

# NATURAL HAZARDS MITIGATION PLAN

Defiance County, Ohio  
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## **Section 1. Resources and Preparations for the Plan**

### *Plan Adoption and Participation*

The Defiance County Natural Hazards Mitigation Plan was developed under a Multi-jurisdictional Adoption. Jurisdictions are defined as villages, cities, or the unincorporated areas of Defiance County. More specifically for this plan jurisdictions include Defiance County, Defiance City, Hicksville Village, Ney Village and Sherwood Village. Each jurisdiction has formally agreed to participate in the planning process by way of memorandum correspondence in April 2011 from the Defiance County Public Safety Office. All jurisdictions have participated in the planning process. After being accepted in final form by the Federal Emergency Management Agency, all jurisdictions [will] have formally adopted the components of the approved plan. Each jurisdiction meeting the requirements have formally approved this countywide plan by authorizing signatures in Appendix JJ.

### *Core Group*

A diverse core group has been utilized for the Defiance County Natural Hazards Mitigation Plan. This core group is the Local Emergency Planning Committee (LEPC) and represents a cross-section of people in the community including local government staff, the public, local industry leaders, law enforcement and fire and rescue personnel. The core group was utilized by involving them with planning procedures, development of natural hazards problem statements, and identifying barriers that exist that prevent the jurisdictions from reaching its “desired state” of mitigation planning. The roll call of the core group is found in Appendix HH.

### *Political Entities Participating*

In April 2011, the political entities of Defiance County were surveyed by U.S. mail with an instrument (Appendix BB) designed to accomplish two goals. The first goal was to have an official response by each political jurisdiction as to their participation in the multi-jurisdiction Defiance County Natural Hazard Mitigation Plan. The second goal was to measure the political entity’s risk to natural hazards that have been previously determined by the Defiance County Natural Hazard Mitigation Plan 2004 and the current County Emergency Operations Plan. The results of the second goal will be discussed in Section 3.

All Defiance County political entities replied with official signatures indicating their participation in the Defiance County Natural Hazard Mitigation Plan 2011. Table 1. summarizes the political entities participation as of October, 2011.

Table 1. Political Entities Participating in the Defiance County Natural Hazard Mitigation Plan 2011.

	Choosing to Participating	Choosing NOT to Participating
Adams Township	X	
Defiance, City of	X	
Defiance County	X	
Defiance Township	X	
Delaware Township	X	
Farmer Township		X
Hicksville Township	X	
Hicksville, Village of	X	
Highland Township	X	
Mark Township	X	
Milford Township		X
Ney, Village of	X	
Noble Township	X	
Richland Township	X	
Sherwood, Village of	X	
Tiffin Township	X	
Washington Township	X	

## **Section 2. Planning Process**

The Defiance County office of Public Safety recruited OSU Extension to provide leadership for the Defiance County Natural Hazards Mitigation Plan 2011 research and development. The process selected and used was simple and effective to develop mitigation strategies for each jurisdiction. The Core Group reviewed and analyzed each section of the plan. Where changes were made are highlighted in yellow. Where no revisions were made, the Core Group decided the information remained current and valid.

### *Open Public Involvement*

An open public involvement process was essential to develop an effective plan. The planning process included an opportunity for the public and their elected officials to comment on the plan during the drafting stage and prior to plan approval. Adjacent counties were notified of the plan development with an invitation for comment (Appendix X).

During the planning stage of the plan, the Defiance County Public Safety Office hosted a public meeting on May 2, 2011, advertised in the Defiance Crescent News and the Hicksville News Tribune newspapers (Appendix Y,Z). The participants had access to the Defiance Natural Hazard Mitigation Plan 2004 during the public meeting. The public was also notified that the plan could be viewed/obtained at the Defiance County website, the Defiance County Commissioners' office, the Defiance County Public Safety office and the OSU Extension Defiance County office. The public comment period was open from May 2, 2011 to May 16, 2011 with written comments to be sent to OSU Extension or the Public Safety office. One oral comment was received but was unrelated to the objective of the Natural Hazard Mitigation Plan but rather a issue between property owners.

During the drafting stage of the plan, the Defiance County Public Safety Office hosted an Open house September 21, 2011, that was open to the public where the participants could review the Defiance County Natural Hazard Mitigation Plan and make comments. The Open House was advertised three times in the Defiance Crescent News (Appendix AA) and had 250 participants with no comments on the plan.

A coordinated implementation by all jurisdictions of the mitigation plan will maximize the efficiency of risk management against all natural hazards. The Local Emergency Planning Committee (LEPC) and the jurisdictions adopting this plan are asked to incorporate the requirements of the mitigation plan into other planning mechanisms such as regulations, codes, ordinances, comprehensive or capital improvement plans, when appropriate.

## Section 3. Risk Assessment

### A. Hazard Identification

#### 1. Existing Documentation and Plans

##### a. Defiance County Emergency Operation Plan

The Defiance County Emergency Operations Plan (EOP) in October 2007 identified natural hazards risking to Defiance County citizens and public and private physical property. The EOP plan identified natural hazards as a threat to Defiance County as: floods, severe storms including winter storms, droughts, tornadoes/high winds, and earthquakes. The EOP plan also provided an assessment that includes estimated population at risk as well as a scale indicating the perceived level of risk. The data is summarized in Table 3.

Table 3.

Defiance County Emergency Operations Plan Risk Assessment 2007

Hazard	Population at Risk	High	Medium	Low
Floods	4,000	X		
Severe Storms including Winter Storms	39,000	X		
Droughts	39,000		X	
Tornadoes/High Winds	5,000		X	
Earthquakes	39,000			X

##### b. Flood Insurance Study

The Flood Insurance Study (FIS), Defiance County, OH, Unincorporated Areas report was used to provide background information on the 100-year floodplain determination. The FIS document was completed August 1990 by Federal Emergency Management Agency in cooperation with, the Ohio Department of Natural Resources, and the U.S. Army Corps of Engineers. Information from the FIS will be discussed in Section 3 Profiling Hazard Events.

##### c. Defiance County Comprehensive Plan

The Defiance County Comprehensive Plan (CP) was used to provide background information for Defiance County demographics, historical data, infrastructure resources and future community planning objectives. Brae Birch Institute, Toledo, OH, completed the CP in January 2000 for the Defiance County Commissioners.

## 2. Political Entity Survey

### Significant Hazards by Political Entity

In April 2011, all the political entities of Defiance County were surveyed by U.S. mail with an instrument designed to measure their risk to natural hazards. The natural hazards had been previously determined by the Defiance County Natural Hazard Mitigation Plan 2004 and the current County Emergency Operations Plan. Each political entity also had opportunity to provide additional natural hazards and concerns.

Each participating political entity completed a rank-scale survey instrument (Appendix BB) that measured the elected officials' relative concern of five natural hazards on how they directly relate to their jurisdiction. The individual responses were summarized (Table 4) but each response can and should be viewed independently to allow for localized or small community perspective. The political entities ranked the natural hazards on a scale of 1 (lowest concern) to 5 (most significant).

Table 4.

2011 Summary of Natural Hazards by Participating Political Entity

	Winter Storm, Blizzard, Ice	Tornado	Flooding	Drought	Earthquake
Adams Twp.	4	5	4	1	1
Defiance, City of	4	4	5	2	1
Defiance, County of	4	5	3	3	1
Defiance Twp.	5	4	3	2	1
Delaware Twp.	5	5	5	5	2
Farmer Twp.	n/a	n/a	n/a	n/a	n/a
Hicksville Twp.	3	2	1	3	1
Hicksville, Village of	3	5	4	1	2
Highland Twp.	3	3	3	2	2
Mark Twp.	3	3	2	2	1
Milford Twp.	n/a	n/a	n/a	n/a	n/a
Ney, Village of	3	3	4	1	1
Noble Twp.	5	4	3	2	1
Richland Twp.	3	4	4	2	2
Village of Sherwood	5	5	5	5	3
Tiffin Twp.	3	5	4	1	2
Washington Twp.	5	5	3	3	1
Average Ranking	3.87	4.13	3.53	2.33	1.47

1 = lowest concern 5 = most significant

### 3. Public Input and Comments

The Defiance County Public Safety Office hosted two separate meetings to gather public input to hazard identification. A public meeting on May 2, 2011 and an Open House on September 21, 2011 were held for area citizens. Public notice was given by newspaper (Appendix X,Y,Z) to invite local and neighboring communities to provide input for hazard identification. The audiences consisted of Defiance County residents and citizens from adjacent counties and communities. The participants had access to the Defiance County Natural Hazard Mitigation Plan and were asked to provide comments and concerns regarding risk to natural hazards. No written comments were received and one oral comment that was unrelated to the content of the Natural Hazard Mitigation Plan but rather an issue between property owners.

### 4. Summary of Hazard Identification

The natural hazards of tornado, winter storm, flooding, drought and earthquake were rated “most significant” to “lowest concern” respectively. The risk of earthquake ranked well below the other four natural hazards.

Within the responses of each political entity, the ranking was fairly consistent to the mean except for some political jurisdictions ranking flooding or drought above or equal to winter storm and/or tornado.

#### *B. Profiling Defiance County’s Natural Hazard Events*

The profile of Defiance County’s natural hazards was completed by contacting governmental agencies, reviewing existing documentation and researching historical records. The top three natural hazards are profiled in the following section and include winter storms, tornados, and flooding. Drought and earthquake will be added based on the guidance of the local emergency planning committee.

#### 1. Winter Storms

Winter storms will be profiled to include all jurisdictions in the plan because of the widely distributed nature of the hazard and the unpredictability of future events. Winter Storm risk is county-wide and includes Defiance County, the City of Defiance, the Villages of Hicksville, Ney, and Sherwood.

Precipitation in the form of snowfall, as expected, has a strong positive correlation with the temperature regime of Ohio. The five warm weather months of May through September are snow-free. Snowfall is a seasonal phenomenon associated with the seven cold weather months. Reported in the Defiance County Comprehensive Plan 2000, the total snowfall averages 24.4 inches annually. However, Kevin Barjenbruch, National Weather Service of Northern Indiana reports by e-mail to the authors (12/20/03) that Toledo averages 37.4 inches of snowfall a year, while Fort Wayne averages 35.1 inches, so the 24.4 inch amount, looks low and is likely the result of missing data. April and

October, on the cusps of spring and winter respectively, have negligible amounts of snowfall (0.9 in. and 0.1 in. respectively). March and November, at the end and the beginning of winter respectively, have moderate amounts of snow (3.6 in. and 1.8 in. respectively). December, January, and February have appreciable amounts of snow (5.3 in., 6.7 in., and 6.0 in. respectively) and constitute the height of the snow season.

Viewing monthly extremes (Table 6) over several decades, however, reveals snowfall maximums over the years ranging from 1.5 in. in October to 26.0 in. in January, with double-digit snowfall amounts from November (13.0 in.), December (19.9 in.), February (19.0 in.), and April (14.0 in.). The record year for the most snowfall was 1977 in which 47.5 inches were received. Conversely, the record year for the least snowfall was 1949 in which only 4.7 inches were received.

Table 6.

Average Monthly Snowfall at Defiance, OH  
 (Source: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov))  
 (Climatology of the United States 1971 – 2000)

Month	Monthly average (inches)	Maximum monthly average (inches)	Year
January	7.1	26.0	1978
February	6.2	19.0	1982
March	2.5	8.0	1977
April	0.4	5.5	1994
May	--	--	--
June	--	--	--
July	--	--	--
August	--	--	--
September	--	--	--
October	0.1	1.0	1992
November	1.3	4.5	1980
December	7.2	18.0	1977
Annual Average of Snowfall = 24.8 inches			

The National Weather Service of Northern Indiana reports all-time records related to the winter season in Defiance County. They are reported for the period 1896-2011 in Table 7.

Table 7.

All-time Winter Season Records (1896-2011). Nat'l Weather Service.

Minimum temperature	-26, January 13, 1912
Minimum max temperature	-10, December 25, 1983 and January 19, 1994
Most days in a row with lows < zero	13, February 1-12, 1978
Lowest daily average temp	-15, January 19, 1994 (high-10, low -20)
Maximum calendar day snowfall	12.0" December 20, 1973

Maximum snowdepth	46" February 8, 1903
Most days in a row with measurable snowfall	6, December 11-16, 1950...January 24-29, 1951...December 30, 1980 - January 3, 1981
Most number of days in a row with measurable snowdepth	67, December 11, 1944 – February 14, 1945 and January 9 – March 16, 1978

The National Weather Service of Northern Indiana records significant winter storm events that cause hardship to human activity and property loss. Years with large snow accumulation did not always directly correlate to a significant winter storm event in the sense of a natural hazard. In the same regards, years with low snow accumulation sometimes in combination with ice and wind causes as much hardship to human activity and property loss.

The National Weather Service has provided data that includes winter storm records from 1993 – 2011. Table 8 summarizes the date and description of each winter storm as reported by the National Weather Service.

Table 8. National Weather Service Defiance County Winter Storm Data 1993-2011  
(Source: <http://www.ncdc.noaa.gov/oa/ncdc.html>)

Date	Description
2/22/93	Heavy Snow
3/4/93	Ice and Snow
3/13/93	Blizzard
12/26/93	Extreme Cold
2/25/94	Heavy Snow
4/6/94	Heavy Snow
1/21/95	Heavy Snow
2/11/95	Extreme Cold
4/4/95	Extreme Cold
4/10/95	Glaze (Ice)
9/11/95	Record Cold Frost
12/9/95	Extreme Cold
1/2/99	Heavy Snow
3/11/00	Heavy Snow
12/13/00	Heavy Snow
12/25/02	Heavy Snow
2/22/03	Heavy Snow
12/22/04	Winter Storm
1/5/05	Winter Storm
1/22/05	Winter Storm
12/08/05	Heavy Snow
2/13/07	Winter Storm
2/24/07	Ice Storm
12/09/07	Ice Storm

12/15/07	Winter Storm
2/01/08	Winter Storm
2/25/08	Winter Storm
3/04/08	Winter Storm
12/19/08	Ice Storm
1/27/09	Heavy Snow
1/07/10	Winter Weather
2/09/10	Winter Storm
12/12/10	Winter Storm
1/11/11	Winter Weather
2/05/11	Heavy Snow/Winter Weather
2/20/11	Winter Weather
2/25/11	Heavy Snow/Winter Weather

During the period of 1993 – 2011, thirty-seven (37) winter storm events occurred. The probability of these events to occur is greater than 2 winter storm events occur per year.

The Ohio Emergency Management Agency (OEMA) reported Presidential declarations of disasters in Ohio from 1964–2003. An example of a disaster declaration in Defiance County for a winter storm event was the blizzard of Jan 26, 1978. Although OEMA reported the costs of the disaster on a statewide basis, the blizzard of '78 cost Ohio an estimated \$3.5 Million.

#### WBGU-PBS, Bowling Green, OH - Summary of the Blizzard of '78

It was the worst storm to ever hit northwest Ohio. Between January 26 and 29 of 1978, 12 inches of snow fell overnight in northwest Ohio. But it wasn't the accumulation that was a problem. Winds gusted at 60 miles per hour, and the temperature dropped to around 11 degrees. Lives were disrupted and some were lost.

The storm caught residents off guard. The night before it started many people thought the incoming storm was just another winter disturbance – certainly nothing to worry about. But upon awaking the next morning, it was all too apparent, this was not a typical storm.

Gas, electric and telephone service was lost in many areas and the storm was preventing city and utility workers from getting service restored. People fought for anything and everything to stay warm; some even tore apart and burned furniture in their effort to have some heat. Some people suffered carbon monoxide poisoning from using outdoor grills indoors for heat.

## Blizzard of '78: A Meteorological Review

This overview is reprinted from a report by United Press International's Jay Gibian. The report, entitled *Blizzard - An Ohio UPI Broadcast Special*, was issued February 17, 1978. The report was re-typed here in its original broadcast copy form.

A storm of unprecedented magnitude.... that's what the National Weather Service terms the blizzard that whipped Ohio last month. What occurred on January 26th, 1978 in Ohio was not a blizzard. What did occur was even rarer and even more dangerous: a severe blizzard.... the worst of winter storms.

The National Weather Service defines a "severe blizzard" as a storm with winds of 45 miles per hour or greater; a great density of falling or blowing snow; and temperatures of 10 degrees or less.

In fact, winds gusted to more than 100 miles per hour over much of the state, with sustained winds in the 45-60 mph range. Record snowfalls were recorded in many areas and an all-time low barometric pressure records were shattered as the intense storm whipped the state.

With the assistance of Ed Degan, a meteorologist at the Akron-Canton Airport's Weather Service Office, UPI has summarized the development of that storm-of-storms:

On January 24th, two seemingly unrelated low pressure areas, one in the western Gulf of Mexico and the other in northern North Dakota, began to develop. The North Dakota low was expected to pass north of Ohio, posing no great weather threat to the state. The gulf low was forecast to move gradually northeastward toward Ohio. Rain was expected to develop over the state, changing to snow, as colder air moved in behind the storm system.

On Wednesday, January 25th, all the weather patterns seemed to be occurring as forecast. The Gulf low moved into northern Louisiana during the morning, the other system was moving to the east. Then the first signs of something ominous began to appear.

The North Dakota low began tracking more to the southeast and atmospheric pressure, north of the Gulf low, began to fall rapidly. It became apparent to meteorologists that the two low pressure systems were on a collision course....and that collision would occur over, or very near, the state of Ohio. At 4:30 p.m., the Weather Service issued heavy snow warnings for northwestern Ohio and a winter storm warning for the remainder of the state.

By early Wednesday evening, the low from North Dakota was tracking directly toward Ohio. It then became obvious that a very dangerous weather situation faced Ohioans. Forecasters issued blizzard warnings for the entire state at 9 p.m., January 25th. The weather conditions at this time, however, were misleading....and those conditions are blamed for many being surprised by the storm.

Rain had spread over Ohio and temperatures were in the 40s across most of the state. The wind increased slightly as midnight approached, but conditions were more typical of an early spring rainstorm, than those preceding a disaster. Midnight passed, however, and wind speeds continued to increase. It swiftly became evident that a storm of unprecedented magnitude was imminent.

But then the two storms met and did something that even the meteorologists....who had expected a blizzard....did not foresee. The two low pressure centers twisted together....a very rare and dangerous occurrence. Warm air began to flow into Ohio from the north and colder air into the state from the south. The rain abruptly changed to snow, spreading northeastward and gaining in intensity. Wind speeds, by that time, had reached the 70 mile per hour range and gusts of more than 100 miles per hour downed power lines, billboards, mobile homes, and tree limbs. And then the snow....caught by the strong winds....began to form deep, deep drifts. An entire semi-trailer truck was buried in one snow bank near Mansfield. The driver was not rescued until nearly a week later.

Hundreds upon hundreds of motorists were stranded in their cars along nearly every highway in the state. The Ohio Turnpike, for the first time in history, was completely shut down. Interstate highways were, for the most part, impassable. Smaller roadways in nearly every county were invisible beneath the snow. Visibility was often reported at zero.

Electric service to thousands of homes across the state was disrupted. Many persons were forced to leave their frigid homes. Suffering, discomfort, and danger were, by then, commonplace. Deaths occurred. Officials urged all Ohioans to remain at home as temperatures dropped to near zero. Wind chill factors across the state plummeted to near 60 degrees below zero.

In all, 35 persons died during that storm. Officials, even today, say some bodies still may be buried in unmelted snowdrifts. The Blizzard of 1978 was, in fact, the worst storm to ever occur in Ohio.

### Summary of Winter Storm Hazard Identification

Each jurisdiction will have equal risk of future winter storm damage from snow, ice, cold temperatures and wind. Although the database from the NCDC is not extensive, the snowfall records and accounts of the Blizzard of '78 show the magnitude of winter storms is high for all jurisdictions.

### Number of Structures and Value at risk to Winter Storms

Defiance County has various structures and infrastructure that are potentially at risk to winter storms. Winter storms will generate damage only for area and structures, but not

the whole county. Appendences CC and DD are references for estimating the number of types of buildings and value at risk.

Appendix CC summarizes the best available 2008 market value of structures and infrastructure that exist in Defiance County as of November 2008. The values were obtained from the Defiance County Auditor's office. The exempt column includes structures that carry a market value but are exempt from property taxes collect by the auditor's office. Utility/Infrastructure includes electric, gas, communication, etc. assets that serve the citizens of Defiance County. The values are considered replacement value of the structures and infrastructure. Appendix DD summarizes the best available number of land parcels that have building structures and/or utility/infrastructure. Each parcel may have multiply structures that combine into the total market value. This is the best available data that exist for the number of structures vulnerable to natural hazards in Defiance County.

### Assessing Vulnerability

There exists a likely probability of winter storms occurring in Defiance County annually. The worst case scenario would be an event similar to the Blizzard of 1978 occurring again. The loss estimate for Ohio from the Blizzard of 1987 was \$3,500,000 and in 2012 dollars would be \$12,351,188. Local damage from winter storms would include snow load on roof tops depending on roof slope, age of building and snow melt. Additional damages may lead to electric power losses to businesses and residence resulting in building damage, loss of livestock and human life. According to the Ohio Enhanced Hazard Mitigation Plan, Defiance County has a 10-year winter storm loss estimate of \$6,250,000 or a per-capita annual winter storm loss of \$15.95.

### Identifying Assets

Winter storm risk will be shared equally among all jurisdictions in Defiance County. The assets at risk are all current buildings, infrastructure, facilities and human population located in Defiance County.

The infrastructure of Defiance County is extensive and includes utilities and transportation. Public sewer and water is extended to several communities of significant population while much of the rural area rely on private wells or ponds for a water supply and an on-site absorption field system for sewage treatment. Either Toledo Edison or Northwest Electric Cooperative distributes electricity to residence and business of Defiance County.

Total highway mileage in the State Highway System is 155 miles. Total highway mileage in the County Highway System 328 miles. The total number of bridges on Defiance County roads and Township roads, 10 feet long or longer is 249. Total highway mileage in the Township Highway System is 433 miles. Total miles of highway in Defiance County are 916 miles.

Facilities critical to government response and recovery activities include: 911 centers, emergency operations centers, police and fire stations, public works facilities, sewer and water facilities, hospitals, bridges and roads, and shelters. Natural hazards that cause damage to these facilities could cause serious secondary impacts to the communities.

Essential facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public's ability to recover from the natural hazard. These facilities may include: jails, law enforcement centers, public services buildings, and other public facilities, such as schools.

Map Critical Facilities – Appendix R

Map Essential Facilities – Appendix S

Map Infrastructure of Defiance County – Appendix T

### Estimating Potential Losses

Problem statements have been developed for winter storm events and prioritized by the core group. In the event of a severe winter storm, jurisdictions in Defiance County typically struggle with the following problems:

- Transportation difficulties for emergency services, medical workforce and commuting needs for local labor force.
- Communication barriers to the public and intra-agency
- Utility failures (ie electricity, phone).
- Lack of knowledge of available alternative emergency vehicles (all-terrain vehicles) in the community to provide essential supplies and medical transportation.
- Increased risk of human loss of life because lack of communication and transportation for otherwise treatable medical situations.
- Adequately resourced shelter facilities to accommodate people in times of widespread utility failure and severe cold temperatures.

The core group also discussed barriers to overcoming the problems associated with winter storm events. They are as follows:

- Lack of communication equipment and training for all agencies
- Lack of backup electrical generators for many shelter facilities

- Lack of early warning systems that reach all residents
- Lack of citizen preparedness for winter storm events
- Lack of citizen heeding to winter storm event warnings
- Lack of resources to clear roadways for transportation demands

### Analyzing Development Trends

Development trends are offered by the 2000 Defiance County Comprehensive Plan. The following are statements made in the Land Use Considerations for Future Planning section. These statements pertain to natural hazard mitigation planning for winter storms and should be used by jurisdictions to guide and prioritize natural hazard mitigation projects.

- Disaster preparedness education can be taught in schools in a manner similar to fire drills, which have become a standard periodic procedure.
- Residential development, optimally, is usually best directed only to those areas in which adequate infrastructure and cultural amenities already exist.
- The Ohio Department of Natural Resources (ODNR) makes grants available for utilities enhancement.
- High quality, modern, efficient, adequate, and professional police, fire, and emergency medical services are expected and deserved by the citizens of Defiance County.
- Defiance County may want to consider as a goal the creation of a permanent emergency facility and shelter for people away, forced, or evacuated from their homes in times of large-scale disasters.
- An emergency management plan should be in place in case of an unforeseen disruptive natural or cultural circumstance.
- Coordination among the various emergency service providers and levels of government is critical.

Appendices CC and DD are used as a baseline to estimate the types, number and value of future buildings. If a percentage growth or regression occurs or is projected, risk values and the number of buildings by jurisdiction are estimated by type (i.e. farm, industrial, commercial, residential, etc.).

## 2. Tornado, Thunderstorm Winds and High Winds

### Tornado

Tornados will be profiled to include all jurisdictions in the plan because of the widely distributed nature of the hazard and the unpredictability of future events. Tornado risk is county-wide and includes Defiance County, the City of Defiance, the Villages of Hicksville, Ney, and Sherwood.

Tornados and thunderstorm winds will be profiled to include the description of all recorded events specific to the jurisdiction as it relates to known historical records and also profiled for all jurisdictions because of the unpredictability of future events.

NOAA reports tornado activities by frequency per land area. Figure 1 provides a national historic record of tornado activity per 1,000 square miles.

Figure 1. Tornado Activity in the US

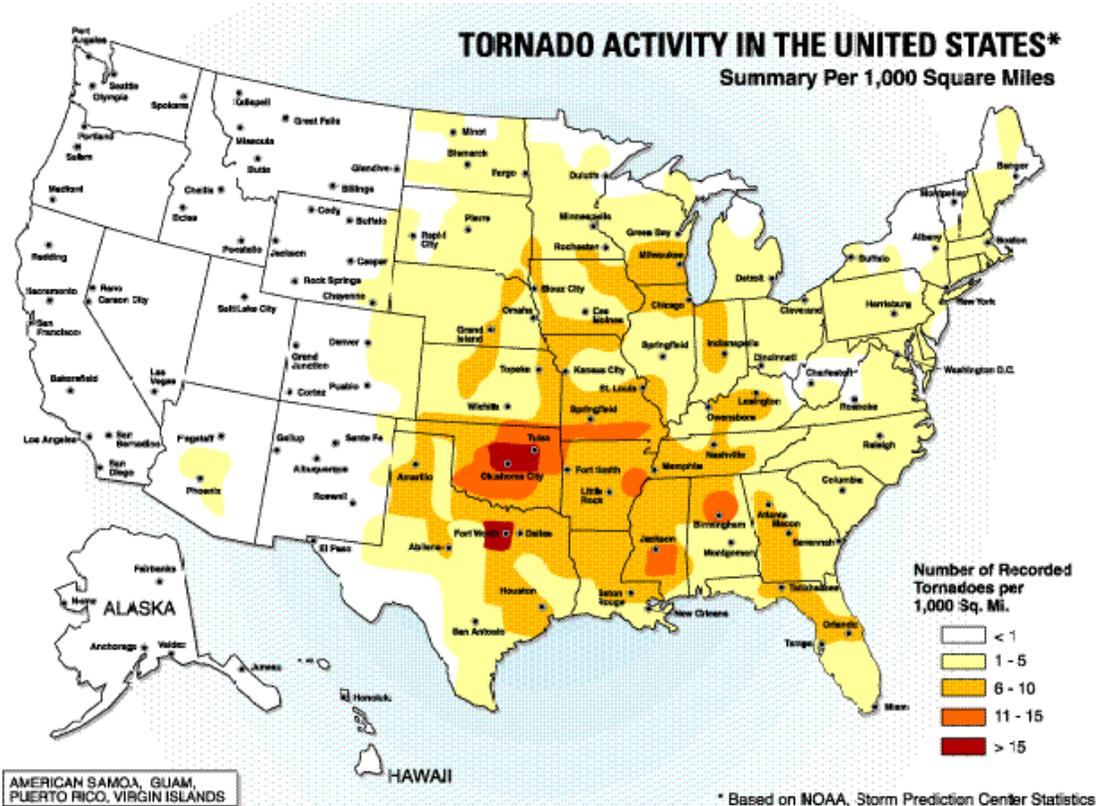


Figure 1.1 The number of tornadoes recorded per 1,000 square miles



For the period 1950 – 2011, Defiance County has experienced eight (8) tornado events at various locations throughout the county. Defiance County has reported zero (0) deaths and zero (0) injuries from Tornadoes during 1950-2011. Table 10 summarizes the National Weather Service records for Defiance County tornado frequencies. Property damage estimates are provided by the National Weather Service for the date of the damage. On average, 13% of the years between 1950 and 2011 had experiences with confirmed tornado events. Another words a confirmed tornado has occurred 1 in every 7.6 years in Defiance County.

Table 10.

National Weather Service Tornado Records for Defiance County

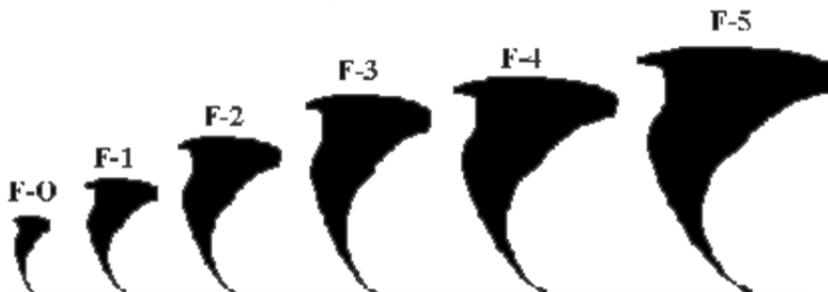
(Source: <http://www.ncdc.noaa.gov/oa/ncdc.html>)

\*Figure 2 describes the F (Fujita) Scale

Date	Beginning Location	Ending Location	Township/Community	Magnitude *	Length X Width	Property Damage	Converted to '04 \$
4/16/60	41° 06' N 83° 42' W	Unknown	Will be located	F0	1 mile X 77 yds	\$2,500	\$15,364
7/19/71	41° 23' N 84° 38' W	Unknown	Will be located	F0	0 mile X 200 yds	\$25,000	\$115,350
8/10/71	41° 18' N 84° 48' W	Unknown	Will be located	F2	1 mile X 100 yds	\$25,000	\$115,350
6/26/73	41° 18' N 84° 17' W	Unknown	Will be located	F0	0 mile X 33 yds	\$300	\$1,283
7/12/86	41° 14' N 84° 21' W	41° 13' N 84° 19' W	Will be located	F2	3 mile X 73 yds	\$2,500,000	\$4,153,592
7/5/87	41° 23' N 84° 32' W	Unknown	Will be located	F0	1 mile X 60 yds	\$25,000	\$40,760
11/10/02	41° 11' N 84° 13' W	41° 11' N 84° 14' W	Highland Twp.	F0	3 mile X 50 yds	Unknown	
				Total Property Damage		\$2,577,800	\$4,441,699

Figure 2.

Fujita - Pearson Tornado Scale



F-0: 40-72 mph, chimney damage, tree branches broken  
F-1: 73-112 mph, mobile homes pushed off foundation or overturned  
F-2: 113-157 mph, considerable damage, mobile homes demolished, trees uprooted  
F-3: 158-205 mph, roofs and walls torn down, trains overturned, cars thrown  
F-4: 207-260 mph, well-constructed walls leveled  
F-5: 261-318 mph, homes lifted off foundation and carried considerable distances, autos thrown as far as 100 meters

This set of records indicates that Ohio, Defiance County included, is very likely to experience tornados and when they occur, people are killed or injured and substantial property is damaged.

### Thunderstorm Winds and High Winds

The National Weather Service has recorded incidences of significant thunderstorm winds. In the period of 1950 – 2011, Defiance County has experienced 96 reported thunderstorm wind events with wind speeds ranging from 70 – 90 mph. The frequency of such thunderstorm wind events has occurred 1.6 times per year. 29 events in 61 years had reported property losses per event averaging \$82,760 for a total of \$2.4 Million.

The National Weather Service has recorded incidences of significant hail events. In the period of 2007 – 2012, Defiance County has experienced 11 reported hail events with hail accumulation ranging from 0.75 in. to 1.75 in. The frequency of the hail events has occurred 1.8 times per year. The NOAA, National Climatic Data Center reports zero property or crop damages from hail during this period.

### Number of Structures and Value at risk to Tornado and Thunderstorm Winds

Defiance County has various structures and infrastructure that are potentially at risk to tornados and thunderstorm winds. Tornados will generate damage only for area and structures, but not the whole county. Appendences CC and DD are references for estimating the number of types of buildings and value at risk.

Appendix CC summarizes the best available 2008 market value of structures and infrastructure that exist in Defiance County as of November 2008. The values were obtained from the Defiance County Auditor's office. The exempt column includes structures that carry a market value but are exempt from property taxes collect by the auditor's office. Utility/Infrastructure includes electric, gas, communication, etc assets that serve the citizens of Defiance County. The values are considered replacement value of the structures and infrastructure. Appendix DD summarizes the best available number of land parcels that have building structures and/or utility/infrastructure. Each parcel may have multiply structures that combine into the total market value. This is the best

available data that exist for the number of structures vulnerable to natural hazards in Defiance County.

### Assessing Vulnerability

A potential worst case scenario at a medium relative risk is an EF-5 tornado going west to east across Defiance County on an azimuth of 90 degrees through Hicksville, Mark Center, Sherwood, The Bend, Defiance and Independence. Wind speed in excess of 200 mph and the tornado path approximately 35 miles in length and 1 mile wide.

	Population	Resident Buildings	Value
Hicksville	3,649	1,337	\$106,373,057
Mark Center	242	89	\$7,080,929
Sherwood	801	293	\$23,311,373
Defiance	4,465	1,636	\$130,161,796
<b>Total</b>	<b>9,157</b>	<b>3,355</b>	<b>\$266,927,155</b>

According to the Ohio Enhanced Hazard Mitigation Plan, Defiance County has a 10-year summer storm loss estimate of \$218,000 or a per-capita annual summer storm loss of \$0.56. Defiance County has 14,471 residential units (including mobile homes) with an average 2011 value of \$79,561. Defiance County has 1,415 mobile homes. Seventy-four percent of the residential units in Defiance County are Pre-1995 at-risk construction to tornados with a value of \$849,000,000.

### Identifying Assets

Map Critical Facilities – Appendix R

Map Essential Facilities – Appendix S

Map Infrastructure of Defiance County – Appendix T

### Estimating Potential Losses

Problem statements have been developed for tornado and thunderstorm wind events and prioritized by the core group. In the event of a severe tornado and/or thunderstorm wind events, jurisdictions in Defiance County typically struggle with the following problems:

- Residents have limited options for an early warning message for approaching tornado or severe thunderstorm events.
- Residences may not have safe rooms to protect occupants from tornado and/or thunderstorm events.
- Communication barriers to the public and intra-agency

- Utility failures (ie electricity, phone).
- Adequately resourced shelter facilities to accommodate people in times of widespread utility failure and/or property damage.
- The core group also discussed barriers to overcoming the problems associated with winter storm events. They are as follows:
  - Lack of adequate, multi-layered early warning system for all residence
  - Lack of evacuation shelters for vulnerable populations (ie mobile home trailer court)
  - Lack of communication equipment and training for all agencies
  - Lack of backup electrical generators for many shelter facilities
  - Lack of citizen heeding to tornado and thunderstorm event warnings

### Analyzing Development Trends

Development trends are offered by the 2000 Defiance County Comprehensive Plan. The following are statements made in the Land Use Considerations for Future Planning section. These statements pertain to natural hazard mitigation planning for tornado and thunderstorm events and should be used by jurisdictions to guide and prioritize natural hazard mitigation projects.

- Disaster preparedness education can be taught in schools in a manner similar to fire drills, which have become a standard periodic procedure.
- Due to the incidence of tornadoes, the creation of basements in dwellings may warrant serious consideration rather than slab construction or crawlspace construction.
- The Ohio Department of Natural Resources (ODNR) makes grants available for utilities enhancement.
- High quality, modern, efficient, adequate, and professional police, fire, and emergency medical services are expected and deserved by the citizens of Defiance County.

- Defiance County may want to consider as a goal the creation of a permanent emergency facility and shelter for people away, forced, or evacuated from their homes in times of large-scale disasters.
- An emergency management plan should be in place in case of an unforeseen disruptive natural or cultural circumstance.
- Coordination among the various emergency service providers and levels of government is critical.

Appendices CC and DD are used as a baseline to estimate the types, number and value of future buildings. If a percentage growth or regression occurs or is projected, risk values and the number of buildings by jurisdiction are estimated by type (i.e. farm, industrial, commercial, residential, etc.).

### 3. Flooding

Flooding will be profiled to include all jurisdictions in the plan because of the widely distributed nature of the hazard and the unpredictability of future events. Flash Flooding risk is county-wide and includes Defiance County, the City of Defiance, the Villages of Hicksville, Ney, and Sherwood. Flooding from the threat of the 100-year flood plain exists in the City of Defiance, the Villages of Hicksville, Ney and Sherwood, all Defiance County Townships with the exception of Adams Township. Flooding from the threat of dam failure exists in the City of Defiance, Defiance Township and Richland Township.

In Defiance County, the United States Geological Survey and the Defiance County Water Treatment Facility maintain river gauge records and daily river flow for the Maumee River. The gage at the Defiance Water Treatment Facility was used to determine the historical frequency of flood events impacting Defiance County. The National Weather Service has determined that 10 feet is the official flood state for the gage at the Defiance Water Treatment Facility.

Precipitation occurs year-round in Defiance County, as every month receives measurable amounts (Table 11). The annual mean is 35.6 in. representing the total precipitation received during the entire year. The average monthly precipitation range is from a high of 3.88 in. in June to a low of 1.82 in. in February. Although the range is significant from a percentage perspective, it does not represent a great change in absolute precipitation amounts. The wettest year was 1990 in which 48.63 inches of precipitation were received while the driest year was 1941 in which 21.54 in. of precipitation were received. Additional all-time records reported by the National Weather Service are maximum calendar day precipitation was 5.93” on August 20, 2007 and most days in a row with measurable precipitation was 14 days on April 2 – 15, 1983. These records are reported for the period 1896-2008.

Table 11.

Average Monthly Precipitation at Defiance, OH  
(Source: 2000 Defiance County Comprehensive Plan)  
(1936-37, 1939-85, 1988-95)

Month	Monthly average* (inches)	Maximum monthly average (inches)	Year	Minimum monthly average (inches)	Year
January	1.92	7.83	1950	0.21	1961
February	1.84	5.77	1990	0.07	1987
March	2.65	5.30	1945	0.31	1981
April	3.30	7.20	1970	0.81	1946
May	3.62	9.11	1943	0.83	1939
June	3.78	12.00	1981	0.53	1984
July	3.89	7.96	1943	0.80	1974
August	3.21	7.19	1977	0.71	1970
September	3.23	7.83	1972	0.58	1940
October	2.59	7.00	1991	0.00	1963
November	2.93	7.75	1982	0.41	1976
December	2.64	6.23	1990	0.16	1958
		Maximum Annual		Minimum Annual	
Annual Mean	35.60	48.63	1990	21.54	1941

\*Source: [http://www.crh.noaa.gov/iwx/program\\_areas/climate/defiance.htm](http://www.crh.noaa.gov/iwx/program_areas/climate/defiance.htm) (1971-2000)

Flooding in Defiance County typically is a combination of snowmelt and rainfall during the months of January, February and March. Over the course of 101 years and 60 flood events, January, February and March is the time period the Maumee River would typically exceed flood stage. Table 12 indicates the distribution of the 75 flood events by month over the period 1907-2011. However, flood stages have been exceeded by rainfall alone such as in June of 1981 when 12 inches of rain fell in Defiance County and the surrounding region.

Table 12.

Frequency by Month of Flood Events Exceeding Flood Stage, Defiance, OH  
(1907-2011)

(Source: Defiance Water Treatment Facility and USGS records)

January	14	July	1
February	13	August	1
March	10	September	1
April	5	October	2
May	4	November	1
June	4	December	8

a. Principal Flood Problem

Records of river stages and discharges on the Maumee River have been maintained since 1898. Significant floods (those with peak discharges over 50,000 cubic feet per second (cfs)) have occurred at least once in each decade since 1913. All of the highest known floods on the Maumee River have occurred during the winter or spring. However, intense local thunderstorms can occur in the summer and cause local flooding.

The greatest known flood to have occurred on the Maumee River was in March 1913. Records indicate that the 1913 flood discharge (138,500 cfs) was approximately 60-percent greater than the next highest known flood discharge. The event occurred as a result of two intense frontal storms that passed over Ohio from west to east between March 23 and 27. Rainfall averaged between 6 and 7 inches over the entire Maumee River Basin, with 6.5 inches recorded at Defiance.

Numerous major floods have occurred since the 1913 flood. The most recent flood (March 1982) was caused by rain and snowmelt in the upper Maumee River Basin. Unseasonably warm temperatures caused snowmelt and combined with precipitation maintained high water levels and extended the period of flooding. Three lives were lost and 876 people were evacuated from Defiance and Paulding Counties. Additional damage in the two counties included 9.5 percent of farmland flooded and damage to dwellings, commercial and public buildings, sewer systems, roads, and bridges.

During the period 1907 – 2011, the Maumee River exceeded flood stage 75 times in 104 years. That relates to 72% or 1 in every 1.4 years.

Table 13 summarizes the individual events in which the river level has exceeded the 10 foot flood stage as measured by the Defiance Water Treatment Facility gauge. Although the river frequently exceeds the 10-foot flood stage, damage to the communities in Defiance County varies with the intensity and crest levels of the river.

Table 13.

Flood Events on the Maumee River Above the 10-foot Flood State at the Defiance Water Treatment Facility. (Source: Defiance Water Treatment Facility 1907-2009, March, USGS 2009, April - 2011)

1907, Jan	13.70	2001, Feb	10.67
1908, Mar	14.50	2002, Feb	11.99
1910, Jan	14.00	2002, Mar	10.77
1913, Mar	26.00	2003, Mar	10.14
1943, May	16.80	2003, May	12.58
1944, Apr	14.80	2003, July	11.10
1948, Feb	13.50	2004, June	12.76
1950, Feb	17.50	2005, Jan	10.84
1959, Feb	15.80	2005, Jan	16.84
1961, Apr	10.90	2005, Feb	10.70
1962, Mar	10.30	2005, Dec	12.68
1963, Mar	14.60	2006, Dec	11.06
1966, Dec	14.50	2007, Jan	10.62

1967, Jan	13.40	2007, Jan	11.30
1967, Dec	12.30	2007, Feb	17.98
1968, Jan	13.26	2007, Mar	11.08
1969, Feb	14.10	2007, Apr	10.41
1974, Jan	13.20	2007, Aug	12.80
1976, Feb	13.70	2007, Dec	10.41
1977, Apr	10.70	2008, Jan	11.47
1978, Mar	16.90	2008, Feb	17.97
1981, Jun	15.40	2008, Dec	10.61
1982, Mar	20.50	2009, Mar	17.63
1985, Feb	18.50	2009, Apr	16.72
1989, Jun	11.20	2009, Jun	16.98
1990, Feb	13.20	2009, Sep	15.79
1991, Jan	17.40	2009, Oct	16.48
1992, Nov	11.30	2009, Dec	16.67
1992, Dec	16.20	2010, Mar	18.22
1993, Jan	13.90	2010, May	17.98
1994, Apr	12.60	2010, Jun	16.65
1996, Jan	10.30	2010, Aug	15.83
1996, May	10.50	2010, Oct	15.62
1997, Feb	13.90	2011, Mar	22.52
1997, Mar	11.11	2011, Apr	17.18
1997, May	10.35	2011, Jun	16.89
1997, Jun	12.47	2011, Aug	15.76
1999, Jan	15.10		

### Repetitive Loss Structures

Repetitive loss structure is a term that is associated with the National Flood Insurance Program (NFIP). For Flood Mitigation Assistance (FMA) program purposes, this is a structure, covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25% of the market-value of the structure at the time of each flood loss event. For the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property, which the NFIP has paid two or more flood claims of \$1,000 or more in any, given 10-year period since 1978. A repetitive loss structure is important to the NFIP, since structures that flood frequently put a strain on the flood insurance fund. It should also be important to a community because residents' lives are disrupted and may be threatened by the continual flooding.

In order to participate in the NFIP, a community must agree to adopt and enforce sound floodplain management regulations and ordinances. In exchange for these practices, FEMA makes flood insurance available to homeowners, business owners and renters in these communities.

Defiance County and Communities within Defiance County comply with the NFIP by Special Purpose Flood Damage Prevention Regulations, of Defiance County, Ohio. All activities shall be completed in accordance with the requirements of said Resolution. An application is required (Appendix LL) and additional information may be required by the administrator in order to determine that the proposed development is compliant with the local and federal flood damage prevention criteria of the NFIP. This may include but is not limited to: site specific plans to scale showing the nature, location, dimensions and elevations of the area and structure(s) in question.

Defiance County Communities Participating in NFIP as of 5/3/2012

CID	Community Name	County
390850#	NEY, VILLAGE OF	DEFIANCE COUNTY
390143#	DEFIANCE COUNTY *	DEFIANCE COUNTY
390144#	DEFIANCE, CITY OF	DEFIANCE COUNTY
390145#	HICKSVILLE, VILLAGE OF	DEFIANCE COUNTY
390859#	SHERWOOD, VILLAGE OF	DEFIANCE COUNTY

Source: Federal Emergency Management Agency Community Status Book Report  
Communities Participating in the National Flood Program, Defiance County, OH

Forty one (41) repetitive loss structures have been identified in Defiance County and all are in Defiance City. They include single family dwellings, 2-4 family dwellings, commercial properties, abandon buildings or vacant lots, and parking lots. Appendix V., Repetitive Loss Structure Area is the general location of the repetitive loss structures.

The record indicates a data set of claims in the period of 1978-2012. Building damage claims of \$1,198,314 and content loss claims of \$419,204 have resulted in a total of \$1,617,519 in claims. There have been a total of 128 claims with an average of \$12,636.

The National Flood Insurance Program (NFIP) insurance information about repetitive loss structures is legally privileged and confidential. Its use is protected under the Privacy Act of 1974, 5 U.S.C. section 552(a). Use of the information provided is restricted to the applicable routine use cited in the system notice published in 56 FR 26415. This information is being provided to the officials of the community/county for hazard mitigation purposes only. The names, addresses and insurance data listed are confidential and will only be used by local officials in the administration of their duties as they relate to the NFIP, hazard mitigation, and mitigation planning. It will be protected so an individual's identifier cannot be used to locate an affected person or property, so care will be exercised if this information will be used to develop any map or table or list, on paper or electronically.

The properties are located on the following streets in Defiance, OH: Auglaize St., South Clinton St., Jackson St., Harrison St., Holgate Ave., E. First St., Front St., Kingsbury Lane, Ralston Ave., Riverside St., Seneca St., and Summit St. Appendix V is a map of the FEMA defined repetitive loss structures. Table 14 provides a summary of the repetitive loss structures by location, name and number of losses since 1978.

Table 14 – Summary of Repetitive Loss Structures, Defiance County, OH

Street #	Address	Description	Losses	Mitigation Action	Mitigation Funding	Recent Date of Loss
Legally privileged and confidential. Protected under the Privacy Act of 1974, 5 U.S.C. section 552(a)	Auglaize St	Residence	6	None	n/a	2/08/2008
	Auglaize St	Residence	5	None	n/a	1/15/2005
	Auglaize St	Residence	2	None	n/a	3/11/2009
	Auglaize St	No known address	2	None	n/a	2/24/1985
	Auglaize St	2-4 family residence	2	None	n/a	2/07/2008
	Auglaize St	Residence	2	None	n/a	2/05/2008
	Auglaize St	Residence	3	None	n/a	3/10/2009
	Auglaize St	Residence	2	None	n/a	2/24/1985
	Auglaize St	Residence	2	None	n/a	2/24/1985
	Auglaize St	Commercial	10	None	n/a	2/07/2008
	Auglaize St	Abandoned bldg	2	None	n/a	2/25/1985
	S. Clinton St	Commercial	3	None	n/a	3/14/1982
	S. Clinton St	Vacant lot	4	None	n/a	12/30/1990
	S. Clinton St	Commercial	4	None	n/a	2/25/1985
	S. Clinton St	Commercial	4	None	n/a	12/30/1990
	S. Clinton St	Commercial	2	None	n/a	2/25/1985
	E. First St	Residence	2	None	n/a	2/07/2008
	Front St	Residence	4	None	n/a	12/31/1990
	Harrison Ave	2-4 family residence	2	None	n/a	2/07/2008
	Holgate Ave	Residence	2	None	n/a	2/08/2008
	Jackson St	2-4 family residence	2	None	n/a	2/07/2008
	Kingsbury Ln	Vacant parking lot	2	None	n/a	2/25/1985
	Ralston Ave	Multi family residence	2	None	n/a	11/1/1982
	Riverside	Residence	3	None	n/a	2/25/1985
	Riverside	Residence	2	None	n/a	3/18/1982
	Riverside	Residence	2	None	n/a	2/09/2008
	Riverside	Residence	2	None	n/a	3/11/2009
	Seneca St	Commercial	3	None	n/a	7/27/1995
	Summit St	Parking lot	2	Acquired, demolished	Local Program	2/24/1985
	Summit St	Parking lot	2	Acquired, demolished	Local Program	2/24/1985
	Summit St	Residence	4	None	n/a	2/07/2008
	Summit St	Residence	4	None	n/a	1/14/2005
Summit St	Residence	2	None	n/a	2/07/2008	

b. Flash Flooding

The National Weather Service also reported six events of flash flooding in Defiance County for the period 1950-2004. Table 15 provides locations, actual property and crop damage, and actual dollars converted dollars to 2004 dollars.

The Ohio Emergency Management Agency reports Presidential disaster declarations in Ohio from 1964 – 2003. Defiance County was part of a Presidential disaster declaration on March 26, 1982 for flooding. Six counties were included in this declaration and the reported total cost of the event was estimated at \$425,000 (2004 \$836,220).

Table 15.

Flood and Flash Flood Occurrences.  
(Query for 1950-2012 from <http://www4.ncdc.noaa.gov>)

Date	Location or County	Type	Property Damage	Crop Damage	Converted to 2012 Dollars
1/4/1993	Defiance	Flood	\$50,000	Not reported	\$76,780
4/12/1994	Defiance	Flood	\$5,000	Not reported	\$7,454
4/11/1995	Defiance	Flood		Not reported	
7/26/1995	Defiance	Flash Flood	\$6,000	Not reported	\$8,719
8/17/1995	Defiance County North Half	Flash Flood	\$4,000	Not reported	\$5,812
8/17/1995	Defiance County West Half	Flash Flood	\$5,000	Not reported	\$7,265
7/8/1997	Defiance County	Flash Flood	\$5,000	\$5,000	\$13,728
8/16/1997	Hicksville	Flash Flood	\$5,000	Not reported	\$6,862
1/22/1999	Multi County	Flood	\$18,000	Not reported	\$23,767
6/17/2003	Sherwood	Flash Flood	\$100,000	Not reported	\$119,629
6/13/2004	Sherwood	Flash Flood	\$10,000	Not reported	\$11,694
2/5/2008	Sherwood	Flood	\$20,000	Not Reported	\$20,760
6/19/2009	Hicksville	Flash Flood	\$0	\$0	\$0
5/21/2010	Hicksville	Flash Flood	\$250,000	\$0	
5/31/2010	Defiance	Flash Flood	\$0	\$0	\$0
5/14/2011	Ney	Flash Flood	\$0	\$0	\$0
5/25/2011	Hicksville	Flash Flood	\$250000	\$0	
		Total	\$	\$5,000	\$

During the period 1993 – 2011, the National Climatic Data Center reports 12 flash flood events in 18 years. That relates to 67% or 1 in every 1.5 years.

The Federal Emergency Management Agency, National Flood Insurance Program, reports flood loss statistics for Ohio by community/county for the period of 1978 to May 11, 2009. Table 16 provides the number of total losses by community or county and the total payments made for each community or county.

Table 16.

FEMA  
National Flood Insurance Program Flood Loss Statistics  
Jan 1, 1978 – July 31, 2011 (Source: <http://www.fema.gov/>)

Community	Policies in Force	Insurance in Force	Loss Claims	Total Payments
Defiance County	86	\$11,101,100	19	\$183,564
City of Defiance	105	\$12,492,600	286	\$2,099,247
Village of Hicksville	8	\$1,903,900	5	\$19,507
Total of Defiance County	199	\$25,497,600	231	\$2,302,318
Total for Ohio	40,788	\$6,443,825,800	23,440	\$262,263,159

c. United States Geological Survey (USGS) 100-Year Flood Plain Study

The Flood Insurance Study (FIS), Defiance County, OH, Unincorporated Areas report was used to provide background information on the 100-year floodplain determination. The FIS document was completed August 1990 by Federal Emergency Management Agency in cooperation with, the Ohio Department of Natural Resources, and the U.S. Army Corps of Engineers.

The Flood Insurance Study covers the unincorporated areas of Defiance County. Flood caused by overflow of the Maumee River, the Auglaize River, the Tiffin River, and Preston Run was studied in detail.

The National Flood Insurance Program encourages local governments to adopt sound floodplain management programs. To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in FIS study, the 100- and 500-year floodplain boundaries have been delineated. The Defiance Countywide 100-year floodplain boundaries are shown in Appendix B. Floodplain Maps by Jurisdiction – Appendix A-Q.

The map modernization was initiated by State and Federal agencies to update floodplain mapping and provide better data to local floodplain managers. The process for Defiance County began in Fiscal Year 2008 with a scoping meeting held on June 4. Preliminary

maps were released on August 7, 2009 and an Open House was conducted on October 21, 2009 for local governmental and public review. The appeals period followed and was kept open until November 20, 2009. The Letter of Final Determination was issued on March 29, 2010 with the maps becoming effective and formally adopted by the County on September 29, 2010.

Defiance County and its jurisdictions have Floodplain Managers that monitor the flood hazard areas on a routine basis and enforce floodplain regulations. These Managers also provide community assistance, to include promoting the upkeep of flood insurance.

Encroachment on floodplains, such as structures and fill, reduces the flood-carrying capacity, increased the flood heights and velocities, and increase flood hazards in areas beyond the encroachment itself. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Impacts on planning will be discussed in Section 3. Flooding Assessing vulnerability – analyzing development trends.

#### d. Dam Failure Flood Hazard

Construction of dams in Ohio dates back to the early 1800's when reservoirs such as Buckeye Lake and Grand Lake St. Mary's were built to supply water to the canal system, which provided a means of transportation for agricultural trade and commerce. Dam construction continued at a modest pace for about the next 100 years with relatively few dams built by private entities. In the early part of the 19th century, several large municipally owned dams and reservoirs were built for public water supply. Severe floods also prompted the formation of Conservancy Districts that constructed dams for flood control.

Defiance County is home to two river dams located on the Auglaize and Maumee Rivers near Defiance, Ohio. The Defiance Power Dam is located on approximately 6 river miles upstream from the confluence of the Auglaize and Maumee rivers. The Independence Dam is located approximately 4 river miles downstream from the confluence of the Auglaize and Maumee rivers.

In 1982, an incident was reported by the National Performance of Dams Program detailed at the Independence Dam that left an abutment overtopped and some damage was caused.

According to the National Performance of Dams Program and the State of Ohio Standard Mitigation Plan, There was 1 incident in 99 years of dam operations in Defiance County or a 1.01% probable chance of a dam incident.

According to the Ohio Department of Natural Resources, Division of Water, the Defiance Power Dam is classified as a Class I dam while the Independence Dam is classified as a Class II.

Table 17. Defiance County River Dams and Classification

<b>Defiance County River Dams</b>		
<b>Name of Dam</b>	<b>River</b>	<b>Class</b>
Defiance Power Dam	Auglaize River	I
Independence Dam	Maumee River	II

The classification system for dams in Ohio was modeled after the Federal Guidelines for Dam Safety established in 1979. The classification criteria are outlined in OAC Rule 1501:21-13-01. The following parameters are the governing criteria for the classification:

1. Height of dam - defined as the vertical dimension as measured from the natural streambed at the downstream toe of a dam to the low point along the top of the dam.
2. Storage volume - defined as the total volume impounded when the pool level is at the top of the dam immediately before it is overtopped.
3. Potential downstream hazard - defined as the resultant downstream damage should the dam fail, including probable future development.

The following defines the Defiance County dam capacity, failure magnitude of severity, vulnerability, and impact.

Class I Dams: including Defiance Power Dam

- Dams having a total storage volume greater than five thousand acre-feet or a height of greater than sixty feet shall be placed in Class I. A dam shall be placed in Class I when sudden failure of the dam would result in one of the following conditions.
  - Probable loss of human life.
  - Structural collapse of at least one residence or one commercial or industrial business.

Class II Dams: including Independence Dam

- Dams having a total storage volume greater than five hundred acre-feet or a height of greater than forty feet shall be placed in Class II. A dam shall be placed in Class II when sudden failure of the dam would result in at least one of the following conditions, but loss of human life is not probable.

- Disruption of a public water supply or wastewater treatment facility, release of health hazardous industrial or commercial waste, or other health hazards.
- Flooding of residential, commercial, industrial, or publicly owned structures.
- Flooding of high-value property.
- Damage or disruption to major roads including but not limited to interstate and state highways, and the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by the chief.
- Damage or disruption to railroads or public utilities.
- Damage to downstream Class I, II or III dams or levees, or other dams or levees of high value. Damage to dams or levees can include, but is not limited to, overtopping of the structure.

#### Class III Dams:

Dams having a total storage volume greater than fifty acre-feet or a height of greater than twenty-five feet shall be placed in Class III. Sudden failure of the Class III dam would not result in probable loss of human life. Possible property losses including but not limited to rural buildings. Damage or disruption to local roads.

#### Class IV Dams:

Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less may be placed in Class IV. Sudden failure of the dam would result in property losses restricted mainly to the dam and rural lands, and loss of human life is not probable.

Uncontrolled floodwaters are one of the most powerful and destructive forces in nature. Dams that are not designed to withstand major storms may be destroyed by them, increasing flood damage downstream. This damage is too often catastrophic. In order to protect lives and property downstream, the Ohio Administrative Code requires that dams be constructed to safely handle an appropriate percentage of the Probable Maximum Flood (PMF). This percentage varies according to the height of the dam, size of the impoundment, and extent and severity of damage possible upon failure. The requirements established in Ohio are similar to those used in other states, and historical records of significant storms and dam failures this century verify that the design criteria are reasonable.

### Probable Maximum Precipitation (PMP)

The Probable Maximum Precipitation (PMP) is the greatest depth (amount) of precipitation, for a given storm duration, that is theoretically possible for a particular area and geographic location.

### Probable Maximum Flood (PMF)

The Probable Maximum Flood (PMF) is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

Defiance County has not experienced a dam failure and the probability in the future is possible but unlikely.

#### e. Number of Structures and Value at risk to Floods and Flash Floods

Defiance County has various structures and infrastructure that are potentially at risk to Floods and Flash Floods. All county structures have some risk of damage to flash flooding. Therefore the number and value of all structures in Defiance County are presented in this plan. Appendices CC and DD are references for estimating the number of types of buildings and value at risk.

Appendix CC summarizes the best available 2008 market value of structures and infrastructure that exist in Defiance County as of November 2008. The values were obtained from the Defiance County Auditor's office. The exempt column includes structures that carry a market value but are exempt from property taxes collect by the auditor's office. Utility/Infrastructure includes electric, gas, communication, etc assets that serve the citizens of Defiance County. The values are considered replacement value of the structures and infrastructure. Appendix DD summarizes the best available number of land parcels that have building structures and/or utility/infrastructure. Each parcel may have multiply structures that combine into the total market value. This is the best available data that exist for the number of structures vulnerable to natural hazards in Defiance County.

#### f. Assessing Vulnerability / Identifying Assets

Map Critical Facilities – Appendix R

Map Essential Facilities – Appendix S

Map Infrastructure of Defiance County – Appendix T

Map Road Closures due to Flooding or Flash Flooding Events – Appendix U

g. Assessing Vulnerability / Estimating Potential Losses

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 (Defiance). The geographical size of the region is 411 square miles and contains 1,727 census blocks. The region contains over 15,000 households and has a total population of 39,500 people (2000 Census Bureau data). There are an estimated 18,158 buildings in the region with a total building replacement value (excluding contents) of 3,261 million dollars (2006 dollars). Approximately 91.42% of the buildings (and 68.68% of the building value) are associated with residential housing.

HAZUS Vulnerability Analysis – **25 year flood**  
event – Defiance County, OH

Building Type	Number of Buildings	
	Buildings	Exposure
Residential	3,782	\$ 678,936,000
Non-Residential	1,817	\$ 326,481,000
Critical Facilities	154	\$ 27,669,000

HAZUS Vulnerability Analysis – **100 year flood**  
event – Defiance County, OH

Building Type	Number of Buildings	
	Buildings	Exposure
Residential	3,854	\$ 678,936,000
Non-Residential	1,828	\$ 326,481,000
Critical Facilities	155	\$ 27,669,000

According to Darlene M. Gagold, GIS Specialist, Floodplain Management Program, Ohio Department of Natural Resources, Division of Water has identified 380 building structures in the 100-year floodplain. A GIS shape file was provided to produce maps in Appendix A-Q. The distribution of them by political entity is summarized in Table 18.

Additionally, Bruce Clevenger, OSU Extension Defiance County, has identified a total of 588 building structures with a value of \$40,662,603 in the 100-year floodplain. This was accomplished by utilizing GIS aerial photography, parcel numbers and Defiance County Auditor Office records.

Table 18 summarizes both sources of information regarding the number and value of building structures within the 100-year floodplain by political entity.

Table 18.  
Distribution of Number and Value of Building Structures within the 100-year Floodplain by Political Entity, 2009.

Name of Political Entity	Number of Structures Source: ODNR	Number of Structures Source: OSU Ext*	Value of Structures Source: OSU Ext* Average Per Structure	25% Loss to Structures Average Per Structure	50% Loss to Structures Average Per Structure
Adams Township	0	0	\$0 ave.\$0	\$0 ave.\$0	\$0 ave.\$0
City of Defiance	100	199	\$14,628,640 ave.\$73,510	\$3,657,160 ave.\$18,377	\$7,314,320 ave.\$36,755
Defiance Township	50	182	\$13,158,298 ave.\$72,298	\$3,289,574 ave.\$18,074	\$6,579,149 ave.\$36,149
Delaware Township	23	25	\$1,895,840 ave.\$75,833	\$473,960 ave.\$18,958	\$947,920 ave.\$37,916
Farmer Township	5	6	\$354,460 ave.\$59,076	\$88,615 ave.\$14,769	\$177,230 ave.\$29,538
Hicksville Township	29	23	\$1,612,510 ave.\$70,109	\$403,127 ave.\$17,527	\$806,255 ave.\$35,054
Village of Hicksville	16	15	1,316,560 ave.\$87,770	\$329,140 ave.\$21,942	\$658,280 ave.\$43,885
Highland Township	12	9	\$561,485 ave.\$62,387	\$140,371 ave.\$15,596	\$280,742 ave.\$31,193
Mark Township	32	16	\$976,990 ave.\$61,061	\$244,247 ave.\$15,265	\$488,495 ave.\$30,530
Milford Township	18	16	\$974,930 ave.\$60,933	\$243,732 ave.\$15,233	\$487,465 ave.\$30,466
Village of Ney	7	11	\$681,960 ave.\$61,996	\$170,490 ave.\$15,499	\$340,980 ave.\$30,998
Noble Township	22	13	\$791,540 ave.\$60,887	\$197,885 ave.\$15,221	\$395,770 ave.\$30,443
Richland Township	24	20	\$1,163,420 ave.\$58,171	\$290,885 ave.\$14,542	\$581,710 ave.\$29,085
Village of Sherwood	0	0	\$0 ave.\$0	\$0 ave.\$0	\$0 ave.\$0
Tiffin Township	12	20	\$591,310 ave.\$29,565	\$147,827 ave.\$7,391	\$295,655 ave.\$14,782
Washington Township	30	33	\$1,954,660 ave.\$59,232	\$488,665 ave.\$14,808	\$977,330 ave.\$29,616
Total for Defiance County	380	588	\$40,662,603 ave.\$69,154	\$10,165,650 ave.\$17,288	\$20,331,300 ave.\$34,577

\*Detailed information is available in Appendix HH

## Floodplain Maps by Political Entity – Number of Structures – Appendix A-Q

Problem statements have been developed for tornado and thunderstorm wind events and prioritized by the core group. In the event of a severe tornado and/or thunderstorm wind events, jurisdictions in Defiance County typically struggle with the following problems:

- Increased health risk to human population due to contact with polluted floodwaters.
- Increased potential for damage to public infrastructure (ie roadways)
- Increased risk of property loss for the 380 building structures that fall within the Defiance County 100-year flood plain.

The core group also discussed barriers to overcoming the problems associated with winter storm events. They are as follows:

- Lack of evacuation shelters for vulnerable populations
- Lack of communication equipment and training for all agencies
- Lack of backup electrical generators for many shelter facilities
- Lack of citizen heeding to flood warnings

### h. Assessing Vulnerability / Analyzing Development Trends

Development trends are offered by the 2000 Defiance County Comprehensive Plan. The following are statements made in the Land Use Considerations for Future Planning section. These statements pertain to natural hazard mitigation planning for tornado and thunderstorm events and should be used by jurisdictions to guide and prioritize natural hazard mitigation projects.

- Disaster preparedness education can be taught in schools in a manner similar to fire drills, which have become a standard periodic procedure.
- Information on the availability and utility of hail, drought, and flood insurance, can be disseminated to the public, especially farmers.
- Industrial, commercial, and especially residential development on floodplains should be avoided as much as possible.

- Building on the floodplain may exacerbate the number of flooding incidents and the resultant flood damage.
- If floodplain development is to occur, building permanent structures upon piers should be encouraged along with consideration of flood insurance by the owners and renters.
- The common practice of constructing floodwalls, dikes or levees around watercourses should not be undertaken without serious study and consideration of the potential negative consequences.
- Stream channelization is another common practice of restricting stream flow that should not be undertaken without serious study and consideration of potential negative consequences.
- Retention ponds are very effective and can be built as needed for new residential and commercial development.
- Potential residential development is encouraged to avoid areas with poor soil drainage.
- Soils analysis service is encouraged for both farmers and residential communities.
- High quality, modern, efficient, adequate, and professional police, fire, and emergency medical services are expected and deserved by the citizens of Defiance County.
- Defiance County may want to consider as a goal the creation of a permanent emergency facility and shelter for people away, forced, or evacuated from their homes in times of large-scale disasters.
- An emergency management plan should be in place in case of an unforeseen disruptive natural or cultural circumstance.
- Coordination among the various emergency service providers and levels of government is critical.
- Defiance County also has additional development regulations pertaining to floodplain management in a local document titled Special Purpose Flood Damage Prevention Regulations. The Defiance County floodplain manager enforces these regulations for the development or improvement of properties within the Defiance County 100-year floodplain. A copy of these regulations is available from the Maumee Valley Planning Commission office located at 1300 E. Second Street, Defiance, OH 43512.

Appendices CC and DD are used as a baseline to estimate the types, number and value of future buildings. If a percentage growth or regression occurs or is projected, risk values and the number of buildings by jurisdiction are estimated by type (i.e. farm, industrial, commercial, residential, etc.).

#### 4. Drought

Drought will be profiled to include all jurisdictions in the plan because of the widely distributed nature of the hazard and the unpredictability of future events. Drought risk is county-wide and includes Defiance County, the City of Defiance, the Villages of Hicksville, Ney, and Sherwood.

Declarations of drought emergency have been declared for Defiance County in the years reported by Ohio EMA 1987-2003. The declarations came in the years 1989 for Defiance County and in 1991 for a statewide declaration. Defiance County also had recently drought declarations from the Secretary of the U.S. Department of Agriculture for the periods August 2010 - December 2010 and February 2011 – July 2011.

Drought Declaration in Defiance County		
Year	State Gubernatorial	Federal Secretary of Agriculture
1989	X	
1991	X	
2010		X
2011		X

Extreme drought events occurred four (4) times during a twenty-two (22) year period. The probability of the occurrence is nearly 20% or 1 in 5 years.

#### Drought Hazards and Statistics for Ohio

Jeffrey C. Rogers, State Climatologist for Ohio wrote in his notes from the Governor’s Drought Assessment Committee Meetings some of the hydrologic, economic and agricultural impacts and concerns of the 1988 and 1991-1992 droughts in Ohio.

##### Water supplies

- Increase draw down in wells, pumping over larger underground areas, yielding potential for contaminants and unwanted minerals.
- Loss of public ground water supplies (drying up)
- Decline in quality of water supplies, shortages of potable water

##### Rivers

- Extreme low levels leading to abnormally warm water, low turbulence, low dissolved oxygen content, higher contaminant concentrations, and reduced ability to accept and dilute industrial discharges

- Susceptibility to local dumping of heated water by power plants and industrial sources, plant by-passes and spills
- Fertilizer flushed into rivers increasing the ammonia and nitrates which affect fish and human babies (respectively)

#### Human Health

- Heat stress on the elderly with no air conditioning
- Increased stress (financial, psychological) in farm families
- Increased illness from improperly developed water supplies

#### Economic/Financial

- Loss of income: migrant workers, businesses on lakes/reservoirs
- Water use restrictions and penalties
- Food price increases, especially wheat, corn products

#### Agricultural

- Failure of hay cuttings, decreases in corn, soybean, wheat production
- Increased slaughter of livestock due to feed shortages, lowered prices
- Increased insect activity and diseases in plants, crops
- Livestock heat stress

#### Wildlife (deer, wild turkey, rabbits)

- Failure in dry springs to produce seed and biomass
- Lack of insect supply (protein) for young birds
- Haying and grazing privileges granted on conservation reserve acreage, affecting game/non-game birds if permitted during peak nesting season, mowing of grasses in these areas

#### Timber/Forests

- Increased fire hazard
- Decline in tree growth potential during prolonged drought
- Failure of new plantings, weakened old growth by insects, disease

#### Recreation

- Low water levels lead to boating/canoeing restrictions, cessation
- Sports fishing affected by low water quality

Table 19 summarizes monthly and annually averaged northwest Ohio precipitation and precipitation extremes, for the period 1895-2011. Data primarily includes cooperative weather observations.

Tables 19.

Northwest Ohio Average Precipitation and Extremes 1895-2011 (Source: Dr. Jeffery C. Rogers, State Climatologist for Ohio).

MONTH	MEAN	MAX	YEAR	% OF NORM	MIN	YEAR	% OF NORM
JAN	2.27"	7.61"	1950	335%	0.23"	1961	10%
FEB	1.90"	5.30"	1990	279%	0.00"	1907	0%
MAR	2.79"	6.85"	1913	246%	0.08"	1910	2.9%
APR	3.22"	6.23"	2011	193%	0.78"	1946	24%
MAY	3.58"	9.66"	1946	270%	0.76"	1939	21%
JUN	3.68"	9.02"	1981	245%	0.43	1988	12%
JUL	3.54"	7.46"	1992	211%	0.48	1974	14%
AUG	3.03"	10.24	2007	338%	0.85	1899	28%
SEP	2.93"	7.86"	1926	268%	0.71"	1963	24%
OCT	2.49"	6.63"	2001	266%	0.24"	1924	9.6%
NOV	2.53"	6.57"	1982	260%	0.00"	1904/1917	0%
DEC	2.41"	6.28	1990	260%	0.33"	1958	14%
ANNUAL	34.37"	51.24	2011	149%	23.23	1963	68%

The National Weather Service of Northern Indiana reports all-time records related to the summer / drought conditions in Defiance County. They are reported for the period 1896-1999 in Table 20.

Table 20.

All-time Summer / Drought Records (1893-2011) for Defiance, OH.

Source: Nat'l Weather Service.

Maximum temperature	111, July 25, 1934
Maximum min temperature	79, July 22, 2011
Most 100 days in a row	7, July 9-15, 1936
Most 90 days in a row	14, August 3-16, 1988
Highest daily average temperature	91.5, July 25, 1934 and July 21, 1930
Longest period without measurable precipitation	42 days, August 18 – September 28, 1908

## Assessing Vulnerability

### Identifying Assets

Map Critical Facilities – Appendix R

Map Essential Facilities – Appendix S

Map Infrastructure of Defiance County – Appendix T

## Estimating Potential Losses

Not required

## Analyzing Development Trends

Development trends are offered by the 2000 Defiance County Comprehensive Plan. The following are statements made in the Land Use Considerations for Future Planning section. These statements pertain to natural hazard mitigation planning for drought and should be used by jurisdictions to guide and prioritize natural hazard mitigation projects.

- Disaster preparedness education can be taught in schools in a manner similar to fire drills, which have become a standard periodic procedure
- Information on the availability and utility of hail, drought, and flood insurance, can be disseminated to the public, especially farmers.
- Defiance County may wish to consider building a reservoir to store river water for the municipal water supplies during those periods when it is relatively free from pesticides.
- An emergency management plan should be in place in case of an unforeseen disruptive natural or cultural circumstance.
- Coordination among the various emergency service providers and levels of government is critical.

Appendices CC and DD are used as a baseline to estimate the types, number and value of future buildings. If a percentage growth or regression occurs or is projected, risk values and the number of buildings by jurisdiction are estimated by type (i.e. farm, industrial, commercial, residential, etc.).

### 5. Earthquake

Earthquakes will be profiled to include all jurisdictions in the plan because of the widely distributed nature of the hazard and the unpredictability of future events. Earthquake risk is county-wide and includes Defiance County, the City of Defiance, the Villages of Hicksville, Ney, and Sherwood.

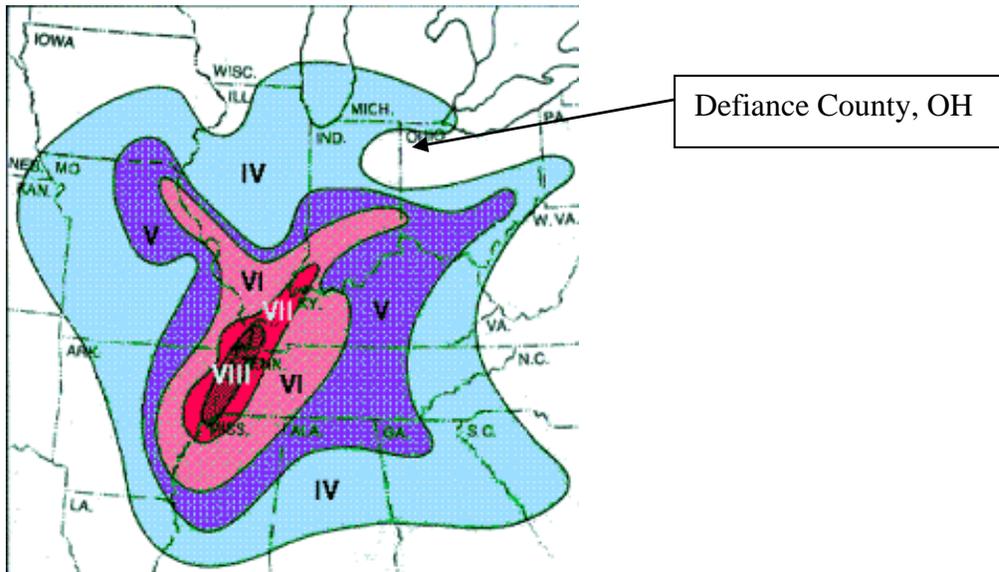
It is very difficult to estimate the chance of an occurrence since there is no known events in Defiance County's written history. Therefore, there is a less than 1% probable chance.

Earthquakes are a natural and inevitable consequence of the slow movement of the Earth's crustal plates. More than 100,000 earthquakes with magnitudes of 3.0 or greater occur worldwide each year. Most earthquakes in the United States occur in California, the boundary of the Pacific and North American crustal plates.

Figure 3 shows the New Madrid Fault that extends from northeast Arkansas, through southeast Missouri, western Tennessee, western Kentucky to southern Illinois. Historically, this area has been the site of some of the largest earthquakes in North America.

Figure 3.

The New Madrid Fault in Proximity to Defiance County, OH.



Between 1811 and 1812, four catastrophic earthquakes, with magnitude estimates greater than 7.0, occurred during a three-month period. Hundreds of aftershocks followed over a period of several years. The largest earthquakes to have occurred since then were on January 4, 1843 and October 31, 1895, with magnitude estimates of 6.0 and 6.2 respectively. On average one earthquake per year will be large enough to be felt in the area. The New Madrid seismic zone is so named because the town of New Madrid, Missouri was the closest settlement to the epicenters of the 1811-1812 quakes.

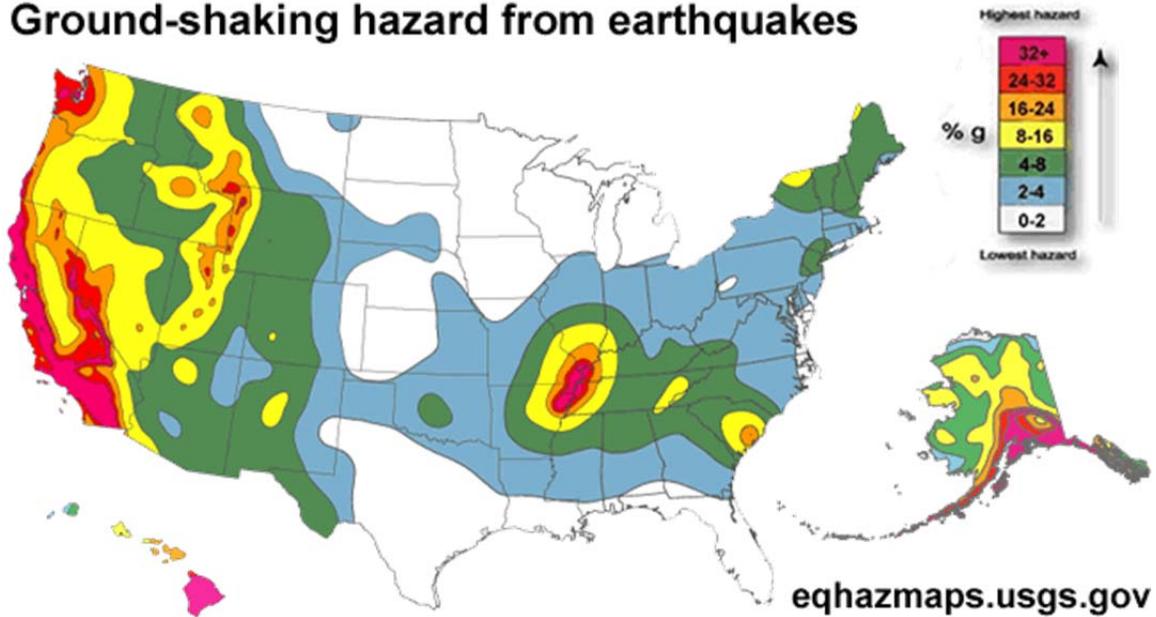
U. S. Geological Survey Earthquake Hazard Map for the United States showing earthquake ground accelerations (horizontal) having a 10 percent probability of being exceeded in the next 50 years for a firm rock site condition. Figure 4 is based on seismicity and fault-slip rates and takes into account the frequency of occurrence of earthquakes of various magnitudes. Locally, hazard may be greater than that shown, because site geology may amplify ground motions.

Figure 4.

USGS Probability of Earthquake in the United States.



## Ground-shaking hazard from earthquakes

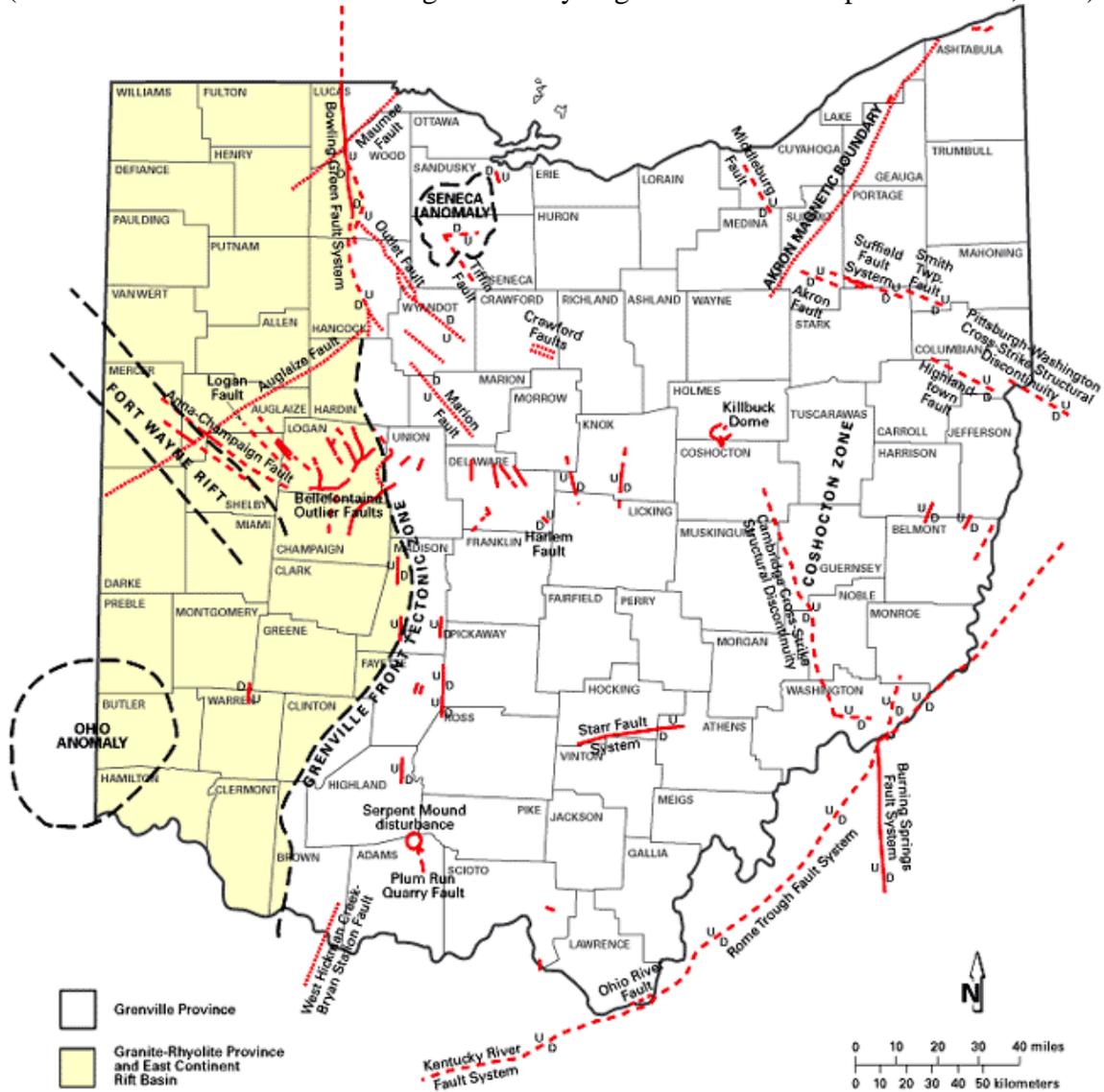


Ohio is on the periphery of the New Madrid Seismic Zone, an area in Missouri and adjacent states that was the site of the largest earthquake sequence to occur in historical times in the continental United States. Figure 4 portrays a number of deep faults and other structures that have been identified by a variety of geologic studies.

Figure 4.

### Basement structures in Ohio

(modified from Division of Geological Survey Digital Chart and Map Series No 7, 1991)



Some faults are well known, whereas others are speculative. Very few of them are visible at the surface. The Anna, or Fort Wayne, rift in western Ohio is the site of numerous historic earthquakes.

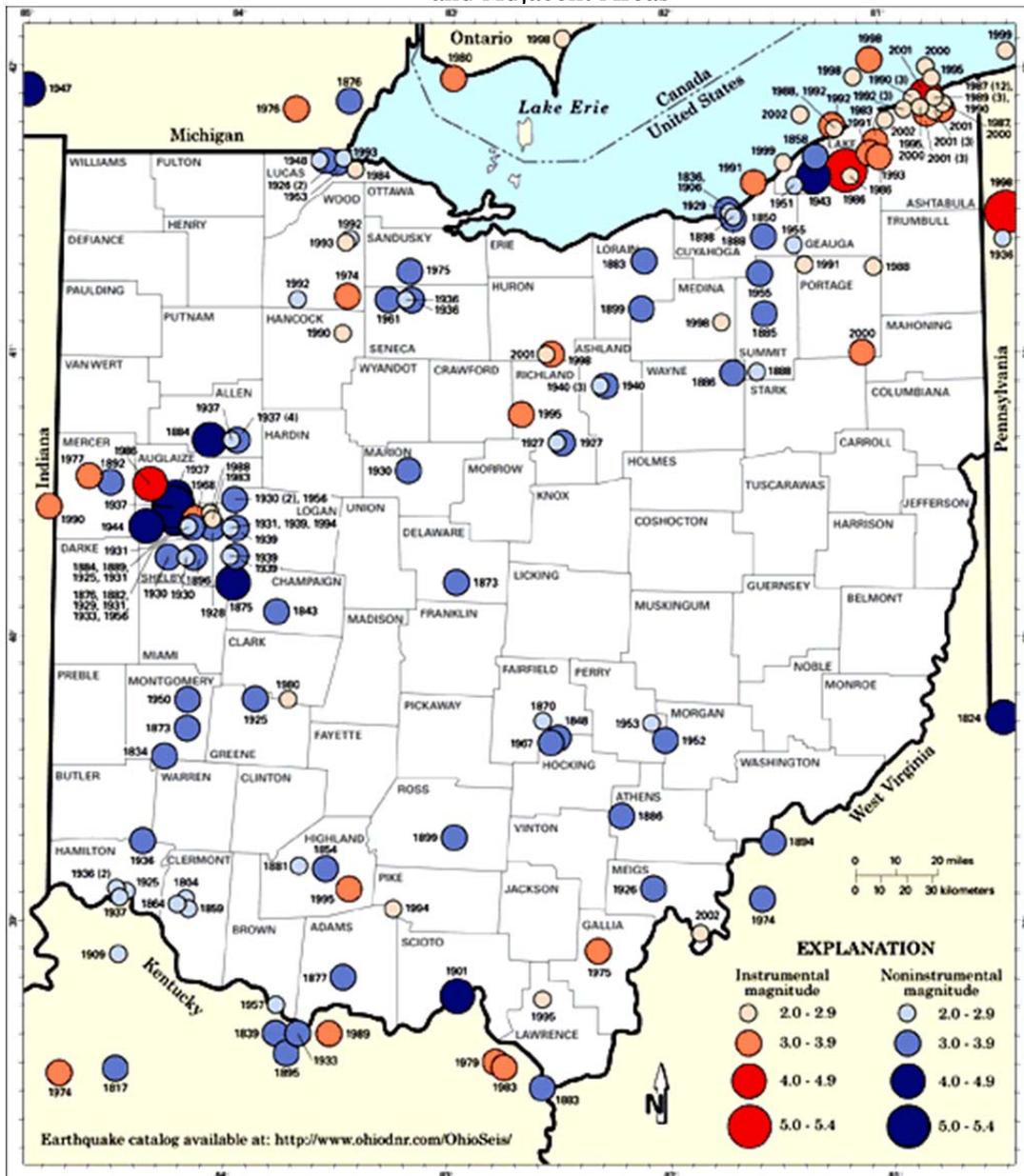
Although most people do not think of Ohio as an earthquake-prone state, at least 120 earthquakes with epicenters in Ohio have been felt since 1776. In addition, a number of earthquakes with origins outside Ohio have been felt in the state. Most of these earthquakes have been felt only locally and have caused no damage or injuries. The four great earthquakes were part of a series at New Madrid in 1811 and 1812. These events

were felt throughout the eastern United States and were of sufficient intensity to topple chimneys in Cincinnati. Some estimates suggest that these earthquakes were in the range of 8.0 on the Richter scale.

However, at least 14 moderate-size earthquakes have caused minor to moderate damage in Ohio. Fourteen (14) earthquakes since 1776 equates to a probability of less than 6% annual chance of occurrence. Fortunately, no deaths and only a few minor injuries have been recorded for these events. Three areas of the state appear to be particularly susceptible to seismic activity (see accompanying Figure 5).

Figure 5.

### Earthquake Epicenters in Ohio and Adjacent Areas



Seismic risk in Ohio, and the eastern United States in general, is difficult to evaluate because earthquakes are generally infrequent in comparison to plate-margin areas such as California. Also, active faults do not reach the surface in Ohio and therefore cannot be mapped without the aid of expensive subsurface techniques.

A great difficulty in predicting large earthquakes in the eastern United States is that the recurrence interval--the time between large earthquakes--is commonly very long, on the order of hundreds or even thousands of years. As the historic record in most areas, including Ohio, is only on the order of about 200 years--an instant, geologically speaking--it is nearly impossible to estimate either the maximum magnitude or the frequency of earthquakes at any particular site.

Earthquake risk in the eastern United States is further compounded by the fact that seismic waves tend to travel for very long distances. The relatively brittle and flat-lying sedimentary rocks of this region tend to carry these waves throughout an area of thousands of square miles for even a moderate-size earthquake. Such deposits are extensive in Ohio. Buildings constructed on bedrock tend to experience much less ground motion, and therefore less damage. Geologic maps, such as those prepared by the Ohio Division of Geological Survey, delineate and characterize these deposits. Geologic mapping programs in the state geological surveys and the U.S. Geological Survey are therefore critical to public health and safety. Damaging ground motion would occur in an area about 10 times larger than for a California earthquake of comparable intensity.

#### Number of Structures and Value at risk to Earthquakes

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 earthquake loss estimates provided in this report were based on a region that included 1 county (Defiance). The geographical size of the region is 411 square miles and contains 9 census blocks. The region contains over 15,000 households and has a total population of 39,500 people (2000 Census Bureau data). There are an estimated 18,000 buildings in the region with a total building replacement value (excluding contents) of 3,261 million dollars (2006 dollars). Approximately 91.00% of the buildings (and 69% of the building value) are associated with residential housing. The replacement value of the transportation and utility lifeline systems is estimated to be \$893,000,000 and \$815,000,000, respectively.

HAZUS Vulnerability Analysis – **5.5 magnitude Earthquake**, Defiance County, OH

Building Type	Number of Buildings	
	Buildings	Exposure
Residential	2,948	\$ 164,440,000
Non-Residential	423	\$ 94,590,000
Critical Facilities	38	\$ 29,130,000

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations. High potential loss facilities include dams, hazardous material sites, etc.

Defiance County has various structures and infrastructure that are potentially at risk to earthquakes. Earthquakes will generate damage only for area and structures, but not the whole county. Appendices CC and DD are references for estimating the number of types of buildings and value at risk.

Appendix CC summarizes the best available 2008 market value of structures and infrastructure that exist in Defiance County as of November 2008. The values were obtained from the Defiance County Auditor’s office. The exempt column includes structures that carry a market value but are exempt from property taxes collect by the auditor’s office. Utility/Infrastructure includes electric, gas, communication, etc assets that serve the citizens of Defiance County. The values are considered replacement value of the structures and infrastructure. Appendix DD summarizes the best available number of land parcels that have building structures and/or utility/infrastructure. Each parcel may have multiply structures that combine into the total market value. This is the best available data that exist for the number of structures vulnerable to natural hazards in Defiance County.

Assessing Vulnerability

Identifying Assets

Map Critical Facilities – Appendix R

Map Essential Facilities – Appendix S

Map Infrastructure of Defiance County – Appendix T

Estimating Potential Losses

Not required

### Analyzing Development Trends

Development trends are offered by the 2000 Defiance County Comprehensive Plan. The following are statements made in the Land Use Considerations for Future Planning section. These statements pertain to natural hazard mitigation planning for earthquake should be used by jurisdictions to guide and prioritize natural hazard mitigation projects.

- Disaster preparedness education can be taught in schools in a manner similar to fire drills, which have become a standard periodic procedure
- Although earthquakes are rare in Defiance County, earthquake insurance is available and this information can be made available to all residences, businesses, and industries.
- An emergency management plan should be in place in case of an unforeseen disruptive natural or cultural circumstance.
- Coordination among the various emergency service providers and levels of government is critical.

Appendices CC and DD are used as a baseline to estimate the types, number and value of future buildings. If a percentage growth or regression occurs or is projected, risk values and the number of buildings by jurisdiction are estimated by type (i.e. farm, industrial, commercial, residential, etc.).

## **Section 4. Mitigation Strategy**

This plan includes a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources.

The mitigation strategy considers projects to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. The mitigation strategy has been prioritized by the jurisdiction on the extent to which the estimated benefits are maximized according to a review of the proposed projects and their associated costs.

Authority of the jurisdictions to act on mitigation strategies is granted by state's primary laws, regulations, programs, and policies related to hazard mitigation strategy. They are but not limited to:

- Ohio Constitution: Section 3 of Article XVIII of the Ohio Constitution designates Ohio as a “home rule” state. Home Rule gives municipal jurisdictions the power to govern themselves in local municipal matters independent of state laws.
- Ohio Revised Code (ORC) and Ohio Administrative Code (OAC): All statutes of a permanent and general nature of the State of Ohio are organized and published in the Ohio Revised Code (ORC). These are the laws passed by the Ohio General Assembly. The Ohio Administrative Code (OAC) is a codification of the rules of the administrative agencies of the state.
- Planning, Zoning, and Subdivision Authorities: Under the Ohio Constitution, the power to plan, zone, subdivide or regulate land use belongs to the General Assembly. Most state authority to plan and regulate land use has been delegated to local government.
- Chapter 5502.22 et seq., ORC – State / Local Emergency Management Agencies: The Chapter provides for a State EMA (which includes the Mitigation Branch), and authorizes countywide (5502.26), regional (5502.27), or local emergency management authorities (5502.271), requiring an emergency management director or coordinator and an Emergency Operations Plan for each county.
- Title XXXVII Health-Safety-Morals, ORC -Ohio Basic Building Code (OBBC): Homes built pre-1995 were not required to meet the same standards as those after the code’s inception, and are more hazard-prone.
- Chapter 1521, ORC - Ohio Dam Safety Program: The ODNR-DOW is the agency that does inspections and the permitting programs for dams and levees.
- Chapter 1521.13-14; 18 ORC - Ohio Floodplain Management Program: The ODNR–DOW, Floodplain Management Program coordinates all floodplain management activities for the State of Ohio. The Floodplain Management Program administers the NFIP established in the National Flood Insurance Act of 1968, “82 Stat. 572, 42 U.S.C.A. 4001, as amended and ensures a participating community’s compliance with all requirements.

To be eligible for Federal funding assistance, a mitigation project must be considered cost-effective. The FEMA Benefit-Cost Analysis (BCA) is the method used to determine the cost-effectiveness of a proposed mitigation project.

The Benefit-Cost Ratio (BCR) is a numerical expression of the cost-effectiveness of a project and is calculated as: total project benefits divided by total project cost. Projects with BCRs of 1.0 or greater have more benefits than costs, and are therefore considered cost-effective. Mitigation projects should provide a BCA that is reasonable, credible, and well documented, using supported values.

April 2011, the Defiance County jurisdictions replied with priority action plan updates and additions. The core committee reviewed the jurisdictions’ needs and grouped similar needs by hazard risk into the Defiance County Natural Hazard Mitigation Action Plans.

Table 21 provides a summary of county jurisdictions that have submitted or have not submitted natural hazard mitigation action plans. The jurisdiction of Defiance County includes the political entities of townships. Eight of the twelve townships and the county

commissioners have provided mitigation action plans for the Defiance County jurisdiction.

Table 21.

Political Jurisdiction Submitting Action Plans to be included in the Defiance County Natural Hazard Mitigation Plan 2011.

	Submitted Action Plans	Choosing NOT to Submit Action Plans
Defiance, City of	X	
Defiance County (including townships)	X	
Hicksville, Village of	X	
Ney, Village of	X	
Sherwood, Village of	X	

*Project Prioritization*

The overall goal of action plan prioritization is to reduce risk held by Defiance County residence and the public and private property to the effect from natural hazards.

The Defiance County Emergency Operation Plan (EOP) provides a means to identify the need for action plans. The EOP is a product of the Local Emergency Planning Committee with membership made up of emergency responders, community leaders, elected officials, business leaders and citizens from all jurisdictions in Defiance County. Table 3 of this plan summarizes the risk assessment in the EOP for floods and severe storms including winter storms as High Risk. Table 3 of this plan summarizes the risk assessment in the EOP for droughts and tornadoes as Medium Risk. Table 3 of this plan summarizes the risk assessment in the EOP for earthquakes as Low Risk.

Mitigation projects identified within this plan or future projects will be prioritized by elected officials of each jurisdiction due to their on-going knowledge of local needs, benefit/cost analysis and funding sources. Table 4 of this plan summarizes the input from public officials and citizens of Defiance County jurisdictions and the results will serve as a guideline for prioritizing future mitigation projects.

County wide, Tornado risk (4.13) is ranked the most significant on a scale of 5 to 1 (5 being most significant), followed by Winter Storm (3.87), Flooding (3.53), Drought (2.33), and Earthquake (1.47). However, substantial variation of local hazard significance exists among the political entities or jurisdictions that planning must consider priorities by jurisdiction as well. Table 4 will serve as a basis for jurisdiction action priorities.

## Natural Hazard Mitigation Action Plans

### Action Plans for Defiance County

- Hazard: Winter Storm
  - Goal: To protect property and human life from the damages of winter storms impacting Defiance County, OH.
  - Objective: To have sheltering resources during severe winter storms that provides heat and other human needs.
    - Activity: Provide backup power generation options for shelter facilities and coordinate with Red Cross on other viable options.
      - Cost Estimate: Manual switching unit, Labor, separation of building power grid, outside receptacle/hookup for auxiliary generator - \$15,000-\$20,000. Add site generator plus 3 year maintenance contract - \$25,000-\$35,000.
      - Leadership: City Administration, Defiance County EMA, and Red Cross.
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
      - Start Date: 2012
      - End Date: 2017
        - Task 1: Identify current backup power resources at current shelter facilities in Defiance County.
        - Task 2: Identify critical shelter facilities without reliable backup power resources.
        - Task 3. Prioritize facilities for updating backup power resources
        - Task 4: Identify funding sources
        - Task 5: Bid projects
        - Task 6: Install
    - Activity: Modify conditions causing snowdrift prone areas on Defiance County roads to provide snowdrift relief.
      - Cost Estimate: Trees, labor and equipment for 150 foot living snow fence: \$2,500
      - Leadership: Defiance County EMA
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
      - Start Date: 2012
      - End Date: 2017

- Task 1: Identify key roads and areas that use high percentages of township winter resources.
  - Task 2. Evaluate best practice for mitigating snow-drifting problem
  - Task 3: Get cost estimates
  - Task 4: Identify funding sources
  - Task 5: Bid projects
  - Task 6: Install
- Activity: To educate Defiance County residence about winter storm risks and safe driving information during winter storm season.
  - Cost Estimate: Class room materials, educational display, and public service announcement development - \$1,000 per year
  - Leadership: Defiance County Public Safety and the Local Emergency Planning Committee.
  - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
  - Start Date: 2012
  - End Date: 2017
    - Task 1: Identify public education priority periods to educate the public about winter storms.
    - Task 2: Contact delivery methods to communicate educational efforts. Examples, radio, newspaper, health fairs, community events and locations.
    - Task 3. Identify funding sources. Task 4: Identify funding sources
    - Task 4: Schedule and conduct education outreach.
    - Task 5: Evaluate educational efforts
- Hazard: Tornado and Thunderstorm Wind
  - Goal: Provide every resident and visitor the best available warning of severe weather approaching Defiance County.
    - Activity: Install countywide early warning systems
      - Cost Estimate: sirens with backup battery system at \$21,000 each
      - Leadership: Defiance County EMA Director and elected officials
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.

- Start Date: 2012
- End Date: 2017
  - Task 1: Identify key locations and best available technology
  - Task 2: Get cost estimates
  - Task 3: Identify funding sources
  - Task 4: Bid projects (possibly county wide)
  - Task 5: Install
- Activity: Educate the public on the meaning of the warning system
  - Cost Estimate: Class room materials, educational display, and public service announcement development - \$1,000 per year
  - Leadership: Defiance County Public Safety and the Local Emergency Planning Committee.
  - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
  - Start Date: 2012
  - End Date: 2017
    - Task 1: Identify public education priority periods to educate the public about winter storms.
    - Task 2: Contact delivery methods to communicate educational efforts. Examples, radio, newspaper, health fairs, community events and locations.
    - Task 3. Identify funding sources. Task 4: Identify funding sources
    - Task 4: Schedule and conduct education outreach.
    - Task 5: Evaluate educational efforts
- Activity: Establish safe room construction incentives for existing and new home construction
  - Cost Estimate: Retro-fit existing home: \$14,000, new home construction \$10,000.
  - Leadership: Defiance County Public Safety and the Local Emergency Planning Committee.
  - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
  - Start Date: 2012
  - End Date: 2017
    - Task 1: Identify current building codes related to safe room construction.
    - Task 2: Identify safe room requirements.
    - Task 3: Identify funding sources

- Task 4: Educate the county residence and the construction industry.
  - Task 5: Document progress of safe room construction
  
- Hazard: Flooding (floodplain and flash)
  - Goal: To reduce flood risk by mitigating flood prone structures.
    - Activity: Conduct mitigation activities on flood prone areas and structures in Defiance County. Evaluate funding sources through Federal Emergency Management Agency, Community Development Block Grants and others.
      - Cost Estimate: Average of \$73,510 per structure
      - Leadership: Defiance County EMA, Elected officials, and Maumee Valley Planning Organization
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
      - Start Date: 2011
      - End Date: 2017
        - Task 1: Obtain funding
        - Task 2: Offer program to willing floodplain residences and businesses
        - Task 3: Prioritize needs/funding
        - Task 4: Make purchases
  
    - Activity: Conduct mitigation activities on flood prone infrastructure including but not limited to roads, utilities and bridges in Defiance County.
      - Cost Estimate: Average of \$65,000 per culvert replacement
      - Leadership: Defiance County EMA and elected officials
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
      - Start Date: 2012
      - End Date: 2017
        - Task 1: Identify emergency infrastructure effected by flooding Obtain funding
        - Task 2: Obtain funding
        - Task 3: Prioritize needs/funding
        - Task 4: Install mitigation plans

- Hazard: Drought
  - Goal: To be prepared for a drought to anticipate needs and actions
    - Activity: Establish a water delivery system for people and livestock
      - Cost Estimate: \$30,000-\$40,000 (truck and tank)
      - Leadership: Defiance County EMA and elected officials
      - Mitigation Area: Defiance County, including Defiance City, Sherwood Village, Ney Village, Hicksville Village and unincorporated areas.
      - Start Date: 2012
      - End Date: 2017
        - Task 1: Identify needs for equipment and resources
        - Task 2: Meet with county health officials
        - Task 3: Propose plan
        - Task 4: Implement plan
  
- Hazard: Earthquake
  - Goal: To have all buildings and public structures capable of withstanding a best known estimated earthquake for northwest Ohio.
    - Activity: Examine existing building codes for inclusion of earthquake related issues by hiring a consultant. Incorporate recommendations in to current code and recommendations. Utilize fire inspection to identify potential structural hazards
      - Cost Estimate: \$30,000-\$35,000
      - Leadership: Defiance County EMA and elected officials
      - Start Date: 2012
      - End Date: 2017
        - Task 1: Conduct an examination of existing building codes for inclusion of earthquake related issues.
        - Task 2: Conduct local vulnerability analysis of structures.
        - Task 3: Identify corrective actions that could be completed to mitigate loss due to a earthquake occurrence.
        - Task 4: Identify funding sources
        - Task 5: Complete earthquake mitigation actions on cooperating structures.

## **Section 5. Plan Maintenance Procedures**

The Defiance County Natural Hazards Mitigation Plan and the Flood Mitigation Assistance Program will be reviewed on an annual basis to determine the effectiveness of programs and to reflect changes in land development or programs that may affect mitigation priorities. Additionally, the plan will be reviewed and update considerations made following any major disaster that takes place in the county. The Defiance County Public Safety Office will provide leadership in presenting the plan for annual review to the Defiance County Local Emergency Planning Committee (LEPC).

The committee reviews the goals and action items to determine relevance to Defiance County. The committee should review the risk assessment portion of the plan to determine if this information should be updated or modified, given any new available data or natural hazard occurrences. The committee can recommend the plan be updated for one or all jurisdictions. Appraising the mitigation strategies will be a priority during the annual review to seek funding for mitigation strategies under FEMA's annual grant programs – Pre-Disaster Mitigation, Flood Mitigation Assistance, Repetitive Loss Claims grants, and the Severe Repetitive Loss grants. The Defiance County Public Safety Office will provide leadership to update the plan based on the committee's recommendations.

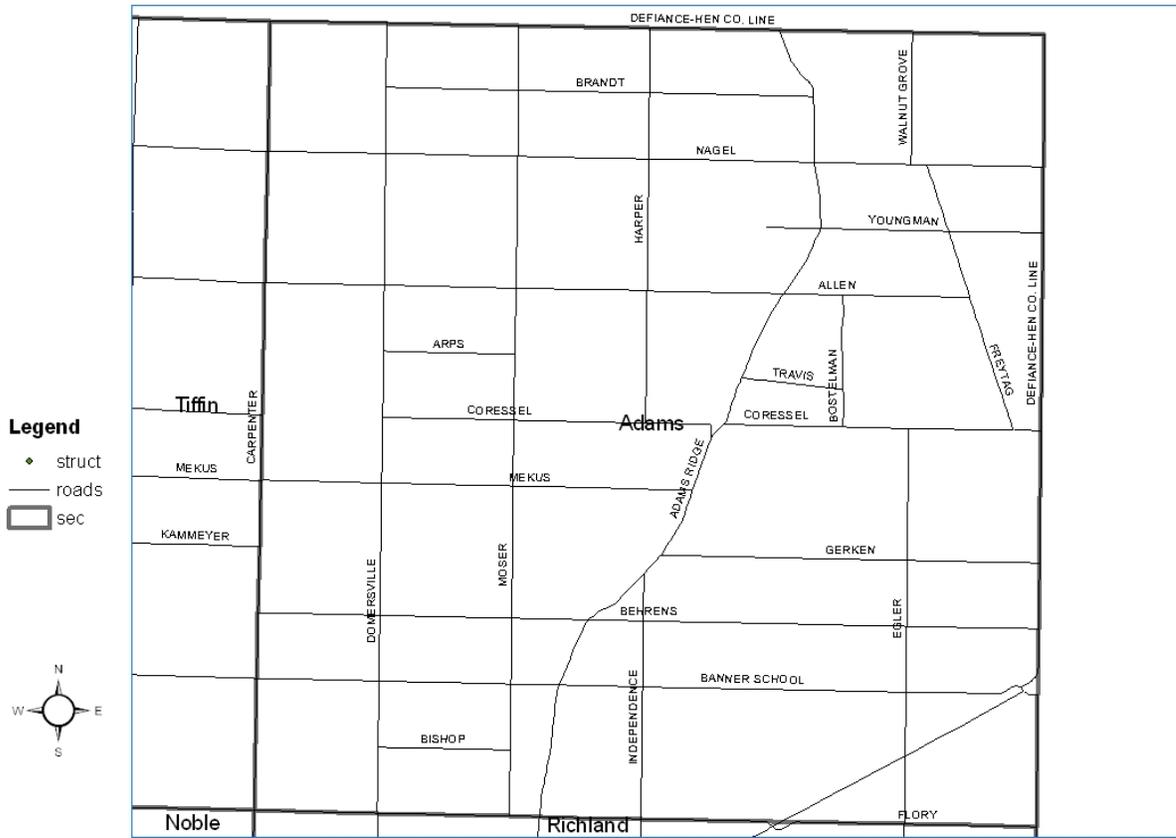
The LEPC meetings are open to the public and announced prior to the meeting in the local media. Upon recommending the plan be updated, the process will involve public involvement similar to the original writing of the plan.

The LEPC will require all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. This plan, upon being locally revised and approved by the Ohio and Federal Emergency Management Agencies, will be provided to local governments that make public planning decisions. This will include but not limited to boards of control, city and village administration, village solicitors, county commissioners and county prosecuting attorney's office.

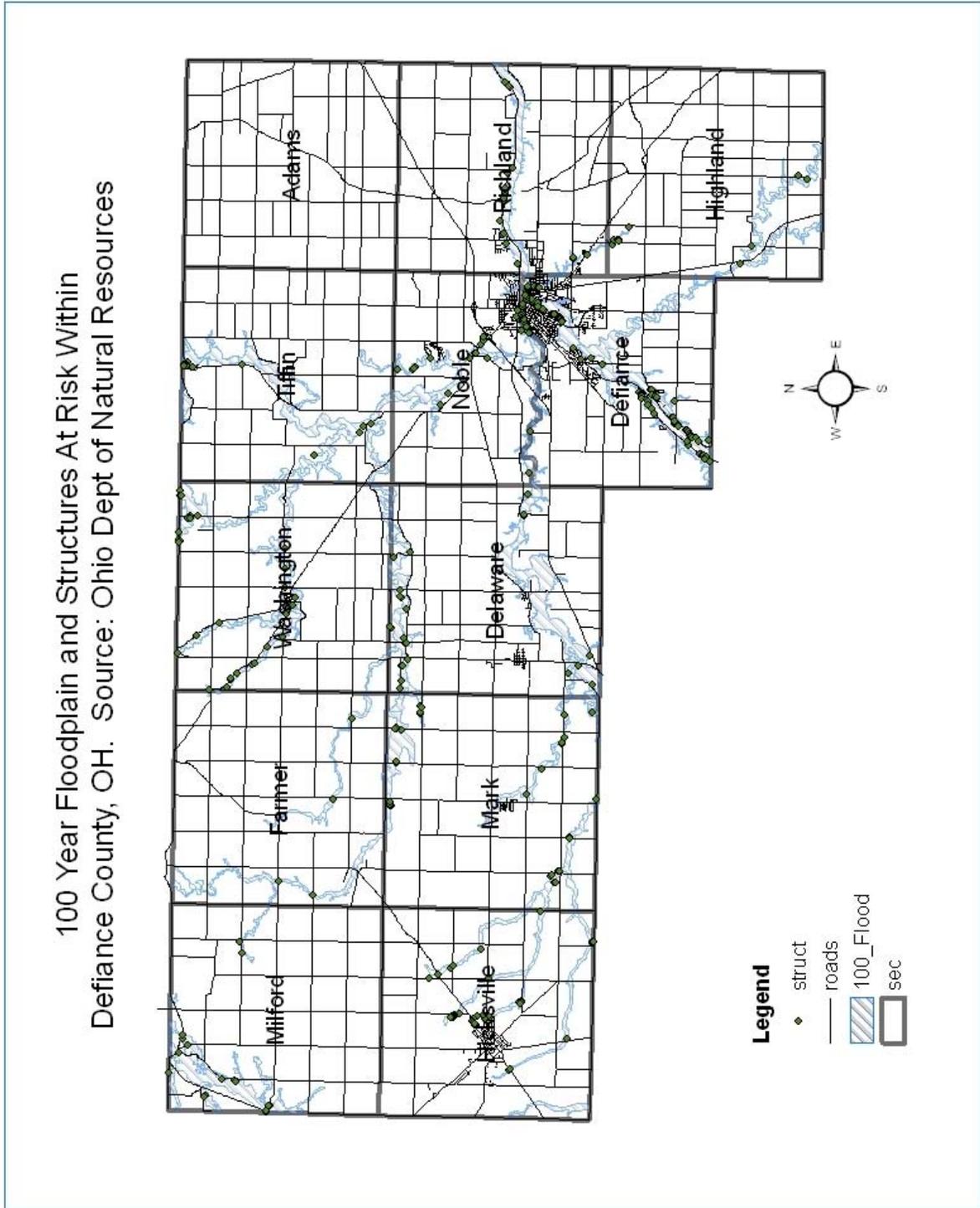
**The plan will further be updated every five years consistent with the requirements of the Disaster Mitigation Act of 2000.**

# Appendix A Adams Township 100-year Flood Plain Map

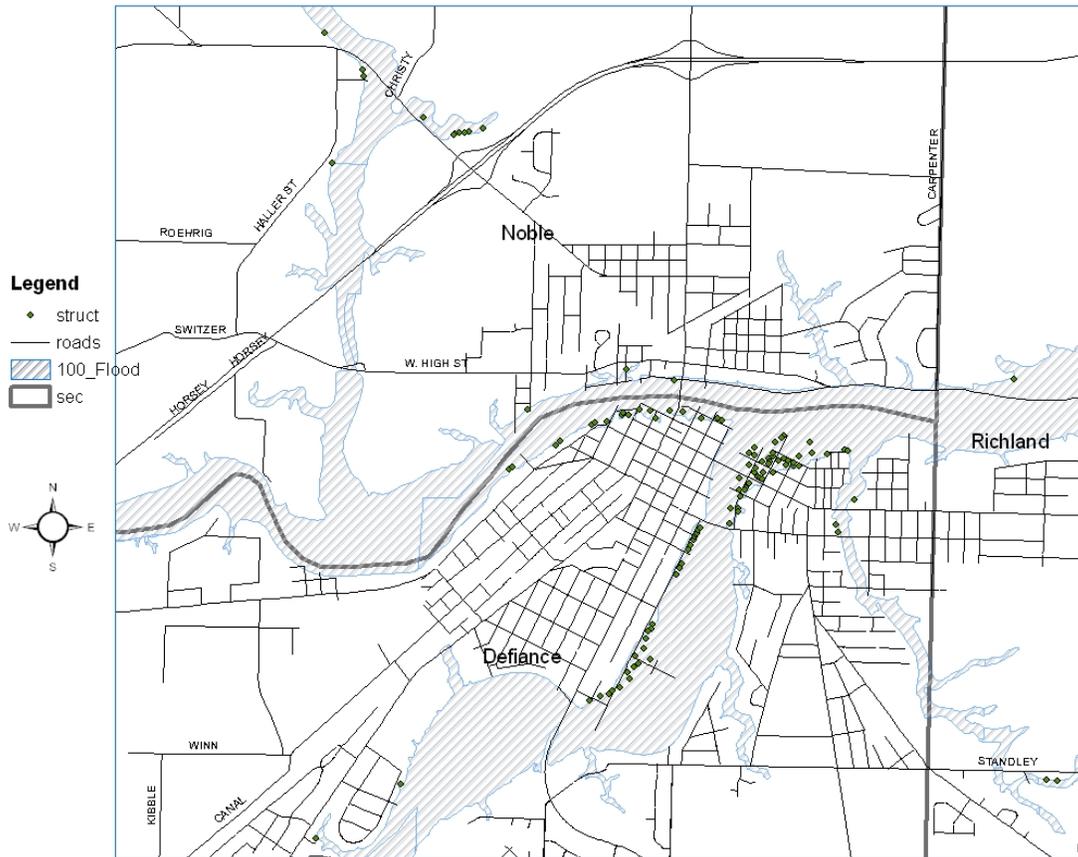
(No structures in the 100-year floodplain) Source: Ohio Dept. of Natural Resources



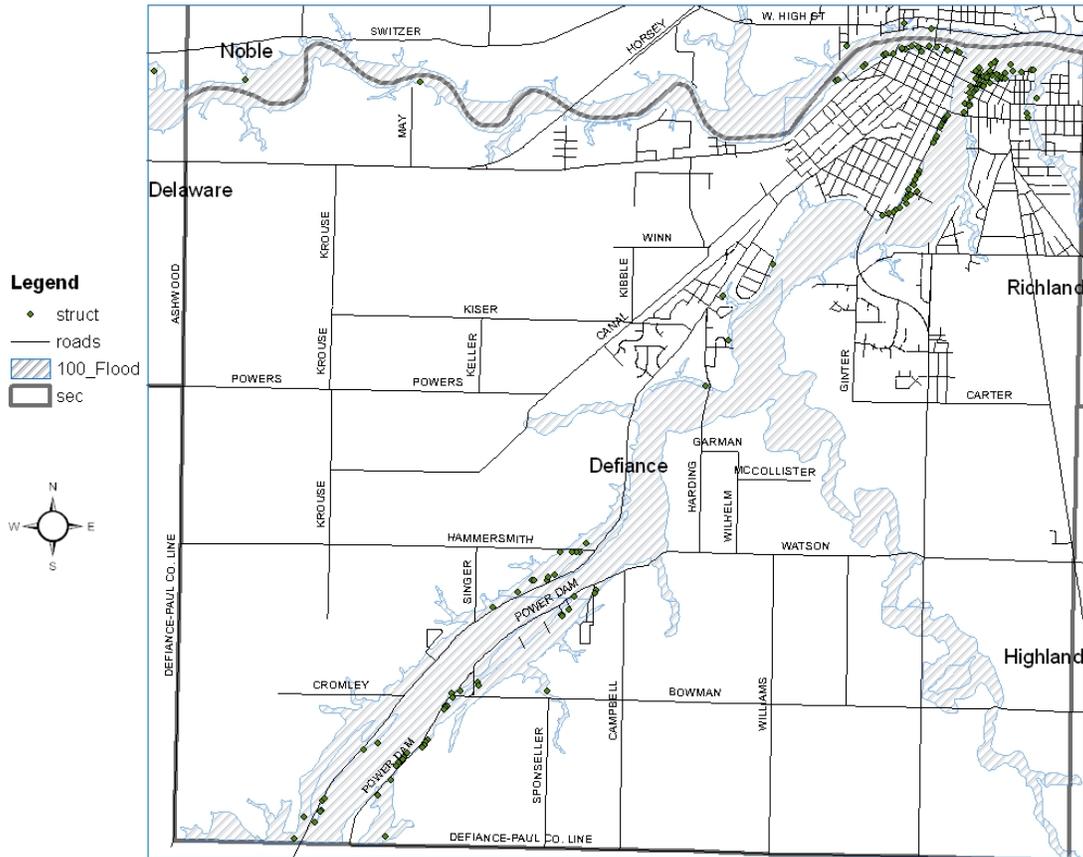
# Appendix B Defiance County (All) 100-year Flood Plain Map



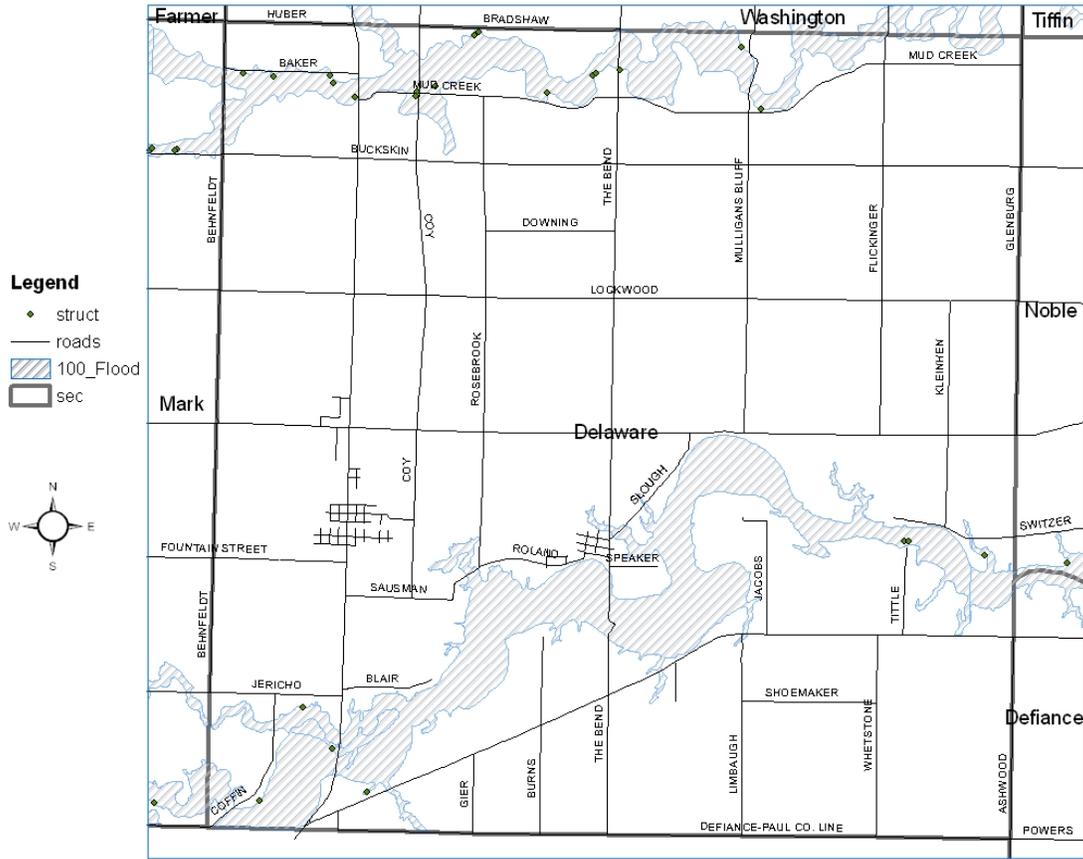
# Appendix C City of Defiance 100-year Flood Plain Map



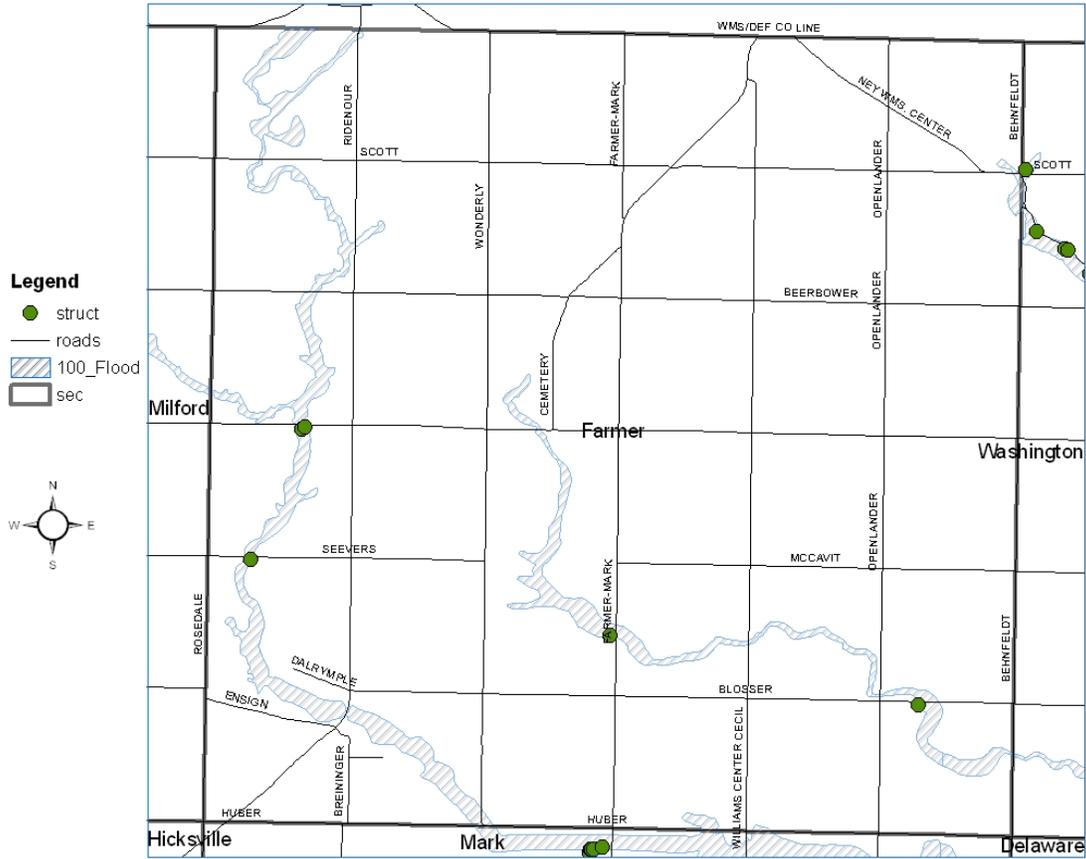
# Appendix D Defiance Township 100-year Floodplain Map



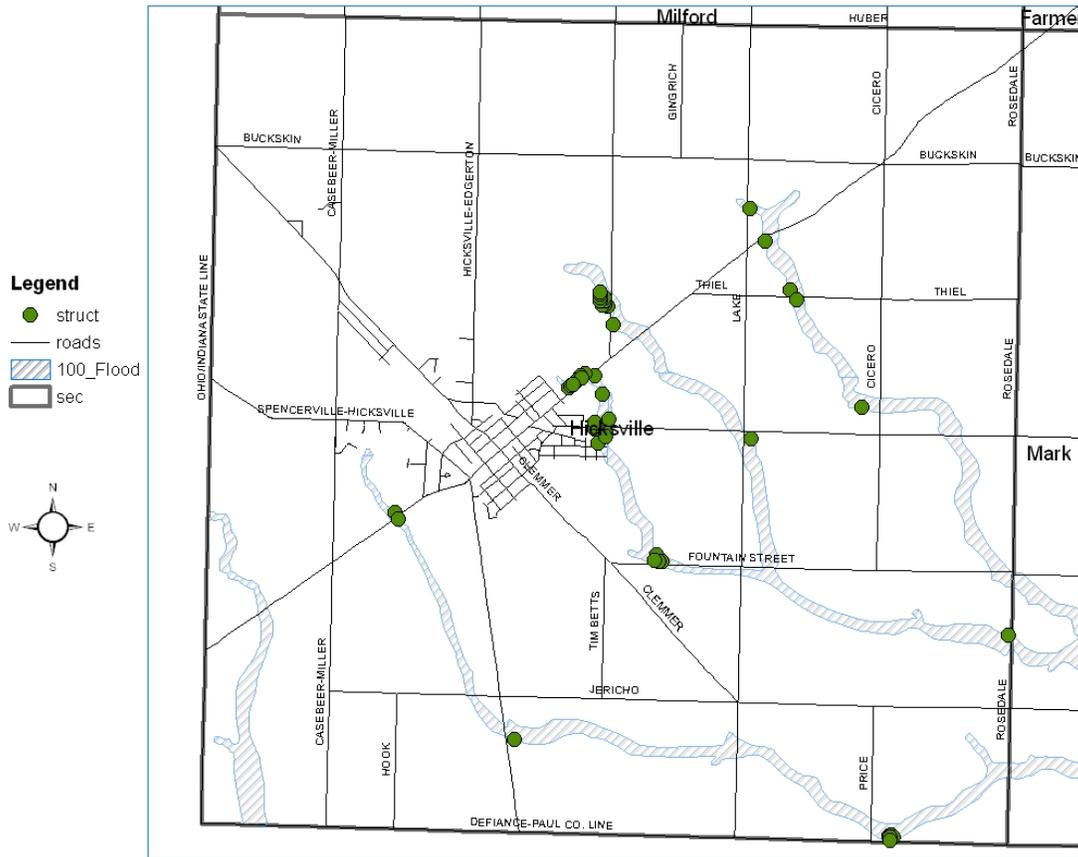
# Appendix E Delaware Township 100-year Floodplain Map



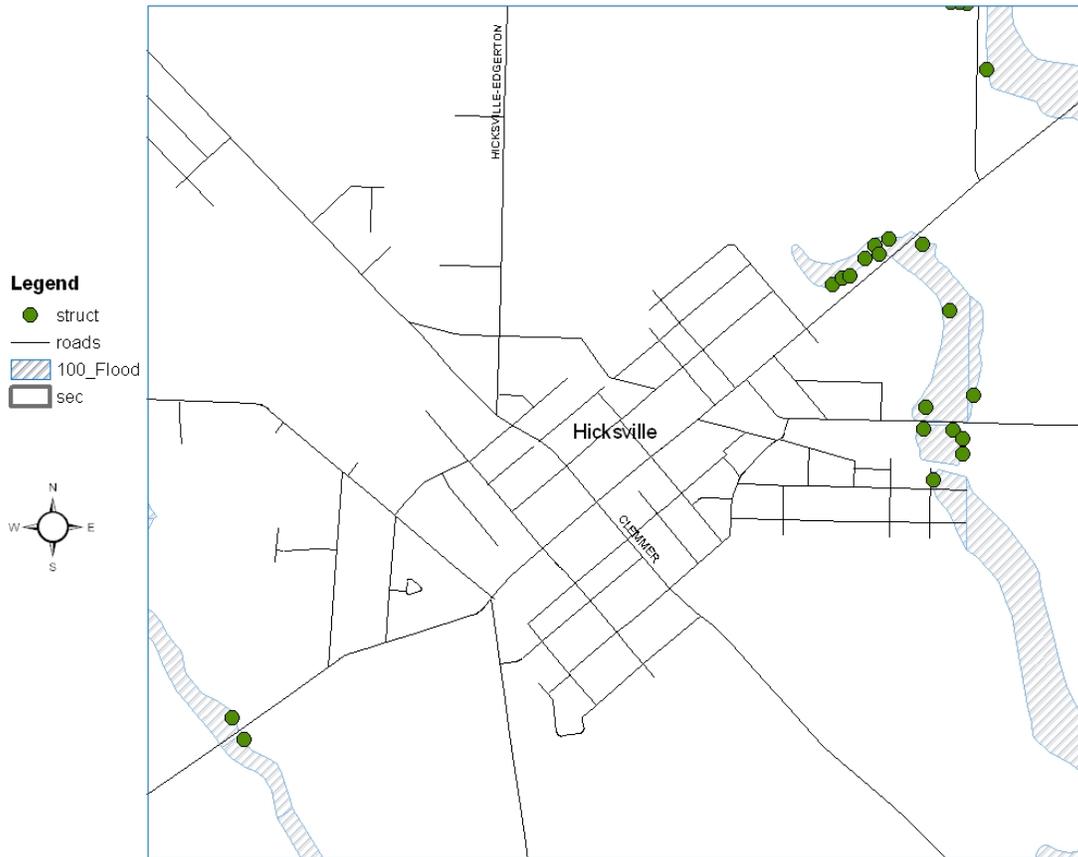
# Appendix F Farmer Township 100-year Floodplain Map



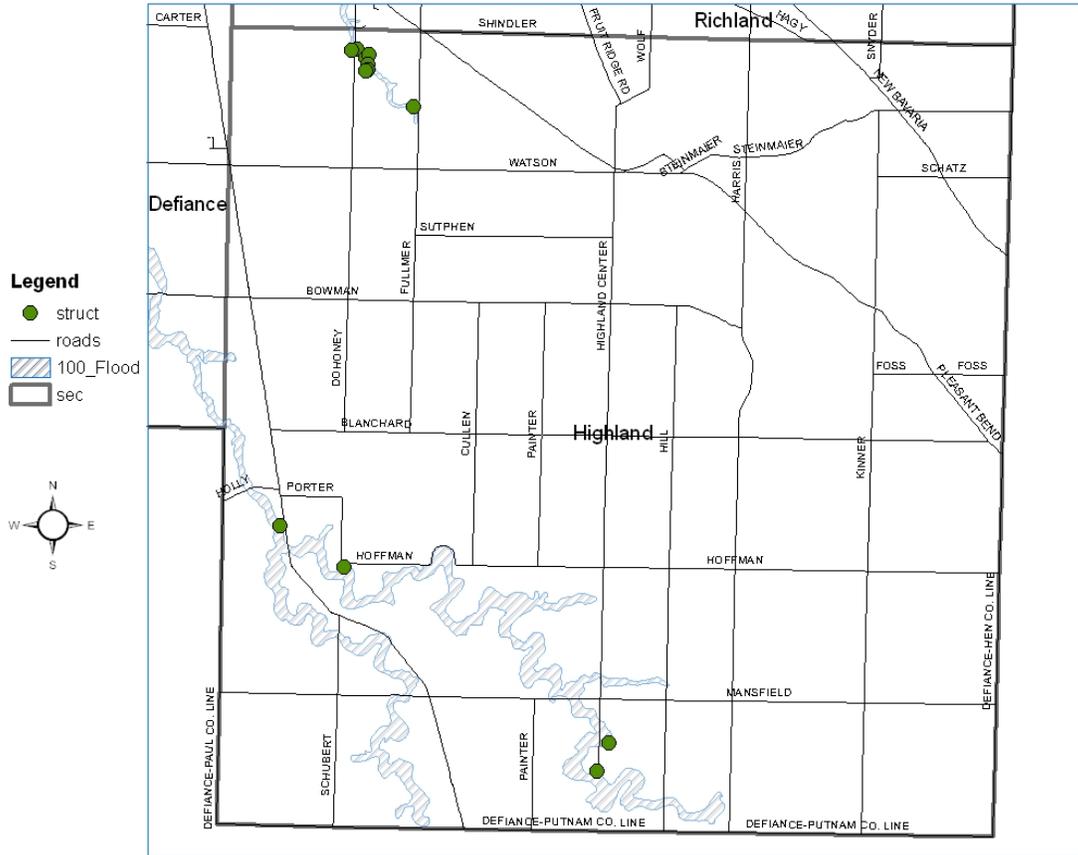
# Appendix G Hicksville Township 100-year Floodplain Map



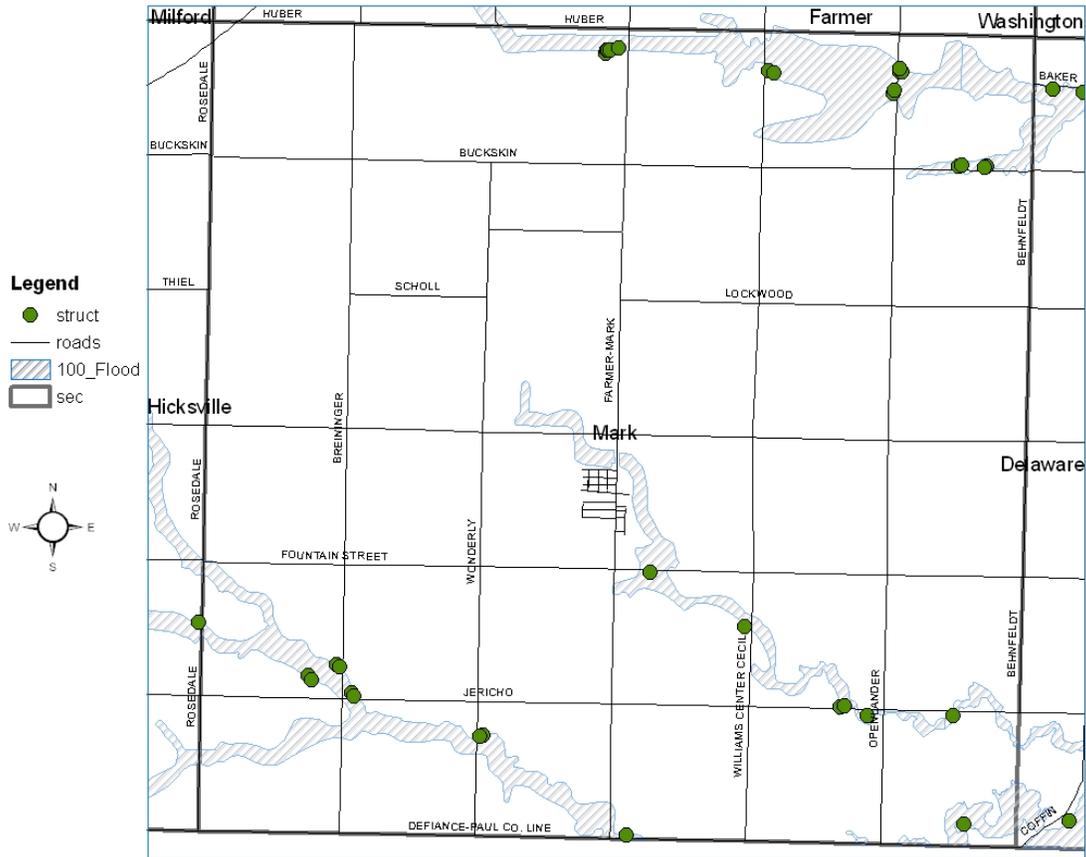
# Appendix H Hicksville, Village of 100-year Floodplain Map



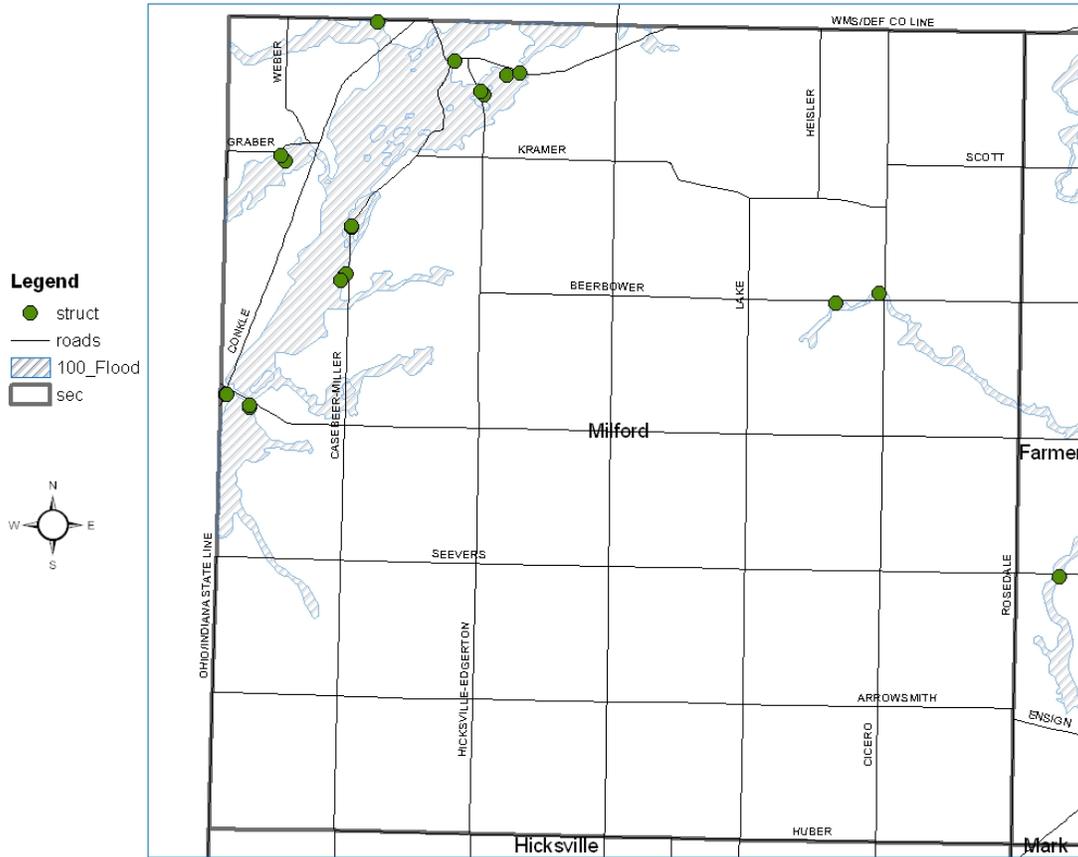
# Appendix I Highland Township 100-year Floodplain Map



# Appendix J Mark Township 100-year Floodplain Map



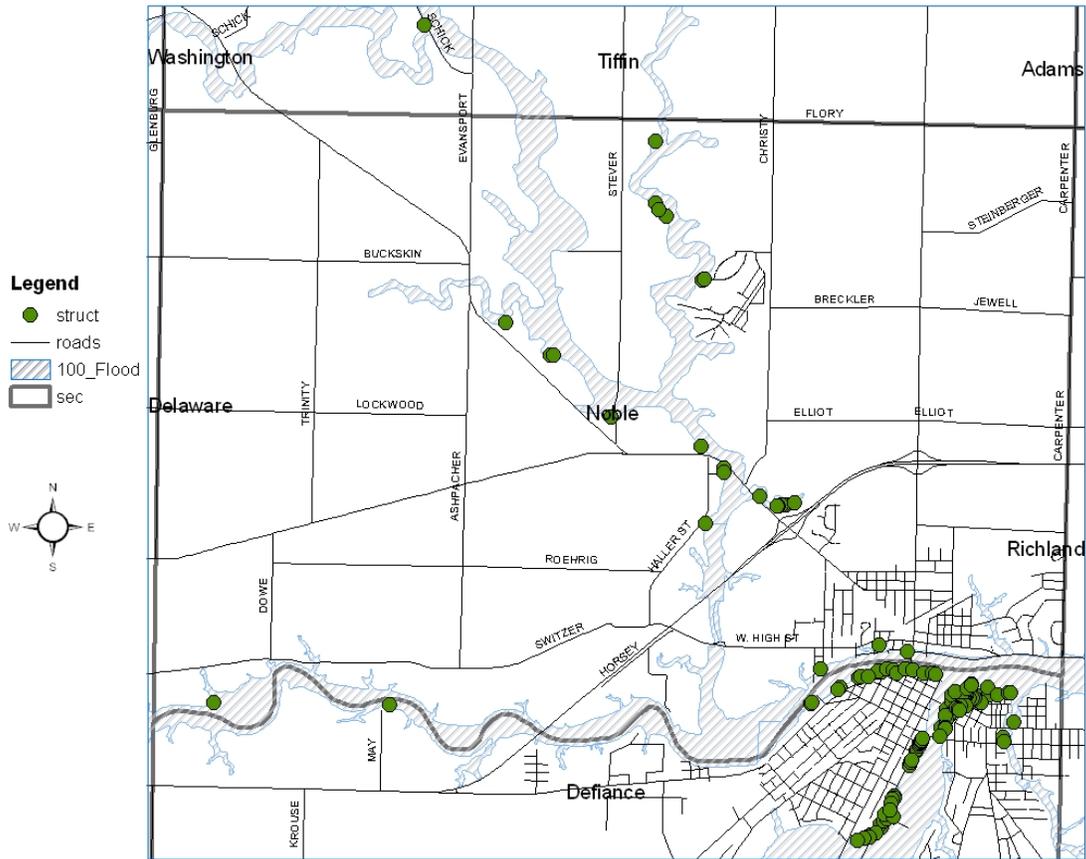
# Appendix K Milford Township 100-year Floodplain Map



# Appendix L Ney, Village of 100-year Floodplain Map



# Appendix M Noble Township 100-year Floodplain Map



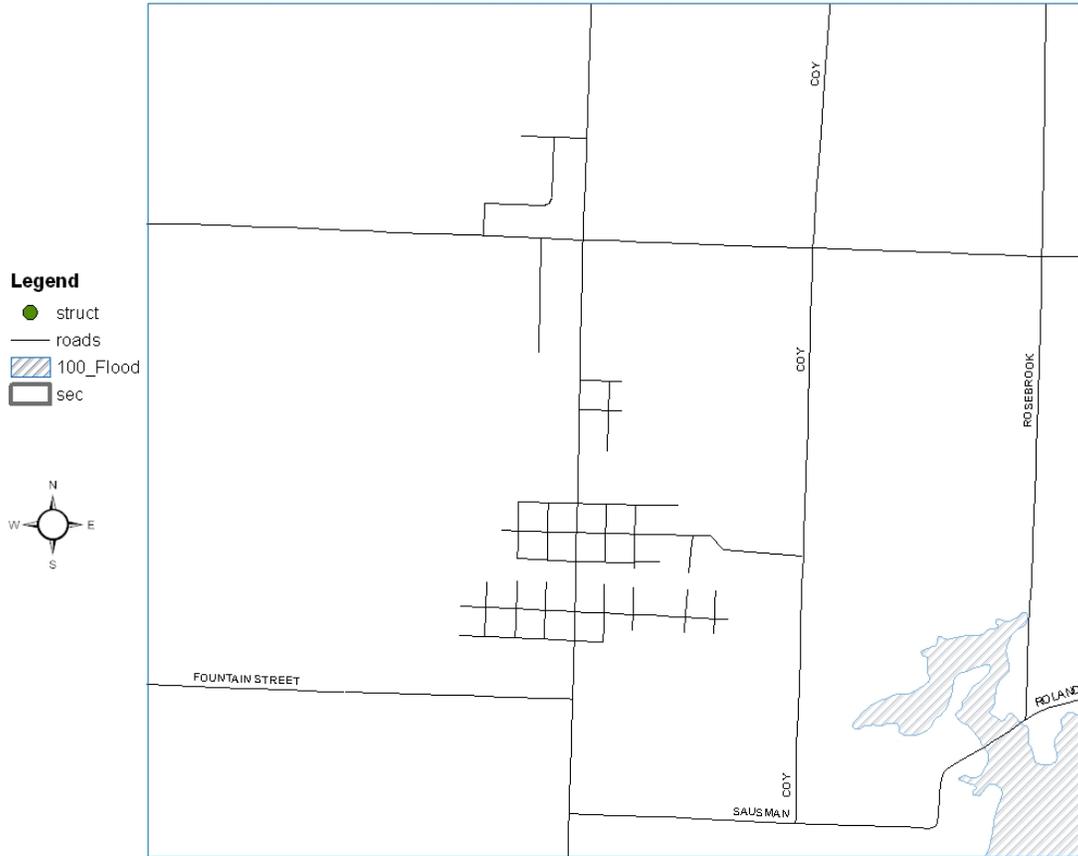
# Appendix N Richland Township 100-year Floodplain Map



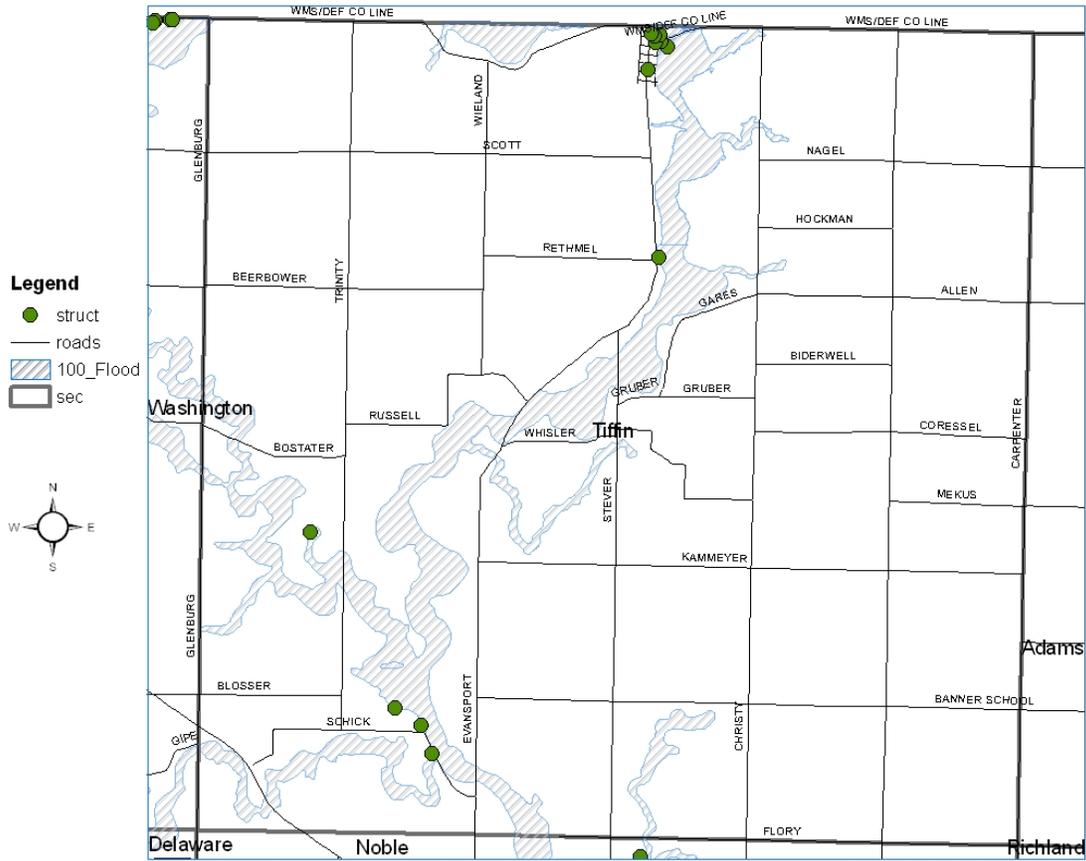
# Appendix O Sherwood, Village of 100-year Floodplain Map

(No structures in the 100-year floodplain)

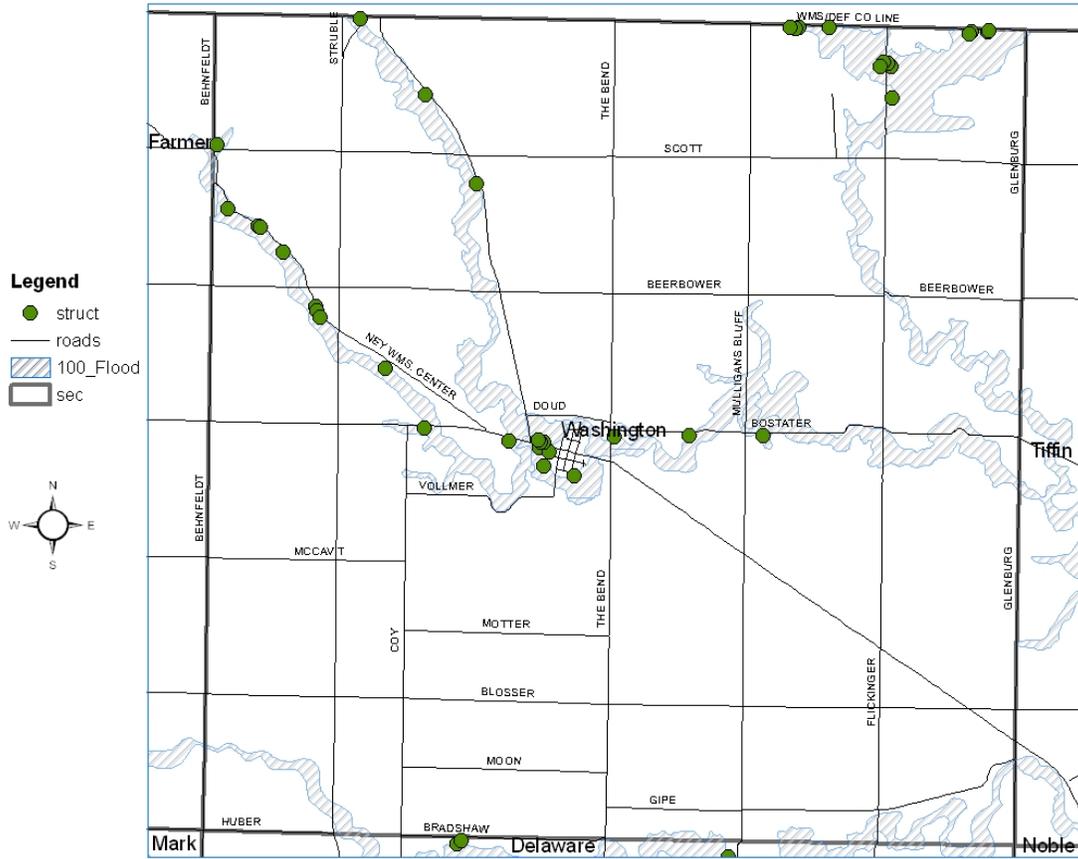
Source of Structures: Ohio Dept. of Natural Resources



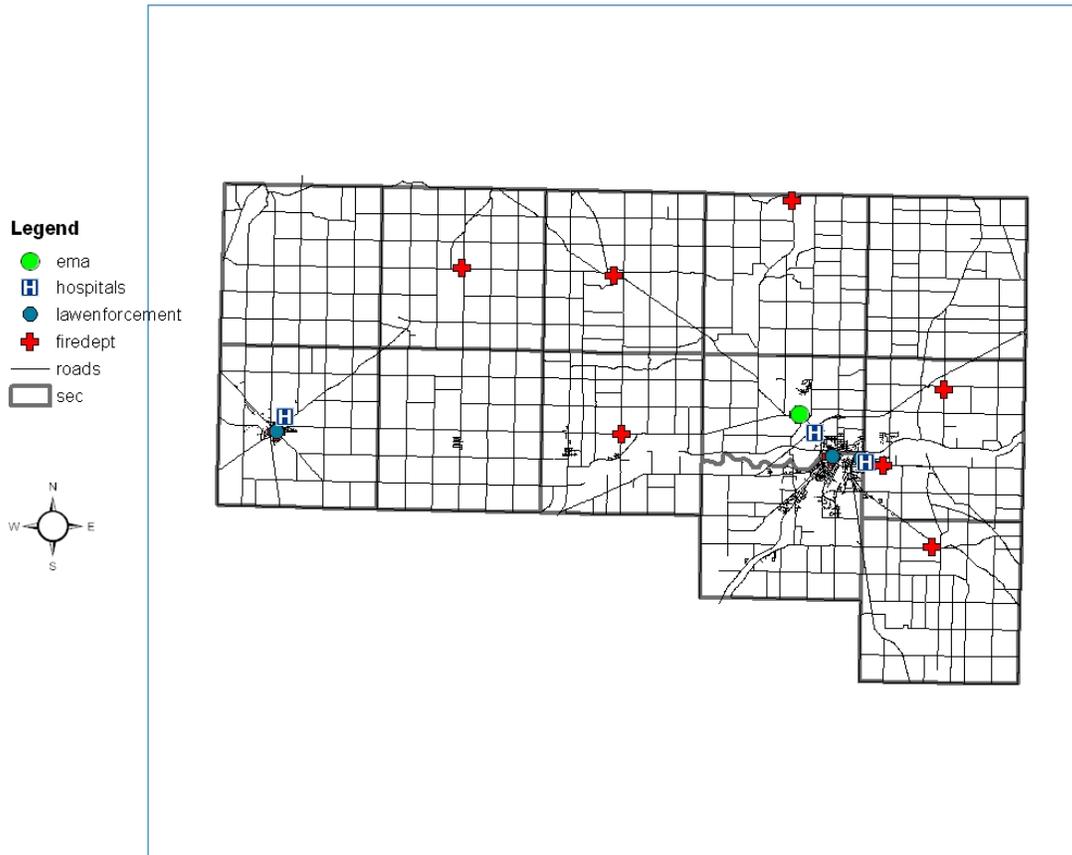
# Appendix P Tiffin Township 100-year Floodplain Map



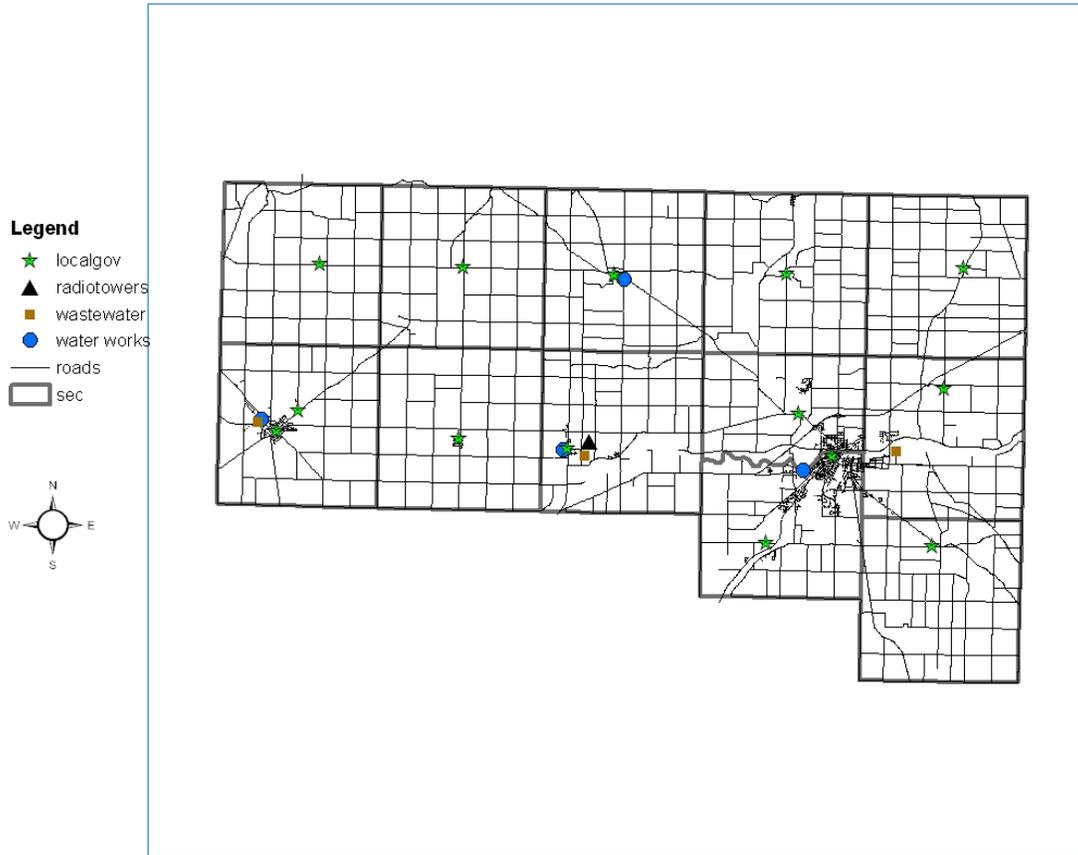
# Appendix Q Washington Township 100-year Floodplain Map



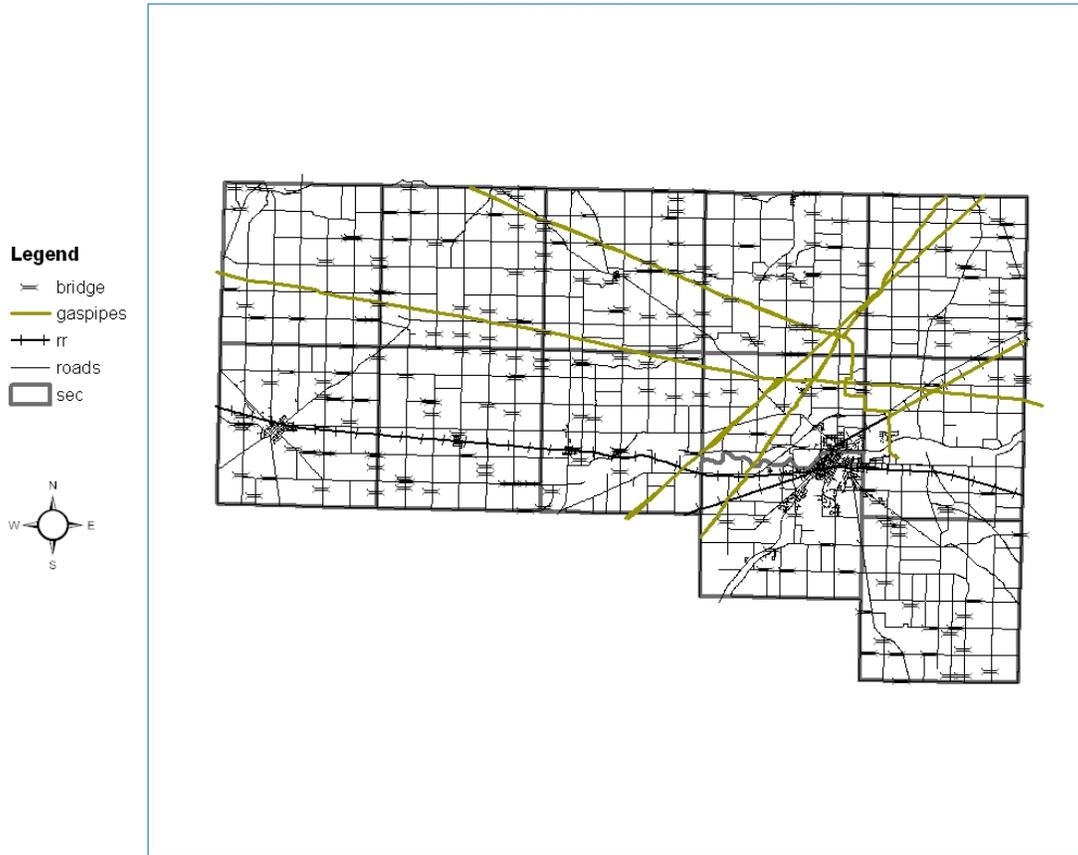
# Appendix R Critical Facilities of Defiance County



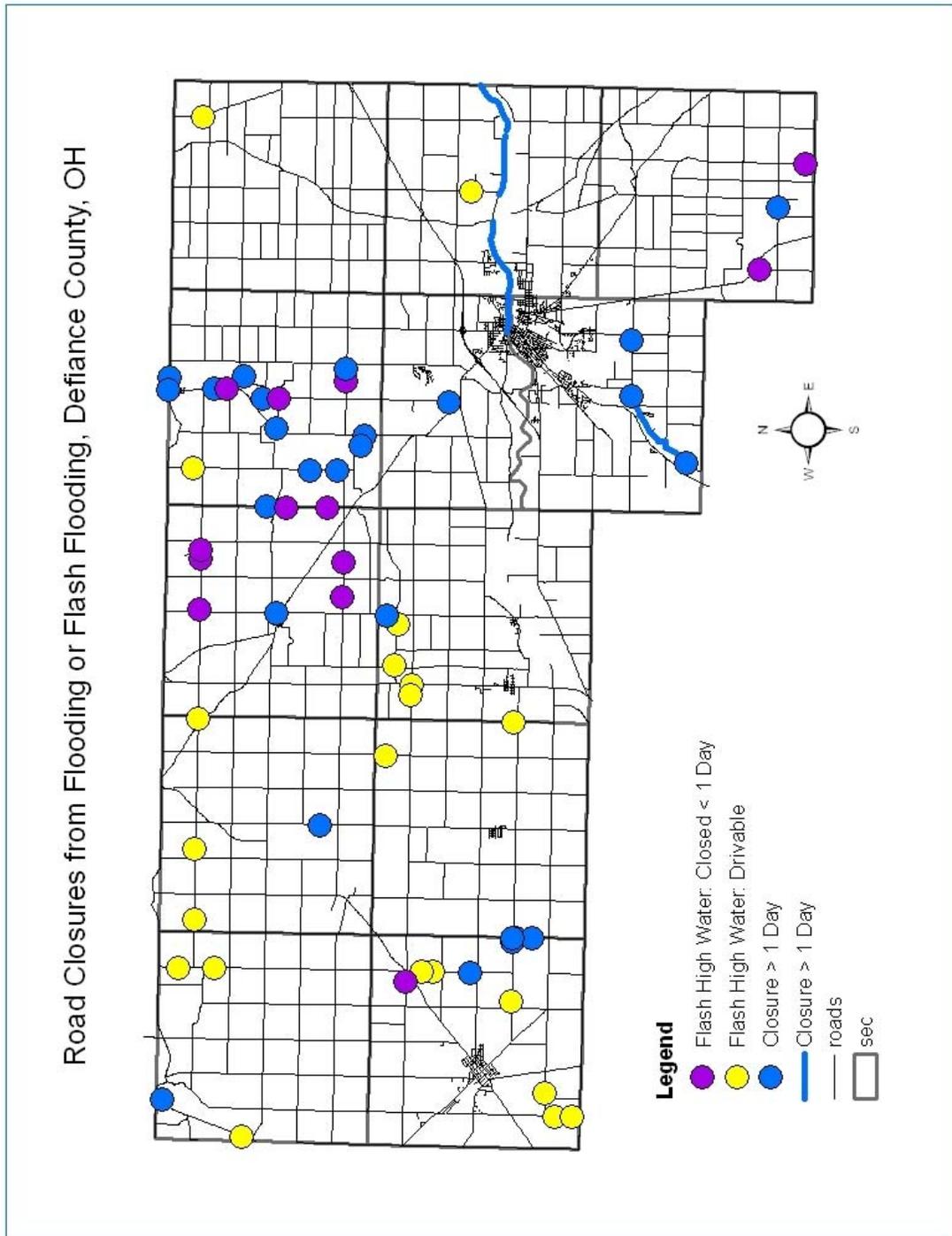
# Appendix S Essential Facilities of Defiance County



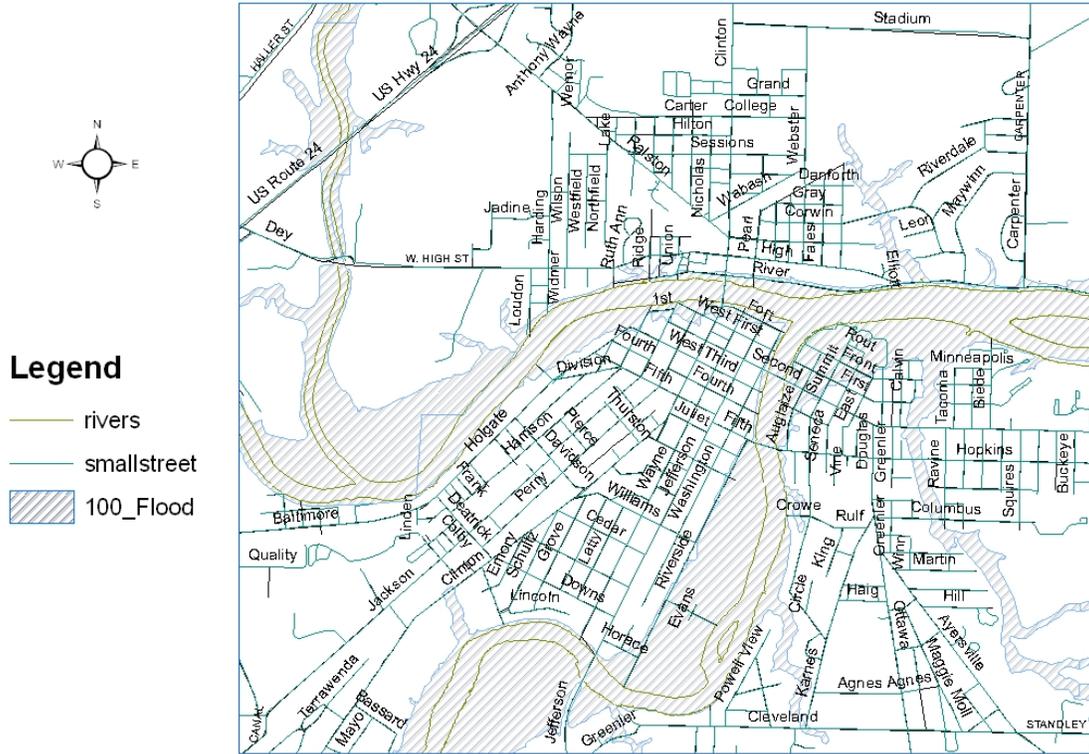
# Appendix T Infrastructure of Defiance County



# Appendix U Road Closures due to Floods and Flash Flooding



# Appendix V Repetitive Loss Structure Area of Defiance County



## **Appendix W Sheltering and Feeding Facilities**

### DEFIANCE COUNTY EVACUEE SHELTERS

*Shelter Agreements on File-Disaster Office, Red Notebook*

Capacity is for sleeping floor space (does not mean seating)

\*\*Updated October 4, 2012\*\*

**SCHOOLS** (\*Capacity First # Evacuation, Second # Post Disaster)

#### **AYERSVILLE LOCAL SCHOOLS (16934)**

28046 Watson Road

Defiance, OH 43512

419-395-1111 (Fax 429-395-9990)

aville\_s@nwoca.org

Contact Persons

- Superintendent-Todd Hug
  - 419-395-1111 (day)
  - 419-395-2212 (evening)
- Maintenance Supervisor-Steve Brown
  - 419-395-1111 (day)
  - 419-395-1867 (evening)
- K-4 Principal- Ron Zachrich
  - 419-395-2166
- 5-8 Principal – Keith Ruhe
  - (Call Ron Zachrich, see above)
- HS Principal Cameron Van Ausdalen
  - 419-782-1872

\*Capacity of 400/200

#### **Defiance Elementary School (136734) (onsite generator)**

400 Carter Road

Defiance, OH 43512

419-785-2260 (FAX 419-785-2261)

Contact Persons

- Keith Westrick
  - 419-782-9243
  - 419-576-9541 (Cell)
- John Mayes
  - 419-784-0045
  - 419-438-9227 (Cell)

#### **DEFIANCE MIDDLE & JR SCHOOL (16931)**

629 Arabella Street

Defiance, OH 43512

419-782-0955 (Middle School), 419-782-0050 (Jr High)

(Fax-419-782-4395)  
def\_ms\_bl@nwoca.org  
Contact Persons

- Middle-Principal-Richard Peters
  - 419-782-0050 (day)
  - 419-438-1374 (cell)
- Jr. High Principal- Kelly Davis
  - 419-782-0050 (day)
  - 419-784-9894 (evening)
- John Mayes
  - 419-784-0070 (day)
  - 419-784-0045 (evening)
  - 419-784-8115 (pager)
- Maintenance-Matt Wurster
  - 419-782-0050 (day)
  - 419-784-8256 (evening)

\*Capacity of 400/200

**DEFIANCE HIGH SCHOOL (16781)**

1755 Palmer Drive  
Defiance, OH 43512  
419-784-2777 (Fax-419-784-2957)

Contact Persons

- Principal-Robert Morton
  - 419-784-2777 (day)
  - 419-438-0588 (cell)
- Head maintenance-John Mayes
  - 419-784-8115 (pager)
  - 419-782-0070 (day)
  - 419-784-0045 (evening)
- Head Custodian- Neil Detter  
419-784-2777 (day)  
419-393-2054 (evening)

Floor space of Study Hall, Cafeteria, Balcony & Gym

\*Capacity 300/150

**FAIRVIEW HIGH SCHOOL (3343)**

US 127 N.  
Sherwood, OH 43556  
419-658-2808  
cenlocal\_s@nwoca.org

Contact Persons

- Superintendent-David Bagley
  - (Cell) 419-506-1010
  - (H) 419-258-7331
- Custodian-Greg Guilford

- 419-658-2074

\*Capacity 300/150

**HICKSVILLE K-12 EXEMPTED VILLAGE SCHOOL (76570) (onsite generator)**

958 E High Street

Hicksville, OH 43526

Phone # 419-542-7665 (FAX 419-542-8534)

Email: millerk@hicksvilleschools.org

Contact Persons

- Superintendent-Jesse Steiner-
  - 419-542-7665 (Work)
  - 419-889-5183 (Cell)
- Principal-Sue Dangler
  - 419-542-7636 (Work)
  - 419-399-9183 (Home)
  - 419-789-1114 (Cell)
- Eric Bassett
  - 419-542-8659 (Work)
  - 419-487-0575

\*Capacity 1490/558

**NOBLE ELEMENTARY (16932)**

10553 Haller Road

Defiance, OH 43512

419-782-7941 (Fax 419-784-3788)

Contact Person

- Superintendent-Jim Roach
  - 419-782-2001
- Maintenance Supervisor- Scott Beckman
  - 419-497-3461 (day)
  - 419-399-8499 (evening)
- Principal- Denise Wright
  - 419-782-7941 (day)
  - 419-395-2232
  - 419-438-6364 (cell)

\*Capacity 100/50

**DEFIANCE SENIOR CENTER (3845)**

104 E Broadway

Defiance, OH 43512

419-782-3233 (Fax 419-782-7610)

admin@defiance/county.com

Contact Persons

- Tina Hiler

- 419-782-3233 (day)
- 419-784-3506 (evening)

Capacity of 150

**TINORA SCHOOL High/Junior High (46700)**

05921 Domersville Road  
 Defiance, OH 43512  
 419-497-2621 (Fax 419-497-3401)  
 tinora\_s@nwoca.org

Contact Persons

- Superintendent- James Roach
  - 419-497-3461 (day)
  - 419-782-2001 (evening)

- Principal- Philip Nofsinger
  - 419-497-2621 (day)
  - 419-782-0220 (evening)

- Maintenance – Tom Hulbert
  - 419-497-3461 (day)
  - 419-758-3214 (evening)

\*Capacity 100/50

**TINORA ELEMENTARY (16779)**

05921 Domersville Road  
 Defiance, OH 43512  
 419-497-1022 (Fax 419-497-1029)  
 tin\_nob\_es@nwoca.org

Contact Persons

- Superintendent- Jim Roach
  - 419-492-3461 (day)
  - 419-782-2001 (evening)
- Principal- Eric Spiller
  - 419-497-1022 (day)
  - 419-782-1444 (evening)
- Maintenance – Scott Beckman
  - 419-497-3481 (day)
  - 419-399-8499 (evening)

\*Capacity 500/250

**CHURCHES**

**DEFIANCE CHRISTIAN CHURCH (8827)**

955 Standley Road  
 Defiance, OH 43512  
 419-782-5786  
 defiancechurch@adelphia.net

Contact Persons

- Minister-Bill Mesaeh
  - 419-782-5786
  - 419-956-4134 (home)
  - 419-785-6322 (cell)
- Elder-Garry Breese
  - 419-784-1672

\*Capacity 200/100

**FAMILY CHRISTIAN CENTER (3892)**

1834 E. 2<sup>nd</sup> Street

Defiance, Oh 43512

419-782-2100

[Jackie@fccenter.net](mailto:Jackie@fccenter.net)

Contact Persons

- Jenni Hoeffel, Operations Director
  - 419-782-2100 ext 202 (day)
  - 419-576-0677 (evening)
- Pastor Tim Tracy,
  - 419-782-2100 (day)
  - 419-576-0677 (evening)

\*Capacity 100

**FIRST BAPTIST CHURCH (16859)**

1399 South Jefferson Ave.

Defiance, OH 43512

419-784-4746

Contact Persons

- Rev Tim Yazel
  - 419-784-4746 (day)
  - 419-782-4108 (evening)
- Greg Schafer
  - 419-395-2396
- Pastor Tim Harlos
  - 419-395-1961

\*Capacity 300/150

**FIRST CHURCH OF CHRIST (3895) (Generator Hook up, Generator stored at Fire Department)**

118 N. Main Street

Hicksville, OH 43526

419-542-8632

Email not available

Contact Persons (**Trustees**)

- John Battershell
  - 419-487-0286

- 419-542-7182
- Dan Turnbull
  - 419-487-1510
- Mark Ryan
  - 419-258-2641
  - 419-966-2468
- Roy Smith
  - 419-487-1259
- Brian Zeedyk
  - 419-769-8007

\*Capacity 200/100

**FIRST CHURCH OF GOD (NO Shelter Agreement but would probably help if needed)**

561 Carter Road  
Route 8  
Defiance, OH 43512  
419-782-0861  
kkw@defnet.com

Contact Persons

- Pastor Rick Rufenacht
  - 419-395-1138
- Asst. Pastor Larry Kennedy
  - 419-395-1338

Capacity of 100

**FIRST PRESBYTERIAN CHURCH (8828)**

501 Washington Ave.  
Defiance, OH 43512  
419-782-2781  
1-presby@defnet.com

Contact Persons

- Reverend Wally Seibel
  - 419-782-2781 (day)
  - 419-463-0509 (evening)
- Jeff Barber
  - 419-576-7449 (home)
  - 419-576-7450 (cell)
- Marilyn Smith
  - 419-784-3240

\*Capacity100/50

**GRACE UNITED METHODIST CHURCH (3889)**

121 W. High Street  
Hicksville, OH 43526  
1-419-542-7927

hicksvillegrace@bright.net

Contact Persons

- Pastor Greg Wack
  - 419-542-7927 (day)
  - 419-542-7479 (evening)

Custodian Tom Battershell

- 419-542-6519

\*Capacity 100/50

**NEY CHURCH OF GOD (16864)**

3413 St Rt 15

Ney, OH 43549

419-658-2813

neych@ncnet.org

Contact Persons

- Pastor Kevin King
  - 419-658-2813 (day)
  - 419-658-5050 (evening)
- Board Member-Shawn Ramey
  - 419-658-2728

\*Capacity 200/100

**SECOND BAPTIST CHURCH (3844)**

1945 E. Second Street

Defiance, OH 43512

419-782-5141

sbc@defnet.com

Contact Persons

- Pastor Max Begley,
  - 419-782-4382
- Associate Pastor Dave Gerken
  - 419-395-1467 (day & evening))
  - 419-769-3137 (cell)

\*Capacity 160/80

**Sherwood United Methodist Church (17193)**

Box 4582

Sherwood, OH 43556

419-899-2492 or 419-899-2747

Contact Persons

- Reverend Kevin Doseck
  - 419-899-2492
  - 419-899-2747
  - 419-979-8573 (cell)
- Secretary Barb Flory
  - 419-899-2492

- 419-899-2578

\*Capacity 50

**ST. JOHN LUTHERAN CHURCH (Hicksville) (3893)**

812 E. High Street

Hicksville, OH 43526

419-542-6269 (Fax-419-542-9329)

Contact Persons

- Pastor Jim Paulson
  - 419-542-6269 (day)
  - 567-881-4054 (evening)
- Linda Foster
  - 419-542-8691

\*Capacity 100

**ST. JOHN LUTHERAN CHURCH OF SHERWOOD (3891)**

09088 Openlander Road

Sherwood, OH 43512

419-899-2850

saintjohnsh@bright.net

Contact Persons

- Rev Mark DeLassus
  - 419-899-2358 (day)
  - 419-899-2358(evening)
- Bill Wendling-Trustee (Main Contact)
  - 419-899-4604

Capacity of 100

**ST. MICHAEL'S CATHOLIC CHURCH (3843)**

100 Antwerp Drive

Hicksville, OH 43526-0052

419-542-8202 (Fax 419-542-9513)

stmikehi@bright.net

Contact Persons

- Secretary-Susan Smalley
  - 419-542-8202 (day)
  - 419-542-7220 (evening)
- Custodian – Jerry Piasecki
  - 419-487-0268
- Hicksville Police
  - 419-542-6661

\*Capacity 200/100

**ST PAUL LUTHERAN CHURCH (3894)**

671 Clinton Street

Defiance, OH 43512

419-782-5771

Capacity Approx 300

Contact Persons

- Minister David Brodston
  - 419-782-0833
- President Jim Martin
  - 419-782-7197
  - 419-782-9911 (ext 220) work
- Trustee Ron Huner
  - 419-782-5769
- Trustee Dan Tuttle
  - 419-395-2403

\*Capacity 100/50

**ST. PAULS UNITED METHODIST CHURCH (28307)**

400 Wayne

Defiance, OH 43512

419-782-3751

Contact Persons

- Mark Donnally
  - 419-782-3751
  - 419-782-0561 (after hours)
- Jeff Leatherman
  - 419-782-3751
  - 419-782-0500

\*Capacity 300/150

**TRINITY UNITED METHODIST CHURCH (16765) (Generator Hook\_up-Generator stored at EOC)**

413 East Second Street

Defiance, OH 43512

419-782-9781

trinity@defnet.com

Contact Persons

- Pastor Joe Graves
  - 419-782-9781 (day)
  - 419-487-0380 (evening)
- Don Heilshorn
  - 419-784-1590
- Custodian-Pat Metz
  - 419-438-2849
- Lori Olds-Secretary
  - 419-782-9781
  - 419-395-2407

\*Capacity 130/65 (has generator hookup of mobile)

**Zion Lutheran Church (71350)**

1801 E Second Street  
Defiance, OH 43512  
419-782-8781 (Fax: 419-782-6719)  
zion111@embarqmail.com  
Contact Persons

- Pastor Tim Reynolds
  - 419-782-8781
  - 419-782-7196 (Home)
- Tom Boals
  - 419-395-1736 (Home)
  - 419-783-8672 (Cell)

\*Capacity 100/50

**OTHER ORGANIZATIONS**

**AMERICAN LEGION POST 223 (HICKSVILLE) (16852)**

229 E High Street  
Hicksville, OH 43526  
419-542-7295

Contact Persons

- Post Commander Robert Sailor II
  - 419-542-7295 (day)
  - 419-487-0658 (evening)
- Robert Sailor I
  - 419-487-3020

\*Capacity 125

**CAMP LAKOTA (16853) (onsite generator)**

2180 Ginter Road  
Defiance, OH 43512  
419-782-4651 (Fax-419-782-2022)

Capacity of 100

Contact Persons

- Ranger Patrick Bohn
  - 419-784-0625 (day)
  - 419-576-2655 (cell)
  - 419-303-4510 (cell)
- Camp Director Mike Saxton
  - 419-393-2513 (day)
  - 419-439-2079 (evening)

\*Capacity 100/50

**CAMP LIBBEY (16869) (onsite generator)**

28325 ST RT 281

Defiance, OH 43512  
419-784-5888

- Camp Administrator Adam Cassi
  - 419-784-5888 (day)
  - 419-615-5956
- Property Manager Jeff Baldwin
  - 419-784-5888 (day)
  - 419-782-6841 (evening)
  - 419-769-4883 (cell)

\*Capacity 400/200

**Defiance County American Red Cross Chapter House (73285)**

1220 S Clinton Street  
Defiance, OH 43512  
419-782-0136 (FAX 419-782-8337)  
dredcros@bright.net

- Disaster Director Sally Ricker
  - 419-782-0136 (day)
  - 419-438-5150 (cell)
- Executive Director Penny Hitt
  - 419-782-0136 (day)
  - 419-438-8188 (cell)

\*Capacity 20/10

**DEFIANCE COUNTY SENIOR SERVICES (3890)**

Defiance County Senior Center  
104 E Broadway Street  
Defiance, OH 43512  
419-782-3233 (Fax 419-782-7610)  
admin@defiance`/county.com  
Contact Persons

- Tina Hiler
  - 419-782-3233 (day)
  - 419-784-3506 (evening)
- Defiance County Commissioners
  - 419-782-4761

\*Capacity 30

**DEFIANCE COLLEGE (16856)**

701 N Clinton Street  
Defiance, OH 43512  
419-783-2503 (Fax 419-784-4101)  
Contact Persons

- President Mark Gordon
  - 419-783-2300 (day)
- Director Of Physical Plant Jim Coressel

- 419-783-2502 (Day)
- 419-439-1605 (Evening)
- Athletic Director Jenni Morrison
  - 419-783-2380 (day)
  - 724-880-3065

\*Capacity 400/200

**YMCA (16913)**

1599 Palmer Drive  
 Defiance, OH 43512  
 419-784-4747 (Fax 419-782-4497)  
 Capacity of 300  
 Contact Persons

- Executive Director Glenn Kuhn
  - 419-784-4747 (day)
  - 419-782-2090 (evening)
- Rich (7/2012)
  - 419-439-0773

\*Capacity 200

**UAW LOCAL 211 (16867)**

2120 Baltimore Road  
 Defiance, OH 43512  
 419-784-5399  
 Capacity 250  
 Contact Persons

- Trustee Sarah Vogelsong
  - 419-899-2529
- Trustee Vince Eickholt
  - 419-523-4495 (day)
  - 419-231-1271 (evening)

\*Capacity 300/150

**Originals found in Shelter Agreement Book in  
 Disaster Office**

## Appendix X Multi-County Notification of Planning

### Defiance County Public Safety Services

22491 Mill Street

Defiance, OH 43512

Phone: 419.782.1130 Fax: 419.782.3714

[ema@defiance-county.com](mailto:ema@defiance-county.com)

FAX

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**DATE:** April 21, 2011  
**TO:** Putnam County EMA  
**FROM:** Julie Rittenhouse, Director  
**SUBJECT:** Natural Hazard Mitigation Plan Update

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Cc: Williams County EMA  
Fulton County EMA  
Henry County EMA  
Paulding County EMA

This memo is to make you aware that Defiance County is in the process of updating our Natural Hazards Mitigation Plan. We will hold several public meetings which will be advertised on the radio and in the Crescent News. We welcome the participation of your jurisdiction in any future public meetings regarding our plan or its process.

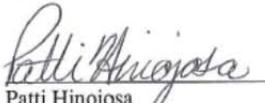
(311)

## Appendix Y Public Notice of Planning (Crescent News)

### Proof of Publication

The Defiance Publishing Company L.L.C.  
624 West Second Street  
Defiance, Ohio 43512  
Phone: (419) 784-5441  
Fax: (419) 784-1492

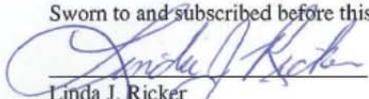
I, Patti Hinojosa, being first duly sworn, depose and say that I am Advertising Clerk of THE CRESCENT-NEWS (FED. ID 34-1842326) a newspaper printed and published in the city of Defiance, and of general circulation in the County of Defiance, State of Ohio, and have personal knowledge of the facts herein stated and that the notice hereto annexed was published in said newspaper for 2 insertions on the same day of the week from and after the 26th day of April, 2011 and that the fees charged are legal.

  
Patti Hinojosa

Name of Account: DEFIANCE CO PUBLIC SAFETY  
Ad Number: 11110217  
No. of Lines: 33

Day(s) Published: 04/26, 04/29.  
Printers Fee: \$166.25

Sworn to and subscribed before this 28th day of April, 2011.

  
Linda J. Ricker  
Notary Public  
Commission Expires September 17, 2012



LINDA J. RICKER  
Notary Public  
In and for the State of Ohio  
My Commission Expires  
September 17, 2012

<b>5 Legals</b>
<b>PUBLIC NOTICE</b>
Defiance County Public Safety Services, in conjunction with the Ohio State University Extension Office, will host a Public Meeting on May 2, 2011 at 5:00 p.m. at the Public Safety Services facility located at 22491 Mill Street in Brunersburg. We will review the 2004 Natural Hazards Mitigation Plan which includes natural disaster mitigation projects proposed by the political jurisdictions in Defiance County. A copy of the plan can also be found on the Defiance County Website: <a href="http://www.defiance-county.com">www.defiance-county.com</a> you can review a hard copy of the plan by stopping by one of these county agencies: Defiance County Commissioners Office, Defiance County Public Safety Services or OSU Extension Office. All public input and suggestions will be addressed in the planning process. Public comment period will remain open until May 16, 2011. Written comments can be sent to:
OSU Extension Office Attn: Bruce Clevenger 06879 Evansport Rd, Suite B Defiance, OH 43512
Public Safety Services Attn: Julie Rittenhouse 22491 Mill Street Defiance, OH 43512
Seating is limited. Please RSVP (419-782-1130) to reserve your seat and allow for materials.

## Appendix Z Public Notice of Planning (News Tribune)

Page 8

The News-Tribune

Wednesday, April 27, 2011

### NOTICE NOTICE NOTICE NOTICE

Defiance County Public Safety Services, in conjunction with the Ohio State University Extension Office, will host a Public Meeting on May 2, 2011 at 5:00 p.m. at the Public Safety Services facility located at 22491 Mill Street in Brunersburg. We will review the 2004 Natural Hazards Mitigation Plan which includes natural disaster mitigation projects proposed by the political jurisdictions in Defiance County. A copy of the plan can also be found on the Defiance County Website: [www.defiance-county.com](http://www.defiance-county.com). You can review a hard copy of the plan by stopping by one of these county agencies: Defiance County Commissioners Office, Defiance County Public Safety Services or OSU Extension Office. All public input and suggestions will be addressed in the planning process. Public comment period will remain open until May 16, 2011.

Written comments can be sent to:

OSU Extension Office	Public Safety Services
Attn: Bruce Clevenger	Attn: Julie Rittenhouse
06879 Evansport Rd., Suite B	22491 Mill Street
Defiance, OH 43512	Defiance, OH 43512

Seating is limited. Please RSVP (419-782-1130) to reserve your seat and allow for materials.

# Appendix AA Public Notice of Draft NHMP 2011



*September*

**national  
emergency  
preparedness  
MONTH**

## ARE YOU PREPARED?

You may need to survive on your own after an emergency. Local officials and relief workers will be on the scene after a disaster, but they cannot reach everyone immediately. For more information on preparedness planning come to:



Defiance County  
Public Safety Emergency  
Management Agency

### OPEN HOUSE

WEDNESDAY, SEPTEMBER 21

NOON - 7 PM

419-782-1130

Located on St. Rt. 15N, next to Noble Fire Dept. in Brunersberg  
**Refreshments Provided**

**A few of the Participating Agencies:**  
 Ohio State Highway Patrol with Impaired Driving Goggles,  
 (Wrecked car provided by Vaughn Auto Sales & Salvage),  
 Napoleon Fire Trailer with Smoke & Lighting Simulator,  
 Promedica Disaster Trailer & Ambulance, Defiance County  
 Sheriff's Office,  
 Defiance Police Department, Defiance Regional Hospital,  
 Defiance County HazMat, 911 Communications, Noble Fire Dept.,  
 Health Dept., Red Cross, DARE

## MAKE A PLAN

Your family may not be together when disaster strikes, so it is important to plan in advance: how you will contact one another; how you will get back together; and what you will do in different situations.

**Family Emergency Plan**

- Identify an out-of-town contact. It may be easier to make a long-distance phone call than to call across town, so an out-of-town contact may be in a better position to communicate among separated family members.
- Be sure every member of your family knows the phone number and has a cell phone, coins, or a prepaid phone card to call the emergency contact. If you have a cell phone, program that person(s) as "ICE" (In Case of Emergency) in your phone. If you are in an accident, emergency personnel will often check your ICE listings in order to get a hold of someone you know. Make sure to tell your family and friends that you've listed them as emergency contacts.
- Teach family members how to use text messaging (also known as SMS or Short Message Service). Text messages can often get around network disruptions when a phone call might not be able to get through.

**Emergency Plans**

You may also want to inquire about emergency plans at places where your family spends time: work, daycare and school. If no plans exist, consider volunteering to help create one. Talk to your neighbors about how you can work together in the event of an emergency. You will be better prepared to safely reunite your family and loved ones during an emergency if you think ahead and communicate with others in advance.

JOIN US! PUBLIC INVITED!

# Appendix BB. Jurisdiction Participation and Rank of Natural Hazards

DEFIANCE COUNTY PUBLIC SAFETY SERVICES / EMA  
22491 Mill Street Defiance, OH. 43512  
Phone: 419-782-1130 ~ Fax: 419-782-3714

Julie Rittenhouse, EMA Director [ema@defiance-county.com](mailto:ema@defiance-county.com)  
Paula Fairchild, Administrative Assistant [pfairchild@defiance-county.com](mailto:pfairchild@defiance-county.com)

---

To: All Defiance County Township Trustees, Mayors, and Administrators

From: Julie Rittenhouse

Date: April 21, 2011

Re: Natural Hazard Mitigation Plan Update Survey

To remain eligible for mitigation funding, the Disaster Mitigation Act of 2000 (DMA2K) requires all jurisdictions to have an adopted and approved all-natural hazard mitigation plan in place. Defiance County has had an approved plan since 2004. This plan has expired and needs updated to remain eligible for mitigation project dollars.

What's in it for you: Eligibility for mitigation project dollars after our updated plan is approved by FEMA. Completed mitigation projects reduce the amount of property damage and the potential for loss of life from a natural disaster.

What happens without the plan: Failing to participate in the county-wide plan will render your jurisdiction ineligible for any mitigation project dollars, either before or after a natural disaster.

Please complete the following survey:

Are you interested in participating?

Yes, we wish to participate in the plan \*

No, we wish to opt-out of participating in the plan \*\*

\* If you answered Yes, please proceed with the survey and sign on the signature line when completed.

\*\* If you answered No, Please skip the remaining questions and sign on the signature line.

(Turn Page Over)

Please review the potential natural disasters that were previously identified in the 2004 Natural Hazards Mitigation Plan. Rank the following disasters as they relate directly to the concerns in your jurisdiction. (5 being the most significant, 1 being the lowest concern)

FLOODING

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

TORNADO

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

WINTER STORM / BLIZZARD / ICE

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

EARTHQUAKE

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

DROUGHT

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

OTHER, Please explain

\_\_\_\_\_

\_\_\_\_\_

\_\_\_ 5      \_\_\_ 4            \_\_\_ 3            \_\_\_ 2            \_\_\_ 1

Other comments or suggestions:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

We require two signatures from each jurisdiction. Please return this survey to Defiance County Public Safety Services via fax 419-782-3714 or mail to 22491 Mill Street Defiance, Ohio 43512  
**Return form no later than June 3, 2011.**

Signature required: \_\_\_\_\_, \_\_\_\_\_  
(Mayor or Trustee) (Date)

Signature required: \_\_\_\_\_, \_\_\_\_\_  
(Administrator or Trustee) (Date)

Questions may be directed to Julie Rittenhouse at 419-782-1130 or [ema@defiance-county.com](mailto:ema@defiance-county.com)  
at Defiance County Public Safety Services, 22491 Mill Street, Defiance Ohio 43512

## Appendix CC Market Value of Structures & Infrastructure in Defiance County, 2008 (Source: Defiance County Auditor)

Political Entity & Sq Miles	Farm	Industrial	Commercial	Residential	Exempt	Utility/ Infrastructure	Total
Adams Township 35.578 mi <sup>2</sup>	\$13,120,780		\$1,484,550	\$29,921,170 \$841K/mi <sup>2</sup>	\$12,464,360	\$9,735,730	\$66,726,590 \$1,876K/mi <sup>2</sup>
Defiance Township 23.893 mi <sup>2</sup>	\$11,311,630	\$99,650	\$2,283,630	\$66,010,990 \$2,763K/mi <sup>2</sup>	\$5,400,810	\$7,318,110	\$92,424,820 \$3,868K/mi <sup>2</sup>
Delaware Township 35.925 mi <sup>2</sup>	\$17,666,060		\$488,540	\$25,560,020 \$711K/mi <sup>2</sup>	\$351,050	\$4,329,280	\$48,394,950 \$1,347K/mi <sup>2</sup>
Farmer Township 36.534 mi <sup>2</sup>	\$12,566,000	\$93,280	\$286,220	\$20,950,950 \$573K/mi <sup>2</sup>	\$1,707,950	\$2,950,950	\$38,555,350 \$1,055K/mi <sup>2</sup>
Hicksville Township 33.042 mi <sup>2</sup>	\$13,436,630	\$429,940	\$1,060,790	\$44,405,870 \$1,344K/mi <sup>2</sup>	\$604,430	\$3,264,260	\$63,201,920 \$1,913K/mi <sup>2</sup>
Highland Township 35.892 mi <sup>2</sup>	\$15,218,770		\$1,074,690	\$66,007,630 \$1,839K/mi <sup>2</sup>	\$7,409,370	\$3,485,770	\$93,196,230 \$2,597K/mi <sup>2</sup>
Mark Township 36.632 mi <sup>2</sup>	\$10,191,720	\$87,450	\$509,100	\$14,613,390 \$399K/mi <sup>2</sup>	\$1,638,750	\$2,642,800	\$29,683,210 \$810K/mi <sup>2</sup>
Milford Township 35.416 mi <sup>2</sup>	\$13,115,420	\$140,300	\$401,610	\$23,160,470 \$654K/mi <sup>2</sup>	\$752,080	\$1,881,570	\$39,451,450 \$1,114K/mi <sup>2</sup>
Noble Township 20.305 mi <sup>2</sup>	\$10,692,540	\$985,960	\$9,390,630	\$88,860,430 \$4,376K/mi <sup>2</sup>	\$4,882,960	\$12,303,450	\$127,115,970 \$6,260K/mi <sup>2</sup>
Richland Township 33.518 mi <sup>2</sup>	\$12,099,180	\$12,889,210	\$11,787,490	\$57,024,870 \$1,701K/mi <sup>2</sup>	\$10,822,670	\$16,284,720	\$120,908,140 \$3,607K/mi <sup>2</sup>
Tiffin Township 36.441 mi <sup>2</sup>	\$14,299,800	\$1,831,100	\$4,607,520	\$43,641,160 \$1,198K/mi <sup>2</sup>	\$5,047,240	\$28,818,600	\$98,245,420 \$2,696K/mi <sup>2</sup>
Washington Township 35.361 mi <sup>2</sup>	\$12,791,950	\$72,470	\$103,460	\$32,863,340 \$929K/mi <sup>2</sup>	\$12,682,270	\$4,262,160	\$62,775,650 \$1,775K/mi <sup>2</sup>
Defiance, City Of 12.644 mi <sup>2</sup>	\$59,720	\$22,398,510	\$156,715,010	\$450,586,100 \$3,564K/mi <sup>2</sup>	\$156,287,130	\$29,844,500	\$815,890,970 \$64,527K/mi <sup>2</sup>
Hicksville Village 2.533 mi <sup>2</sup>	\$126,090	\$9,628,520	\$14,792,200	\$85,805,040 \$33,874K/mi <sup>2</sup>	\$21,519,250	\$5,159,850	\$137,030,950 \$54,098K/mi <sup>2</sup>
Ney Village 0.392 mi <sup>2</sup>	\$70,000	\$398,920	\$701,870	\$8,418,340 \$21,475K/mi <sup>2</sup>	\$433,640	\$851,300	\$10,874,070 \$27,740K/mi <sup>2</sup>
Sherwood Village 1.573 mi <sup>2</sup>	\$64,550	\$994,230	\$2,768,270	\$17,591,430 \$11,183K/mi <sup>2</sup>	\$1,501,140	\$1,155,710	\$24,075,330 \$15,305K/mi <sup>2</sup>
Defiance County 414.105 mi <sup>2</sup>	\$156,830,840	\$50,049,540	\$208,455,580	\$1,075,421,200 \$2,597K/mi <sup>2</sup>	\$243,505,100	\$134,288,760	\$1,868,551,020 \$4,512K/mi <sup>2</sup>
% of Total	8%	3%	11%	58%	13%	7%	100%

**Appendix DD Number of Parcels with Structures or  
Utility/Infrastructure, 2008 (Source: Defiance County Auditor)**

<b>Political Entity</b>	<b>Farm</b>	<b>Industrial</b>	<b>Commercial</b>	<b>Residential</b>	<b>Exempt</b>	<b>Utility/ Infrastructure</b>	<b>Total</b>
Adams Township	164	0	4	254	14	9	445
Defiance Township	142	2	22	673	17	11	867
Delaware Township	216	0	5	341	3	12	577
Farmer Township	135	2	9	255	6	8	415
Hicksville Township	134	2	15	454	5	5	615
Highland Township	212	0	17	773	11	6	1019
Mark Township	132	1	10	254	3	7	407
Milford Township	170	1	3	257	5	15	451
Noble Township	129	3	50	728	10	9	929
Richland Township	155	5	92	628	25	14	919
Tiffin Township	174	2	23	477	10	7	693
Washington Township	176	1	5	365	8	8	563
Defiance, City Of	5	37	521	5,664	133	19	6,379
Hicksville Village	4	12	130	1,307	44	5	1,502
Ney Village	1	1	12	141	8	4	167
Sherwood Village	2	3	44	334	11	3	397
Defiance County	1,951	72	962	12,905	313	142	16,345
% of total	12%	<1%	6%	79%	2%	1%	100%

# Appendix EE Special Flood Hazard Area Development Permit Application

Planning Commission

DEFIANCE COUNTY PLANNING COMMISSION SPECIAL FLOOD HAZARD AREA DEVELOPMENT PERMIT APPLICATION		
<b>SECTION 1: APPLICANT INFORMATION (Please Print or Type)</b>		
<p>Application is hereby made for a DEVELOPMENT PERMIT as required by the SPECIAL PURPOSE FLOOD DAMAGE PREVENTION REGULATIONS, of Defiance County, Ohio, for development in all areas of special flood hazard within the jurisdiction of Defiance County. All activities shall be completed in accordance with the requirements of said Resolution. The development to be performed is described below and in attachments hereto. The applicant understands and agrees that:</p> <ol style="list-style-type: none"> <li>1) This permit is issued on the conditions and facts described;</li> <li>2) any permit may be repealed if conditions or facts change;</li> <li>3) permit void if the activity has not begun within 180 days of the issuance date; and,</li> <li>4) permit void if activity not completed within one year from date of issuance.</li> </ol>		
Owner's Name: _____	Builder: _____	
Address: _____	Address: _____	
Phone: _____	Phone: _____	
<p><i>NOTE: In addition to completion of this form the applicant agrees to submit any additional information required by the administrator in order to determine that the proposed development is compliant with the local and federal flood damage prevention criteria of the National Flood Insurance Program. This may include but is not limited to: site specific plans to scale showing the nature, location, dimensions and elevations of the area and structure(s) in question.</i></p>		
Address of proposed development site: _____		
Legal description: _____		
Kind of development proposed (check all that apply):		
<input type="checkbox"/> new building	<input type="checkbox"/> existing structure	<input type="checkbox"/> filling/grading
<input type="checkbox"/> residential	<input type="checkbox"/> alteration	<input type="checkbox"/> mining/dredging
<input type="checkbox"/> nonresidential	<input type="checkbox"/> addition	<input type="checkbox"/> watercourse
<input type="checkbox"/> installation	<input type="checkbox"/> accessory	<input type="checkbox"/> alteration
<input type="checkbox"/> manufactured home	<input type="checkbox"/> materials storage	<input type="checkbox"/> other*
*Describe activity: _____		
<p>If the proposed construction is an alteration, addition or improvement to an existing structure, indicate the cost of proposed construction. \$ _____ What is the estimated market value of the existing structure? \$ _____</p> <p><i>NOTE: An existing structure must comply with the flood protection standards if it is substantially improved (an improvement equal to or greater than 50% of the market value of the structure). FEMA maintains that the "substantial improvements" definition applies to existing structures only and that once a structure meets the definition of "new construction" any further improvements to that structure must meet "new construction" requirements. For floodplain management purposes "new construction" means structures for which "start of construction" began on or after the effective date of the initial Flood Insurance Rate Map issued by FEMA for the community.</i></p>		
<p>Does proposed development involve a subdivision or other development containing at least 50 lots or 5 acres (whichever is less)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>NOTE: If yes, base flood elevation data is required from applicant if it has not been provided by FEMA.</i></p>		
<p>I AGREE THAT ALL STATEMENTS IN AND ATTACHMENTS TO THIS APPLICATION ARE A TRUE DESCRIPTION OF THE EXISTING PROPERTY AND THE PROPOSED DEVELOPMENT ACTIVITY. I UNDERSTAND THE DEVELOPMENT REQUIREMENTS FOR SPECIAL FLOOD HAZARD AREA ACTIVITIES PER THE APPROPRIATE RESOLUTION AND AGREE TO ABIDE THERETO. I UNDERSTAND IT IS MY RESPONSIBILITY TO OBTAIN ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS.</p>		
Form Approved 02/98	Applicant's Signature and Date	

## **Appendix FF Public Notice of Flood Mitigation Assistants Program Planning**

Date: July 7, 2009

### **PUBLIC NOTICE ON DEFIANCE COUNTY FLOOD CONCERNS**

The Ohio State University Extension Office will host a Public Meeting on July 23, 2009 at 7:00 p.m. at the Public Safety Services facility located at 22491 Mill Street in Brunersburg. The public is requested to provide input on Defiance County flood concerns that impact homes, businesses, infrastructure and critical services. All public input and suggestions will be addressed in the planning process. Public comment period is open now through August 7, 2009. Written comments can be sent to: OSU Extension Office, Attn: Bruce Clevenger, 06879 Evansport Rd, Suite B., Defiance OH 43512

Seating is limited. Please RSVP (419-782-4771) to reserve your seat and allow for materials.

*To: The Crescent News and Hicksville Tribunes:*

*We would like this ad ran twice before the meeting on July 23, 2009. Please confirm the dates these will run. If you have questions please call 419-782-4771*

*From: Wm. Bruce Clevenger, OSU Extension Educator, Defiance County*

## Appendix GG 2011 Core Group Members

**2011 Defiance County Local Emergency Planning Committee**  
**22491 Mill Street Defiance, OH 43512**  
**Ph: 419-782-1130 Fax: 419-782-3714**

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LEPC Voting Members:

<b>Elected Officials</b>		<b>Health</b>	
Otto Nicely	Commissioner	Cheryl Kehnast	Defiance County Health Department
Tom Kime	Commissioner	Kim Moss	Defiance County Health Dept – Director
James Harris	Commissioner	<b>Environmental</b>	
Jeff Leonard	Defiance City	Jeff Ankney	Defiance Soil & Water Conservation District
<b>Fire</b>		Greg Reinhart	Defiance County Waste Water
Edward Bohn	Defiance Fire EMS	<b>Transportation</b>	
Dave Schmaltz	Defiance Fire Chief	John McCalla	Hicksville
Les Tiejie	General Motors Fire Chief	<b>Industry</b>	
Charlie Weber	Noble Twp Fire Chief	Brent Peterson	Jewell Grain
<b>Law Enforcement</b>		Chuck Renn	General Motors
Laura Szabo	Hicksville PD Chief	Jim Smargassi	Johns Manville
Tim Tobias	Defiance PD Chief	<b>Others</b>	
Dave Westrick	Sheriff	Carol Armitage	911 Director
Chris Clawson	Sheriff Office	Bruce Clevenger	OSU Extension, Agriculture
Doug Engel	Sheriff Office	Dr. Brian Harr	OH Dept of Ag, DVM
Jeff Mack	Defiance PD Assist Chief	Penny Hitt	Defiance County Red Cross
<b>EMA</b>		Adam McDowell	Defiance Water - Supervisor
Julie Rittenhouse	Director		
Paula Fairchild	Admin Assistant		
<b>Medical Facility</b>			
Betty Rife	Hicksville Community Memorial Hospital		
Karen Weaver	Defiance Regional Medical Center		

## **Appendix HH Multi-Jurisdiction Adoption of Approved Plan**

The primary role of government is to provide for the welfare of its citizens. The welfare of Defiance County citizens is never more threatened than during natural disasters. The goal of the Natural Hazard Mitigation Plan is to be forward thinking and develop tangible plans to prevent loss of property and human life due the natural hazards.

This plan includes multiple jurisdictions that play important roles in mitigating natural hazards. Multiple jurisdictions have the opportunity to work cooperatively with other jurisdictions and agencies in the county and the surrounding region. Combining efforts to accomplish a goal is at the center of this mitigation plan.

Adoption of the approved plan will be asked of each participating jurisdiction. The following appendixes will document the official adoption of the Defiance County Natural Hazard Mitigation Plan and the Flood Mitigation Assistance Program Plan at the jurisdiction level.

## Appendix II Resolutions & Promulgations 2012 NHMP Plan

Memo

To:

From: Wm. Bruce Clevenger, Extension Educator

Date:

Re: **Draft Defiance County NHMP and Request of Resolve**

Enclosed is the draft 2012 Natural Hazard Mitigation (NHM) plan for Defiance County. The plan is in the final stages of review by Ohio EMA and will be forwarded to the Federal EMA Region V for final approval.

**An Approved Plan Means:** Participating jurisdictions in Defiance County remain eligible for natural hazard mitigation funding for cost effective and technically feasible mitigation projects.

**Request of Resolve:** Ohio EMA recommends that jurisdictions formally resolve to adopt the Flood Mitigation Assistance plan after the plan is approved by FEMA Region V. Your resolution will be included in the draft NHM plan that is sent to FEMA showing jurisdictions support and future promulgation.

**Please reply with an official resolution or provide two signatures by**

Jurisdiction: **Defiance City**

Resolution: Upon approval by the Federal Emergency Management Agency Region V, we hereby resolve to promulgate the Defiance County Natural Hazard Mitigation Plan 2012.

Signature: \_\_\_\_\_, \_\_\_\_\_

Title: \_\_\_\_\_ (Date)

Signature: \_\_\_\_\_, \_\_\_\_\_

Title: \_\_\_\_\_ (Date)

Questions may be directed to Bruce Clevenger at 419-782-4771 or clevenger.10@cfaes.osu.edu at the OSU Extension Defiance County, 06879 Evansport Road, Defiance, OH 43512