		**37**		**15**		**3**	

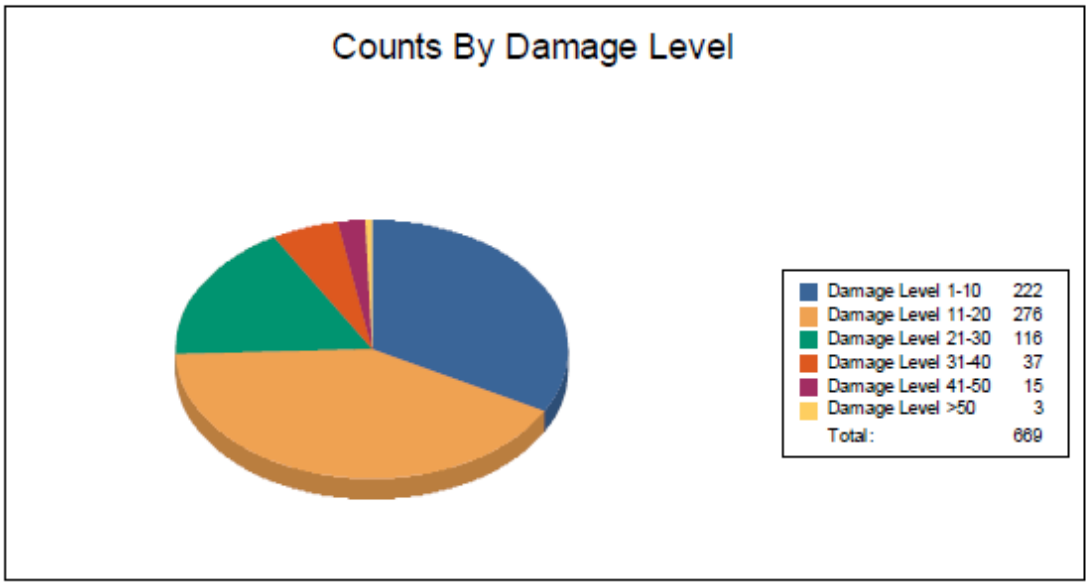


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	5	63	1	13	0	0	2	25	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	0	0
Masonry	36	40	43	47	11	12	1	1	0	0	0	0
Steel	12	67	6	33	0	0	0	0	0	0	0	0
Wood	164	31	218	41	101	19	34	6	13	2	3	1

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 255 hospital beds available for use. On the day of the scenario flood event, the model estimates that 255 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	21	0	0	0
Hospitals	4	0	0	0
Police Stations	9	0	0	0
Schools	52	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

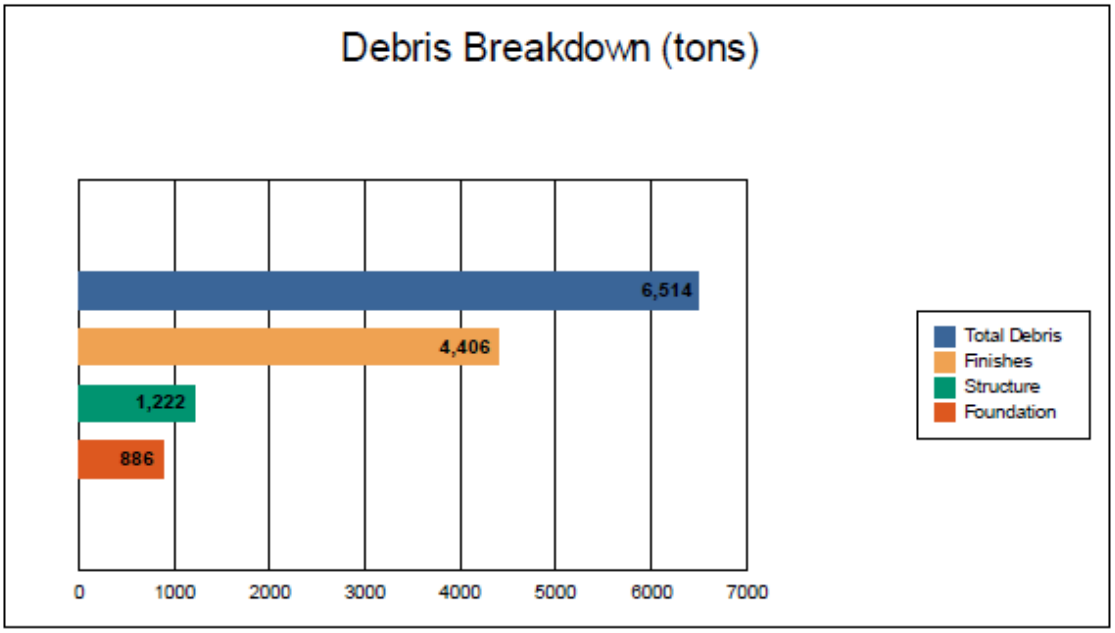
(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



The model estimates that a total of 6,514 tons of debris will be generated. Of the total amount, Finishes comprises 68% of the total, Structure comprises 19% of the total, and Foundation comprises 14%. If the debris tonnage is converted into an estimated number of truckloads, it will require 261 truckloads (@25 tons/truck) to remove the debris generated by the flood.

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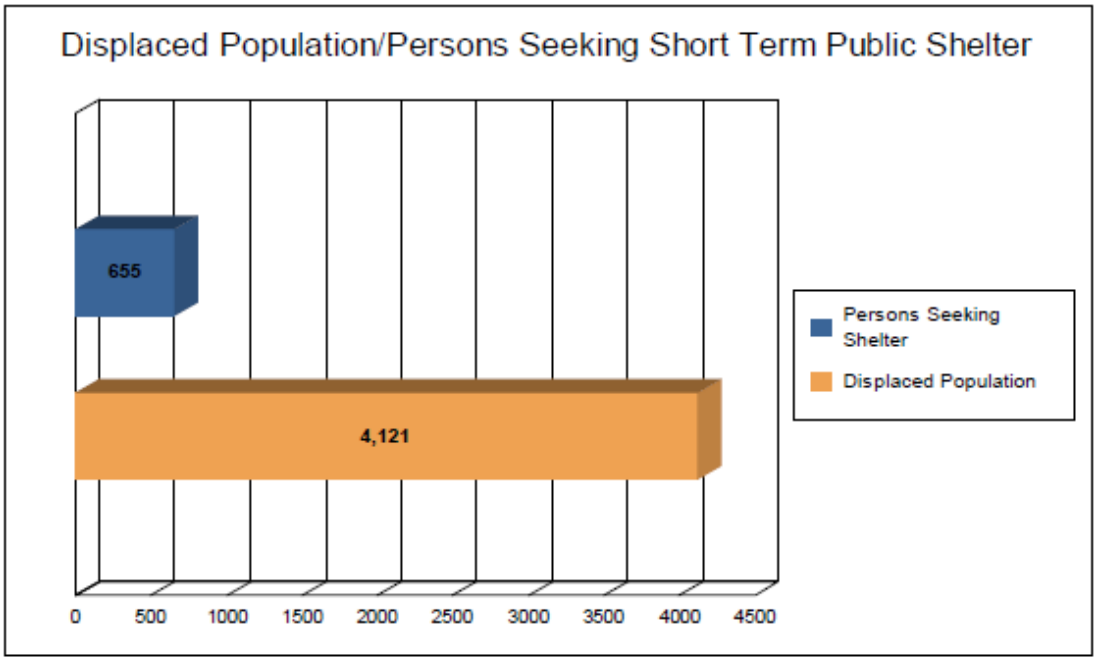
Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,374 households (or 4,121 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 655 people (out of a total population of 158,878) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 1,202.33 million dollars, which represents 18.71 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 522.49 million dollars. 57% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 11.98% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

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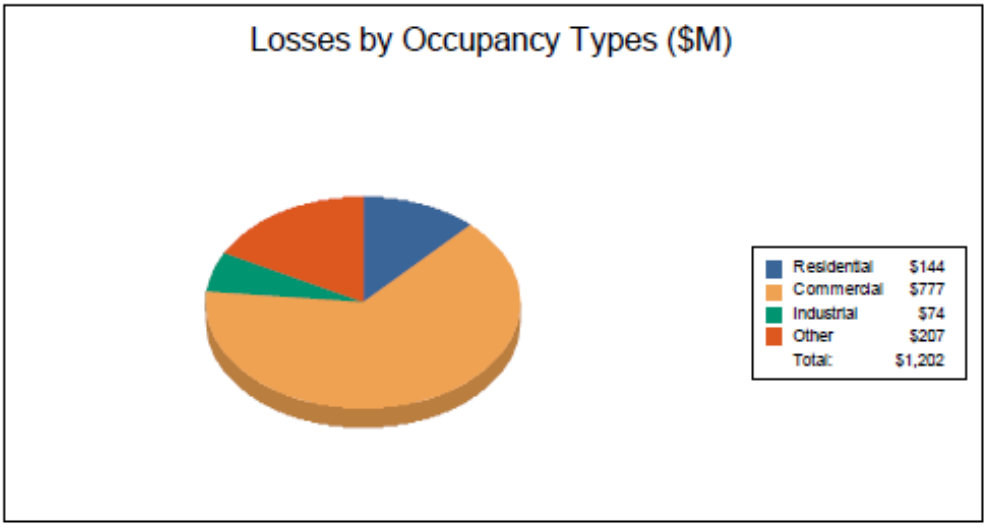
Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	61.99	80.09	17.47	5.57	165.12
	Content	32.40	219.17	42.42	31.62	325.61
	Inventory	0.00	24.61	6.44	0.71	31.75
	Subtotal	**94.39**	**323.87**	**66.33**	**37.90**	**522.49**
Business Interruption						
	Income	5.62	165.79	2.20	15.98	189.59
	Relocation	20.34	55.80	2.12	10.23	88.49
	Rental Income	10.52	28.13	0.60	1.67	40.92
	Wage	13.22	203.11	2.88	141.65	360.85
	Subtotal	**49.69**	**452.83**	**7.80**	**169.52**	**679.84**
ALL	**Total**	**144.08**	**776.70**	**74.13**	**207.42**	**1,202.33**



Appendix A: County Listing for the Region

Ohio
- Fairfield

Appendix B: Regional Population and Building Value Data

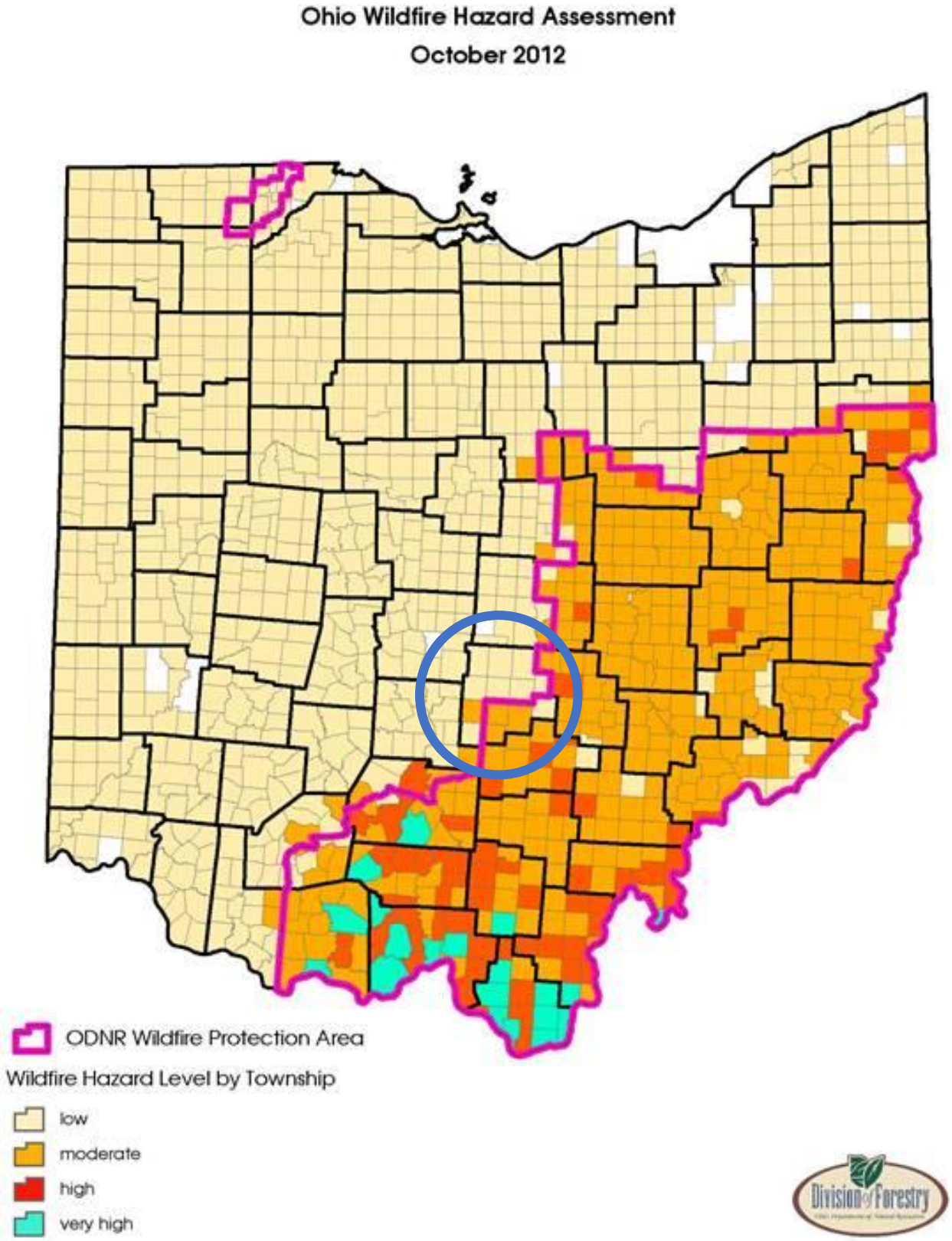
		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Ohio				
Fairfield	158,878	20,387,854	9,301,735	29,689,589
Total	**158,878**	**20,387,854**	**9,301,735**	**29,689,589**
Total Study Region	**158,878**	**20,387,854**	**9,301,735**	**29,689,589**

Appendix L – Severe Summer Storm Data

Location	Date	Type	Injuries	Fatalities	Property Damage	Crop Damage
Rushville	1/10/2017	Thunderstorm Wind	0	0	$5,000	$0
Rushville	3/1/2017	Thunderstorm Wind	0	0	$5,000	$0
Bremen	5/19/2017	Thunderstorm Wind	0	0	$3,000	$0
West Rushville	6/18/2017	Thunderstorm Wind	0	0	$4,000	$0
Millersport	1/7/2017	Thunderstorm Wind	0	0	$5,000	$0
Sugar Grove	7/7/2017	Hail	0	0	$0	$0
Lancaster	7/10/2017	Hail	0	0	$0	$0
Bremen	7/10/2017	Thunderstorm Wind	0	0	$3,000	$0
Lancaster	7/22/2017	Lightning	1	0	$0	$0
Fairfield County Airport	1/22/2018	Thunderstorm Wind	0	0	$0	$0
Baltimore	4/3/2018	Hail	0	0	$0	$0
Lancaster	4/3/2018	Thunderstorm Wind	0	0	$10,000	$0
Baltimore	5/14/2018	Thunderstorm Wind	0	0	$3,000	$0
Millersport	5/14/2018	Thunderstorm Wind	0	0	$1,000	$0
Sugar Grove	5/14/2018	Hail	0	0	$0	$0
Stoudertown	6/16/2018	Thunderstorm Wind	0	0	$5,000	$0
Baltimore	6/16/2018	Thunderstorm Wind	0	0	$5,000	$0
Beals	6/16/2018	Thunderstorm Wind	0	0	$500	$0
Thurston	6/16/2018	Thunderstorm Wind	0	0	$0	$0
Lancaster	6/16/2018	Thunderstorm Wind	0	0	$500	$0
West Rushville	6/16/2018	Thunderstorm Wind	0	0	$3,000	$0
West Rushville	6/16/2018	Thunderstorm Wind	0	0	$20,000	$10,000
Bremen	6/16/2018	Thunderstorm Wind	0	0	$10,000	$0
Bremen	6/16/2018	Thunderstorm Wind	0	0	$2,000	$0
Rushville	7/1/2018	Thunderstorm Wind	0	0	$5,000	$0
Baltimore	8/10/2018	Thunderstorm Wind	0	0	$1,000	$0
Baltimore	8/10/2018	Thunderstorm Wind	0	0	$1,000	$0
Royalton	8/10/2018	Thunderstorm Wind	0	0	$1,000	$0
Beals	3/14/2019	Hail	0	0	$0	$0
Beals	3/14/2019	Hail	0	0	$0	$0
Lancaster	3/14/2019	Thunderstorm Wind	0	0	$1,000	$0
Sugar Grove	6/24/2019	Thunderstorm Wind	0	0	$1,000	$0
West Rushville	6/24/2019	Thunderstorm Wind	0	0	$5,000	$0
Beals	7/2/2019	Thunderstorm Wind	0	0	$2,000	$0
Lancaster	7/2/2019	Thunderstorm Wind	0	0	$2,000	$0
Bremen	8/8/2019	Thunderstorm Wind	0	0	$1,000	$0
Fairfield County	12/30/2019	High Wind	0	0	$0	$0
Baltimore	3/28/2020	Hail	0	0	$0	$0
Stoutsville	4/8/2020	Thunderstorm Wind	0	0	$750	$0
Delmont	6/4/2020	Thunderstorm Wind	0	0	$500	$0
Lancaster	6/4/2020	Hail	0	0	$0	$0
Bremen	6/4/2020	Thunderstorm Wind	0	0	$2,000	$0
Bremen	6/4/2020	Thunderstorm Wind	0	0	$1,000	$0
Bremen	6/4/2020	Thunderstorm Wind	0	0	$12,000	$0
Amanda	6/4/2020	Hail	0	0	$0	$0
Oakland	6/10/2020	Thunderstorm Wind	0	0	$5,000	$0
Lancaster	6/10/2020	Thunderstorm Wind	0	0	$4,000	$0

Beals	8/25/2020	Thunderstorm Wind	0	0	$3,000	$0
Sugar Grove	8/25/2020	Thunderstorm Wind	0	0	$3,000	$0
Beals	8/26/2020	Thunderstorm Wind	0	0	$1,000	$0
Reynoldsburg	10/23/2020	Hail	0	0	$0	$0
Beals	10/23/2020	Hail	0	0	$0	$0
Fairfield County Airport	11/15/2020	Thunderstorm Wind	0	0	$0	$0
Fairfield County	3/25/2021	High Wind	0	0	$5,000	$0
Clearport	10/16/2021	Thunderstorm Wind	0	0	$50,000	$0
Delmont	10/16/2021	Thunderstorm Wind	0	0	$2,000	$0
Sugar Grove	10/16/2021	Thunderstorm Wind	0	0	$250	$0
Royalton	5/3/2022	Thunderstorm Wind	0	0	$10,000	$0
Royalton	5/3/2022	Thunderstorm Wind	0	0	$8,000	$0
Hooker	5/3/2022	Hail	0	0	$0	$0
Lancaster Campground	5/3/2022	Hail	0	0	$0	$0
Hooker	5/3/2022	Hail	0	0	$0	$0
Lancaster	5/3/2022	Hail	0	0	$200,000	$0
Baltimore	5/3/2022	Hail	0	0	$0	$0
Dumontville	5/3/2022	Hail	0	0	$0	$0
Baltimore	5/3/2022	Hail	0	0	$150,000	$0
Hooker	5/3/2022	Thunderstorm Wind	0	0	$5,000	$0
Sugar Grove	5/26/2022	Thunderstorm Wind	0	0	$5,000	$0
Lockville	6/8/2022	Thunderstorm Wind	0	0	$2,000	$0
Dumontville	6/8/2022	Thunderstorm Wind	0	0	$3,000	$0
Lancaster	6/8/2022	Thunderstorm Wind	0	0	$1,000	$0
Pleasantville	6/8/2022	Thunderstorm Wind	0	0	$5,000	$0
Lancaster	6/8/2022	Thunderstorm Wind	0	0	$6,000	$0
Thurston	6/16/2022	Thunderstorm Wind	0	0	$2,000	$0
Beals	6/22/2022	Thunderstorm Wind	0	0	$250	$0
Dumontville	6/22/2022	Thunderstorm Wind	0	0	$3,000	$0
Millersport	7/20/2022	Thunderstorm Wind	0	0	$12,000	$0
Lancaster	7/20/2022	Thunderstorm Wind	0	0	$4,000	$0
TOTALS	**34 Days**	**4 Event Types**	**1**	**0**	**$610,750**	**$20,000**

Appendix M – Ohio Wildfire Hazard Assessment



Appendix N – Winter Storm Data

Location	Date	Event Type	Deaths	Injuries	Property Damage	Crop Damage
FAIRFIELD (ZONE)	1/6/1996	Winter Storm	0	0	$500,000	0
FAIRFIELD (ZONE)	3/6/1996	Ice Storm	0	0	0	0
FAIRFIELD (ZONE)	3/19/1996	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/24/1997	Ice Storm	0	0	0	0
FAIRFIELD (ZONE)	1/1/1999	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/7/1999	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/13/1999	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	12/13/2000	Ice Storm	0	0	0	0
FAIRFIELD (ZONE)	2/15/2003	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/25/2004	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	12/23/2004	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/21/2005	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/22/2005	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/13/2007	Ice Storm	0	0	0	0
FAIRFIELD (ZONE)	12/7/2007	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/1/2008	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/21/2008	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/7/2008	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	12/19/2009	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/7/2010	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/26/2010	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/25/2010	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/16/2010	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/1/2011	Ice Storm	0	0	0	0
FAIRFIELD (ZONE)	1/13/2012	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/20/2012	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/8/2012	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/28/2012	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/25/2013	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/31/2013	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/5/2013	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/24/2013	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	11/26/2013	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/6/2013	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	12/10/2013	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/2/2014	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/17/2014	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/18/2014	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/20/2014	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/4/2014	Winter Storm	0	0	0	0

FAIRFIELD (ZONE)	2/14/2014	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/2/2014	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	11/16/2014	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	11/22/2014	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/5/2015	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/25/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/4/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/14/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/15/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/20/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/21/2015	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/1/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/4/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/23/2015	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/10/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/12/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/22/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/8/2016	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/14/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/15/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/24/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/3/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/13/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/16/2016	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/5/2017	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/8/2017	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	3/13/2017	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/29/2017	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/8/2018	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/12/2018	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/15/2018	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/6/2018	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/20/2018	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	4/1/2018	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/12/2019	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/19/2019	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/1/2019	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/10/2019	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/20/2019	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	11/11/2019	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/15/2019	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/6/2020	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/8/2020	Winter Weather	0	0	0	0

FAIRFIELD (ZONE)	2/27/2020	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	11/30/2020	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/1/2020	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/16/2020	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	12/24/2020	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/1/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/17/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/17/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/30/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/8/2021	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	2/10/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	4/20/2021	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/6/2022	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	1/16/2022	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	1/28/2022	Winter Weather	0	0	0	0
FAIRFIELD (ZONE)	2/2/2022	Winter Storm	0	0	0	0
FAIRFIELD (ZONE)	3/11/2022	Winter Storm	0	0	0	0
	100 Events	**3 Types**	**0**	**0**	**$500,000**	**0**

Appendix O – HHPD Structures

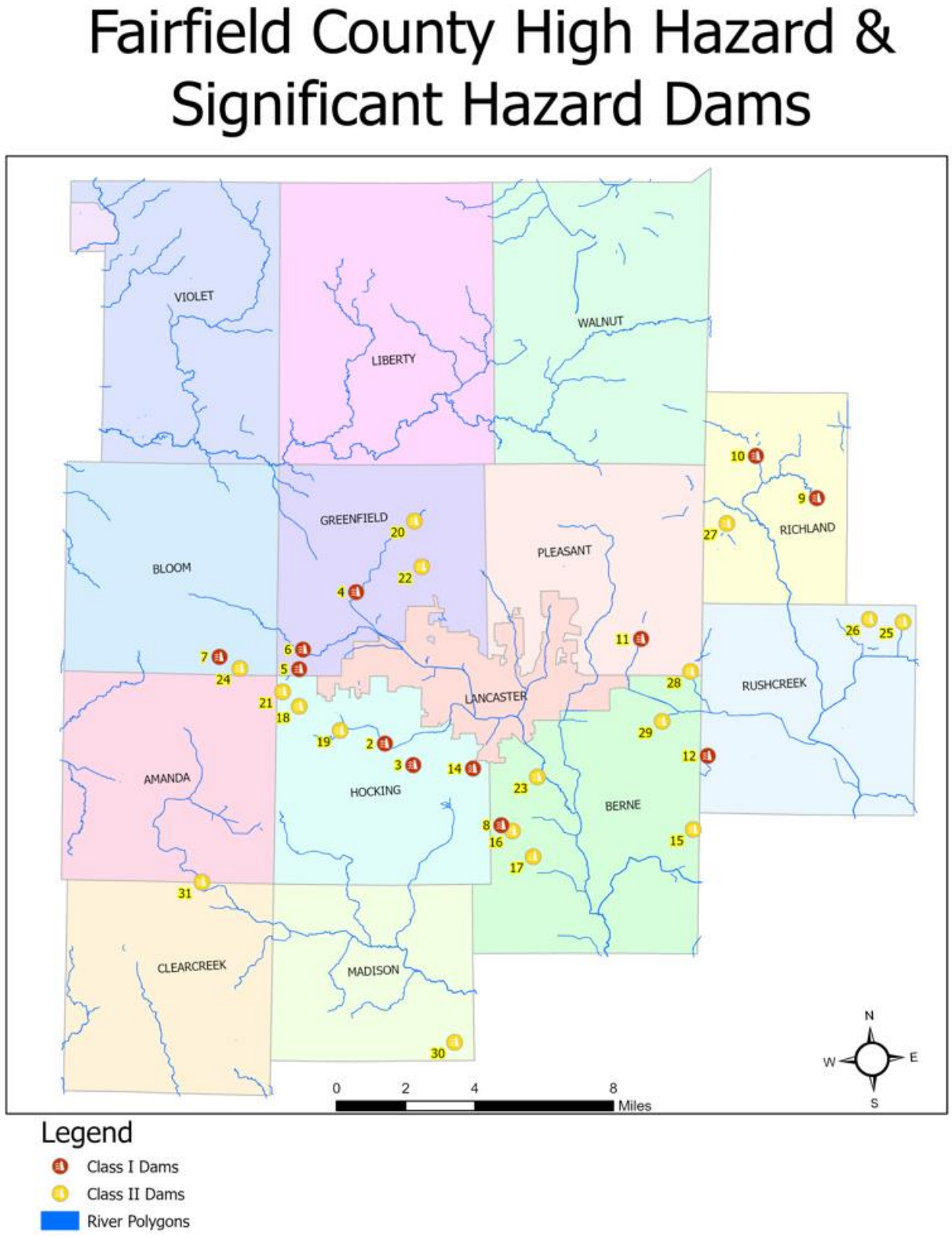
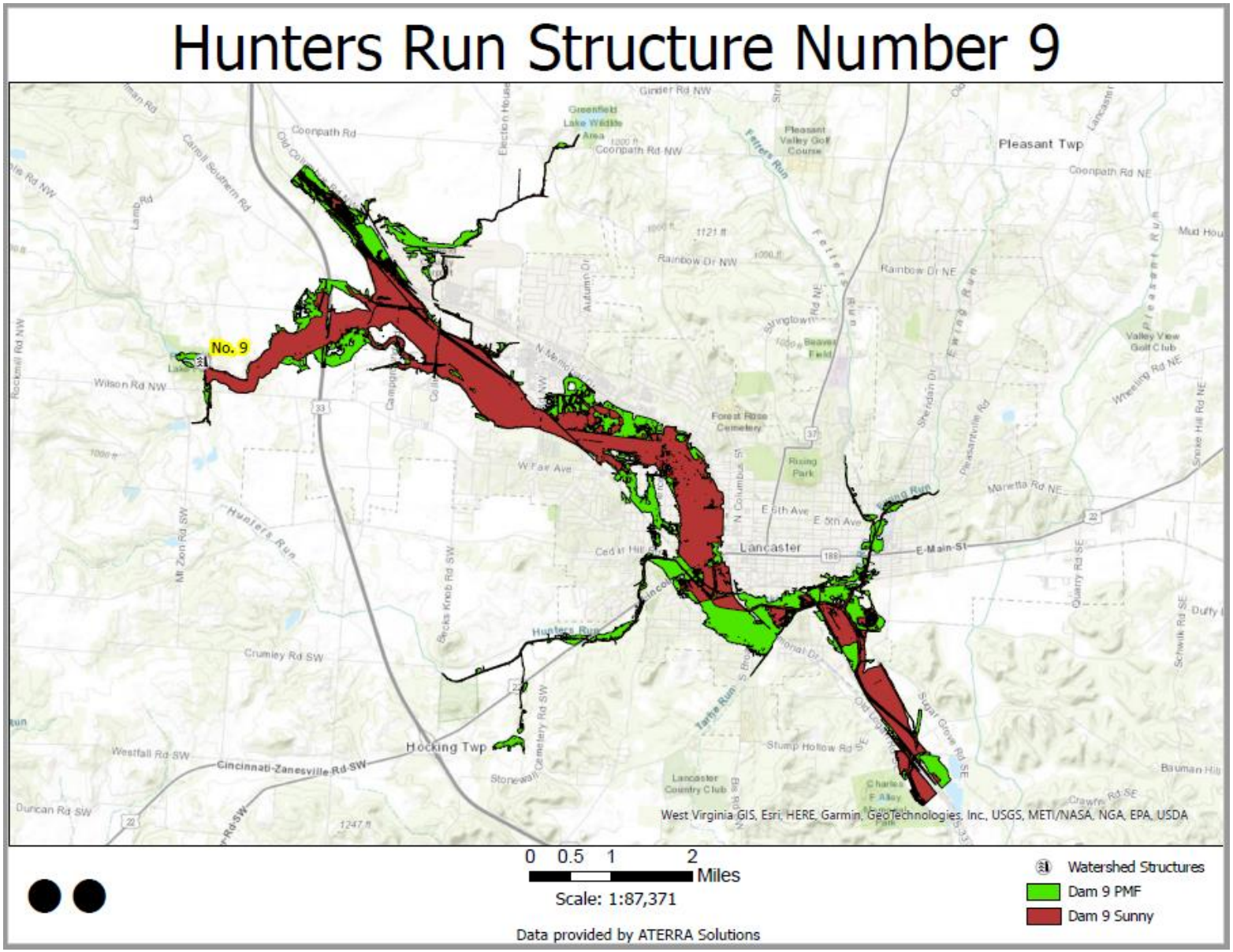
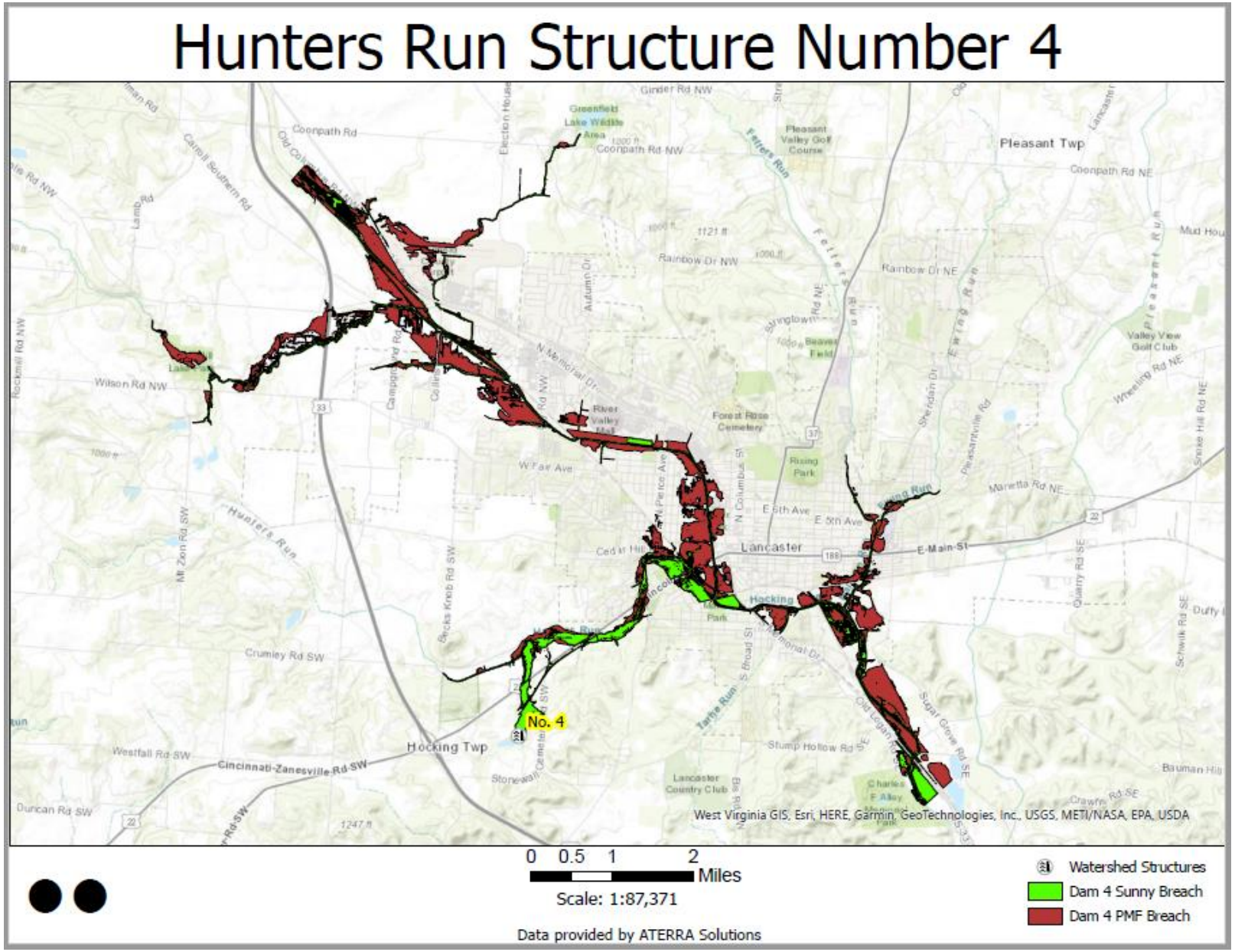


Figure 27: Fairfield County high hazard and significant dams.

Appendix P – HRCD Dam 9 & 4 Inundation Map




Hunters Run Structure Number 4
Pleasant Twp
Lancaster
Hocking Twp
No. 4
Wilson Rd NW
Coonpath Rd
Rainbow Dr NW
Rainbow Dr NE
W Fair Ave
E Main St
Cincinnati-Zanesville Rd SW
Crumley Rd SW
Westfall Rd SW
Duncan Rd SW
Stump Hollow Rd SE
Marietta Rd NE
Hunters Run
West Virginia GIS, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, METI/NASA, EPA, USDA
0 0.5 1 2
Miles
Scale: 1:87,371
Data provided by ATERRA Solutions
Watershed Structures
Dam 4 Sunny Breach
Dam 4 PMF Breach

Appendix Q – 2018 Land Use Map

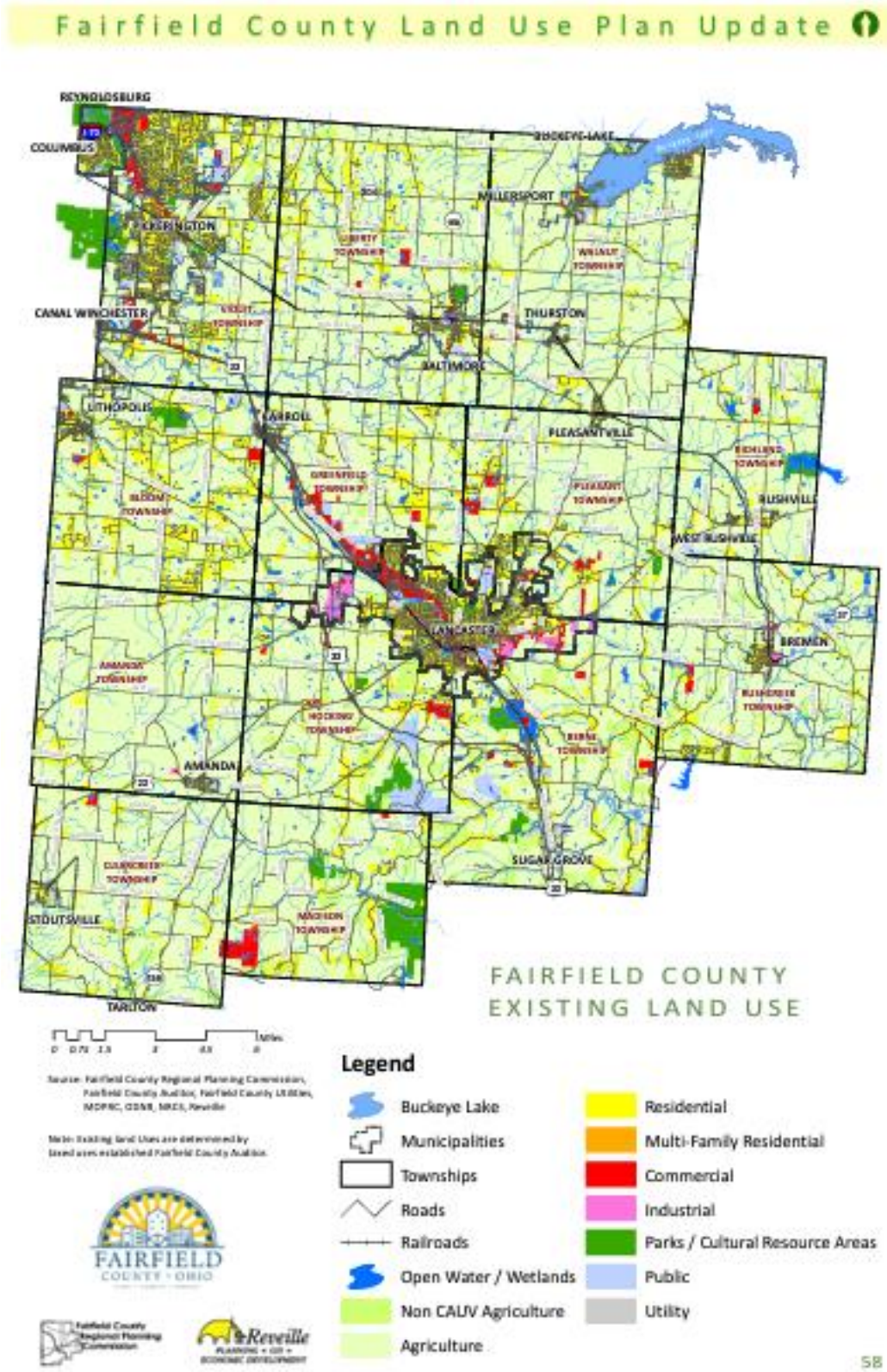


Figure 28: Existing Land Use map from Fairfield County Land Use Plan 2018

Appendix R – 2021 Land Use Map

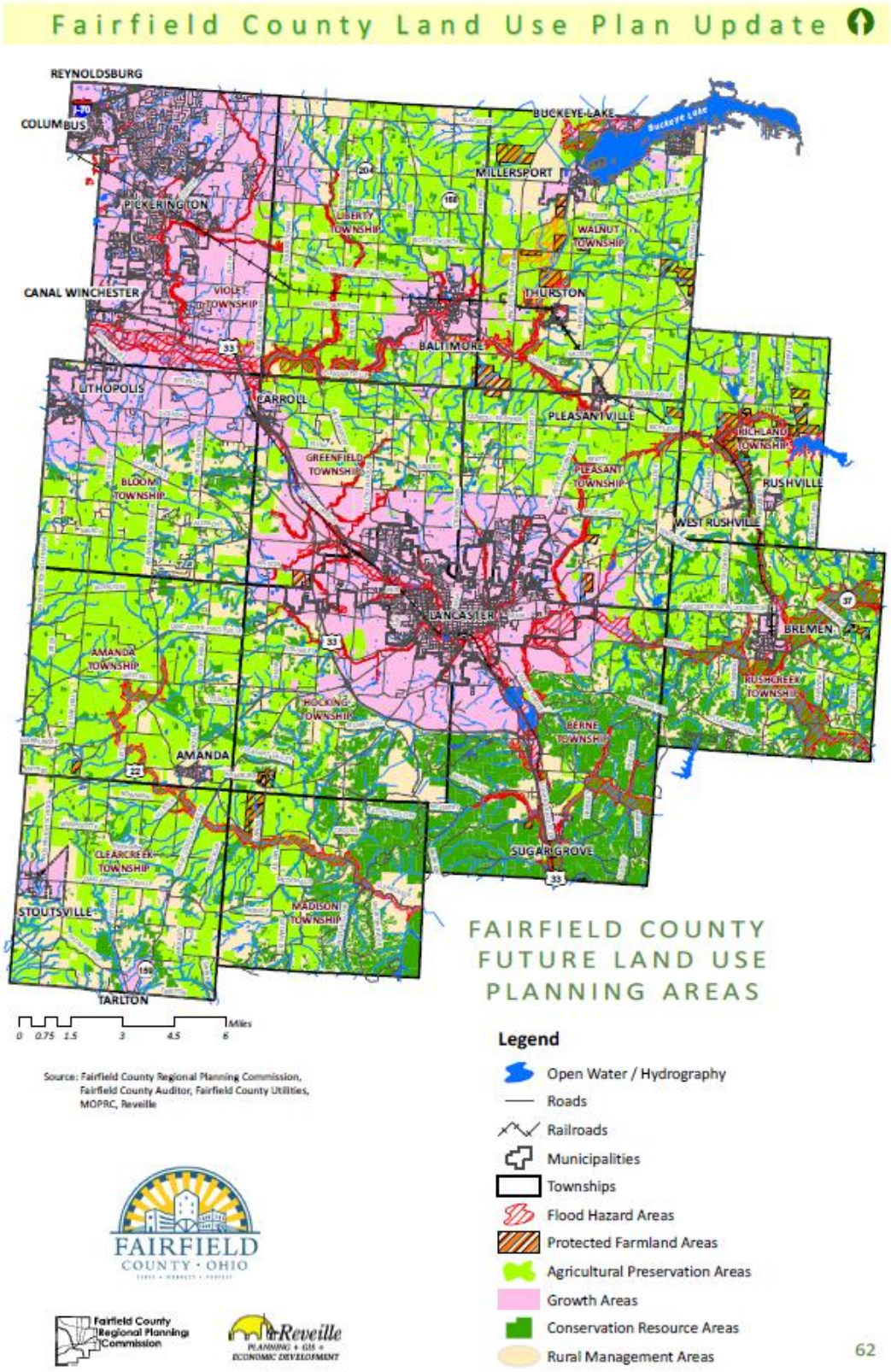


Figure 29: 2021 Land Use Map

Appendix S – Previous Mitigation Projects Status

Jurisdiction	Year Identified	Mitigation Action Plan/Project	Status
Bloom Township	2017	Replace culverts on various Township roads to upgrade old metal culverts	In Progress
Bloom Township	2017	Acquire bids on debris removal of trees and shrubs along roadways which are blocking signs	In Progress
Bloom Township	2017	Purchase alternative power supply	Not Started
Bloom Township	2017	Update Township signs on roads or older signs per ODOT Regulations	In Progress
Bloom Township	2017	To reduce the possibility of flooding during weather events caused by ditches and stream along the road which are full of debris	In Progress
City of Lancaster	2017	Update Inundations Plan for Tarhe Run	Completed - 2017
City of Lancaster	2017	Emergency Generator for Olivedale Senior Center	Long Term Plan
City of Lancaster	2017	Tornado Siren at Tarhe Trails	Complete - 2017
City of Lancaster	2017	Second Waterline Feed to River Valley Highlands	Long Term Plan
City of Lancaster	2017	Fire Station #4 / Police Substation	In progress - Site Identified
City of Lancaster	2017	Stormwater Management	Ongoing
City of Lancaster	2017	Install Canopy at Fuel Depot	In Progress - Planning Phase
City of Lancaster	2017	Educate public on the importance of keeping the area around storm drains clean of debris.	Complete - 2020
City of Lancaster	2017	Backup fuel Delivery Plan for Critical Facilities and Vehicles	Completed by Department
City of Lancaster	2017	Increase Mosquito Spraying after Emergencies	Ongoing
City of Lancaster	2017	Retrofit Lightning Protection for Government Buildings	In Progress - In Design for City Hall
City of Lancaster	2017	Flood Gates at Water and Wastewater Plants	Not Started
City of Lancaster	2017	Flood Protection at Fuel Depot	Completed - 2022
City of Lancaster	2017	Emergency off site storage of critical equipment	Ongoing
City of Lancaster	2017	Install Duck Bill Valves to prevent flood backup in storm sewers	In progress - started 2019

City of Lancaster	2017	Emergency Generator for North Water Plant	In progress - under contract
City of Lancaster	2017	Stream Restoration	In Progress - Fetter's Run, Lanreco Park, Fetters Run High School completed. Ewing Run at McLain, Fetter's Run OU-L in design.
City of Lancaster	2017	Stream Corridor Easements	As needed
City of Lancaster	2017	Easements to remove log jams at critical facilities	As needed
City of Lancaster	2017	Removal of Equipment Crossing on Ewing Street	Not Started
City of Lancaster	2017	Develop Emergency Webpage to Archive for quick retrieval	Not Started
City of Lancaster	2017	Spare parts inventory for Critical Items	Department Asset Management
City of Lancaster	2017	Update emergency Communication Plan	Not Started
City of Lancaster	2017	Contract Services for emergency sewer cleaning	In progress - contract established 2020
City of Lancaster	2017	Mutual Aid for Critical Services	Not Started
City of Lancaster	2017	Outside Assistance/Cross Training for Insurance Claims/Permits	Not Started
City of Lancaster	2017	Retrofit surge protection for Government Buildings	In progress - City Hall under design
City of Lancaster	2017	Retrofit Phase Protection to Critical Facilities.	Not Started
City of Lancaster	2017	Portable Generator Fleet	Not Started
City of Lancaster	2017	Authorize Emergency Web Banner	Completed - 2017
City of Lancaster	2017	Pre-Prepared Emergency Application package for Residents	Not Started
City of Pickerington	2011	Prepare a Storm Drainage Master Plan for the city	Not Started
City of Pickerington	2017	Complete maintenance at Windmiller Dam	Complete - Dam Decommissioned
Fairfield County	2003	Encourage and assist local jurisdictions to adopt storm water / erosion control and floodplain regulations	In Progress
Fairfield County	2003	Seek funding for maintenance / upgrading dams to current standards	In Progress - Benefits reappraisal underway
Fairfield County	2003	Re-size culverts / bridges that are undersized	Ongoing

Fairfield County	2003	Purchase warning devices for public facilities, parks, and recreational areas	Ongoing
Fairfield County	2003	Funding for removal of debris/log jams	In Progress - Ohio Federation of SWCD passed resolution sponsored by Fairfield County to encourage State funding.
Fairfield County	2003	Educate / conduct workshops for contractors, inspectors, government officials, and developers	Ongoing
Fairfield County	2003	Subsidy residential program for early warning devises (weather radios)	Complete
Fairfield County	2003	Encourage participation in ODNR floodplain seminars	Complete - J. Ferbrache has attended Ohio Flood Plain Managers Conference annually since 2007
Fairfield County	2003	Support activities of Conservancy District	Ongoing - Support HRCD daily, RCCD annually, encouraging SLWCD in preparing new work plan.
Fairfield County	2003	Expand Emergency Alert System (EAS) notifications	Complete
Fairfield County	2003	Develop program / brochures on various related topics and distribute to the public	Complete
Fairfield County	2003	Develop brochures to educate the public on stream ownership responsibilities	Complete - FCSWCD published online Stream Guide with updates every 2 years.
Fairfield County	2003	Program to purchase floodplain / conservation easements in floodplain / flood prone areas	Ongoing
Fairfield County	2003	Purchase development rights below dams to keep them from becoming high classes	Ongoing - Commissioners acquired Farmland Preservation Easements through Clean Ohio LAEPP below Rushcreek Lake, Oakthorpe Lake in Richland Township, and along Little Rushcreek with FCSWCD conducting annual monitoring.
Fairfield County	2003	Funding for pilot projects to implement new / experimental flooding control techniques	Complete - HRCD R23 and Dam 8 were part of funding in 2002 - 2004
Fairfield County	2003	Warning devices for high-risk structures	Ongoing
Fairfield County	2003	Purchase home(s) in floodplain areas and make into open spaces	Ongoing
Fairfield County	2003	Make Fairfield County a STORM READY COMMUNITY	Complete

Fairfield County	2003	Establish shelters / saferooms at mobile home parks	Ongoing
Fairfield County	2003	Funding for retrofitting for runoff detention	Ongoing
Fairfield County	2017	Mitigate land flow to reduce flooding in repetitive and severe repetitive Fairfield County locations	In Progress - North Walnut Township Study underway
Fairfield County	2019	Conduct a study and engineering assessment of each dam to determine the structural integrity and identify the potential for breach or failure	In Progress - Several studies are underway
HRCD	2011	Hocking River flood control measures.	In Progress
HRCD	2019	Decommission existing Hunters Run Dams where engineering supports the practice	In Progress - R32 removed from inventory in 2021. PDM study grant on others is not yet complete
Pleasant Township	2017	Replace a culvert in Pleasant Lee Subdivision	Complete - 2020
Village of Amanda	2003	Purchase of tornado-warning siren	Complete
Village of Amanda	2011	Repair or replace an old, inadequate culvert	In Progress
Village of Baltimore	2003	Purchase of tornado-warning siren	Complete - 2009
Village of Baltimore	2011	Mitigate flood hazards throughout the Village of Baltimore	Not Started
Village of Baltimore	2017	Improve the hydraulic opening and clear all streams of debris to reduce flooding	Not Started
Village of Bremen	2003	Funding for removal of debris/log jams	Not Started
Village of Bremen	2011	Protect Village Wastewater Treatment Plant from flood water damages	In Progress - New screen installed 2022
Village of Bremen	2017	Repair or replace storm drainage system	In Progress - pieces have been replaced
Village of Carroll	2003	Purchase of weather receiver in all schools, municipal offices, fire stations and police station	Complete
Village of Carroll	2011	Provide a safe, severe weather shelter for village residents	Not Started

Village of Lithopolis	2003	Purchase of weather radios for school, library, mayor's office, police department, fire department, and water plant	Complete
Village of Lithopolis	2011	Upgrade the electrical system of the Village's four sewer lift stations in order to permit rapid hook-up of generators to permit continued uninterrupted operation of the sanitary sewer system.	In Progress
Village of Lithopolis	2017	Improve and update the village lift stations	In Progress
Village of Millersport	2003	Purchase of tornado-warning siren	Complete - 2014
Village of Millersport	2011	Inspect, repair, or replace older storm sewers and catch basins	Ongoing
Village of Millersport	2017	Updating Storm Sewers and Catch Basins	Ongoing
Village of Pleasantville	2003	Purchase of weather radios for public school buildings, library, post office, and municipal office.	Complete
Village of Pleasantville	2011	Develop and install a system designed to provide protection from lightning strikes on the Village Water Tower	Not Started
Village of Pleasantville	2019	Replace existing storm water collection lines and storm water collection drops as well as increase the outflow from village to reduce flooding on residential and commercial lots.	Not Started
Village of Rushville	2003	Removal of older trees in village to prevent damage to power lines, structures, etc.	Complete
Village of Rushville	2011	Procure a generator to provide backup power source to the Village water booster station.	Not Started
Village of Rushville	2017	Purchase alternative power supply	Not Started
Village of Rushville	2017	Tornado Siren	Complete - 2017
Village of Stoutsville	2003	Purchase of tornado-warning siren.	Complete

Village of Stoutsville	2011	Minimize impact that storms and heavy rainfall have on homes on the west side of the Village of Stoutsville.	On Hold - Bridge Issue
Village of Stoutsville	2017	Upgrade storm drains and catch basins on secondary arteries in the village	In Progress
Village of Sugar Grove	2003	Purchase of NOAA weather radios for the school and fire department.	Complete
Village of Sugar Grove	2011	Provide an alternate power source to the Village Wastewater Treatment Plant.	Not Started
Village of Sugar Grove	2017	Test and Protect well Water	Not Started
Village of Sugar Grove	2017	Sewer treatment plan needs updated/retrofitted and enlarged increasing incoming pipelines	Complete
Village of Thurston	2003	Purchase of weather radios for community	Complete
Village of Thurston	2011	Improve culvert system for increased drainage capacity	Ongoing
Village of Thurston	2017	Upgrades to storm drainage system	Ongoing
Village of West Rushville	2003	Trimming of trees that are on village property that are into power lines.	Not Started
Village of West Rushville	2011	Minimize impact that severe weather has on the Village of West Rushville.	Not Started
Village of West Rushville	2017	Tornado Siren	Complete -2017
Village of West Rushville	2017	Upgrade storm water sewer drainage	Not Started
Walnut Township	2017	Acquire Severe Repetitive Loss Structures	Not Completed - New Developments
Walnut Township	2017	Storm Water Collection System	In Progress

Appendix T – New & Carryover Projects to 2023 Mitigation Plan

Jurisdiction	Year Identified	Mitigation Action Plan/Project	Lead	Status	Priority	Funding Sources	Timeframe	Estimated Cost
Amanda Township	2022	Tornado Sirens (x4)	Trustees	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-5 Years	$100,000
Amanda Township	2022	Stormwater Management along Sandhill Rd	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-3 Years	TBD
Amanda Township	2022	Stormwater Management along Marburger Rd	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Berne Township	2022	Improve culvert system for increased drainage capacity	Trustees	New Project	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Berne Township	2022	Improve drainage of water by hills and roads	Trustees	New Project	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Berne Township	2022	Tornado Siren at Blue Valley	Trustees	New Project	3	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000
Bloom Township	2017	Acquire bids on debris removal of trees and shrubs along roadways which are blocking signs	Trustees	Carryover	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Bloom Township	2017	Update Township signs on roads or older signs per ODOT Regulations	Trustees	Carryover	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Bloom Township	2017	To reduce the possibility of flooding during weather events caused by ditches and stream along the road which are full of debris	Trustees	Carryover	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD

Bloom Township	2022	Upgrade dry hydrant as weather affects ponds and is filling with sediment - wildfire risk	Trustees	New Project	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Bloom Township	2022	Tornado Sirens	Trustees	New Project	4	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000 - $100,000
Bloom Township	2017	Upgrade culverts to improve drainage	Trustees	Carryover	3	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Bloom Township	2022	Larger permanent generator for fire department and CIKR	Trustees	New Project	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
City of Lancaster	2017	Emergency Generator for North Water Plant	Service Safety Director	Carryover	A	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2025	TBD
City of Lancaster	2017	Update emergency Communication Plan	Service Safety Director	Carryover	D	Local funds; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Mutual Aid for Critical Services	Service Safety Director	Carryover	D	Local funds; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Outside Assistance/Cross Training for Insurance Claims/Permits	Service Safety Director	Carryover	D	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Pre-Prepared Emergency Application package for Residents	Service Safety Director	Carryover	D	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Portable generator fleet	Service Safety Director	Carryover	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2025	$250,000

City of Lancaster	2017	Emergency generator for senior facility, Olivedale	Service Safety Director	Carryover	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$250,000
City of Lancaster	2022	Generator for city hall	Service Safety Director	New Project	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2026	$500,000
City of Lancaster	2022	Emergency webpages archived for quick retrieval	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Promote employee awareness for all hazards	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Promote public awareness for all hazards	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Prepare emergency application packages for residents	Service Safety Director	New Project	E	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	As Needed	$0
City of Lancaster	2022	Procure emergency cell phones for during loss of critical services	Service Safety Director	New Project	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$60 each
City of Lancaster	2017	Flood-protect fuel depot	Service Safety Director	Carryover	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$600,000
City of Lancaster	2022	Secure alternative source of fuel for critical services	Service Safety Director	New Project	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Relocation of fuel depot out of flood hazard area	Service Safety Director	New Project	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$750,000
City of Lancaster	2017	Stream restoration projects	Service Safety Director	Carryover	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022 and As Needed	$10,000/LF

City of Lancaster	2017	Easements for critical facilities to access and remove debris	Service Safety Director	Carryover	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2030	$40,000/Acre
City of Lancaster	2022	Removal of water crossing on Ewing Run	Service Safety Director	New Project	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$1,000,000
City of Lancaster	2022	Retrofit storm detention basins	Service Safety Director	New Project	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	$50,000 each
City of Lancaster	2017	Retrofit backflow valves on storm sewers at Hocking River	Service Safety Director	Carryover	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	On-going	$35,000 Ea
City of Lancaster	2022	Stream bank stabilization to protect sanitary sewers	Service Safety Director	New Project	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$10,000/LF
City of Lancaster	2022	Construction of flood mitigation projects	Service Safety Director	New Project	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$10,000/acre
City of Lancaster	2022	Encourage/Incentivize construction of detention/retention basins	Service Safety Director	New Project	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	1000000
City of Lancaster	2022	Flood plain restoration projects	Service Safety Director	New Project	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$10,000/acre
City of Lancaster	2022	Regular dam inspections	Service Safety Director	New Project	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	0
City of Lancaster	2022	Establish Olivedale as an emergency shelter	Service Safety Director	New Project	B	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2025	0
City of Lancaster	2022	Establish agreement with American Red Cross for shelters	Service Safety Director	New Project	B	Local funding; Existing funds; FEMA HMA,	2022-2025	0

						including HMGP, BRIC, PDM, and FMA		
City of Lancaster	2017	Retrofit lightning protection of city buildings	Service Safety Director	Carryover	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$100,000/building
City of Lancaster	2017	Retrofit surge protection on critical facilities	Service Safety Director	New Project	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$100,000/building
City of Lancaster	2017	Retrofit phase protector on critical facilities	Service Safety Director	New Project	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$100,000/building
City of Lancaster	2017	Second feed line to River Valley Highlands/Tarhe Trails	Service Safety Director	Carryover	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$1,000,000
City of Lancaster	2022	Second feed line from South Water Plant	Service Safety Director	New Project	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$5,000,000
City of Lancaster	2022	Water line loop from Wilson Rd to Magna Ave	Service Safety Director	New Project	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2025	$500,000
City of Lancaster	2022	Promote public education on clogged inlets	Service Safety Director	New Project	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Establish non-street department cleaning program/contact	Service Safety Director	Carryover	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2017	Flood gates Lawrence St WPCD	Service Safety Director	Carryover	B	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2030	$2,000,000
City of Lancaster	2017	Offsite equipment storage for critical equipment	Service Safety Director	Carryover	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	On-going	$0
City of Lancaster	2022	Mutual aid for critical services	Service Safety Director	Carryover	D	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	On-going	$0

City of Lancaster	2022	Water facilities for compost facility fires	Service Safety Director	New Project	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2025	$50,000
City of Lancaster	2017	Fire Station #4/Police Substation	Service Safety Director	Carryover	A	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2026	$15,000,000
City of Lancaster	2017	Increase Mosquito Spraying after Emergencies	Service Safety Director	New Project	E	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	As Needed	$20,000
City of Lancaster	2022	Outside assistance/cross training on insurance claims and permits	Service Safety Director	New Project	E	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	As Needed	$0
City of Lancaster	2022	Construction of indoor storage for vehicles and equipment	Service Safety Director	New Project	C	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2022-2035	$2,000,000/facility
City of Lancaster	2022	Invest in critical equipment capable of withstanding extreme temperatures	Service Safety Director	New Project	E	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	On-going	varies
City of Lancaster	2022	Develop extreme temperature policy	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2025	$0
City of Lancaster	2022	Employee training on heat stroke, heat exhaustion, and frostbite	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Promote public education on extreme temperatures	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Annually	$0
City of Lancaster	2022	Extend hours at pools during extreme heat event days	Service Safety Director	New Project	E	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	As Needed	$0

City of Lancaster	2022	Develop emergency weather policy for employees	Service Safety Director	New Project	D	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2025	$0
City of Pickerington	2011	Prepare a Storm Drainage Master Plan for the city	Service Director	Carryover	3	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
City of Pickerington	2022	Study for Weatherall Dam	Service Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
City of Pickerington	2022	Tornado Siren	Service Director	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000
City of Pickerington	2022	Improve culverts for drainage due to flooding	Service Director	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Clearcreek Township	2022	Generator for critical infrastructure	Trustees	New Project	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Clearcreek Township	2022	Clean out road culverts	Trustees	New Project	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Clearcreek Township	2022	Clear out debris at Amanda Southern bridge	Trustees	New Project	2	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Fairfield County	2003	Encourage and assist local jurisdictions to adopt storm water / erosion control and floodplain regulations	County Commissioners	Carryover	2	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	$0
Fairfield County	2003	Seek funding for maintenance / upgrading dams to current standards	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD

Fairfield County	2003	Re-size culverts / bridges that are undersized	County Engineer	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Fairfield County	2003	Purchase warning devices for public facilities, parks, and recreational areas	EMA Office	Carryover	2	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Fairfield County	2003	Funding for removal of debris/log jams	County Commissioners	Carryover	2	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Fairfield County	2003	Educate / conduct workshops for contractors, inspectors, government officials, and developers	County Engineer	Carryover	3	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Fairfield County	2003	Support activities of Conservancy District	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2003	Program to purchase floodplain / conservation easements in floodplain / flood prone areas	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2003	Purchase development rights below dams to keep them from becoming high classes	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2003	Warning devices for high-risk structures	County Commissioners	Carryover	3	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD

Fairfield County	2003	Purchase home(s) in floodplain areas and make into open spaces	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2003	Establish shelters / saferooms at mobile home parks	County Commissioners	Carryover	2	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Fairfield County	2003	Funding for retrofitting for runoff detention	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Fairfield County	2017	Mitigate land flow to reduce flooding in repetitive and severe repetitive Fairfield County locations	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2019	Conduct a study and engineering assessment of each dam to determine the structural integrity and identify the potential for breach or failure	County Commissioners	Carryover	1	Local funding; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Fairfield County	2022	Expand Emergency Alert System (EAS) utilizations through community sign-ups	EMA Office	New Project	3	County funds; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	$0
Fairfield County	2022	Generator for Fairfield Medical Center (hospital)	County Commissioners	New Project	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	$6,600,000
Fairfield County	2022	Generator for critical infrastructure	County Commissioners	New Project	1	Local funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD

Fairfield County	2022	Dewatering pump for flood mitigation in county	County Utilities	New Project	2	County funds; Existing funds; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	$200,000
Fairfield County	2022	Digitize all dam inundation areas	EMA Office	New Project	4	County funds; Existing funds	1-3 Years	TBD
Greenfield Township	2022	Evaluate Mt. Zion Rd for continued flooding	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Greenfield Township	2022	Tornado Siren	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	$25,000
Hocking Township	2022	Upgrade tornado Sirens x8	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$200,000
HRCD	2011	Hocking River flood control measures	Director	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-4 Years	
HRCD	2022	Planning, studies, and engineering for lessening risk or declassification of a dam	Director	Carryover	1	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-4 Years	$50,000
HRCD	2019	Decommission existing Hunters Run Dams where engineering supports the practice	Director	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-4 Years	TBD
HRCD	2022	Buyout of properties and easements to lessen risk and reduce hazard	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-5 Years	TBD
HRCD	2022	Improve and reconstruct existing dams where engineering supports	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$350,000

HRCD	2022	Education and outreach on benefits of dam systems	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
HRCD	2022	Lower classification of dams where engineering supports	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Liberty Township	2022	Tornado Sirens	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	$25,000 - $100,000
Liberty Township	2022	Monitor culverts and tiles near roadways	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Madison Township	2022	Tornado Siren	Trustees	New Project	4	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	$25,000
Madison Township	2022	Safe Room	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Madison Township	2022	Improve roadways to prevent roads from washing out	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Madison Township	2022	Improve culvert system for increased drainage capacity	Trustees	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Pleasant Township	2022	Improve drainage at Old Millersport and Coonpath	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Pleasant Township	2022	Tornado Sirens - 2	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	$50,000
Richland Township	2022	Put a weather station at the fire house	Trustees	New Project	6	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Richland Township	2022	Tornado Siren	Trustees	New Project	7	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	5 Years	$25,000

Richland Township	2022	Flood mitigation at Drums Bottom Road	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-3 Years	TBD
Richland Township	2022	Flood mitigation along Little Rush Creek	Trustees	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	5 Years	TBD
Richland Township	2022	Debris cleanout along Rush Creek	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	5 Years	TBD
Richland Township	2022	Generator for critical infrastructure	Trustees	New Project	4	Local Funding	1 Year	TBD
Richland Township	2022	Policy development on handling wind and solar farms	Trustees	New Project	5	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	$0
Rush Creek Conservancy District	2022	Emergency Action Plan updates for Class I dams	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Rush Creek Conservancy District	2022	Zoning upgrades in inundation areas	Director	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Rush Creek Conservancy District	2022	Weather stations through watershed and county	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1 Year	TBD
Rush Creek Conservancy District	2022	Property acquisitions in inundation areas	Director	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Rushcreek Township	2022	Weather stations	Trustees	New Project	5	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Rushcreek Township	2022	Generator for critical infrastructure	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Rushcreek Township	2022	Policy for how the jurisdiction will handle wind and solar farms	Trustees	New Project	4	Local funding; existing funds	1-2 Years	$0

Rushcreek Township	2022	Improve culverts along St. Rt. 37 and Zion Rd	Trustees	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Rushcreek Township	2022	Raise Avalon/Harvey Rd by Sniders Lake Dam due to regular flooding	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
South Licking Watershed Conservancy District	2022	Removal of sediment and debris from water courses to maintain capacity or restore capacity after an event	Director	New Project	1	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
South Licking Watershed Conservancy District	2022	Stabilization of water course bank	Director	New Project	3	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
South Licking Watershed Conservancy District	2022	Wetland creation and remediation to store water runoff and supplement flood plain storage	Director	New Project	4	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
South Licking Watershed Conservancy District	2022	Improve roadway culverts and bridges along water course	Director	New Project	2	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Amanda	2011	Repair or replace an old, inadequate culvert	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Amanda	2022	Upgrade and add new technology for lift stations	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Amanda	2022	Add surge/lightning protections for all administrative and	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD

		critical infrastructure buildings						
Village of Amanda	2022	Add back-up generator for municipal building	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Amanda	2022	Mitigate flooding on west side during heavy rains	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Amanda	2022	Update Emergency Plan for Village	Mayor	New Project	2	Local funding	2-4 Years	TBD
Village of Amanda	2022	Promote emergency preparedness and awareness to residents through outreach	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Amanda	2022	Provide emergency kits to households and businesses to promote individual preparedness beyond outreach measures.	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Amanda	2022	Expand municipal building for meeting space that meets pandemic planning	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Amanda	2022	Debris removal in streams to aid in water flow	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Amanda	2022	Upgrade culvert on East Main by school to improve drainage	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Amanda	2022	Upgrade storm sewer drainage	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Amanda	2022	Host a Community Awareness event with mock disaster training	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD

Village of Baltimore	2011	Mitigate flood hazards throughout the Village of Baltimore	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Baltimore	2017	Improve the hydraulic opening and clear all streams of debris to reduce flooding	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Baltimore	2022	Upgrade culvert system for increased drainage capacity	Administrator	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Baltimore	2022	Storm shelter at Alt Park	Administrator	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Baltimore	2022	Upgrade storm sewer drainage	Administrator	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Bremen	2003	Funding for removal of debris/log jams	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Bremen	2011	Protect Village Wastewater Treatment Plant from flood water damages	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Bremen	2017	Repair or replace storm drainage system	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Bremen	2022	Stormwater Management	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Bremen	2022	Upgrade water and sewer lines	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Bremen	2022	Upgrade catch basins throughout Village	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD

Village of Bremen	2022	Backup generator for CIKR	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Bremen	2022	Tornado Siren	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000
Village of Bremen	2022	Backup Generator for water plant	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Bremen	2022	Backup Generator for wastewater plant	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Carroll	2011	Provide a safe, severe weather shelter for village residents	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Carroll	2022	Upgrade water system and hydrants in Village for CIKR	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Lithopolis	2011	Upgrade the electrical system of the Village's four sewer lift stations in order to permit rapid hook-up of generators to permit continued uninterrupted operation of the sanitary sewer system.	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Lithopolis	2017	Improve and update the village lift stations	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Lithopolis	2022	Tornado Siren	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000

Village of Millersport	2011	Inspect, repair, or replace older storm sewers and catch basins	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Millersport	2017	Updating Storm Sewers and Catch Basins	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Millersport	2022	Acquire generators for each water tower (2 total)	Administrator	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Millersport	2022	Acquire generator for Village Hall	Administrator	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Pleasantville	2011	Develop and install a system designed to provide protection from lightning strikes on the Village Water Tower	Mayor	Carryover	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Pleasantville	2019	Replace existing storm water collection lines and storm water collection drops as well as increase the outflow from village to reduce flooding on residential and commercial lots.	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Pleasantville	2022	Improve and upgrade stormwater system	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Pleasantville	2022	Improve stormwater infrastructure	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD

Village of Pleasantville	2022	Update stormwater drains	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Pleasantville	2022	Upgrade water tank to protect from severe storms	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of Rushville	2011	Procure a generator to provide backup power source to the Village water booster station.	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Rushville	2017	Purchase alternative power supply	Mayor	Carryover	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Rushville	2022	Backup generator for pump station for water tower	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of Stoutsville	2011	Minimize impact that storms and heavy rainfall have on homes on the west side of the Village of Stoutsville.	Village Council	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of Stoutsville	2017	Upgrade storm drains and catch basins on secondary arteries in the village	Village Council	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of Stoutsville	2022	Upgrade Fosnaugh School Rd culvert	Village Council	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of Stoutsville	2022	Clean out Amanda Southern bridge of debris	Village Council	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-3 Years	TBD
Village of Stoutsville	2022	Generator for critical infrastructure	Village Council	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD

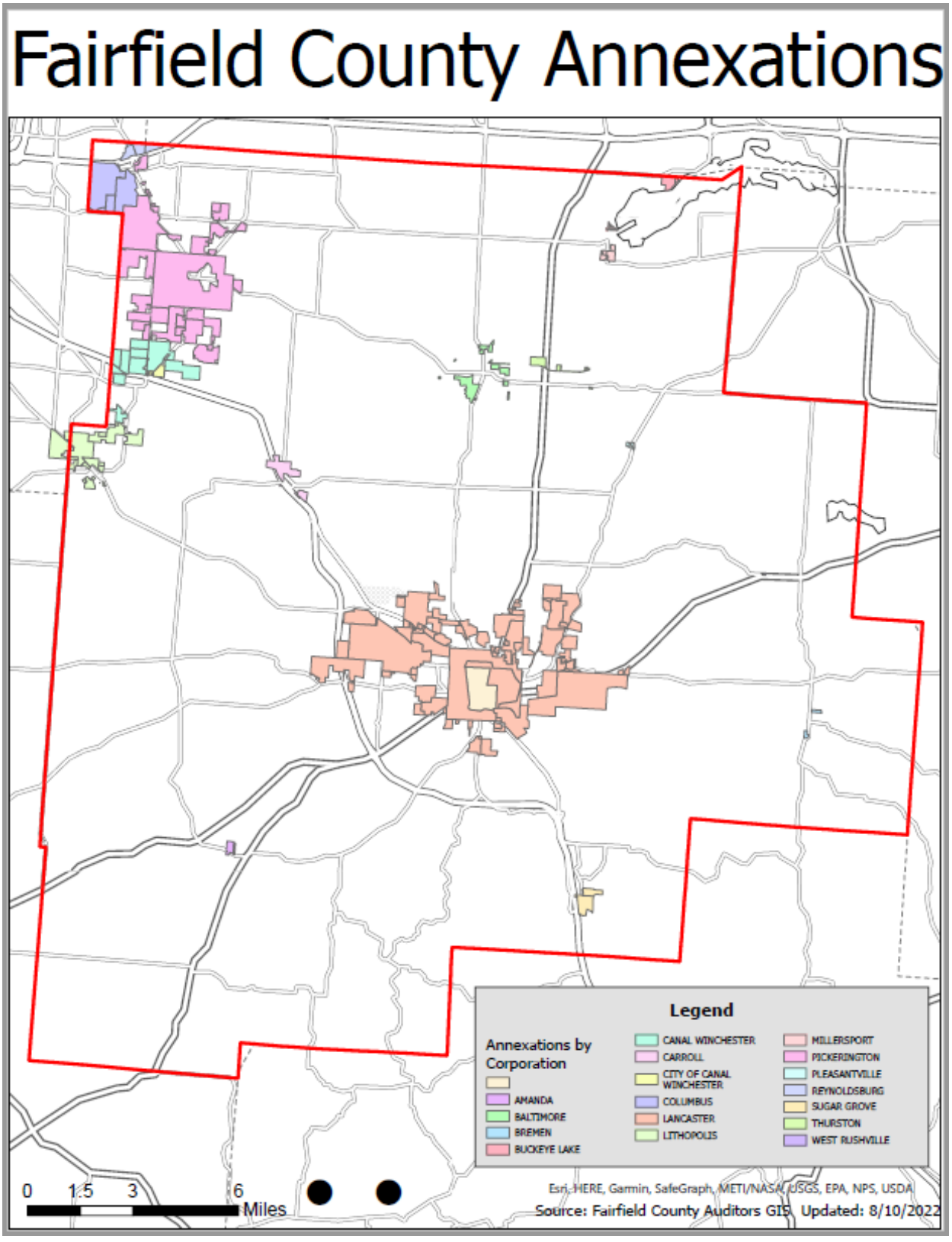
Village of Sugar Grove	2011	Provide an alternate power source to the Village Wastewater Treatment Plant.	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of Sugar Grove	2017	Test and Protect well Water	Mayor	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	Ongoing	TBD
Village of Sugar Grove	2022	Alarm for sewage treatment center when it stops working	Mayor	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of Sugar Grove	2022	Upgrade to sewer system to prevent it from backing up	Mayor	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	$800,000
Village of Sugar Grove	2022	Tornado Siren	Mayor	New Project	4	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	$25,000
Village of Sugar Grove	2022	Study on riverine flooding in the community	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Thurston	2011	Improve culvert system for increased drainage capacity	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Thurston	2017	Upgrades to storm drainage system	Administrator	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Thurston	2022	Install a back-up generator for the water treatment plant.	Administrator	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Thurston	2022	Conduct storm drain mapping and a study on efficiency	Administrator	New Project	4	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Village of Thurston	2022	Improve storm drainage in village	Administrator	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD

Village of Thurston	2022	Install a storm shelter in the center of town	Administrator	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD
Village of West Rushville	2003	Trimming of trees that are on village property that are into power lines.	Mayor	Carryover	2	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-2 Years	TBD
Village of West Rushville	2011	Minimize impact that severe weather has on the Village of West Rushville.	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of West Rushville	2017	Upgrade storm water sewer drainage	Mayor	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Village of West Rushville	2022	Install sidewalks to businesses for public safety	Mayor	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Violet Township	2022	Mitigate flood at Waterloo Road by elevate roadway. Priority 1 due to life safety and ODOT project at Pickerington Road	Administrator	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Violet Township	2022	Tornado sirens - 5 different areas for coverage	Administrator	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	$125,000
Walnut Township	2017	Acquire Severe Repetitive Loss Structures	Trustees	Carryover	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Walnut Township	2017	Storm Water Collection System	Trustees	Carryover	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Walnut Township	2022	Improve stormwater drainage at Lakeside Road	Trustees	New Project	2	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	3-5 Years	TBD

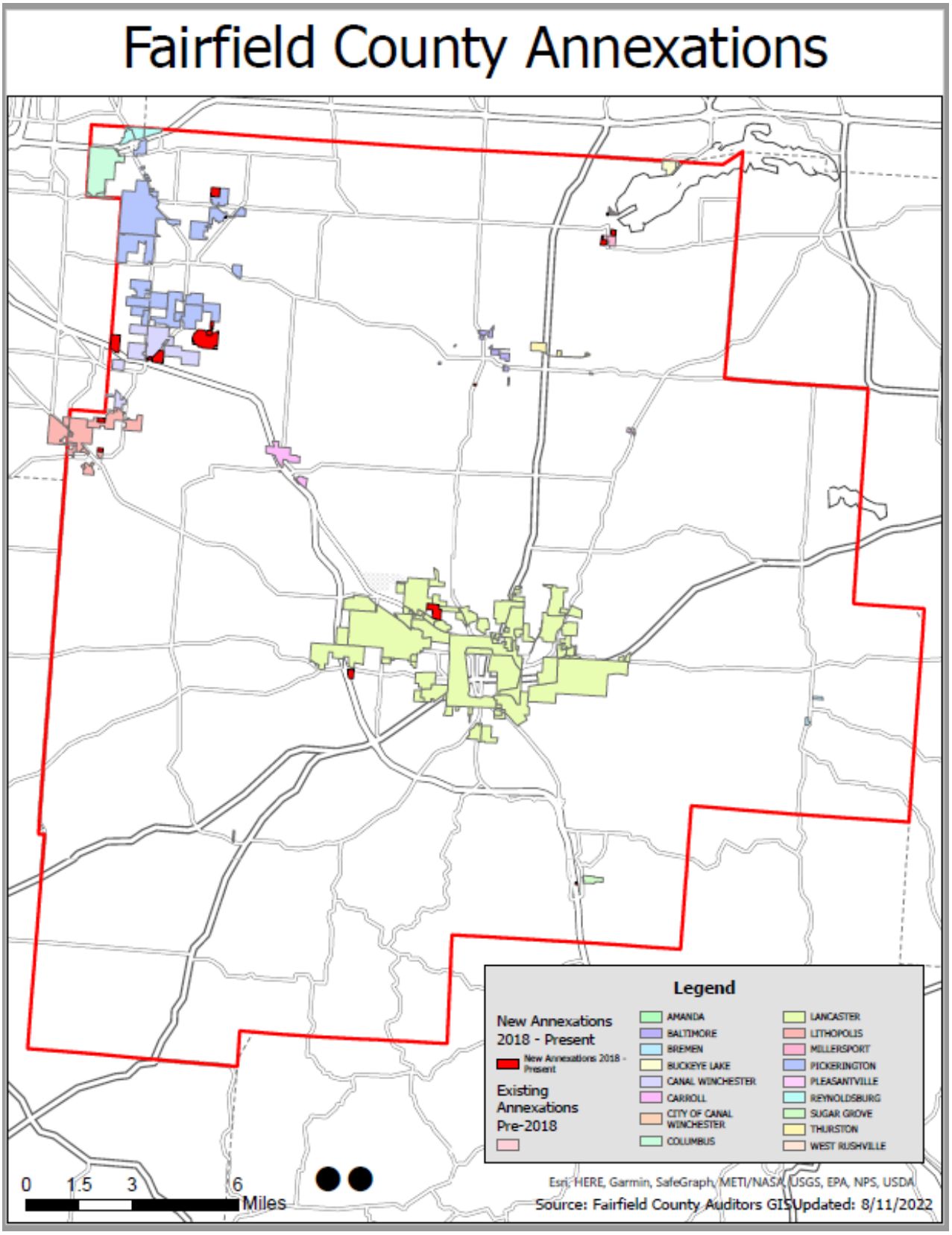
Walnut Township	2022	Tornado Siren	Trustees	New Project	6	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	$25,000
Walnut Township	2022	Upgrades to stormwater drainage at Fairfield Beach	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Walnut Township	2022	Upgrade and improve culvert system for increased drainage capacity	Trustees	New Project	3	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	2-4 Years	TBD
Walnut Township	2022	Remove ditch enclosure that impedes proper drainage	Trustees	New Project	4	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	TBD
Walnut Township	2022	Implement zoning to restrict building in inundation zone for Whetstone and Walden Pond dams	Trustees	New Project	5	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	$0
Walnut Township	2022	North Walnut Stormwater conveyance	Trustees	New Project	1	Local funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-4 Years	TBD
Walnut Township	2022	Storm sewer final design and construction	Trustees	New Project	1	Local funding; State funding; FEMA HMA, including HMGP, BRIC, PDM, and FMA	1-3 Years	$4,280,000

Appendix U – Annexations

Annexations by corporation.



Annexations 2018 to present.



Appendix V – Jurisdiction Resolutions

Resolutions passed by the jurisdictions follow this page and are amended as needed.

Jurisdiction	Resolution Present
Fairfield County – Plan Point of Contact	Yes – 12/20/2022
Cities	
Lancaster	Yes – 12/20/2022
Pickerington	Yes – 1/13/2023
Townships	
Amanda Township	
Berne Township	Yes – 12/20/2022
Bloom Township	Yes – 12/20/2022
Clearcreek Township	
Greenfield Township	Yes – 12/20/2022
Hocking Township	
Liberty Township	Yes – 12/20/2022
Madison Township	
Pleasant Township	Yes – 12/20/2022
Richland Township	Yes – 12/20/2022
Rushcreek Township	Yes – 12/20/2022
Violet Township	Yes – 12/20/2022
Walnut Township	Yes – 12/20/2022
Villages	
Amanda	Yes – 12/20/2022
Baltimore	
Bremen	Yes – 12/20/2022
Carroll	Yes – 12/20/2022
Lithopolis	Yes – 12/20/2022
Millersport	Yes – 12/20/2022
Pleasantville	Yes – 12/20/2022
Rushville	
Stoutsville	Yes – 12/20/2022
Thurston	Yes – 12/20/2022
Sugar Grove	
West Rushville	Yes – 12/20/2022
Conservancy Districts	
Hunter's Run Conservancy District	Yes – 12/20/2022
Rushcreek Conservancy District	Yes – 12/20/2022
South Licking Watershed Conservancy District	Yes – 12/20/2022