EMH&T INC.

Champaign County Natural Hazards Mitigation Plan

Prepared for
Champaign County, Ohio

February, 2005

List of Appendices

EXECUTIVE SUMMARY

The Champaign County Emergency Management Agency/Office of Homeland Security spearheaded this effort to complete a comprehensive countywide All Natural Hazards Mitigation Plan for all of Champaign County and their incorporated jurisdictions. Their dedication to this mitigation planning effort is seen in the results of having full participation from the County as well as the incorporated jurisdictions.

Champaign County is subject to natural hazards that threaten life and health and have caused extensive property damage. To better understand these natural hazards and their impacts on people and property and to identify ways to reduce those impacts, the County's Emergency Management Agency undertook this Countywide All Natural Hazards Mitigation Plan.

Most mitigation activities need funding. Under the Disaster Mitigation Act of 2000 (DMA2K, 42 USC 5165), a mitigation plan is a requirement for Federal mitigation funds. Therefore, a mitigation plan will both guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from The Department of Homeland Security's Federal Emergency Management Agency (FEMA). This mitigation plan meets the criteria as set forth by FEMA in the DMA2K and provides a community with a "comprehensive guide" for future mitigation efforts as they relate to the hazards that affect their community.

This Mitigation Plan was developed under the guidance of a Core Group of individuals from communities and agencies throughout Champaign County. The Core Group met four separate times during the planning process to discuss the hazards that affect the county, the problems associated with these hazards, potential mitigation alternatives to minimize the effect of these hazards and goals that they would like to see achieved within the County. Local participation is "key" to the successful implementation of this mitigation plan. All the incorporated jurisdictions chose to participate in the development of this plan.

Champaign County has experienced many natural disasters in the past one hundred years. The Core Group evaluated these hazards and chose to address the following five hazards based on their impact on human health and property damage: severe storms (winter, thunderstorms, high winds, lightning, hail), floods, tornadoes, droughts (extreme temperatures), and earthquakes.

With the hazards identified, a vulnerability assessment was completed for Champaign County. This assessment reviews how vulnerable the County is to property damage, threats to public health and safety, and adverse impact on the local economy. It also evaluates the location and likely damage to critical facilities and other structures from different scenarios of strikes by the five hazards. Also, as part of this assessment a multi-hazard map was produced to illustrate some of the hazard areas and locations of structures and critical facilities with respect to these hazard areas.

The culmination of Champaign County's All Natural Hazard Mitigation Plan was an Action Plan for the communities to use to track progress on the implementation of their mitigation alternatives.

LIST OF ACRONYMS

BFE	Base Flood Elevation
BMPs	Best Management Practices
CBR	Coastal Barrier Resources System
CEA	Coastal Erosion Area
CREP	Conservation Resource Enhancement Program
CRP	Conservation Resource Program
CSP	Conservation Security Program
DMA2K	Disaster Mitigation Act of 2000
EAS	Emergency Alert System
EMA	Emergency Management Agency
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIMS	Geographical Information Management Systems
gpm	gallons per minute
GPS	Global Positioning System
HMGP	Hazard Mitigation Grant Program
HUD	Housing and Urban Development
LEADS	Law Enforcement Automated Data System
mi^2	square miles
Mitigation Plan	All Natural Hazards Mitigation Plan
mph	miles per hour
NASA	National Aeronautic and Space Administration
NAWAS	National Warning Systems
NCDC	National Climatic Data Center
NEC	National Electric Code
NFIP	National Floodplain Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NWR	National Oceanic and Atmospheric Administration Weather Radio
NWS	National Weather Service
OBC	Ohio Building Code
OBOA	Ohio Building Officials Administration
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEMA	Ohio Emergency Management Agency
OSP	Ohio State Highway Patrol
PDM	Pre-Disaster Mitigation
PUCO	Public Utilities Commission of Ohio
RMC	Regional Medical Center
SRWC	Sandusky River Watershed Coalition
SWCD	Soil and Water Conservation District
SWMD	Solid Waste Management District
U.S.	United States

USDA	United States Department of Agriculture
USDA-NRCS	United States Department of Agriculture Natural Resources Conservation Service
USGS	United States Geographical Survey
WMSC	Water Management and Sediment Control
WWTP	Wastewater Treatment Plant

Introduction

1.0 INTRODUCTION

Champaign County has taken steps to become disaster resistant by creating a Countywide All Natural Hazards Mitigation Plan. A mitigation plan addresses natural disasters that could affect a local community, whether it is flooding, tornadoes, high winds, winter storms, landslides or some other natural disaster. A mitigation plan is an administrative document that is issued to establish activities that should reduce or, when possible, eliminate long-term risk to human-life and property. The plan will also provide a community with a "comprehensive guide" for future mitigation efforts as they relate to the hazards that affect their county. By developing a mitigation plan, a community can identify their areas of risk, assess the magnitude of the risk and develop strategies and priorities to identify projects for reducing risk.

The Champaign County Commissioners supported this effort with funds received from Ohio Emergency Management Agency (OEMA) and the Federal Emergency Management Agency (FEMA). Although this planning effort was specifically designed to address the creation of a Pre-Disaster Mitigation (PDM) compliant plan, there has been an on-going effort in publicizing the County's activities in relation to mitigation and how the public can continue to get involved and support the County's mitigation efforts.

The State of Ohio completed an analysis in 1988 that determined the hazards that affect the state as a whole. Champaign County used this analysis for guidance when choosing their hazards. They include but are not limited to:

- Flooding
- Tornadoes
- Severe Storms
- Erosion (Stream Bank and Landslides)
- Earthquakes
- Droughts

As part of the Disaster Mitigation Act, (DMA2K,42 USC515) communities that desire to remain eligible for Federal and State mitigation funds must have an approved Mitigation Plan in place by November 2004.

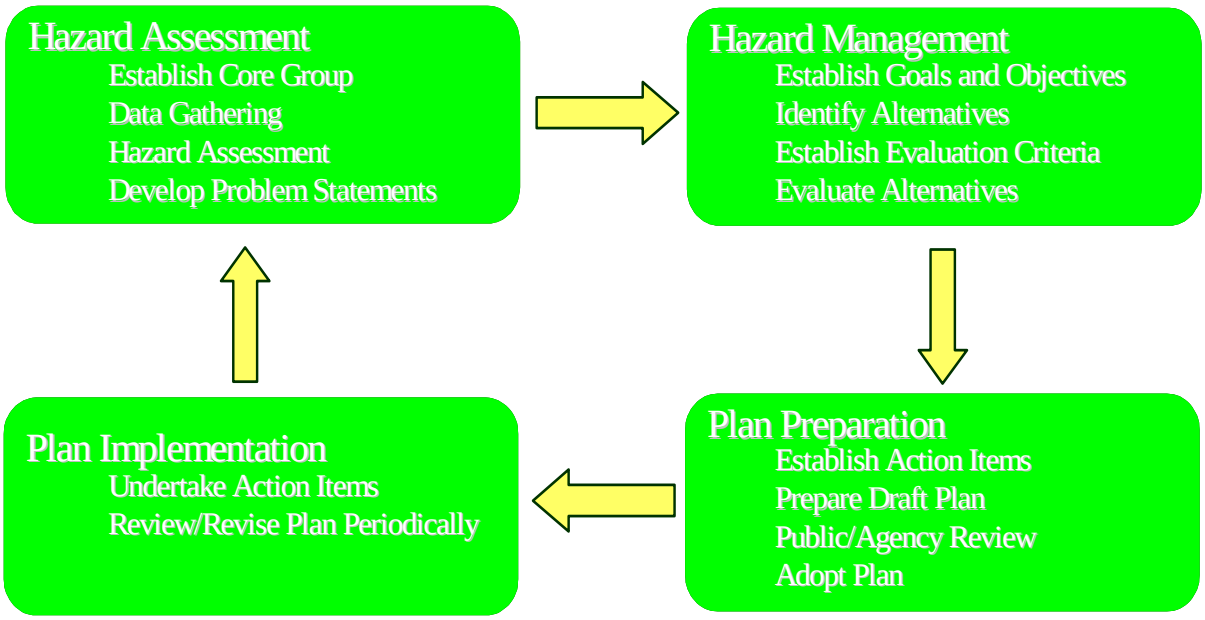
According to the Disaster Mitigation Act of 2000, incorporated jurisdictions within a County must participate as well as representatives from the unincorporated areas. Townships are not required to participate because the County Commissioners can represent them on mitigation projects. However, if a township would like to take an active part by submitting a hazard mitigation project, then their participation in the planning effort is crucial. Local participation is "key" to the successful implementation of these mitigation plans.

If a community chooses not to participate in the Natural Hazard Mitigation Planning effort, then the community will become ineligible for any future federal or state mitigation money. This mitigation money usually comes in the form of a grant such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) or the Pre-Disaster Mitigation Grant Program (PDM), which is to be used to implement mitigation strategies and activities. Examples of eligible activities that could be supported by mitigation dollars include: relocation, acquisitions, elevation, dry-floodproofing, wet-floodproofing, lightning prediction systems, interoperable siren system, stream restorations or any other activity potentially funded with mitigation dollars.

The mitigation planning process that Champaign County followed was adapted from the State of Ohio's Guidance Book, 2001, and the Disaster Mitigation Act of 2000 Federal Guidelines. The planning process also involved evaluating several approved FEMA Mitigation Planning efforts from around the country that the Core Group approved for their content and set-up, which met the needs of Champaign County as well as satisfied the requirement of the reviewers, the State of Ohio EMA and FEMA.

Below is the typical Natural Hazard Mitigation Planning Process that was followed:

NATURAL HAZARD MITIGATION PLANNING PROCESS



In addition to the aforementioned process, the Core Group and the designated leaders of the group made sure that every community that participated in this planning effort was aware of their responsibilities as well as how they could represent their community the best. Below are some suggestions that were incorporated into the initial invitation to participate in the Natural Hazard Mitigation Planning Effort.

How can you and your community help?

- Participate in the Core Group planning meetings representing your community's interests
- Supply any historic information (background) on natural disasters for your community to the Core Group
- Review and comment on the Draft Mitigation Plan
- Review and select mitigation activities developed by the Core Group for your community to implement
- Be an advocate for Final Adoption of the Plan by your community

1.1 Planning Approach

In an effort to continue to meet the mission of protecting lives, property, economic viability and quality of life for the people of Champaign County, the County Commissioners desired to create the Champaign County Natural Hazard Mitigation Plan for their community and its residents. Champaign County sought the expertise of the engineering consulting firm EMH&T, Inc. to help them fulfill this task.

The approach undertaken in the creation of the Mitigation Plan for the county can be described as both comprehensive and collaborative. The comprehensive approach includes following the interim final rule guidelines enacted under the Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency (FEMA) suggested guidelines for the creation of a Mitigation Plan. Any additional items that Champaign County and the Core Group chose to address as part of the comprehensive analysis of their community were addressed as well.

The collaborative portion of creating the Plan included working with the different agencies within Champaign County as well as coordination with all participating jurisdictions. The County could not have a comprehensive plan without the coordination of several other agencies. Information was collected from agencies such as the Champaign County Emergency Management Agency, the Regional Planning Commission, Champaign Soil and Water Conservation District, the Farm Service Agency, American Red Cross, and any other agencies that were involved in planning efforts for the County.

1.2 Participating Communities

Champaign County has seven (7) incorporated areas. All seven (7) incorporated communities chose to participate in this planning effort. The Village of Christiansburg, Mutual and Woodstock were unable to attend the designated Core Group meetings due to the timing of the meetings during the day. The representatives from these small villages were employed full-time at positions other than those in which they represented their community. The Champaign County EMA, in coordination with their consultant, developed a comprehensive survey for each of these villages to complete and return with mitigation planning information specific to their community. Each of these communities was also contacted for involvement in the selection of problem statements and mitigation alternatives. See Appendix A for a copy of the list of attendees from each community as well as the initial concept of how the groups would interact. See Appendix A for an example of the letter that was sent, via certified mail, to each of the villages unable to attend the Core Group meetings.

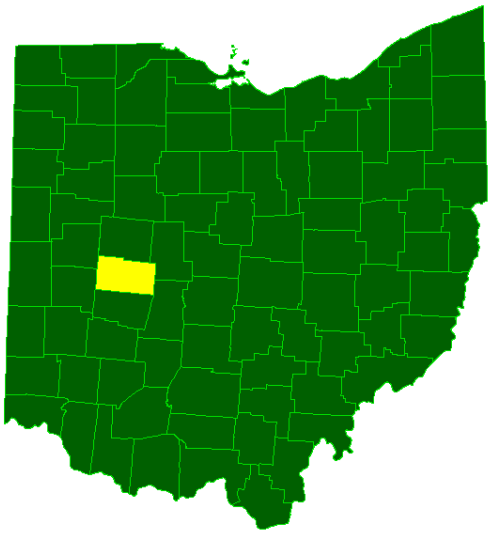
The process to create the Mitigation Plan started with the creation of a “Mitigation Core Group” of decision makers and implementers. In order to lead the planning efforts effectively and on a countywide basis, other representatives were added. The Core Group included individuals from the following departments and agencies:

- Champaign County Emergency Management
- City of Urbana
- Champaign County Soil and Water Conservation District
- Village of St. Paris Street Department
- Mechanicsburg Police Department
- Urbana Police Department

- St. Paris Police Department
- Farm Service Agency
- Village of Mechanicsburg
- Village of North Lewisburg
- Mechanicsburg Water/Wastewater
- Champaign County American Red Cross
- Mechanicsburg Emergency Medical Squad
- Ohio State University Extension

Community Information

2.0 COMMUNITY INFORMATION



Champaign County is a rural county located in west-central Ohio. Shelby, Miami, Clark, Madison, Logan, and Clark Counties form the boundaries of Champaign County. Its physical location is both Champaign County's greatest asset and one of the biggest challenges to its development future. Champaign County is comprised of approximately 428.6 square miles.

The City of Urbana (county seat) is the largest metropolitan area in the county, with almost 12,000 residents in the year 2000. The other six villages combined do not total half of Urbana's population. Villages in the area, in order of descending population, are St. Paris, Mechanicsburg, North Lewisburg, Christiansburg, Woodstock, and Mutual.

2.1 County History

Champaign County derives its name from the character of its topography, a French word meaning level or flat. Half its area is level or slightly undulating, one quarter rolling, twenty percent hilly and five percent prairie flat. The population of Champaign County is approximately 36,000. Approximately 20,000 live in the towns and villages and approximately 16,000 live in the rural areas. According to the County's Economic Development Department, the rural population is expanding at a greater rate than the villages and towns.

Champaign County is rich in many ways, with its people, soil, history and tradition. It is wealthy in heritage, culture and beauty. The residents of Champaign County can be proud of their agriculture production, schools, industry, churches, human and public services.

Champaign County became a recognized county on March 1, 1805. It was the eighteenth out of 88 counties to become organized in the state of Ohio. It was carved from Greene and Franklin counties by legislative action. The original boundary stretched north to Lake Erie from the Greene County Line with its seat in Springfield. On March 1, 1817, Champaign County took on its present boundaries when both Logan and Clark counties were formed. An attempted population count in 1800 showed 100 pioneer settlers. This area was considered Shawnee Native American land. The Miami, Ottawa, Mingo, Delaware and Seneca Native American tribes often passed through this area. Historians say the modern day North American Native American Tribes developed from the "mound builders". Mounds in Champaign County have been found on Pretty Prairie, close to Mechanicsburg and eight miles southeast of Urbana between the north and east fork of Buck Creek.

Between 1600 and 1750 this area was the hunting grounds for parties from the Northern and Southern tribes. The Northern Tribes were victorious in taking possession of the land south to the Ohio River. However, no permanent Indian settlements were established. It was at this time that Daniel Boone and Simon Butler Kenton came into this region exploring and establishing settlements. Simon Kenton is now buried in Urbana's Oakdale Cemetery.

Champaign County sent 3,235 men to fight for the Union in the Civil War. 578 men lost their lives and a statue is dedicated to these men in Urbana's town square. The statue, referred to as The Man on the Monument, is a bronze cavalryman and faces north with head bowed for his fallen comrades.

2.2 Jurisdictions

Urbana

Urbana was incorporated in 1868 and encompasses approximately 6.8 square miles. The town, as originally platted, contained 212 inlots: 6 rods in front abutting streets and running back 10 rods, two tiers of lots on the western border and one tier on the southern border. Twenty-two lots were combined and redistributed, ranging in size from an acre and a half to two acres, with suitable streets. Lots No. 201 and 202 were donated for educational and religious purposes, but were used, in part, for a burial-ground.

The first Methodist Episcopal Church was on Inlot No. 207, on the corner of Locust and Ward streets, where James Hendley now lives.

The first schoolhouse was a log cabin on the knoll on the north side of Scioto Street, about forty rods east of the corner of East Lawn Avenue, and was known as "College Hill." The cabin was built by Thomas Pearce, for a family residence, in 1804. The teachers in this cabin were Peter Oliver and William Stephens.

Fabian Engle opened the first store on the Springfield road, at about halfway between the present dwellings on the Newell and Dallas farms.

John Reynolds and William Ward erected the first grist-mill in 1814, connecting with it Carding and Fulling, which was the foundation of the present woolen factory of Messrs. Henry Fox & Co.

The first marriage license was issued to Daniel Harr and Elizabeth Ross, dated May 28, 1805. Both lived to an honored old age, and saw their children's children to the third generation.

The first deed recorded was executed by Samuel Wheeler to Timothy Woods, in Mad River Township, March 2, 1805, and was recorded by Joseph C. Vance, September 30, 1805.

The first frame house built in Urbana was by John Reynolds, on the northeast corner of what is now called the "Weaver House," and subsequently the frame building on the southeast side of the public square, adjoining the brick store-house of Messrs. Hitt, White & Mitchell, and now occupied as photograph rooms and grocery. Mr. Reynolds used the building for his dwelling-house and had a store-room on the corner.

St. Paris

Many St. Paris forefathers arrived from the beautiful Shenandoah Valley of Pennsylvania and the Virginias. David Huffman arrived in 1831 with his wife and 11 children from Culpepper County, Kentucky. They were the first family in St. Paris. The Apples, Peter and Catherine, were second.

David Huffman built the town's first home on what is now the northwest corner of Main and Springfield Streets. Platted by Huffman on September 21, 1831, the village was incorporated in 1859 and had its first mayor, John Riker, who had just returned from the California Gold Rush. By 1878, the railroad had arrived and the population had grown to just over 1,500. By 1880, the census figure had risen to 1,749 residents. The second family to arrive in St. Paris was the Apples who delivered the first child born there. They named him Adam Apple. On November 28, 1883, St. Paris had a tragic fire. It began in the rear of Gordon's Feed Store and quickly consumed most of the town's businesses and several residences.

From a historical perspective, St. Paris' greatest claim to fame is its tradition as a center for carriage manufacturing in the late nineteenth century. The most prominent "Pony Wagon" manufacturer was the Walborn and Riker Company whose carriages were considered to be of the finest quality, a fact attested by the display at the Chicago World's Fair of 1893. Other St. Paris carriage builders were the Sturm and Mattoon Co., Kump and Fry, and Charles Smith.

Another booming industry in St. Paris was the distilling of alcoholic beverages. At one point there were three distilleries operating in town at the same time. The largest was the Runkle and Ellston Distillery, which in 1877 was making 800 gallons of liqueur a day. The mash from the distilling process was then fed to hogs in a cooperative agreement with local pig farmers. In 1897 the first municipal power plant was installed. It had 500 subscribers and two rates of charge, one for those who turned out their lights by 10 PM, and another for those who let them burn all night.

One of the most distinguished citizens of St. Paris was the late John Kiser. His many contributions to the community include the donation in 1933 of 1,200 acres of land for the construction of what is now Kiser Lake. Today the lake provides an easily accessible recreational facility to the residents of St. Paris and surrounding vicinity. Because it is restricted to man powered boats and sailboats, Kiser Lake has great appeal to water sport "Purists."
In 1957, Graham High School was built east of the village on US Highway 36. In 1960, Dayton Power and Light Company offered gas service to the village. In 1972, the first income tax was approved and that same year the Johnson St. Paris Emergency Medical Service was formed. Although it is surrounded by larger municipalities and has kept pace with the burgeoning technology, St. Paris still provides its inhabitants with a strong sense of tradition and country charm, making it forever known as "The Pony Wagon Town."

Mechanicsburg

In the year 1814, August 6, dates the formal birth of Mechanicsburg. The State of Virginia laid first claim to the ownership of Mechanicsburg's soil; from Virginia it passed to William Reynolds, by Survey No. 4,747; then to Robert Means, Duncan McArthur, and finally to John Kain, who laid out the town on the above date. As laid out, the village was 1,012 feet square, containing about twenty-three and a half acres. Commencing at the crossing of Chillicothe and Sandusky

Streets, there were the facings of four lots, 115 1/2 feet square, on each side of each street; back of these, sixteen lots, ten and one-half poles square, filled out the plat. Thus twenty-eight front and sixteen back lots, with the alleys and the two streets crossing, made the first of the village plat. On March 15, 1836, Isaac Putman's Additions were recorded and other additions, by various persons at various times. In 1880, the town included more than 640 acres.

On August 5, 1865, the Council resolved to submit to the voters of the town, at the following October election, the matter of extending the corporation so as to make it one mile square, the intersection of Sandusky and Chillicothe streets being the center. On October 10, 1865, by a vote of 103 to 3, the proposition-was affirmatively decided, and the corporation was made a mile square.

On February 27, 1834, the Legislature passed an act of twenty sections, the first section of which is as follows: SECTION 1. Be it enacted by the General -Assembly of the State of Ohio, That so much of the township of Goshen, in the county of Champaign, as is comprehended in the plat of the town of Mechanicsburg, together with such plats as have been or may hereafter be recorded as additions thereto, be and the same is hereby created and constituted a town corporation by the name of the town of Mechanicsburg.

There is a famous story of a slave (Addison White) and the Underground Railroad that put Mechanicsburg in history books. Sometime in August 1856, Addison White made a dead-of-the-night break from the Kentucky plantation where he was enslaved, crossed the Ohio River with slaveholders in pursuit and was eventually liberated when sympathetic folks in Mechanicsburg, Ohio, bought his freedom.

North Lewisburg

The Village of North Lewisburg is located in the northeast corner of Champaign County, Ohio near the border of Logan and Union Counties. Both State Routes 245 and 559 meet in North Lewisburg. State Route 33, which connects to Columbus, is 9 miles north of the Village. The closest interstate highway is I-70, 25 miles to the south. Cities in close proximity include Marysville in Union County (9 miles), Urbana in Champaign County (17 miles), Bellefontaine in Logan County (18 miles), Springfield in Clark County (28 miles), Columbus (45 miles) and Dayton (55 miles).

North Lewisburg was first platted in 1826 and incorporated in 1844. It occupies approximately 652 acres in Rush Township. Spain’s Creek runs through town and is part of the Darby Creek Watershed. Undeveloped land represents about 50% of the land in the Village, which is typical of most rural communities. However, most of the land that is undeveloped is actually zoned Residential. At this time, there is no land that is actually designated with the U-1 Undeveloped/Rural zoning code.

In 1805, two years following the statehood of Ohio, the first settlers arrived in the North Lewisburg area. There were 91 pioneers who settled a mile west of North Lewisburg from Virginia. In 1826, a settler by the name of Gray Gary platted North Lewisburg on a fertile location on Spain’s Creek on a high point of land signifying the beginning of North Lewisburg’s formal existence as part of Rush Township. North Lewisburg became incorporated in 1844 after the citizens petitioned the state legislature for an election. North Lewisburg soon became occupied with shops and people, including Quaker settlers from Pennsylvania and North

Carolina. Some of the shops included general stores, sawmills, harness shops, shoe shops, tinners, blacksmiths, tailors, not to mention churches and a town hall.

The first lot was sold for $18 by Gray Gary, and the initial boundaries had remained intact for 123 years until the annexation of 192 acres of land occurred in 1990. Following that, annexation has taken place in order to advance economic development.

Another point of interest is that North Lewisburg was part of the Underground Railroad line. It was believed that many Quaker homes served as “depots” or stops for slaves fleeing to Canada. Many slaves were helped to freedom from North Lewisburg residents.

Among past North Lewisburg inhabitants are a few famous names. The first is that of the late artist Frances Moore whose paintings have been shown at the Metropolitan Museum of Art in New York City. Ms. Moore concentrated on religious artwork made with oils, watercolors, and pastels. The late Joseph Emmons, who was born and raised in North Lewisburg, was an engineer by profession and a ground breaking metallurgist who held 26 patents for cutting tools. Finally, Rev. Albert Green of North Lewisburg was the last known ex-slave in Champaign County. He fled the southern plantations of Virginia at a young age until he met members of the Ohio Volunteer Infantry who gave Rev. Green a job cooking for them. After the battle of Lookout Mountain, Dr. Jesse Brock, the regimental veterinary surgeon, took Albert Green back to his hometown of North Lewisburg given that his enlistment had retired. Rev. Green worked for Dr. Brock for a time and made North Lewisburg his home until his death in 1939 at age 93.

Christiansburg

The town was incorporated in 1835. This little hamlet was laid out by Joshua Howell, in 1817, on land entered by him some time before. It grew rather slowly, having in 1820 only six houses, or rather log huts, used as houses. The first frame house in the town was built ten years afterward by William McCrea, and used by him for a grocery store. The town was then called Christiansburg, in memory of the town in Virginia from which the Howells emigrated. The post office still retains the name of Christiansburg, although the name of the town was changed to Addison, in 1842.

As of the 2000 census, Christiansburg had a total population of 553. The Village has a total area of 0.2 square miles, all of which is land. None of the area is covered with water.

Woodstock

This village is situated near the geographical center Woodstock Township, and on the C., C. & I. C. Railroad. It was laid out in 1832 by Sylvanus and Phoebe Smith, and consisted of twenty-five lots of about one- fourth acre each, of which the former laid off fourteen lots, numbered 1 to 14, and located in the northwest corner of the Milford, Urbana, Mechanicsburg and Bellefontaine roads, and the latter eleven lots, numbered from 15 to 25. The town first took the name of Hartford, but afterward finding there was a post office in the State by the same name, they changed it to Woodstock, in order to have the name of post office correspond with the town. When the town was laid out, Phoebe Smith's house came on Lot No. 24, and therefore was the first in town. The first house built after the village was laid out was on Lot No. 3, by David H. Hall, a shoemaker. The second house was built on Lot No. 2, by William B. Linell, a blacksmith, who also built a shop on Lot No. 15. During the next three years houses were built on Lots Nos. 5, 4, 16, and 1. On the last-named lot a dwelling-house and store-room was erected.

Mutual

The Village of Mutual, formerly called Texas, is situated in the center of Mutual Township on Buck Creek, with the Urbana and Mechanicsburg pike passing through it. The first lots on the site of the village were sold about the year 1840 by William Lafferty, who, probably, tired of the "Buck Creek" region, told the neighboring people he was going to Texas; but instead, it was soon discovered that he had moved into a little cabin adjoining the settlement. When the people ridiculously called it "Lafferty's Texas", the name of Texas originated to the present village of Mutual. It was laid out in July, 1846, but no original plat was ever made and recorded until July, 1869.

The first house in Mutual was built by David Conklin on the present site of Smith's blacksmith-shop. The second house was built by John Sargent, These houses were built about the year 1840. The first tavern was erected about the year 1842 or 1843 by Stephen Runyan and later was occupied by P. Gardner as a wagon-making shop. While on this subject, we will add that the first wagon-making shop was carried on by Daniel Conklin, who was also one of the earliest tavern-keepers. Jacob Lands is another name to be added to the early tavern-keepers of the village.

The village was incorporated May 4, 1869 with a population of about 200.

2.3 Census Information

2.3.1 County Population Projection

Champaign County has shown a steady growth in population over the last eighty years. Population has increased from 26,793 in 1950 to a 2000 Census population of 38,890. The largest change in population since 1930 was from 1950 to 1960 when the population increased by 10.9%. Since 1960, the population has grown by 30.9% according to the 2000 census. Champaign County is expected to keep growing over the next three decades with an increase of 21% expected between the years 2000 and 2030.

Total Population

Census				Projected	
1800		1900	26,642		
1810	6,303	1910	26,351	2000	41,269
1820	8,479	1920	25,071	2020	44,047
1830	12,131	1930	24,103	2030	47,024
1840	16,721	1940	25,258	Largest Changes in	
1850	19,782	1950	26,793	Population Since 1900	
1860	22,698	1960	29,714	Net Change	
1870	24,188	1970	30,491	3,158	1970 to 1980
1880	27,817	1980	33,649		
1890	26,980	1990	36,019	Percent Change	
		2000	38,890	10.9%	1950 to 1960

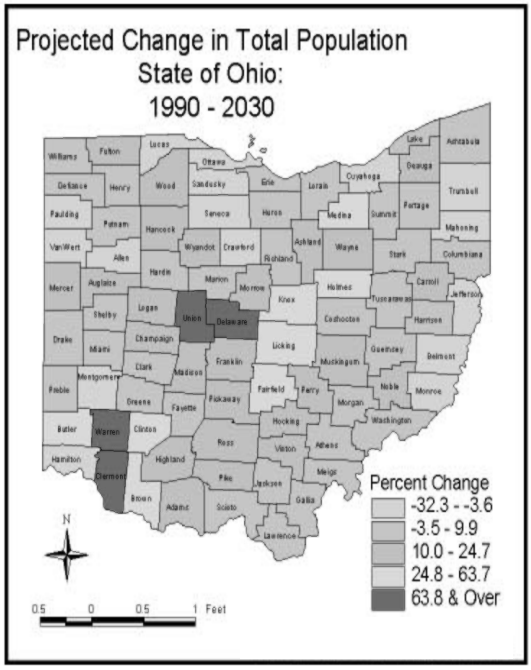
The pace of growth can only be expected to increase due to the continued development and expansion of both Dayton-Springfield and Columbus metropolitan areas. Unfortunately, the science of population projection is not an exact one, and there is no way to know exactly how many residents will live in Champaign County in the year 2020. The Ohio Department of

Development has made a PDF Document available on their website that provides more specific information for Champaign County and the other political jurisdictions. (http://www.odod.state.oh.us/osr/profies/pdf/.)

2.3.2 State Population

Comparatively, the net population change for the State of Ohio has also been a positive one. Within the last 50 years, the State's population has increased by 43%.

The State of Ohio's population in 2000 was 11,353,140 and it is projected to climb to 12,317,613 by 2030; that is an increase of 8.5%. However, it appears that Ohio's population growth rate is diminishing. Several factors may be contributing to this decline. The birth to death ratio is much larger than in faster growing states, with Ohio expected to have 4.4 million births and 3.6 million deaths. Net migration is a factor as well. Ohio may gain approximately 247,000 people through in-migration but may lose about 758,000 people through out-migration.



The projected percentage of population change by county in Ohio from 1990 to 2030 is reflected on the map to the right. Counties surrounding a major metropolitan area – Cincinnati, Columbus, and Cleveland – generally will experience higher growth rates. Counties in the north central and eastern region of the state are projected to experience a decline.

2.4 County Land Use and Future Land Use

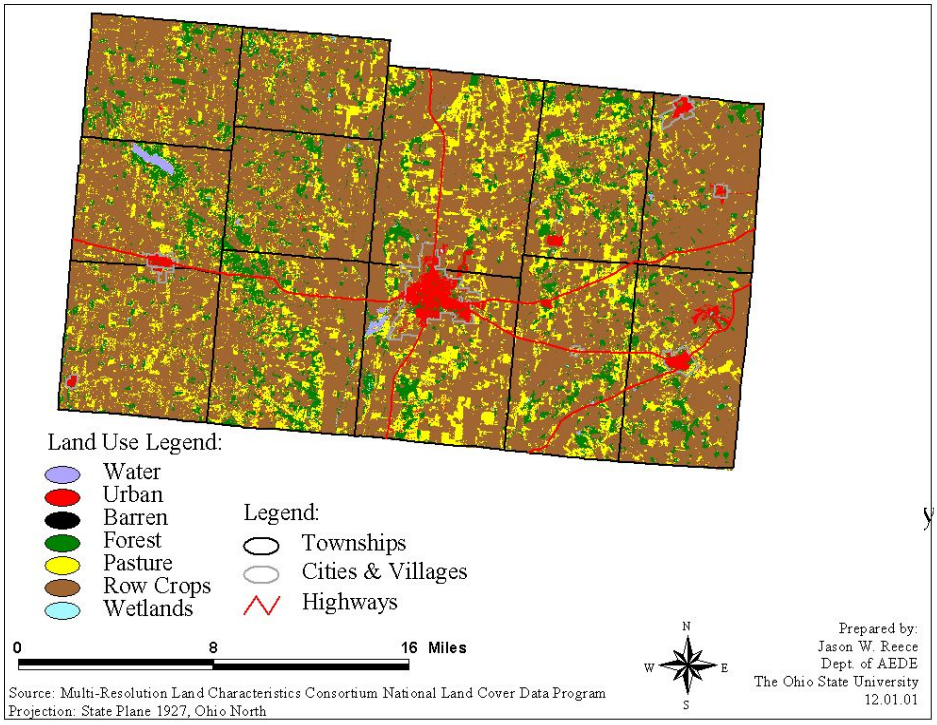
2.4.1 Land Use

Champaign County's land use and development is primarily rural in character. In 2000, approximately 79% of Champaign County land was in farm use. In 1990, about 86% was in farm use. Of Champaign County's developed land, about 1% is in incorporated areas. 77.5% of Champaign County's land areas have soil types which are considered to be prime farmland. 22.5% of Champaign County's land areas have soil types which are classified as somewhat poorly drained, poorly drained, or very poorly drained.

According to the 1993 *Urbana/Champaign County Comprehensive Plan Update*, during the last twenty years the county has seen an increasing amount of residential development in the rural townships. The townships have experienced substantially more residential development than the villages. Unfortunately, no statistics regarding current land use with regard to housing development were given.

Recreation and Natural Areas in Champaign County include Kiser Lake State Park, Davey Woods State Nature Preserve, and Cedar Bog State Natural Preserve. They comprise approximately 1,400 acres. There are also 27 parks in addition to the ones listed above which are both publicly and privately owned.

Below is a map of Champaign County's detailing their land use from the early 1990's.



2.4.2 Future Land Use

The community of Champaign County has expressed several ideas and concerns about future land use in their *2004 Champaign County Comprehensive Plan for Unincorporated Areas*. Champaign County is faced with development pressures due to an expanding Dayton-Springfield area and Columbus area. Below are some guidelines Champaign County has established:

- Imperative to the retain the rural character of the county, including agriculture and open space;
- Densities between 1.5 acres and twenty (20) acres per dwelling recommended for new residential development;
- Residential dwellings include living structures no more than three stories high;
- A balance between concentrated areas of businesses so that unwanted congestion is avoided;
- Protection of highly permeable geologic deposits to avoid potential groundwater contamination.

2.5 County Utilities

Champaign County does not have a centralized water distribution system in its unincorporated areas and residents rely on individual wells for water. It also does not have a centralized waste water collection, treatment, and disposal system in its unincorporated areas. On-site waste water disposal systems such as septic tanks, aeration systems, or mound systems are used to service development in the unincorporated areas of Champaign County. Soil characteristics in some parts of Champaign County place limitations on the use of septic tanks. However, several of the incorporated jurisdictions have both water treatment and wastewater treatment systems.

Mechanicsburg, Urbana, and North Lewisburg have water treatment plants and wastewater treatment plants.

Phone companies that service Champaign County include Alltel Ohio, Champaign, SBC Ohio, Sprint and Verizon North. Columbia and Vectren provide the County with its gas energy. The following companies service Champaign County's electricity: Dayton Power & Light, Logan Rural Electrification Administration (REA), Ohio Edison, Pioneer REA and Union REA. See Appendix B for utility service area maps retrieved from the Public Utilities Commission of Ohio.

Countywide All Natural Hazards Mitigation Planning Process

3.0 COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLANNING PROCESS

3.1 Mission Statement

At the beginning of the planning process, a mission statement was drafted to establish a clear goal for the Core Group. The Core Group reviewed and approved the following as its Mission Statement:

"To develop a working document that fulfills the mandates of the Federal Disaster Mitigation Act of 2000, and satisfies the requirements of FEMA and the Ohio EMA, as well as meets the needs of all of Champaign County. Further, by researching and planning for future natural hazards and implementing appropriate mitigation techniques, all of Champaign County can save lives and protect property, reduce the cost of disasters and provide for a rapid and efficient recovery by coordinating response efforts, and increasing the educational awareness of natural hazard events and their effects on the people, property, and resources of all Champaign County."

3.2 Notification Process

The incorporated jurisdictions of the County, as well as other agencies that work within the County, were notified of the Mitigation Planning Process. The Champaign County EMA Office created a master list of any and all jurisdictions they felt necessary to participate in this planning effort. The comprehensive list was reviewed by EMH&T to ensure that all the appropriate agencies as well as jurisdictions would be invited to participate in this effort. The Core Group representing a wide array of political subdivisions, as well as agency and private businesses, was notified of the Mitigation Planning Process.

In addition to this effort, prior to commencing the planning process, letters were sent from the Champaign County EMA to adjacent counties informing them of the process that was to begin in Champaign County, as well as contact information if the adjacent County was interested in learning more about the Mitigation Planning Process. A press release dated January 26, 2004 was issued inviting concerned citizens and incorporated jurisdictions. Please see Appendix A for a copy of this press release.

3.3 Groups

The Core Group is the original planning unit for this project, and will not change. They are the decision makers and implementers. The purpose of the Core Group is to provide information to the various entities of the County that have a stake, either directly or indirectly, in the Mitigation Plan. They provide feedback, input, and review as the process of Mitigation Plan development is completed, potentially leading to a better quality and more inclusive scope of Mitigation Plan that everyone can acknowledge and adopt, truly implementing a countywide plan.

Obtaining support from the whole community required a comprehensive approach to preparing the Mitigation Plan. Identifying those persons, community leaders and government agencies with the knowledge and authority to help the community organize a plan was key to the planning effort. A group of leaders was necessary in order to give this task validity.

Those that participated as the Core Group included:

- Craig Evans, Champaign County Emergency Management Agency Director;
- Karen Richards, Champaign County Soil & Water Conservation District Representative
- Bobbie Moore, City of Urbana Mayor;
- Pat Wagner, City of Urbana Police Department;
- Wendell Ernelisen, Village of Mechanicsburg Street Department Representative;
- Tim Bostic, Village of Mechanicsburg Police Department;
- Keith Slone, Village of Mechanicsburg Representative;
- Barry First, Village of North Lewisburg Representative;
- Barry Ward, OSU Extension Representative;
- Cindy Keeran, Village of Mechanicsburg EMS Representative;
- Jim Pence, Village of St. Paris Police Chief;
- Tony Risley, Village of St. Paris Police Department Officer;
- Tyler Adkins, Village of St. Paris Police Department Officer;
- Curt Cunningham, Farm Service Agency Representative;
- Terri Jenkins American Red Cross Representative;
- EMH&T Staff Members;

Please see Appendix A for a complete list of participants.

3.4 Core Group Meetings

There were three Core Group meetings, and one community meeting for public comment on the Draft Mitigation Plan.

3.4.1 Determination of Hazards - Meeting 1-Kick-Off Meeting

The kick-off meeting items of discussion included the process to be followed in the creation of a Mitigation Plan. Overall goals of the Plan for Champaign County were discussed, and it was decided, as a group, upon which hazards to focus. By the end of the first meeting, Core Group members had exchanged contact information, organized and scheduled several interviews to be conducted, established a priority list of hazards and discussed the general process and timeline of the project. The list of prioritized hazards were established looking at the NCDC (National Climatic Data Center) tables that explained which hazards in Champaign County have produced the largest amount of damage based on human or monetary measures. The Core Group also used the collective knowledge they had coupled with the vast amount of experience and history to determine these hazards. They are as follows:

1. Severe Storms (Winter, Thunderstorms/High Winds/Lightning, Hail)
2. Floods
3. Tornadoes
4. Droughts (Extreme Temperatures)
5. Earthquakes

Please see Appendix C referring to Meeting 1 Minutes.

3.4.2 Determination of Problem Statements and Overall Goals – Meeting 2

The second meeting was focused on the discussion of the problems within the County as it related to the hazards that were identified at the first meeting. Each Core Group member received several documents to prepare for discussion during the second meeting. The Core Group then developed problem statements for each community hazard that was identified at the first meeting.

Along with the development of problem statements, the Core Group determined overall goals to address the hazards. Goals are defined as general guidelines that explain what a community wants to achieve in the future. The goals are used to set a community's priorities. Goals should be realistic and explain what a community wants to achieve concerning mitigation in the future.

A draft of problem statements that were created for the hazards associated with Champaign County is attached in Appendix D. In order to determine the issues associated with the hazards in Champaign County and to establish the problem statements associated with the hazards, the group first decided on an overall "state of the hazard" and how it has affected the community in the past. The draft problem statements were reviewed by the Core Group in the time period between the second and third meeting, to be revised or approved as noted a the third Core Group meeting. Please see Appendix C for the Meeting 2 Minutes.

3.4.3 Determination of Alternatives and Evaluation Criteria – Meeting 3

At the commencement of this meeting, the problem statements were approved as drafted by the Core Group. The third meeting focused the Core Group's discussion on developing possible mitigation alternatives with respect to each hazard. The draft problem statements were used as a reference guide in discussing these possible solutions. The Core Group received several guidance documents at this meeting to facilitate discussion. Alternatives were discussed among the Core Group members and noted for the Mitigation Plan when all were in agreement. These alternatives were then transposed into a rating matrix with specific evaluation criteria to be discussed in following sections of this report. See Appendix D for a complete listing of possible mitigation alternatives developed by the Core Group.

In addition to the selected evaluation criteria, the Core Group discussed and evaluated the potential costs and benefits of each of the mitigation alternatives at this meeting. By evaluating "No Action" as an alternative, the Core Group was encouraged to analyze the feasibility that each alternative could be implemented. A detailed benefit/cost analysis was not conducted due to the impracticality of this analysis since mitigation projects were not yet evaluated.

See Appendix C for Meeting 3 Minutes.

3.4.4 Wrap-Up – Meeting 4

The final meeting with the Core Group focused on the discussion of the final mapping products, as well as the mitigation alternatives and completed matrices. The multi-hazard maps were reviewed for any errors or omissions. The results of the matrices were then reviewed by the Core Group for approval. Each individual community also chose which alternative or alternatives that they wanted to support and implement within their community.

The remaining steps in the mitigation planning process were reviewed, which included setting a date for a public meeting. This meeting gave the public an opportunity to comment on the plan. The public meeting was held on Tuesday, October 19th, 2004.

3.4.5 Public Meeting

Public input is necessary in order to gauge the opinion of the community and build support for the draft Mitigation Plan. Several draft copies of the Mitigation Plan were made available at the public meeting, along with a set agenda to keep the meeting on course.

EMH&T presented a PowerPoint presentation on the process of how the draft Mitigation Plan was created and how the overall goals of the plan should be implemented. Representatives from the Core Group participated in order to show support for the draft Mitigation Plan. EMH&T also produced several large-scale maps to enable the public to envision suggested mitigation projects in the draft Mitigation Plan. Ample time for public comment was provided, which is documented and incorporated into the Mitigation Plan.

3.5 Matrix Development

Once the alternatives were created for each hazard, the Core Group established evaluation criteria to rank each of the alternatives. The criteria included: economically justifiable; technically feasible; socially equitable; environmentally sound; and publicly acceptable.

To determine how the County evaluated each of the developed mitigation alternatives as a whole, the mitigation alternatives that the Core Group selected for each hazard were transposed into a matrix. This matrix was sent to each Core Group member, along with directions for completing the matrix. Each Core Group member was asked to rate each mitigation alternative against the selected evaluation criteria in the order of importance for their specific community. This rating was used to tabulate the overall County rating to evaluate the importance of each alternative on a countywide basis.

Utilizing a matrix allowed the community to systematically review all alternatives, identifying which mitigation method(s) were appropriate based on the specified criteria. The combined results of all the Core Group members were tabulated and the matrix comparison was complete. Each of the activities was given an averaged number based on all the Core Group scores, which helped Champaign County focus their mitigation strategies on the highest rating activities.

The matrix results will be discussed in a later section of this report.

3.6 Public Review and Involvement

Since public participation was crucial for implementation of the draft mitigation plan, four draft professionally bound copies were mailed to the Champaign County EMA Director for posting at several key locations around the County for public comment. Suggested locations for posting the draft plan were local libraries, the County Commissioners Office, the local EMA office and other publicly accessible facilities.

The formal public notification process as defined in the Federal Code occurred prior to approval and/or adoption of the plan. A press release informing residents of status of the mitigation process, the locations the plan was posted for review, as well as the public meeting date, was

published in the local media. The public was notified of their opportunity to review and comment on the draft plan during a 30 day review period. Comments were to be forwarded to the EMA Director for inclusion in the final plan. Please see Appendix A for a copy of the draft plan press release. Please see Appendix A for public comments received.

The draft mitigation plan was submitted concurrently to the Ohio Emergency Management Agency and the Federal Emergency Management Agency for review and approval.

3.7 Finalization

Once all comments have been reviewed and added to the draft Plan, the preparation of the final Plan begins. EMH&T, Inc. will be present at the formal adoption of the Countywide All Natural Hazards Mitigation Plan by the Champaign County Commissioners, to provide any needed information regarding the development process.

Each community that participated in this planning effort will be responsible for administering the various aspects of the Plan. This will also include how the Plan will be implemented within their particular community.

Implementation of the Plan is crucial. The Core Group must strategize effectively to put the Plan into action. Champaign County must follow through to translate the goals and objectives developed during the planning process into action steps. It is recommended that a monitoring program be included in the Plan.

Hazard Profile

4.0 Hazard Profile

4.1 Initial Hazard Assessment

Champaign County has experienced many natural disasters in the past one hundred years. These disasters have ranged from tornadoes and blizzards, to flooding and droughts. The purpose of this document is to bring to light the number and frequency of disasters in Champaign County to better prepare and deal with them when they do occur.

In order to properly evaluate the natural hazards to which Champaign County may be susceptible, a three-step process was utilized. This three step process was completed in order to "narrow-down" the hazards for which Champaign County should prepare, and potentially mitigate, in the future.

Ohio Disaster History According to FEMA
1989 Severe Storms & Flooding
1990 Severe Storms, Tornadoes & Flooding
1992 Severe Storms, Tornadoes & Flooding
1995 Severe Storms & Flooding
1996 Severe Storms & Flooding
1996 Severe Storms & Flooding
1997 Severe Storms & Flooding
1998 Severe Storms

Step 1 - EMH&T, Inc. researched FEMA's database to determine which hazards FEMA had documented as possible natural hazards, including future threats, for the State of Ohio. Several hazards that are listed on FEMA's website include Flooding, Severe Storms, Tornadoes and Winter Storms.

Step 2 - EMH&T, Inc. contacted the National Climatic Data Center (NCDC) that allows reviews of historic hazard information all the way down to the County level. The NCDC website presents each type of hazard and the historic information associated with it for each County, offering several hazard search parameters. These parameters include: droughts, dust storm, flooding, fog, hail, hurricanes, lightning, tornadoes, wild/forest fires, ocean/lake surf, precipitation, snow & ice, temperature extremes and thunderstorms & high winds. Earthquakes are not part of the NCDC database. The information pertaining to earthquake susceptibility was attained from USGS and the Ohio Earthquake Program Manager at the Ohio Emergency Management Agency (OEMA).

Step 3 - In addition to the NCDC data, EMH&T, Inc. reviewed the *Ohio Hazard Analysis and Risk Assessment,* a document created in 1998 by OEMA for local and state emergency preparedness officials. The *Ohio Hazard Analysis and Risk Assessment* looks at both natural and non-natural (technological) hazards.

4.2 Risk Assessment Ranking

All of the above documents were provided to the Core Group for their review and assessment. The Core Group evaluated all the hazards being considered and ranked them based on the number of historic events and cumulative damage that has occurred. The following lists the Core Group's ranking of hazards with number one being the hazard of the most concern.

1. Severe Storms (Winter, Thunderstorms/High Winds/Lightning, Hail)
2. Floods
3. Tornadoes
4. Droughts (Extreme)
5. Earthquakes

4.3 Severe Weather

Champaign County, like most communities in Ohio, is susceptible to severe weather. The severe weather category is a “catch all” of hazards that do not meet other specific criteria. Hazards that fit into the severe weather category include winter storms and thunderstorms. One of the biggest problems associated with severe weather is the lack of public education and awareness. Severe storms can do damage, but are often the precursor for much more severe weather to follow. For example, there is a direct association between thunderstorms and the tornadoes that may follow.

4.3.1 Severe Thunderstorms

A severe thunderstorm watch is issued by the National Weather Service when the weather conditions are such that damaging winds of 58 mph or more, or hail three-fourths of an inch in diameter or greater, are likely to develop. Citizens should locate a safe place in the home and tell family members to watch the sky and listen to the radio or television for more information. A severe thunderstorm warning is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, danger is imminent and citizens should move to a safe place, turn on a battery-operated radio or television, and wait for the "all clear" by the authorities.

Since tornadoes and flash flooding are spawned by thunderstorms, people should review what action to take under a tornado warning or a flash flood warning when a "severe thunderstorm warning" is issued. When thunderstorms are forecasted to bring heavy rains (which can cause flash flooding), strong winds, hail, lightning and tornadoes, people should get inside a sturdy building and stay tuned to a battery-operated radio for weather information. People should also be award that lightning and high winds are also major threats during thunderstorms.

Severe storms affect Ohio with great frequency and are increasing every year. See Table 4-1 Severe storms are also associated with other hazards such as tornadoes and severe flooding.

Table 4-1
Ohio Disaster History

Year	Disaster Type	# of Storm Events
1989	Severe Storms & Flooding	831
1990	Severe Storms, Tornadoes & Flooding	870
1992	Severe Storms, Tornadoes & Flooding	951
1995	Severe Storms & Flooding	1065
1996	Severe Storms & Flooding	1097
1996	Flooding & Severe Storms	1122
1997	Severe Storms & Flooding	1164
1998	Severe Storms	1227

4.3.2 High Winds

Straight-line winds are often responsible for most of the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado. Property damage and loss of life from windstorms are increasing due to a variety of factors. According to the Ohio Manufactured Housing Association, the use of manufactured housing is on an upward trend, and this type of

structure provides less resistance to wind than conventional construction. Uniform building codes for wind resistant construction are not adopted by all states, and population trends show rapid growth in the highly exposed areas.

4.3.3 Lightning

Lightning kills between 75-100 people a year. It is the second largest killer, exceeded only by floods. Lightning strikes can happen anywhere and affect anyone. Only 10% of lightning strikes result in death, leaving the rest with various degrees of disability, most being central nervous system issues.

4.3.4 Hail

Hail is a type of precipitation composed of balls or irregular lumps of ice. It occurs when supercooled water droplets (remaining in a liquid state despite being below the freezing point, 0 °C/32 °F) in a storm cloud collide with some solid object, such as a dust particle or an already-forming hailstone.

Hail often forms in strong thunderstorms, often along a cold front, where the layer of air on top is much colder than that on the bottom. The smaller hailstones can bounce up and down between the warm and cold layers due to updrafts and gravity. The longer the stones bounce around, the larger they grow. These strong, severe, or even supercell thunderstorms can also occur in summer, even without a cold front.

Hailstones, while most commonly only a few millimeters in diameter, can sometimes grow to several inches or occasionally even bigger. Such large hailstones can do serious damage, notably to automobiles, skylights, and glass-roofed structures. Pea or golf ball-size hailstones are not uncommon in severe storms. Rarely, massive hailstones have been known to cause concussions or to kill people by causing head trauma.

4.3.5 Winter Storm Watches and Warnings

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. A blizzard warning signifies that large amounts of falling or blowing snow, and sustained winds of at least 35 mph are expected for several hours.

4.3.6 Frequency/Probability of Future Occurrence

Severe storms for Champaign County quantitatively have the highest likelihood of occurring on a yearly basis. According to the NCDC, 117 storm events including winter storms, thunder storms (lightning, high winds), and hail were documented for Champaign County since 1950. Severe storms in Champaign County also have caused the most cumulative property and crop damage with estimated total losses of $19.0 million over a 54 year period. Based on historical information, the Champaign County can expect to endure at least five severe storms in any given year.

4.4 Floods (including Flash Floods)

Floods are a naturally recurring event for a river or stream, and are caused by weather phenomena and events that deliver more precipitation to a drainage basin that can be readily absorbed or stored within the basin. Flooding is a result of heavy or continuous rainfall exceeding the absorptive capacity of soil and the flow capacity of rivers and streams. Flooding is a localized hazard that is generally the result of excessive precipitation. Floods can be generally considered in two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and general floods, caused by precipitation over a longer time period and over a given river basin.

Flash floods occur within a few minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Flash floods can destroy buildings and bridges, uproot trees, and scour out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or by heavy rains from hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urban areas where much of the ground is covered by impervious surfaces. Roads and buildings generate greater amounts of runoff than typical forested land. Fixed drainage channels in urban areas may be unable to contain the runoff that is generated by relatively small, but intense, rainfall events.

Periodic flooding of lands adjacent to non-tidal rivers and streams is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal water course, some of the above-normal stream flow spills over onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of the stream or river. The recurrence interval of a flood is defined as the average time interval, in years, expected to take place between the occurrence of a flood of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

The data collected indicated that on several occasions in the past, flooding and flash flooding has affected multiple sites within the County. For example, in August 1995, the Village of St. Paris was declared a Federal Disaster Area due to flooding. See Appendix H for a more detailed description of significant events that have affected Champaign County.

4.4.1 Repetitive Loss

In most counties there are areas that periodically suffer damages from floods. They are known as “repetitive loss” properties. Repetitive loss properties are defined as properties with structures that have had two or more insurance claims within a 10 year period. According to the Federal Emergency Management Agency, there are no repetitive loss properties within Champaign County.

4.4.2 Non-Flood Zone Flooding

After discussing as a group the issue of non-flood zone flooding, the Core Group did not note any non-flood zone flooding issues with the County.

4.4.3 Frequency/Probability of Future Occurrence

Past floods are indications of what can happen in the future, but mitigation plans are based on the risk of future flooding. Flood studies interpret historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their recurrence interval.

Recurrence interval, or frequency of occurrence, is defined as the average number of years between storms of a given intensity. Recurrence intervals commonly used in technical studies and design are 2, 10, 25, 50 and 100 years. Recurrence interval addresses how often a flood of a specific depth will be expected to occur. Structures located within areas considered at higher risk should be prioritized higher as it relates to mitigation.

According to the NCDC, Champaign County has experienced 13 flood and flash flood events over a 54 year period with damage estimates totaling approximately $800,000. The Core Group evaluated this information and determined that it was only partially correct since the earliest flood documented was in 1996. The Core Group concluded that since most of Champaign County is rural in nature, estimated losses were based on just a few higher populous areas, where significant property damage was likely to occur.

Historical information for non-flood zone flooding within Champaign County was not readily available or well documented. However, the Core Group thought that the probability of having more non-flood zone flooding in the future in Champaign County was significant based on the amount of new development occurring with the County. Due to the lack of available data, estimated losses for this type of flooding were not quantified. However, by evaluating the situations in surrounding counties, the Core Group decided that the best way to mitigate future problems is to establish regulations that address existing storm water and drainage issues, as well as future development storm water and drainage issues.

4.5 Tornadoes

Tornadoes are produced from the energy released during a thunderstorm, but account for only a tiny fraction of the overall energy generated. What makes them particularly dangerous is that the energy is concentrated in a small area, perhaps only a hundred yards across. Not all tornadoes are the same, of course, and science does not yet completely understand how a portion of a thunderstorm's energy becomes focused into something as small as a tornado.

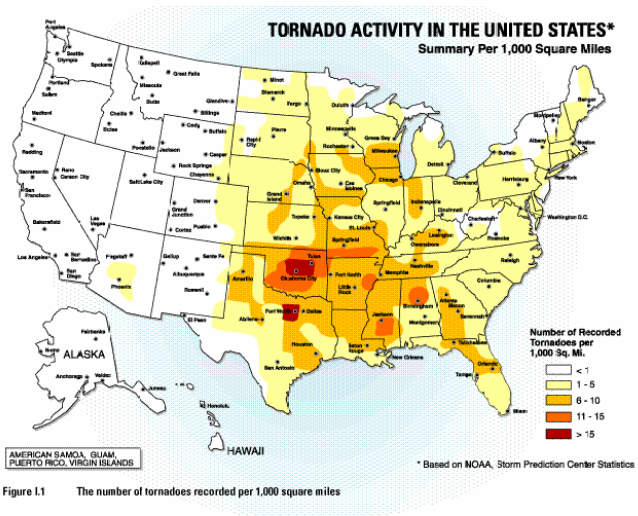
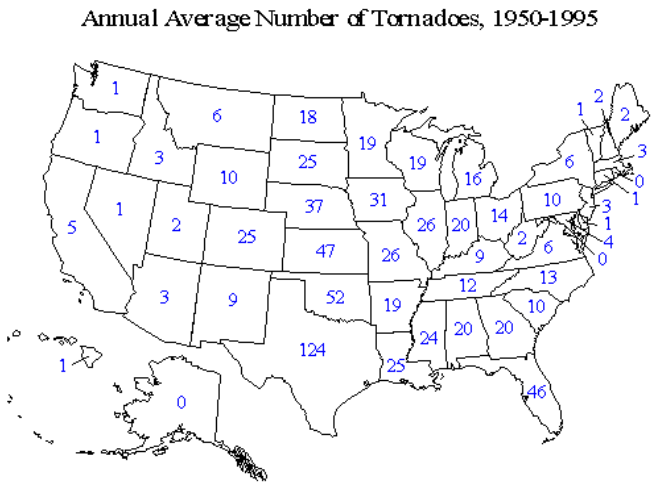


Figure I.1 The number of tornadoes recorded per 1,000 square miles

Based on NOAA Storm Prediction Center Statistics

Tornadoes occur mostly in the central plains of North America, east of the Rocky Mountains and west of the Appalachian Mountains. They occur primarily during the spring and summer – the tornado season comes early in the south and later in the north according to the seasonal changes in relation to latitude – usually during the late afternoon

and early evening. They have been known to occur in every state in the United States and every continent on the earth, any day of the year, and at any hour.



The damaging strong winds generated from tornadoes can reach 300 mph in the most violent tornadoes, causing automobiles to become airborne, ripping ordinary homes to shreds, and turning broken glass and other debris into lethal missiles. The biggest threat to living creatures (including humans) during tornadoes is flying debris and the risk of being tossed about in the wind. Contrary to previous belief, it is not true that the pressure in a tornado contributes to damage by making buildings "explode."

Today, the development of Doppler radar has made it possible, under certain circumstances, to detect tornado winds with radar. However, spotters remain an important part of the system to detect tornadoes, because not all tornadoes occur in situations where the radar can "see" them. Ordinary citizen volunteers make up what is called the SKYWARN (*www.skywarn.org*) network of storm spotters, who work with their local communities to watch out for approaching tornadoes to ensure that appropriate action is taken during tornado events. Spotter information is relayed to the National Weather Service, who operates the Doppler radars and issues warnings (usually relayed to the public by radio and TV) for communities ahead of the storms. They utilize all the information they can obtain from weather maps, modern weather radars, storm spotters, monitoring power line breaks, and so on.

Although the process by which tornadoes form is not completely understood, scientific research has revealed that tornadoes usually form under certain types of atmospheric conditions. Those conditions can be predicted, but it is not yet possible to predict in advance exactly when and where they will develop, how strong they will be, or precisely what path they will follow. There are some "surprises" every year, when tornadoes form in situations that do not look like the right conditions in advance, but these are becoming less frequent. Once a tornado is formed and has been detected, warnings can be issued based on the path of the storm producing the tornado, but even these cannot be perfectly precise regarding who will, or will not, be struck.

Table 4-2 shows that although the State of Ohio may not have the most tornadoes, those that do hit Ohio are significant in damage and in all the indication factors of a large scale tornado.

Table 4-2
State Tornado Ranking

Rank	Total Number of Tornadoes	Deaths per 10,000 sq. miles	Number of Killer Tornadoes	Total Tornado Path Length per 10,000 sq. miles	Killer Tornadoes as a % of all Tornadoes	Annual Tornadoes per 10,000 sq. miles
1	Texas	Massachusetts	Texas	Mississippi	Tennessee	Florida
2	Oklahoma	Mississippi	Oklahoma	Alabama	Kentucky	Oklahoma
3	Florida	Indiana	Arkansas	Oklahoma	Arkansas	Indiana
4	Kansas	Alabama	Alabama	Iowa	**Ohio**	Iowa
5	Nebraska	**Ohio**	Mississippi	Illinois	Alabama	Kansas
6	Iowa	Michigan	Illinois	Louisiana	Mississippi	Delaware
7	Missouri	Arkansas	Missouri	Kansas	North Carolina	Louisiana
8	Illinois	Illinois	Indiana	Indiana	Michigan	Mississippi
9	S Dakota	Oklahoma	Louisiana	Nebraska	New York	Nebraska
10	Louisiana	Kentucky	Tennessee	Wisconsin	Massachusetts	Texas

Although the number of tornadoes in Ohio does not rank high compared to other states in the United States, the State does average around 14 tornadoes a year. Ohio's peak tornado season runs from April through July, with most tornadoes occurring between 2-10 p.m. Even though June has been the month with the most tornado occurrences, many of the State's major tornado outbreaks have taken place in April and May. However, history has shown that tornadoes can occur during any month of the year and at any time of the day or night.

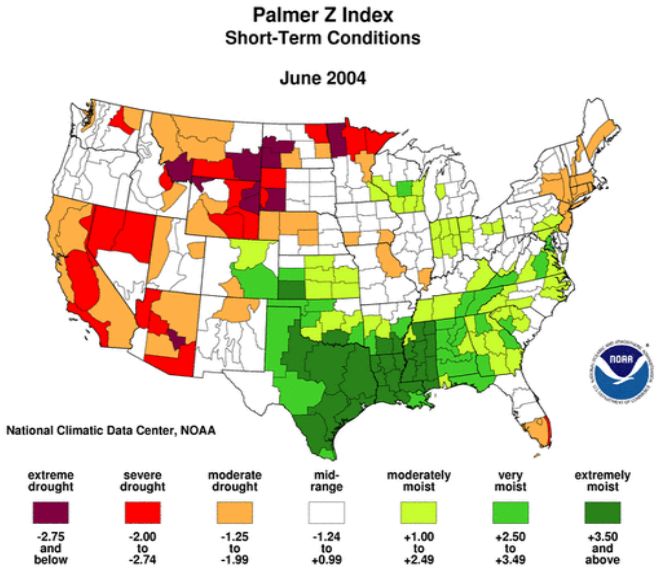
Tornadoes are considered the most violent atmospheric phenomenon on the face of the earth with their strength being measured by the Fujita Scale as described in Table 4-3. This scale below is the mechanism used to determine the potential type of tornado that may have affected a particular community. It is based on velocity of wind and the type of damage the tornado caused. Many F0 and F1 tornadoes have touched down in Ohio, but Ohio has also been struck by some of the most destructive (F5) tornadoes ever, including the April 3, 1974 tornado which devastated Xenia, killing over 30 people and destroying 2,000 buildings.

Table 4-3
Fujita Scale for Tornadoes

Scale	Wind Speed	Typical Damage
F-0 Weak	40-72 miles per hour (mph)	Light Damage: Some chimneys damaged, twigs and branches broken off trees, shallow-rooted trees pushed over, signboards damages, some windows broken.
F-1 Weak	73-112 mph	Moderate Damage: Surface of roofs peeled off, mobile homes pushed off foundations or overturned, outbuildings demolished, moving autos pushed off the roads, trees snapped or broken; beginning of hurricane speed winds.
F-2 Strong	113-157 mph	Considerable Damage: Roofs torn off frame houses, mobile homes demolished, frame houses with weak foundations lifted and moved, large trees snapped or uprooted, light-object missiles generated.
F-3 Strong	158-206 mph	Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forecast uprooted, heavy cars lifted off the ground and thrown, weak pavement blown off the roads.
F-4 Violent	207-260 mph	Devastating Damage: Well-constructed houses leveled, structures with weak foundations blown off the distance, cars thrown and disintegrated, trees in forest uprooted and carried some distance away.
F-5 Violent	261-318 mph	Incredible Damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile-sized missiles fly through the air in excess of 300 feet, trees debarked, incredible phenomena will occur.

4.5.1 Frequency/Probability of Future Occurrence

Champaign County does not have a significant history of tornado occurrences. According to the NCDC, there have been four tornadic events recorded in Champaign County over the past 54 years. On average, tornadoes occur in the County every 10 years. No tornado stronger than an F2 has been documented in the County. The probability of future occurrences is quite high but the likelihood of severe damage based on past events is low. One reason that the County would not expect to suffer severe damage is because most of the County is sparsely populated. The County is affected much more by straight-line winds, which are not categorized as a



tornadic event but can do just as must damage. Please see Section 4.3.2 High Winds for more discussion on this topic.

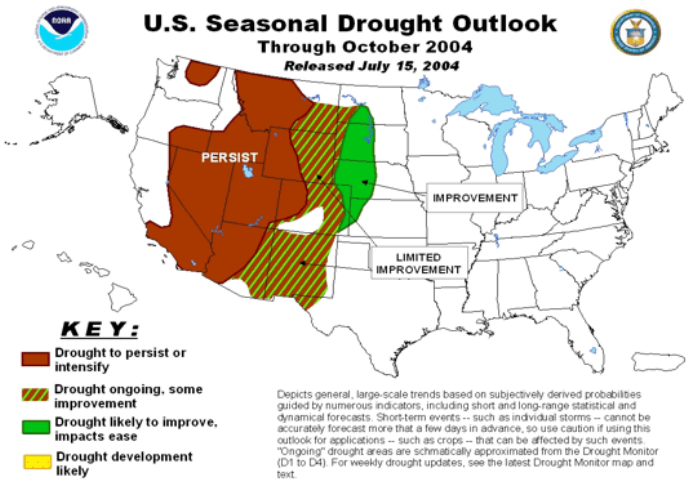
4.6 Drought

A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance (i.e., crop damage, water supply shortage, etc.) The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area.

The worst drought in 50 years affected 35 states during the long, hot summer of 1988, when some areas had been suffering from lack of rainfall since 1984. Rainfall totals in 1988 throughout the mid-west, Northern Plains and the Rockies were 50% to 85% below normal. Crops and livestock died, and some areas became desert. Forest fires began over the Northwest that left 4,100,000 acres destroyed by autumn. During the great drought of 1988, Governor Guy Hunt of Alabama led a statewide prayer for rain. It came the very next day, and the thunderstorms continued for weeks.

4.6.1 Current Conditions

As you can see from the U.S. Seasonal Drought Outlook map to the right, the State of Ohio was not experiencing significant drought conditions in June 2004. The map shows that drought conditions are not predicted for the State of Ohio and for Champaign County. The Palmer drought index map to the right indicates that Ohio is in the mid-range to moderately moist. Both drought maps were obtained from the National Oceanic and Atmospheric Administration (NOAA) website.



4.6.2 Droughts-Precursor to Other Disasters

Champaign County is susceptible to wild land fires. When most people think of wild fires, the first thing that comes to mind is the devastating and disastrous western fires that are quite prevalent during the summer months.

During an average year in Ohio, an estimated 15,000 wildfires and natural fuel fires occur. Typically, a reported 1,000 wild land fires burn an average between 4,000 to 6,000 acres in Ohio each year.

With more people than ever living, working, traveling and recreating in the urban/urban interface, the odds of wild land fires are increasing. Causes of wild land fires include the careless burning of debris, household trash and cigarettes; lightning; equipment and vehicles; railroad accidents; electrical fires; and arson.

Fire fighters talk of the fire triangle in terms of the heat of combustion, fuel and oxygen all being necessary for fire to occur. Wild land fire fighters are concerned with the wild land fire triangle of fuel (grass, brush, forests, crops, etc.), terrain (open flat lands, steep slopes and everything conducive to wild land fire spread) and weather (hot, dry, windy conditions are typical wild land fire weather).

4.6.3 Urban/Rural Fire Interface

The wildland-urban interface can be defined as the zone where structures and other human developments meet or intermingle with undeveloped lands.

Topography plays a major role in how fast a wildfire spreads. Steep slopes are the greatest topographical influence on fire behavior. As the steepness of a slope increases, fires spread more quickly. A fire will spread twice as fast on a 30% slope than it will on level ground. This fast speed is due to the fact that a fire starting at the bottom of a slope has a longer upslope run with more available fuel in its path.

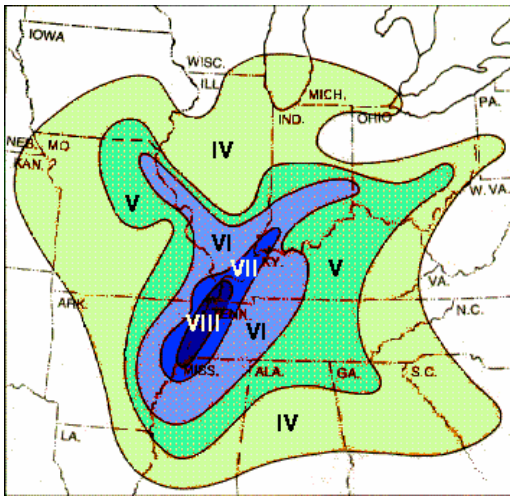
Unlike most hazards, the threat of a drought tends to be dismissed because of the relatively long time a drought takes to have damaging effects.

4.6.4 Frequency/Probability of Future Occurrence

According to the NCDC, Champaign County has experienced one drought of significance in the past 54 years. The odds of future occurrences based on this information are less than 1% (.01). However, Champaign County is largely agricultural and suffers varying amounts of crop damage during severe heat and dry conditions that may not be categorized as a drought. The Core Group concluded that this damage is not always recorded but still has a detrimental effect on the County. The Core Group also realized that, unlike other hazards such as flooding or tornadoes, there is little mitigation that can be preplanned to reduce the amount of agricultural damage caused by a drought.

4.7 Earthquakes

4.7.1 Earthquakes Can Happen



New Madrid Line
Map provided by NOAA

It is surprising to many Ohioans that the State has experienced more than 120 earthquakes since 1776, and that 14 of these events have caused minor to moderate damage. The largest historic earthquake in Ohio was centered in Shelby County in 1937. This event, estimated to have had a magnitude of 5.5 on the Richter scale, caused considerable damage in Anna and several other western Ohio communities, where at least 40 earthquakes have been felt since 1875. Northeastern Ohio, east of Cleveland, is the second most active area of the state. At least 20 earthquakes are recorded in the area since 1836, including a 5.0 magnitude event in 1986 that caused moderate damage. A broad area of southern Ohio has experienced more than 30 earthquakes.

Although the New Madrid Line is in close proximity to the State of Ohio, there has not been an earthquake of any significance since 1875, when an earthquake on June 18, caused damage in western Ohio, and affected a total area estimated at over 40,000 square miles. Walls were cracked and chimneys thrown down in Sidney and Urbana. The shock was felt sharply at Jeffersonville, Indiana. The affected area included parts of Illinois, Indiana, Kentucky and Missouri.

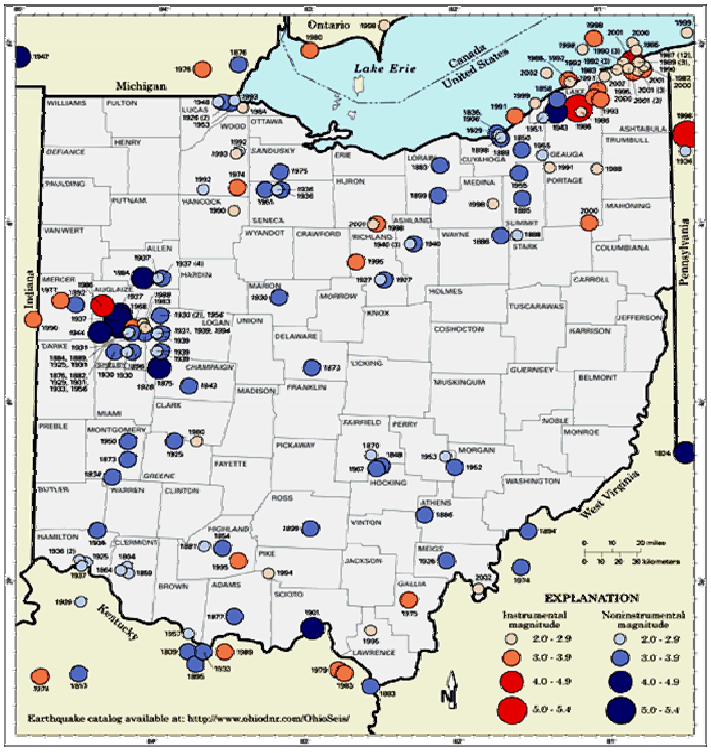
Champaign County has had two recorded epicenters within its boundaries (Please see the Section 4.7.2). The problem with earthquakes are major earthquakes are a low probability, high consequence event. It is because of the potential high consequences that geologists, emergency planners and other government officials have taken a greater interest in understanding the potential for earthquakes in some of the areas of the eastern United States and educating the population as to the risk in their areas. Although there have been great strides in increased earthquake awareness in the eastern United States, the low probability of such events makes it difficult to convince most people that they should be prepared.

4.7.2 Monitoring of Earthquakes

The Ohio Department of Natural Resources (ODNR) Division of Geological Survey has established a 23 station cooperative network of seismograph stations throughout the State in order to continuously record earthquake activity. The network, which went on line in January 1999, ended a five-year gap during which there was only one operating station in Ohio. The state was dependent on seismographs in Kentucky and Michigan to record Ohio earthquakes.

The 23 stations of the new seismograph network, which is called OhioSeis, are distributed across the state, but are concentrated in the most seismically active areas or in areas that provide optimal conditions for detecting and locating very small earthquakes that are below the threshold of human notice. These small micro earthquakes are important because they occur more frequently and help to identify the location of faults that may periodically produce larger, potentially damaging earthquakes.

The OhioSeis seismograph stations are located at colleges, universities and other institutions, employing new technology that not only makes them very accurate, but also relatively inexpensive and easy to operate and maintain. In contrast to the old technology, in which a pen made a squiggly line on a paper drum, the new system is entirely digital and uses a desktop computer to continuously record and display data. Two other innovations have made the system unique. An inexpensive Global Positioning System (GPS) receiver is used to keep very precise time on the continuously recorded



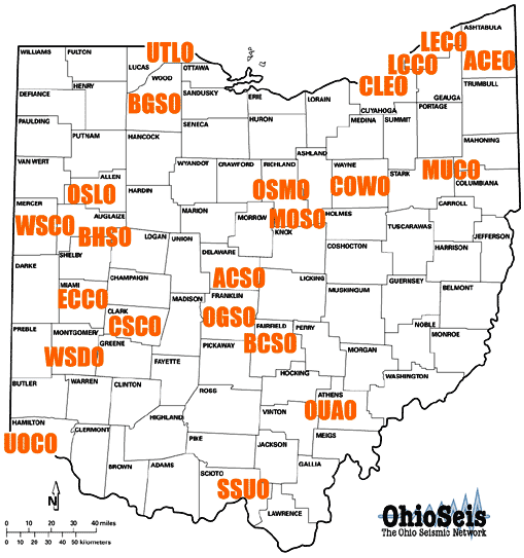
Epicenters of past earthquakes in Ohio.

seismogram, and each station's computer is connected to the Internet for rapid data transfer.

Each OhioSeis station is a cooperative effort. Seismometers, the instrument that detects Earth motions, and other seismic components were purchased by the Division of Geological Survey with funds provided by the Federal Emergency Management Agency (FEMA) through the Ohio Emergency Management Agency, as part of the National Earthquake Hazards Reduction Program. The computers and Internet connection were purchased and provided by the cooperating institutions.

The Division of Geological Survey is coordinating the seismic network and has established the Ohio Earthquake Information Center at the Horace R. Collins Laboratory at Alum Creek State Park, north of Columbus. This facility functions as a repository and laboratory for rock core and well cuttings, but has a specially constructed room for earthquake recording. The seismograph system allows for very rapid location of the epicenter and calculation of the magnitude of any earthquake in the State. The earthquake records, or seismograms, from at least three seismograph stations are needed to determine earthquake locations (epicenters). These records can be downloaded from the Internet at any station on the network, and location and magnitude can be determined. Small earthquakes were in many cases not even detected by distant, out-of-date seismograph stations.

The OhioSeis network provides a whole new dimension of understanding about the pulse of the Earth beneath Ohio. Although the new seismograph network will not predict earthquakes or provide an alert prior to an event, it will provide insight into earthquake risk in the State so that intelligent decisions about building and facility design and construction, insurance coverage and other planning decisions can be made by individuals, business and industry, and governmental agencies.



4.7.3 Frequency/Probability of Future Occurrence

Based on historical occurrences of earthquakes in the County, the odds of an earthquake striking Champaign County in any given year would be less than 1% (0.01). Within the past 130 years, there have been two epicenters recorded in Champaign County, with the most recent recorded in 1875. However, scientists speculate that the New Madrid Fault line, which runs in close proximity to the State of Ohio, has a high probably of activity within the next 50 years.

4.8 Significant Events

Significant earthquake events pertaining to Champaign County were chosen looking at the NCDC (National Climatic Data Center) tables that explained which hazards in Champaign County have produced the largest amount of damage based on human or monetary measures. The Core Group also used the collective knowledge they had coupled with the vast amount of experience and history to determine which events they considered significant. Refer to Appendix H for descriptions of significant events affecting this county for each type of hazard.

Vulnerability Assessment

5.0 VULNERABILITY ASSESSMENT

The Hazard Profile Section reviewed the hazards that affect Champaign County. If a hazard event struck vacant land, there would not be much cause for concern. Because Champaign County has close to 40,000 residents and thousands of homes, businesses and critical facilities, the potential for damage and injury could be high, especially in higher populous areas such as Urbana, Mechanicsburg or North Lewisburg.

This chapter reviews how vulnerable Champaign County is to property damage, threats to public health and safety and adverse impact on the economy. The potential for property damage is measured in dollars based on historical events of the past and damage incurred from those events.

A four step process was followed to estimate the cost to Champaign County of the hazards reviewed in the Hazard Profile section of this report. This process was documented on a per hazard basis.

Step 1: Inventory critical facilities and structures susceptible to property damage.
Step 2: Determine potential dollars lost based on various levels of damage on different categories of structures.
Step 3: Evaluate the impact on infrastructure and general population.
Step 4: Evaluate property damage, loss of life and economic losses.

5.1 Critical Facilities

Members of the Core Group from each of the communities were asked to compile a list of critical facilities pertaining to their community. All the critical facilities within Champaign County (schools, hospitals, water treatment plants, airports, police and fire stations, nursing homes, entertainment facilities, and any other facility deemed a critical facility for their county) are charted on the map entitled 'Champaign County Multi-Hazard Map' in Appendix F. See the Table 5-1 for a summary of critical facilities by facility type. Please refer to Appendix G for a complete list of these critical facilities.

Table 5-1
Critical Facilities in Planning Area

Property	Count
Utilities	
Water Plants	3
Wastewater Plants	3
Medical Facilities	1
Emergency Services	3
Schools	3
Nursing Homes/Senior Facilities	4
Child Care Facilities	1
Libraries	1
Community Facilities/Churches	4
Apartments/Mobile Home Parks	10
Municipal/Government Facilities	4
Air Fields	1
Total Critical Facilities	38

The Multi-Hazard Map will also be made available in digital form so that the table associated with the critical facilities shape file will be accessible. This accessibility will allow the attributed information for the critical facilities to be viewed by simply clicking on the critical facility on the map and viewing the information for that facility. This will also allow for easy facilitation of updates to the critical facilities list when the Mitigation Plan is updated.

5.2 Potential Dollars Lost

The second step of the vulnerability assessment was to calculate the impact of the given hazards in terms of property damage and loss of their use. Averages and typical situations were used. This approach does not predict which facilities will be hit by which hazard, but it does provide a general estimate of the level of damage that would be expected based upon available data.

First the value of the property being damaged was determined based on average value of a facility within that category. Typical values of the structures were determined using data received from the County's Auditor's Office.

Contents value was calculated as a percentage of the structure's value. Table 5-2 shows the relative value of the typical contents to the typical structure type. These ratios were taken from FEMA guidance.

Table 5-2
Contents Value as a Percentage of Structure Value

Occupancy Class	Value (%)
Residential	50%
Commercial	100%
Industrial	150%
Medical Facilities	150%
Emergency Services	150%
General Government	100%
Schools/Libraries	100%
Colleges/Universities	150%
Religion/Non-profit	100%
Shelters	100%

Second, three levels of physical damage were evaluated for each category of structure. These levels have a percentage of damage associated with each. The dollars lost for each level, however, may be underestimated since there may be some downtime associated with closing a business for an extended period of time.

- **Minor damage:** Many structures exposed to a storm or other hazard will suffer only moderate damage. For examples, a hurricane may just damage the roof and windows of some structures. For this calculation, 5% of the structure's value was used. Because the structure stays substantially intact, no contents losses were considered.

- **Moderate damage:** This category represents more serious damage, such as a collapsed wall or floodwater over the first floor of a building. Moderate damage is calculated as 40% of the structure's value plus 40% of the content's value.

- **Major damage:** This category is used when a building is demolished or heavily damaged. An example of the former is a house leveled by a tornado. An example of the latter is floodwater more than 1.5 feet over the lowest floor (i.e., over the electrical outlets). The average dollar figure for this category is 75% of the structure's value and 75% of the contents' value.

Table 5-3 shows the calculated dollar losses for each level of damage per facility type. The type of facility as listed was limited to that information available from the County Auditor's Office.

Table 5-3
Physical Potential Dollar Losses

Property	Avg. Value	Minor Damage	Moderate Damage	Major Damage
Residential	$80,066	$4,775	$57,300	$107,438
Commercial	$129,795	$6,490	$103,836	$194,693
Industrial	$583,688	$29,184	$583,688	$1,094,415
Nursing Homes/Private Hospitals	$1,483,530	$74,177	$1,483,530	$2,781,619
Exempt Property Owned by Municipalities	$219,949	$10,997	$175,959	$329,924
Exempt Property Owned by Colleges, Academies Private	$976,728	$48,836	$976,728	$1,831,365
Churches – Public Worship	$192,493	$9,625	$153,994	$288,740

5.3 Vulnerability Data Collection

Prior to beginning an assessment of a community's vulnerability to hazards, EMH&T researched local sources of information which included comprehensive plans, land use plans, land development regulations and flood regulations, to determine if the County previously addressed its vulnerability to any particular hazard. In most cases, local plans and regulations did not yet exist or were very minimal in addressing natural hazard situations and building parameters.

Therefore, EMH&T turned to other state and national sources of detailed information. One of these resources was the National Climatic Data Center (NCDC). NCDC is the world's largest active archive of weather data. NCDC produces numerous climate publications and responds to data requests from all over the world. NCDC supports a three tier national climate services support program - the partners include: NCDC, Regional Climate Centers, and State Climatologists. The Center has long served the Nation as a national resource for climate information. NCDC's data is used to address issues that span the breadth of this Nation's interests. As climate knows no boundaries, the Center works closely with scientists and researchers world-wide to develop both national and global data sets that have been used by both government and the private sector to maximize the resource provided by our climate and minimize the risks of climate variability and weather extremes. The Center has a statutory mission to describe the climate of the United States and NCDC acts as the Nation's Scorekeeper regarding the trends and anomalies of weather and climate. NCDC's climate data have been used in a variety of applications including agriculture, air quality, construction, education, energy, engineering, forestry, health, insurance, landscape design, livestock management, manufacturing, recreation and tourism, retailing, transportation, and water resources management among other areas. The Center's data and products fulfill needs ranging from building codes to power plant and space shuttle design.

Another source of hazard information that was explored was the Ohio Seismic Network as described in previous sections of this report. The Division of Geological Survey of the Ohio Department of Natural Resources coordinates a 23-station cooperative network of seismograph stations throughout the state in order to continuously record earthquake activity. We also contacted the Ohio Emergency Management Agency's (OEMA) Ohio Earthquake Program Manager, to discuss the risks associated with each County to determine if the type of geology lends itself to increased damage. According to OEMA's Earthquake Program Manager, the risk in Champaign County's zone is low. Though Champaign County has had earthquake tremors in the past, the natural geology in the area lends itself to very stable conditions if an earthquake were to occur.

Because the state and national agencies are not always privy to the local knowledge, some information extracted from their libraries may not be comprehensive or complete. Therefore, EMH&T solicited information from the Core Group with verification from the local Emergency Management Agency directors to prioritize the hazards determined to affect the County the most and assess them according to local concerns.

5.4 Vulnerability Assessment by Hazard

5.4.1 Severe Storms

Champaign County is highly susceptible to severe storms, which encompass thunderstorms, high winds, lightning, snow, ice and hail. Since the County is located in the central region of the state, it may see moderate amounts of snowfall on an annual basis. See Appendix I for tables extracted from the National Climatic Data Center that show the number of reported events since 1950.

5.4.1.1 Infrastructure Impacts

Since severe storms are random in nature, the impact on the County's infrastructure is not limited to a certain area as with river flooding. Homes and businesses all throughout the County are susceptible to high winds, lightning and hail. Shingles are blown from rooftops and hail may dent siding or break windows. Lightning strikes may be more damaging to structures that are not grounded with lightning rods. Trees may become uprooted and limbs detached and blown into structures. Winds also cause severe damage to mobile home parks and camp grounds if units are not properly tied down. Because the area receives a moderate amount of snowfall, all of the structures erected in the County are susceptible to damage if not designed to the proper snow loading parameter.

Utilities and municipal plants may also be damaged during severe storms. Debris, such as tree limbs, blown into utility lines may cause downed power lines. Wastewater plants may also be adversely affected with blown limbs and debris clogging the tanks and filters.

Please see the Champaign County Multi-Hazard Map in Appendix F for detailed areas that have been delineated as affected by severe storms.

5.4.1.2 Population Impacts

Because severe thunderstorms are random in nature, the entire County population is susceptible and should be prepared. The populations located in mobile home parks and campgrounds should take particular care to seek adequate shelter with approaching severe weather.

Since winter storms occur countywide, the entire County population should be aware of the dangers of snow and ice. Motorists should be aware of declared snow emergencies and seek safety before becoming stranded. The sensitive populations will be the most susceptible to the deep snows and extreme temperatures and should prepare for such events prior to the winter months.

5.4.1.3 Property Damage

According to the National Climatic Data Center, there have been 127 severe thunderstorm events, including lightning and hail, in Champaign County reported since 1958 with total property losses totaling $2.14 million. There was no property damage recorded prior to 1994. The average annual losses reported for the County from 1994 through 2003 was approximately $237,220. The year 2002 proved to be the most costly with losses totaling $1.03 million.

According to the National Climatic Data Center, there have been 22 winter storm events in Champaign County reported since 1994, with total property losses of $16.55 million. The losses due to snow and ice were recorded in the years 1994, 1995 and 1996, with January 1996 accounting for $14.33 million. The average annual losses reported for the County from 1994 through 1996 was approximately $5.52 million. No property damage losses have been recorded since February of 1996 due to snow and ice.

5.4.1.4 Loss of Life

Since 1994, there have been 17 recorded injuries and 2 deaths due to severe storms, wind, lightning and hail. All but three of the injuries were associated with high wind events. Twelve of these injuries occurred during one high wind event in 2002. Due to the frequency of the storms affecting Champaign County, the potential for death and injury is relatively low to moderate.

In addition to the loss of life figures for severe storms, NCDC has also recorded 34 injuries and 5 deaths due to snow and ice. All of the recorded injuries and two of the deaths occurred in the year 1995. With the exception of 1995, the potential for death and injury in Champaign County because of winter storms is low based on recorded injuries and deaths since 1994. Since the population of the County is forecasted by the 2000 census to increase, the potential for injury and/or loss of life will also increase. One of the biggest problems associated with severe storms is the lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with severe weather, such as driving on wet roads, snow and ice.

5.4.1.5 Economic Losses

The economic losses a community suffers during a severe storm event can be high. In communities with hazard trees, these trees have the potential to destroy homes and businesses if uprooted. Fallen branches may also cause severe damage. If power lines become burdened with snow and snap, prolonged power outages may cause some businesses to close for an extended period of time leading to loss of revenue. Residents and business owners then turn their efforts from work and running a business to clean up efforts.

With the average house value at $80,066 and the majority of the houses built prior to 1970, damage costs from storms and high winds begin to accumulate quickly due primarily to the age of the house and its susceptibility to damage. Residents often can not rely on federal assistance for the total damages incurred. Since January 1, 1964, the President of the United States has declared Champaign County a disaster area on only two occasions due to damage suffered by severe thunderstorms and winter storms and associated flooding. If a Presidential disaster declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process.

5.4.2 Flooding

Flooding is a site specific hazard. Therefore, floodplains are an important planning consideration. A floodplain is any land area susceptible to inundation by floodwaters from any source. Floodplains are measured in terms of the amount of stormwater that it takes to cover a given area of land. These storm events are measured in frequency of occurrence, such as 5-year, 100-year and 500-year, with the standard measurement being the 100-year storm or floodplain. The 100-year floodplain is the land area having a 1 in 100 chance of flooding in any given year, but the statistics can be misleading. In reality, the 100-year storm or flood could occur two, three, or several years in a row (unlikely but possible), because the 100-year flood is a statistical probability and not a predictable recurrence. Statistically, the 100-year flood has a 25% chance of occurring during the typical 30-year lifespan of a home mortgage.

Any development within floodplains can impact the direction, flow and level of the watercourse during periods of high water or flooding. In other words, if fill material is placed or a house constructed in a floodplain, it will alter the boundaries of the floodplain downstream. This alteration happens because structures or fill utilize valuable space that would otherwise act as a natural retaining area for floodwaters to spread and slow. Not only does development in the floodplain increase dangers downstream, developments within the floodplain are at higher risk of damage due to flooding. This damage includes fill material and debris from destroyed structures upstream colliding with structures in the floodplain downstream. Many bridges are washed out in floods because river borne debris clog their free-flow area.

See Appendix I for tables extracted from the National Climatic Data Center that show the number of reported events since 1950.

5.4.2.1 Infrastructure Impact

There are a total of 530 structures in Champaign County considered to be at-risk. Of this total number, 349 of the structures are located in the unincorporated areas of the County. (This information was collected from the Ohio Department of Natural Resources, Division of Water Floodplain Geographical Information Management System (GIMS) Project.) All the at-risk structures are located on the map in Appendix F. These at-risk structures are located within the 100-year floodplain and are therefore susceptible to damage during a flood.

At-risk structures in areas of flash flooding areas, which are not within the 100-yr floodplain, have not been mapped. There are no documented critical facilities that are considered at risk as it relates to flooding.

5.4.2.2 Population Impact

Based on the NCDC data published for the 1950 through April 2004 time period, Champaign County's citizens have had to endure multiple flooding situations, including flash floods and river floods. Flash floods affect a specific area over a short period of time and a smaller population than river floods. On occasion, a life may be lost because of water rising very quickly in this short time. However, in Champaign County's history from 1950, no deaths or injuries have been reported due to flash flood events.

Unlike flash flooding, special zone flooding has less likelihood of occurring but will impact a larger population. The streams and rivers within the floodplain will flood in special zone flood areas on average of once every 100 years. The populations occupying at-risk structures located in the floodplain shown on the Multi-hazard Map will be affected by this flood. See Appendix F for the Multi-hazard Map.

5.4.2.3 Property Damage

Based on information retrieved from the National Climatic Data Center, river flooding in Champaign County has accounted for $717,000 in property damage from 1996 through 2003. On average the County suffered $89,625 per year in total damage during that time period. This average also includes three years in which no property damage losses were recorded.

Approximately 25% of Champaign County is in a 100-year floodplain as shown on the Multi-Hazard Map in Appendix F. There are an estimated 530 at risk structures in the 100-year floodplain. Of this number of at risk structures, 10% are assumed to be commercial buildings with the rest of the buildings being residential. According to the County's auditor's office, the average value of a residential housing unit in Champaign County is $80,066. With 477 of the at risk structures being residential, the County's average potential dollars lost due to residential property complete destruction is $38,191,482, not including contents replacement. The average commercial unit value is $129,795, which would account for an average loss in property damage of $6,879,135, not including contents replacement, assuming the structures were completely destroyed.

Based on information retrieved from the National Climatic Data Center, most flood damage in Champaign County is caused by river flooding. One river flood event in 2003 accounted for $600,000 of the total $717,000 property damage losses.

5.4.2.4 Loss of Life

Even though the National Climatic Data Center has no recorded deaths or injuries due to flooding from 1996 through 2004, the potential for death and injury is ever present, especially in flash flood events. During flash floods water rises very quickly and may catch citizens by surprise. Homeowner's may not be prepared for the rising waters and the need to seek safety quickly. Motorists often think that they can drive through standing water and risk getting stuck in the flooded area.

5.4.2.5 Economic Losses

The economic losses a community suffers during a flood event can be high. Productivity decreases as residents miss work to tend to the damage incurred at their homes. Some inventory within a business itself may be lost if the owner was not prepared and the facility not flood proofed prior to a flood event. Small businesses may suffer so much damage that they are unable to reopen. Contractor's and clean up companies may reap the benefits of the damage but not enough to offset the overall losses to the economy.

The County's infrastructure will also suffer damage to be repaired. Some roads and bridges may wash out. Roads may become blocked by debris such as tree limbs, which may strand some residents until the floodwaters recede.

Residents often cannot rely on federal assistance for the damages incurred. Since January 1, 1964, Champaign County has been declared a federal disaster area on only one occasion due to damage suffered by severe storms and associated flooding. If a Presidential Disaster Declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process.

5.4.3 Tornadoes

As seen in the hazard profile and as determined by the Core Group, Champaign County has a low risk of incurring damage from tornadoes. See Appendix I for tables extracted from the National Climatic Data Center that show the number of reported events since 1950.

5.4.3.1 Infrastructure Impact

Because tornadoes are random in nature, no one area of the County is more susceptible to infrastructure damage than another. In Champaign County, the occurrence of tornadoes is low with only four occurring since 1950. Since the occurrence of tornadoes is low, the effect on the infrastructure will also be low with only a few houses or businesses needing repairs. On occasion, a structure may be destroyed completely but a high frequency of this extent of damage will not be expected.

Please see the Champaign County Multi-Hazard Map in Appendix F for detailed areas that have been delineated as affected by tornadoes.

5.4.3.2 Population Impact

Since tornadoes typically present localized hazards, the overall population impact within the County is relatively low. Several homes may need repair, but typically homeowners will have insurance to cover these expenses and will not suffer any long term financial hardship. The populations located in mobile home parks and camp grounds should take particular care to seek adequate permanent shelter with approaching severe weather.

5.4.3.3 Property Damage

According to the National Climatic Data Center, there have been 4 tornadoes in four separate years in Champaign County reported since 1950 with magnitudes ranging from F1 to F3. These tornadoes left behind total property losses averaging around $578,000. The average loss for these four recorded events was $144,500, with one event in 1973 causing only $3,000 in property damage. Based on the infrequency of tornadoes in the County, there is a low impact relative to property damage.

5.4.3.4 Loss of Life

Since 1950, there have been no recorded deaths and four recorded injuries due to tornadoes. Those four injuries occurred as a result of an F2 tornado that struck the County in 1965. Because only one of the tornadoes that have struck the County caused any injury, the potential for death and injury is low. Since the population of the County is forecasted by the 2000 census to increase, the potential for injury and/or loss of life will also increase.

One of the biggest problems associated with tornadoes is the lack of public education and awareness, especially since tornadoes do not happen that frequently. Citizens are not aware of the warnings and dangers associated with severe weather and tornadoes and thus may not be prepared.

5.4.3.5 Economic Losses

Due to the infrequency of tornadic events in Champaign County, the overall impact on the economy is very low. If a tornado were to touch down, the majority of the economic losses would be local versus county-wide. It is very unlikely that a Presidential Disaster Declaration would occur, therefore the all clean up costs would be funded locally. Champaign County has never been included in a presidential declaration for a tornado to date.

5.4.4 Drought and Temperature Extremes

As seen in the hazard profile and as determined by the Core Group, Champaign County has a low risk of incurring damage from droughts and extreme temperatures. Due to the non-site specific nature of this hazard, the best way to deal with preparing for future events is to consider historical occurrences. This information was obtained from the National Climatic Data Center (NCDC) website, and is shown in Appendix I.

5.4.4.1 Infrastructure Impact

Because droughts are a non-site specific hazard, the effects of a drought should be evaluated county-wide. By themselves droughts and temperature extremes do not damage developed property. However, over the long run, certain soils can expand and contract resulting in some structural damage to buildings. A small percentage of buildings in areas with such soils suffer minor damage during their "useful lives." Therefore the overall impact on the County's infrastructure will be very low.

5.4.4.2 Population Impact

Since droughts and temperature extremes are non-site specific, the entire County population could be affected by the hot, dry or extremely cold conditions. The overall impact on the Champaign County population is low since only 6 events in three separate years have been recorded by the National Climatic Data Center. However, many communities throughout the County depend on wells for their water supply. These communities need to be more aware of the potential for their water supply to be disrupted. In addition, the County residents, especially the sensitive populations, should still be aware of the dangers of extreme heat and cold, such as heat exhaustion, heat stroke, frost bite and hypothermia.

5.4.4.3 Property Damage

According to the National Climatic Data Center, there have been two droughts and four extreme temperature events in Champaign County reported since 1950. The only property damage recorded was from 3 extreme cold events in 1995 and 1996, which caused $1.362 million in property damage.

There has been one summer in which the County suffered from extreme heat and drought conditions. The summer of 1999 produced a heat wave but caused no property damage losses.

With the exception of the February 1995 and February 1996 extremely cold temperatures, the County has not suffered significant property or crop damage due to extreme temperatures or drought conditions. Therefore, based on the number of occurrences, there is a low impact relative to property damage.

5.4.4.4 Loss of Life

Since 1993, there have been 17 recorded deaths and one recorded injury due to extreme temperatures and drought conditions. Because the number of drought and extreme temperature events that have affected Champaign County is small, the potential for death and injury is low. As the population of the County continues to grow as forecasted by the 2000 census, the more potential for injury and/or loss of life. Since the frequency of drought conditions in the County is low, even with a growing population, the potential for death or injury will still be relatively low.

One of the biggest problems associated with extreme temperatures is the lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with conditions like heat exhaustion or hypothermia and thus may not be prepared.

5.4.4.5 Economic Losses

Due to the infrequency of drought and extreme temperature events in Champaign County, the overall impact on the economy is very low. However, if a drought does occur, the economic losses would be county-wide hitting the farming community the hardest. It is very unlikely that a Presidential Disaster Declaration would occur, therefore the all mitigation costs would be funded locally.

5.4.5 Earthquake

As seen in the hazard profile and as determined by the Core Group, Champaign County has a very low risk of incurring damage from earthquakes. The County has had one epicenter within its boundaries in 1843.

5.4.5.1 Infrastructure Impact

Due to the infrequency of earthquakes occurring in Champaign County, the impact on the County's infrastructure is quite low. The one quake that was recorded registered between 3.0 and 3.9 on the Richter scale. An earthquake of this magnitude is not expected to cause damage to infrastructure.

5.4.5.2 Population Impact

Since the threat of an earthquake is minimal, the overall impact on the County's population will be very low.

5.4.5.3 Property Damage

The level of damage expected from an earthquake in Champaign County is very low. It would be expected to be on the order of a 3.0-3.9 magnitude quake as registered on the Richter scale. A quake of this magnitude would be felt by most people and include some breakage of dishes, windows and plasters.

5.4.5.4 Loss of Life

The level of an expected earthquake is not considered to be life threatening. Some minor injuries may result from falling objects. Because the likelihood of an earthquake occurring is very low, the potential for death or injury is minimal.

5.4.5.5 Economic Losses

Based on the very limited property damage expected from a 3.0-3.9 magnitude earthquake, the impact on the local economy and local government expenditures is considered to be minimal.

Goals

6.0 GOALS

6.1 Background

Goals are needed for this planning effort to guide the review of the possible mitigation measures. This plan needs to make sure that the recommended actions are consistent with what is appropriate for Champaign County. Mitigation goals need to reflect community priorities and be consistent with other plans for the County.

After the determination of the draft problem statements, the Core Group agreed to goals that they wanted to achieve for each hazard. These goals are listed in the following section.

6.2 Goals

Severe Storms

Overall Goal: To increase awareness of severe storms, save lives, and the reduction of property damages.

Flooding

Overall Goal: To save lives and property, reduce damage and to increase education (awareness) of community.

Strive for better management and maintenance of own streams in Champaign County.

Tornadoes

Overall Goal: To save lives, reduce potential damage, and to increase awareness of the hazards of tornadoes.

Droughts (Severe)

Overall Goal: To reduce potential damage and to increase awareness of drought occurrences throughout Champaign County by increased preparedness.

Earthquakes

Overall Goal: To reduce the potential loss of lives and damage to property, as well as increase awareness.

Hazard Mitigation Practices

7.0 HAZARD MITIGATION PRACTICES

7.1 Property Protection

Protection measures are usually undertaken by property owners on a building-by-building or parcel basis. They help reduce a building's susceptibility to flood damage.

7.1.1 Acquisition

Acquisition of a property and removing any structures eliminates the potential for harm to residents and businesses. After any structures are removed, the land is usually converted to public use, such as a park, or allowed to revert to natural conditions.

7.1.2 Relocation

Relocation is moving a building to higher ground, either within the same property boundary or to a separate property. The building should always be moved to an area not susceptible to flooding.

7.1.3 Retrofitting

Retrofitting a flood-prone structure entails installing flood protective measures on a specific structure or group of structures. Some of the more common examples of floodproofing are elevating a flood-prone building above the flood level, creating barriers around a flood-prone structure, dry floodproofing a structure to make it water-tight and wet floodproofing to intentionally allow flood waters to enter and yet reduce water pressure on the structure.

Retrofitting structures for other hazards is also possible. Structures affected by high winds can possibly be mitigated by securing a roof structure with adequate fasteners or tie downs can mitigate damage that may occur. Another retrofit is to strengthen garage doors, windows and other large openings. For tornadoes, constructing underground shelters or safe rooms can save lives. Burying power lines is a retrofit measure that addresses the winds from tornadoes, thunderstorms and ice that accompany winter storms.

7.2 Preventive Measures

7.2.1 Planning and Zoning

7.2.1.1 Comprehensive Planning

Comprehensive plans and land use plans specify how a community should be developed (and where development should not occur). Through these plans, uses of land can be tailored to match the land's hazards. Comprehensive planning reflects what a community wants to see happen to their land in the future. A comprehensive plan can look 5, 10, or even 20 years into the future to help a community plan and shape how they envision their community. However, planning is only one part of the puzzle and usually has limited authority. Tied with zoning, comprehensive planning can be more effective.

In 1970 the Logan-Union-Champaign (LUC) Regional Planning Commission completed The *Logan, Union, Champaign (LUC) Regional Plan.* It presented a large scope analysis of land use, transportation, and housing and community facilities for the three county region. This served as Champaign County's Comprehensive Plan until 1993.

In September of 1993, Champaign County and the City of Urbana published an update to the County's *Comprehensive Plan* entitled *"Comprehensive Plan Update; The City of Urbana/Champaign County, Ohio*." The purpose of the update was to provide a policy basis that encourages desired patterns of development and discourages growth that is counter-productive to the stability of the community. As a result of updating the plan, three important sections were added to the document: a Land Use Plan, a Transportation Plan, and an Action Plan.

The Land Use plan identified what they felt to be an undesirable trend: The population in rural areas had increased by more than thirty-five percent in 1970 while the urbanized areas increased overall by less than four percent. Growth boundaries were outlined around the cities of Urbana, St. Paris, North Lewisburg, and Mechanicsburg in an effort to encourage developers to focus on certain areas. Within these boundaries five different residential land use types were identified: Suburban Residential, Village Residential, Rural Residential, Rural Conservation, and Residential Infill.

The Transportation Plan's challenges included improving the transportation network between cities, the completion of the proposed U.S. 68 Bypass, and funding for The Simon Kenton Historic Corridor applicable to U.S. 36. These concerns led to recommendations that should be adopted. The first was to pursue a U.S. 68 bypass passing through the west of Urbana. Other recommendations included improving the connections between Urbana and Marysville, Urbana and Bellefontaine, and the connections between Urbana and the growth centers. Adopting a classification system based on the access the route serves between destinations and volume of traffic on the roads was another recommendation. Pursuing a historic corridor through Intermodal Surface Efficiency Act (ISTEA) was the source chosen for obtaining funding for The Simon Kenton Historic Corridor. The last recommendation included incorporating the greenway recreational system into the long term transportation plan.

The Action Plan contains four sections: County Responsibility, Urbana's Responsibility, Townships' Responsibility, and Villages' Responsibility. Under these heading it lists what further recommendations for which these entities should be responsible when looking at the concerns mentioned in the previous sections. Among the County's responsibilities were continuing to lobby the state to construct the U.S. 68 bypass, adopting a building code, and strengthening the septic system. Developing an urban design for downtown, creating historic districts, and providing additional downtown parking were some of Urbana's responsibilities. The townships were encouraged to establish zoning regulations, participate in the formation of building codes, and to participate in the study of failed septic systems. Lastly, the villages were encouraged to conduct a vacant land inventory as well as to participate in building code adoption and zoning regulations.

Outside of the County's *Comprehensive Plan*, the Logan-Union-Champaign Regional Planning Commission completed a plan entitled *A Comprehensive Plan of North Lewisburg, Ohio* in December of 2002. The goals of the plan are to apply a comprehensive plan that provides the Village with an inventory of existing demographic patterns and community service and to formulate Village goals and objectives during this planning process. The following is a categorized list of some of the objectives discussed in this plan:

1. Economic Development: Create a Village growth management effort, make use of county Economic Development Director, and look into developing the approximately 70 acres of land zoned "industrial".
2. Administration: Periodic working sessions of officials, create networking system such as village email.
3. Zoning and Land Use: Develop local maintenance code, implement village beautification program.
4. Community Development: Create newsletters, community focus groups and have town meetings.
5. Infrastructure: Increase communications with ODOT to improve S.R. 245 corridor east to U.S. 33.

Further, the intention of North Lewisburg plan is to address goals with an action or implementation plan. The North Lewisburg plan also is to be used to guide future development in the area and to provide the Village with legal fortitude.

Champaign County recently completed the *Champaign County Comprehensive Plan for Unincorporated Areas* in March of 2004. This plan serves as community land use guidance, not legislation, for Township Trustees in exercising their zoning authority over the county's unincorporated areas. The plan is divided into specific areas of concern: Land Use, Transportation, Environmental, Drainage, Drinking Water, Citizen Participation, and Planning Administration. These categories are further subdivided into goals, objectives, and policies sections. The recommended course of actions will help decision making over a 10 year planning period.

The Land Use policies were divided into six sections: General Land Use Policies, Agricultural Land Use Policies, Residential Land Use Policies, Commercial Land Use Policies, Industrial Land Use Policies, and Park and Recreation Facilities. One of the policies established included confining urban development to areas designated as urban services on Township Land Use Plan maps in order to contain sprawl, minimize the cost of providing public services and conserve land. Research and, if warranted, establish a Champaign County Agricultural Easement Purchase Fund to serve as a local supporting fund for the Clean Ohio Fund Agricultural Easement Purchase Program was a policy under the Agricultural Land Use Policies Section. Residential Land Use policies included ensuring plan partners support residential platting in those areas shown as urban service areas on the Township Land Use Plan Map in order to infill the existing urban areas, not supporting development in prime agricultural areas and those areas that lack access to necessary infrastructure. Plan partners will support larger scale, general commercial developments in locations which are bordered by one or more major arterial thoroughfares, making sure it will not conflict with established residential neighborhoods and presenting a marketable area for such intensive activity was a policy under the Commercial Land Use section. Industrial Land Use Policies included plan partners supporting and encouraging industrial activity concentration in industrial parks and adjacent lands served by municipal utilities and strongly discouraging new industrial development on individually spot-zoned sites. Encouraging the preservation of open space in flood plain areas, heavily forested areas, areas with steep slopes, stream and river corridors, sensitive groundwater sources and aquifers, sand other areas with unique features was a policy developed within the Park and Recreation Facilities section of the plan.

Transportation Policies developed under the Transportation section of the plan include land developers dedicating and/or constructing roadways designated in the County. The Thoroughfare Plan is described below:

- In all instances, right-of-way necessary to implement the County Thoroughfare Plan will be dedicated to the County at the time of property development.
- In cases where there are missing segments in the traffic circulation system or no thoroughfare constructed, a land developer will construct and dedicate to Champaign County that portion of the thoroughfare that lies within or abuts the boundary lines of the development.
- If for reasons of safety or system continuity, the County Engineer deems the improvement of the thoroughfare unfeasible at the time of development, the developer will provide funds or other security for this share of the cost in lieu of undertaking construction at that time.

A policy developed by the Environmental section of the plan included maintaining buffer areas based on Soil and Water Conservation District recommendations for conservation purposes along the Mad River, Little Darby Creek, Nettle Creek, Honey Creek and Kings Creek, measured from the top of the bank of the creeks which would preclude development and encourage natural vegetative growth. Two research projects were discussed. The first was establishing a Mad River Overlay District as a mechanism to manage land use and development within the immediate area of the Mad River; to manage land use changes that other wise may not be sensitive to aesthetic and environmental characteristics. The second considered establishing a Water Quality Management Plan to manage land use and development relative to sensitive aquifer areas.

Planning Administration focused on intergovernmental planning. Some of the policies discussed were for the plan partners to encourage all affected bodies to utilize the Comprehensive Plan as an overall guide when making development decisions. Plan partners will utilize the plan when reviewing zoning and land subdivision requests, and when reviewing or commenting on other development proposals. They also will annually review, during the first quarter of each year, the Comprehensive Plan with local officials and citizens in an effort to continually update and solicit input into the planning process.

The smaller sections of the plan were the Drainage, Drinking Water, and Citizen Participation sections. Policies for drainage included developing a permitting process to require the submittal of a grading plan and storm sewer layout, including existing and proposed surface and subsurface drainage features and how storm runoff will be handled. Identify and protect local recharge areas, as well as groundwater and surface water resources were established with regard to drinking water. A citizen participation policy was to continue to encourage ongoing citizen participation beyond the development and adoption of the Comprehensive Plan including future updating and revision efforts.

7.2.1. 2 Zoning

A zoning ordinance regulates development by dividing the community into zones or districts and establishing the type of development allowed within each district. The floodplain can be designated as one or more separate zoning districts in which development is prohibited or allowed only if it is not susceptible to flood damage. Some districts that are appropriate for floodplains are those designated for public use, conservation or agriculture. Zoning works best when coupled with a comprehensive plan or “road map” for future development.

Champaign County is zoned at the township level. This was developed in the late 1960’s and early 1970’s. Township trustees have the decision authority for all zoning activities which include planning, resolution development and changes, variances, appeals, and enforcement.

The Champaign County Comprehensive Plan of 2004 is to be used as a basis for making decisions on zoning requests and subdivision proposals for the unincorporated areas of the County.

7.2.1.3 Open Space Preservation

Open space preservation is a technique that can be used to not only preserve floodplains but to preserve lands that may be crucial to controlling runoff that adds to flood problems. Existing undeveloped areas can be preserved as open space through zoning ordinances. Lands that ought to be set aside as open space but are already being put to other uses can be converted to public ownership (acquisition) or to public use (easement). Once the land is owned by the county, municipality, or state, buildings and other development that are subject to flood damage can be removed or prohibited. Open space lands and easements do not always have to be purchased outright. Developers can be required to dedicate land to the public for a park and/or to provide easements for flood flow, drainage, or maintenance.

Kiser Lake State Park and Wetlands, the Cedar Bog State Nature Preserve, Davey Woods Nature Preserve, the Mad River, the Simon Kenton Trail, Ohio Caverns, and the Concord Community Park serve as park and recreation facilities outside of Champaign County's incorporated areas.

There are no locally adopted/implemented programs for farmland protection or open space preservation at this time for Champaign County.

7.2.1.4 Subdivision Regulations

Subdivision regulations govern how land will be broken up into individual lots. These regulations set construction and location standards for the infrastructure built by the developer, including roads, sidewalks, utility lines, storm sewers, stormwater retention or detention basins, and drainage ways.

Effective January 1, 1998, Champaign County enforced its "Subdivision Regulations for Champaign County, Ohio; Managing Growth and Development through Preservation and Planning." It was enacted in accordance with Ohio Revised Code Chapter 711. The regulations are broken down into ten (10) articles:

1. Title of Regulations
2. Scope and Jurisdiction
3. Procedure for Subdivision Approval
4. General Subdivision Standards
5. Requirements for Construction of Improvements
6. (This Article is reserved for future use)
7. Enforcement
8. Required Statements and Signatures to be Affixed on the Plat
9. Definitions
10. Enactment

In 2000, Champaign County established a Technical Review Committee procedure for approving subdivisions and coordinating activities of various County agencies in evaluating development.

7.2.1.5 Building Codes

Building codes provide some of the best methods of addressing all the hazards in this plan. It is the prime measure to protect new property from damage by high winds, tornadoes, earthquakes, hail, and winter storms. When properly designed and constructed according to code, the average building can withstand the impact of most of these forces.

Champaign County has the OBOA (Ohio Building Officials Association) Residential Code and the OBC (Ohio Building Code) commercial code enforced. The electric code that exists is the NEC (National Electric Code).

7.2.1.6 Manufactured Homes

Previously, the location and installation of manufactured and mobile homes were regulated at the local level of government, with the construction and fabrication standards being set by the United States Department of Housing and Urban Development (HUD). All mobile type homes constructed after 1976 must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements.

The installation of manufactured homes in Champaign County is currently regulated by Senate Bill 102 which became effective on August 6, 2004. This bill created the Ohio Manufactured Homes Commission to regulate the installation of manufactured housing, which includes mobile and manufactured homes, and vests it with the exclusive authority to regulate manufactured housing installers, the installation of manufactured housing and manufactured housing foundations and support systems. The bill set forth that municipal corporations and other political subdivisions are preempted from regulating and licensing installers and regulating and inspecting the installation of manufactured housing and manufactured housing foundations and support systems. The Commission has exclusive power to adopt rules of uniform application throughout the state to govern the installation of manufactured housing, the inspection of manufactured housing, the inspection of manufactured housing foundations and support systems, the training and licensing of manufactured housing installers, and the investigation of complaints concerning manufactured housing installers. No political subdivision of the state or any other department or agency of the state may establish any other standards.

The Commission must establish standards by rule that govern the installation of manufactured housing, with the minimum standards being the model standards the Secretary of the United States Department of Housing and Urban Development (HUD) adopts. The standards established by the Commission must be consistent with, and not less stringent, than the standards adopted by the Department of HUD. The Commission has the exclusive authority to make rules regarding "blocking" and "tiedowns" of mobile and manufactured homes. Permanent foundations to which a mobile or manufactured home may be affixed must also be approved by the Commission.

7.2.1.7 Floodplain Regulations

Communities that adopt and enforce a floodplain management ordinance, to regulate new development within the floodplains, can significantly reduce the effects of flood damage. Communities typically adopt minimum standards that are recommended by the Federal Emergency Management Agency (FEMA). The objective of these regulations is to ensure that development will not aggravate existing flooding conditions and that new buildings will be protected from flood damage. Zoning and open space preservation work to keep damage-prone development out of hazardous or sensitive areas while floodplain development regulations impose construction standards on what is allowed to be built in the floodplain.

Champaign County has special zone floodplains identified within the county. The best way to combat a disaster happening within these special zone flood hazard areas is through awareness. All of Champaign County is in compliance with state floodplain management standards and participates in the National Flood Insurance Program (NFIP). The county has been considered current and effective since August 3, 1998. The following are incorporated areas that have also been in compliance and participate in the NFIP along with their date of entry:

- Christiansburg November 2,1984
- Mechanicsburg September 1,1986
- Mutual May 13, 1983
- St. Paris May 29, 1979
- Urbana April 3, 1984

New Lewisburg and Woodstock are eligible and can participate in the program. Based on information provided by the Core Group and from research done, these villages have yet to contact officials from the National Flood Insurance Program (NFIP) expressing their desire to participate or not.

7.2.1.8 Drainage Regulations

In order to protect a County's natural resources a community can implement regulations such as County Water Management and Sediment Control Regulations. The purposes of these regulations are to protect the County's water resources by ensuring that the proper storm water and erosion and sediment control measures are in place. Erosion and sediment control measures are called Best Management Practices (BMPs), and when installed and maintained correctly, they help prevent soil from leaving the site. Storm water control measures ensure that the volume of storm water runoff remains the same as before development occurs.

Some examples of what can go into a County Water Management and Sediment Control Ordinance are as follows:

- Proposed commercial, industrial, or residential development sites on parcels greater than five acres, need to submit a Water Management and Sediment Control (WMSC) plan.
- Sites on parcels less than five acres and part of a larger plan of development must submit an abbreviated plan.

- Residential dwellings are not required to submit a plan unless village, township, or city zoning requires you to do so. Check with your appropriate community for this information.
- All County residents are responsible for knowing and complying with the regulations whether or not a plan is required.

A designated agency should inspect sites to ensure that the regulations are being followed correctly. The designated agency should also work diligently to review plans and perform site inspections to ensure that these erosion and sediment control measures are in place.

Currently, Champaign County does not have any drainage regulations in place. However, according to the 2004 Champaign County Comprehensive Plan, establishing a program for the management of water resources as it relates to drainage is a goal for the future.

7.2.1.9 Wetlands Protection

Riparian Buffer/Wetland Protection
Riparian area refers to the vegetated area next to a watercourse often thought of as the floodplain and its connected uplands. Riparian buffers can protect water resources from non-point source pollution and provide bank stabilization, flood storage and aquatic wildlife habitat. They can be a natural resource management tool used to limit disturbance within a certain distance of a water course to maintain streamside vegetation. Some communities in the State of Ohio have proceeded to adopt riparian buffer overlays and zoning ordinances to reap the benefits of such protection.

There are no wetland protection programs implemented in Champaign County. The Champaign County Soil and Water Conservation District adheres to the Federal and State Minimum Standards as they become available for wetland protection issues.

7.2.1.10 Urban Forestry

Eighty percent (80%) of Ohioans live and/or work within urban areas. The quality of life for them and their families is dependent upon the urban environment. Healthy, safe, and healthy trees enhance this environment by promoting clean air and water, increasing property values, reducing erosion and stormwater runoff, providing wildlife habitat, moderating temperature, lessening energy demands, and offering year-round enjoyment.

Ohio's Urban Forestry Program was created in 1979 within the Ohio Department of Natural Resources to promote trees and other vegetation as tools to enhance the quality of life within our cities and villages. The purpose of the Urban Forestry Program is to provide community officials and allied agencies with the organizational and technical ability to effectively manage the trees along streets, within parks, and on public grounds. Through a statewide network of regional urban foresters, the program helps communities manage their urban forest resources to meet their local needs.
Trees are particularly subject to damage by tornadoes, wind, ice and snow storms. Downed trees and branches break utility lines and damage buildings, parked vehicles, and anything else that was under them. An urban forestry program can reduce the damage potential of trees. A properly written and enforced urban forestry plan can reduce liability, alleviate the extent of fallen trees and limbs caused by wind and ice build-up, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a Tree City USA.

Ohio has been the Tree City USA national leader for the past twenty-three (23) years. There are 233 Tree Cities USA in Ohio. Counties are not eligible for the program but can implement the credited activities. The City of Urbana became involved in the program two years ago. In their first year they planted fifty-one (51) trees. This year, they are currently focused on removing hazard trees that were identified and have currently removed seven (7). In addition, they have pruned forty (40) trees and planted four (4).

Although the following villages are not involved in the Tree City USA program, they are active in creating a better environment through their efforts. Christiansburg created a hazard tree inventory in 2001. The community then began removing hazard trees identified within this inventory. St. Paris is in the beginning stages of designing a park area and has recently contacted a Service Forester for ideas. And lastly, in Mechanicsburg, a committee is working on revitalizing the downtown area keeping in mind areas for tree planting.

7.3 Emergency Services

Emergency Services protect people before, during, and after a disaster. A good emergency management program addresses all hazards, natural and man-made. It involves the active participation and involvement of all County departments and municipalities. Emergency services include:

- Warning
- Response
- Post-event activities

Further, an Emergency Operations Plan is imperative for an organized and responsible county. It should always be updated, keeping people abreast of these changes and possible changes in roles or responsibilities. Champaign County has instituted a new Emergency Operations Plan and is approaching completion within the near future.

7.3.1 Threat Recognition

The first step in responding to a hurricane, flood, tornado, or other natural hazard is knowing when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated. Champaign County has no formalized weather spotters group. The Champaign County EMA is considering coordinating this effort.

7.3.2 Warning

After there is a potential hazard recognized following steps must be taken to notify the public of its possible onset. The earlier and more specific the warning, the greater the number of people will be able to set into motion protection procedures.

The following describes the warning measures in place in Champaign County.

National Weather Service
The National Weather Service issues notices to the public using two levels of notification:

Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.
Warning: a flood, tornado, etc. has started or has been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

– Commercial or public radio or TV stations
– The Weather Channel
– Cable TV emergency news inserts
– Telephone trees/mass telephone notification
– NOAA Weather Radio
– Tone activated receivers in key facilities
– Outdoor warning sirens
– Sirens on public safety vehicles
– Door-to-door contact
– Mobile public address systems
– E-mail notifications

Another source of information for Champaign County is the National Oceanic and Atmospheric Administration Weather Radio (NWR). This resource consists of a nationwide network of radio stations broadcasting continuous weather conditions twenty-four hours a day. They work in conjunction with the Federal Communications Commission (FCC) to alert residents of areas when natural and environmental hazards could affect people in a certain area. Champaign County has two NWR stations:

- Call Numbers: KIG86 and WXJ46; operating out of Columbus and Dayton respectively and both operating with 1000 watts of power.

7.3.3 Response

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries.

Typical actions and responding parties include the following:

– Activating the emergency operations center (emergency preparedness)
– Closing streets or bridges (sheriff or public works)
– Shutting off power to threatened areas (utility company)
– Passing out sand and sandbags (public works)
– Holding children at school/releasing children from school (school superintendent)
– Opening evacuation shelters (Red Cross)
– Monitoring water levels (engineering)
– Establishing security and other protection measures (police/sheriff)

An emergency operations plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

The Champaign County Red Cross chapter provides assistance to people in need, free of charge, every single day. The Red Cross' Disaster Action Team responds to local disasters that

affect those in Champaign County. Trained teams provide emergency services to those affected by a house fire, flooding, or other emergencies in which families can not return to their home.

7.3.4 Evacuation and Sheltering

7.3.4.1 Evacuation

There are five key components to a successful evacuation:

1. Adequate warning
2. Adequate routes
3. Traffic control
4. Knowledgeable travelers
5. Care for special populations (i.e. handicapped, prisoners, school children)

7.3.4.2 Shelter

Shelter is required for those who cannot get out of harms' way. Typically, the Red Cross will staff a shelter and ensure that there is adequate food, bedding and washing facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring their pets in and the potential for an overcrowded facility. Champaign County EMA works in tandem with the local Red Cross Chapter to establish needed shelter networks throughout the community.

7.3.5 Post-Disaster Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

– Patrolling evacuated areas to prevent looting
– Providing safe drinking water
– Monitoring for diseases
– Vaccinating residents for tetanus
– Clearing streets
– Cleaning up debris and garbage

Throughout the recovery phase, everyone wants to return to their daily routines. The problem is when recovery efforts are being instituted people may be performing a quick fix that returns them to their daily routines faster. However, it is imperative that during this recovery phase every effort should be made to think about how to prevent repeated damage from happening if another disaster were to strike. Some efforts include:

- Advising residents through public information activities to advise residents about mitigation measures they can incorporate into their reconstruction work
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs
- Acquiring substantially or repeatedly damaged properties from willing sellers,
- Planning for long term mitigation activities, and
- Applying for post-disaster mitigation funds.

7.4 Flood Control

Flood control projects have traditionally been used by communities to control or manage floodwaters. They are also known as “structural” projects that keep flood waters away from an area as opposed to “non-structural” projects, like retrofitting, that do not rely on structures to control flows.

7.4.1 Flood Control Measures

The most common type of measures that keep flood waters away from an area are reservoirs and dams, diversion channels, levees and floodwalls, and flood compensation banking.

7.4.1.1 Reservoirs and Dams

Reservoirs and dams impound water to reduce the amount that reaches an area at one time. A reservoir holds high flows behind a dam or in a storage basin. Water is released at a controlled rate. Reservoirs and Dams are generally perpendicular to a stream or river.

7.4.1.2 Diversion Channels

A diversion is a new channel or overflow weir that sends floodwater to a different location, thereby reducing flooding along a watercourse. During normal flows, the water stays in the old channel. During flood flows, the stream spills over to the diversion channel.

7.4.1.3 Levees and Floodwalls

Levees and floodwalls restrain the flow of the stream or river. During a flood, the stream or river flow is not reduced; only confined. Levees and floodwalls are generally parallel to the flow of the stream.

7.4.1.4 Flood Compensation Banking

A flood compensation bank is a detention basin that is used for floodplain encroachment compensation or for flood storage in which the basin’s volume may be purchased to mitigate the effects of new development. A development may purchase storage volume from a bank to compensate for floodplain encroachment or to satisfy storm water detention requirements provided the basin is within the appropriate zone of influence.

Champaign County currently has nothing enacted within the county addressing flood control measures.

7.4.2 Watershed Planning Efforts

7.4.2.1 Habitat Restoration

In urbanized watersheds, some stream and/or rivers suffer the effects of increased erosion and water quality problems because of the amount of development that is occurring in a given area. Bioengineering techniques can help prevent further degradation and also provide water quality and habitat benefits.

The Ohio Department of Natural Resource's (ODNR) Division of Water has an Ohio Stream Management Program that involves three areas of the Mad River in Champaign County. In 1993, 800 linear feet of tree kickers, evergreen revetment, and willow posts were installed in Mad River Township. In the summer of 1994, 100 feet of rock was placed in parts of the Mad River in Mad River Township and Urbana Township. This helped improve habitats in a channelized stream.

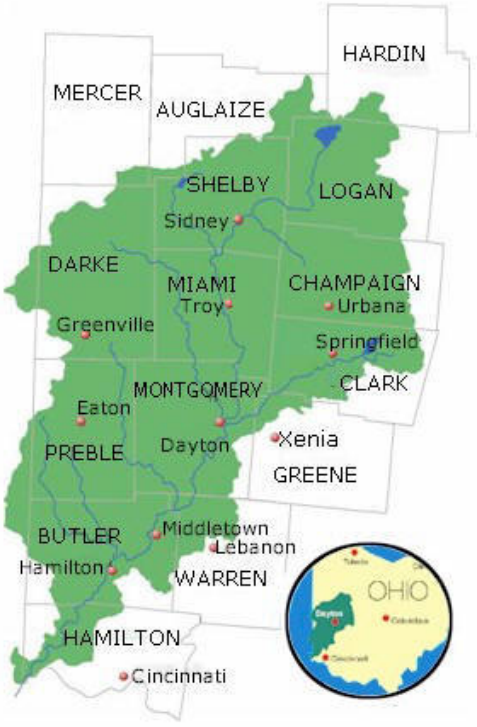
7.4.2.2 Watershed Groups

There are three big rivers associated with Champaign County. The Big Darby Creek runs through the northeast portion of the county, the Mad River runs through the central portion of the county, and the Great Miami River to the west has spawned Mosquito Creek and Kiser Lake. There are six watershed conservancy groups within Champaign County associated with these rivers.

Darby Creek Association, Inc.

Darby Creek Association, Inc. was founded in 1972 by a group of concerned citizens in response to a June 5, 1967 Columbus Dispatch article stating Columbus was going to acquire land for an Upper Darby site that would have altered 4,000 acres. They are a 501 (c)(3) non-profit educational organization and comprised of all volunteers. The Association's mission statement is as follows: The Darby Creek Association unites concerned citizens to preserve, protect, and restore the scenic Darby Creek ecosystem so that this and future generations may benefit from its rich diversity. Darby Creek Advocate, published quarterly, is the most complete and current public source of information on issues affecting the Darby Creeks.

The organization has been actively involved in local issues, acquiring an impressive track record. They have currently secured a seat on the Darby Watershed Steering Committee, the Darby Vision, and participate in local information and planning groups. They have created a Legal Fund to assist homeowners in appeal process regarding development that could impact their homes and the Darby Creek. Working with local residents to appeal filling the Hamilton Floodplain is also an area of concern. Every fall, along with Franklin County Metro Parks, they co-sponsor a creek clean-up called Darby Creek Day.



Miami Conservancy
(Great Miami River Watershed)

The Miami Conservancy District (MCD) is a watershed-based organization that was established in 1915 to provide flood protection for the Miami Valley after the Great Flood of 1913. The challenge for the conservancy group in the 21st century is to maintain and continue upgrading the region's flood protection system, while working to protect and preserve the Great Miami River watershed and the region's valuable water resources. MCD's Watershed Initiatives Team works with other local watershed coordinators, and community leaders with the

goal of combining forces to have the most positive impact on water quality in the Great Miami River watershed. This partnership group has been calling themselves the Great Miami River Watershed Alliance. The Watershed Alliance meets quarterly to discuss items of mutual concern, share ideas, review projects and effectively leverage resources. Members of the Alliance include watershed coordinators, soil and water conservation professionals, OSU Extension personnel, environmental planners, as well as representatives from local governments, state agencies and universities.

Middle Great Miami Watershed Alliance

The Middle Great Miami Watershed Alliance developed from a request by a number of parties to work on water quality issues in the central and northeast portions of Miami County. The Middle Great Miami Watershed takes in portions of the Great Miami River and tributaries on both the east and west sides of the river from downstream of Plum Creek to upstream of Honey Creek. The watershed includes the drainage areas of Lost, Spring, Peters, Tawawa, Leatherwood and Mosquito Creeks and includes areas in Miami, Shelby and Champaign counties. The watershed also includes the cities of Piqua, Troy and parts of Tipp City. Locally those cooperating with the group include the Miami County Farm Bureau, the Miami County SWCD, OSU Extension and a long list of residents and land owners.

The Darby Creek Watershed Planning Group

The Darby Watershed Planning Group is a group involved in sponsoring, guiding, and supporting the Darby Vision – a community based-planning process initiative. The purpose of the group is to develop an implemental community-based plan to maintain and enhance the socio-economic and ecological health of the Darby Watershed. The Watershed Planning Group is made up of a Joint Board of Supervisors, a Steering Committee, and a Stakeholder Task Force. The Joint Board of Supervisors supervise the organizational process and procedures of the group, works with the Steering Committee and Stakeholder Task Force to adopt the plan, and is the fiscal agent for grants and other project funds. The Steering Committee is the central planning arm and makes decisions about how to organize the process and develop the plan. It includes people appointed by county commissioners, Soil and Water Conservation Districts, and the chairs of the workgroups in the Stakeholder Task Force. The Stakeholder Task Force includes landowners, local government officials, permitted dischargers, resource organizations, and interested individuals.

The Honey Creek Watershed Association

The Honey Creek Watershed Committee was originally known as The Honey Creek Watershed Association. It is a chartered non-profit organization. The Honey Creek Watershed Association is devoted to the protection and enhancement of the outstanding water resources of the Honey Creek which flows through Champaign, Miami, Clark, and Montgomery Counties.

The Mad River Steering Committee, Inc.

The Mad River Nonpoint Source (NPS) Project began as a request from the Top of Ohio Resource Conservation & Development Project for a presentation about geology and hydrogeology of the Mad River watershed to a group of interested local residents. The turnout

was small, but a subsequent presentation on the same subject generated greater interest. Further meetings were held that included major landowners in the valley and representatives of state agencies and local organizations. With strong local interest and agency involvement, the Mad River Steering Committee was formed. Chaired by a local landowner, the committee began defining problems in the watershed and generating a plan of action. All parties involved felt that a clear understanding of how the ground water/surface water system works would be a sensible first step in developing a plan of action. After discussion with staff members at the Ohio Department of Natural Resources and the Ohio Environmental Protection Agency, ODNR Division of Water submitted a proposal to OEPA for a Section 319 nonpoint source grant for fiscal year 1993.

7.4.3 Drainage Maintenance

Man-made ditches and storm sewers help drain areas where the surface drainage system is inadequate, or where underground drainageways may be safer or more practical. Particularly appropriate for depressions and low spots that will not drain naturally, drainage and storm sewer improvements are designed to carry the runoff from smaller, more frequent storms. There are three types of drainage improvements that are usually pursued to reduce stormwater flooding: putting drainageways in underground pipes, channelization, and removing obstructions caused by stream crossings, such as culverts and bridges with small openings. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving stream or river has sufficient capacity to handle the additional volume and flow of water. To reduce the cumulative downstream flood impacts of numerous small drainage projects, additional detention or run-off reduction practices should be provided in conjunction with the drainage system improvements.

The Champaign County Engineer is responsible for construction and maintenance of ditch improvements as petitioned by the landowners. The following ditches are those that are currently maintained by the County Engineer:

- Offenbacker
- Honey Creek
- Proctor
- Wiant
- Fairgrounds
- Upper Valley
- Crowder
- McMullen
- Fullington
- Jumping Run
- Pence-Batdorf
- Foster-Brubaker-Mumford
- Coddington
- Dugan

Please refer to the multi-hazard map in Appendix F for locations of these ditch petitions.

7.5 Public Information

A successful hazard mitigation plan program involves both the public and private sectors. Public information activities advise property owners, renters and businesses about hazards and ways to protect people and property from these hazards. These activities can motivate people to take the steps necessary to protect themselves and others. Information can bring about voluntary mitigation activities at little or no cost to the government. Property owners mitigated their flooding problems long before there was government funding programs.

7.5.1 Outreach Projects

Outreach projects are the first step in the process of orienting property owners to the hazards they face and the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties.
Research has proven that outreach projects work. However, awareness of the hazard is not enough; people need to be told what they can do about the hazard, so projects should include information on safety, health and property protection measures. Research has also shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Currently there are no outreach programs as they relate to hazards implemented within Champaign County.

7.5.2 Real Estate Disclosure

Many times after a natural disaster, people say they would have taken steps to protect themselves if only they had known they had to purchase a property that is exposed to a natural hazard. By reaching out to residents in a community to become informed as to what hazards are a potential in the community, the community has armed them with information that they did not have previously. This knowledge allows them to make an informed decision on purchasing insurance to cover their potential losses.

7.5.2.1 Federal law

Federally regulated lending institutions must advise applicants for a mortgage or other loan that is to be secured by an insurable building whether the property is in a floodplain as shown on the Flood Insurance Rate Map. If so, flood insurance is required for buildings located within the floodplain if the mortgage or loan is federally insured. However, because this requirement has to be met only 10 days before closing, often the applicant is already committed to purchasing the property when he or she first learns of the flood hazard.

7.5.2.3 State law

The state of Ohio's Department of Commerce has a Residential Property Disclosure Form pursuant to section 5302.30 of the Revised Code and rule 1301:1-4-10 of the Administrative Code. It is to be filled out by the owners who are looking to sell their property. Under a good faith stipulation, they are to note any areas of the house that may be dangerous which include being in a flood plain/Lake Erie Coastal Erosion Area, whether there are drainage/erosion problems, and if there are zoning/code violations.

Currently there are no county or township laws or regulations as they relate to real estate disclosure enacted within Champaign County.

7.5.3 Websites

The Champaign County 2004 Comprehensive Plan is available online at:

http://www.gochampaign.com/pdfs/Champaign%20County%20Land%20Use%20Plan.pdf

Highest Rated Activities and Action Plan

8.0 HIGHEST RATED ACTIVITIES AND ACTION PLAN

8.1 Matrix Results

The Core Group chose a total of 51 potential activities. Of those 51 activities, 19 were labeled as "prioritized" activities and are listed in the following sections. The Core Group evaluated the activities by first taking into account the risk assessment ranking of hazards located in Section 4.0 of this report. The various hazards had been ranked according to past historical events and the cumulative costs of each potential disaster.

The below matrices results show the average rating for all the Core Group members. Each member filled out an individual matrix, and then the results for each hazard were averaged. The hazard of flooding had the most activities associated with it. The four top rated activities have been highlighted; however the other activities are equally important and should be re-evaluated during the monitoring process of the Countywide All Natural Hazards Mitigation Plan for Champaign County. Please Note: To see the complete list of mitigation alternatives for each hazard please see the complete matrix in Appendix J.

8.1.1 Matrix Results for Severe Storms

Champaign County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Totals
Severe Storms							
No Action.	10	10	20	10	5	5	10.0
1992 - July, 2004 - Evaluate existing plan, Champaign County Emergency Operating Plan (EOP), to see if it needs updated. Utilizing existing emergency response plans in existence (i.e. - Xenia's plan - looking @ their plan).	21	28	28	29	28	5	23.2
Evaluate centralizing 911 systems. There are currently two systems in operation.	30	30	27	26	26	5	24.0
Creating a dedicated "radio" channel for decision-makers to utilize for coordination during a disaster.	25	22	26	24	28	5	21.7
Seek funding for better, more reliable, interoperable communication between incorporated and unincorporated areas within Champaign County.	20	28	29	28	27	5	22.8
Enhancement of communication efforts between Champaign County and its municipalities with surrounding counties and other agencies within the State of Ohio.	25	26	28	30	23	5	22.8

The four highest rating activities within the severe storm hazard category include:

- *Evaluate centralizing 911 systems. There are currently two systems in operation.*
- *1992- July, 2004 – Evaluate Champaign County (EOP) Emergency Operation Plan needs to be updated. Utilizing existing emergency response plan in existence. (i.e.- Xenia's plan- looking at their plan).*
- *Seek funding for better, more reliable, interoperable communication between incorporated and unincorporated areas within Champaign County.*
- *Enhance communication efforts between Champaign County and its municipalities with surrounding counties and other agencies within the State of Ohio.*

8.1.2 Matrix Results for Flooding

Champaign County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Totals
Flooding							
No Action.	9	9	19	9	4	4	9.0
Work with the County Engineer offices to determine flood-prone properties and designate them as flood-prone properties utilizing GIS.	19	25	24	23	27	4	20.3
Evaluate existing emergency operations and equipment within the County and determine the needs across Champaign for handling a severe storm (large scale) disaster.	24	24	29	29	28	4	23.0
Evaluate existing method for helping disaster victims determine needed area of improvement.	19	21	4	24	29	4	16.8
Educate public about the NFIP and reducing uninsured loss.	24	27	27	29	27	4	23.0
Increase public awareness of high hazard areas, such as floodplains through educational outreach.	24	26	27	28	26	4	22.5

The four highest rating activities within the flooding hazard category include:

- *Evaluate existing emergency operations and equipment within the County and determine the needs across Champaign for handling a severe storm (large scale) disaster.*
- *Educate public about the NFIP and reducing uninsured loss.*
- *Increase public awareness of high hazard areas, such as floodplains through educational outreach.*
- *Work with the County Engineer offices to determine flood-prone properties and designate them as flood-prone properties utilizing GIS.*

8.1.3 Matrix Results for Tornadoes

Champaign County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Totals
Tornados							
No Action.	3	8	21	8	3	3	7.7
Evaluate procedures for verifying tornado sightings.	28	19	28	19	26	3	20.5
Increase public awareness of tornadoes by targeting "K-12"; evaluate current programs for improvement.	13	16	28	24	25	3	18.2
Evaluate location of current shelter locations and determine needs.	23	16	28	28	25	3	20.5
Need to establish Tornado Shelter Network throughout the county.	18	22	28	27	28	3	21.0
Evaluate needs of shelter to have back-up generators.	18	25	27	28	27	3	21.3
Conduct study to determine existing facilities; determine where the gaps are as it relates to shelters.	17	28	28	20	27	3	20.5

The five highest rating activities within the tornado hazard category include:

- *Evaluate needs of shelter to have back-up generators.*
- *Need to establish Tornado Shelter Network throughout the county.*
- *Evaluate procedures for verifying tornado sightings.*
- *Evaluate location of current shelter locations and determine needs.*

- *Conduct study to determine existing facilities; determine where the gaps are as it relates to shelters.*

8.1.4 Matrix Results for Droughts

Champaign County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Totals
Droughts							
No Action.	2	7	23	7	2	2	7.2
Increase awareness of urban/rural interface and the damage potential of such interface.	22	25	23	21	20	2	18.8
Determine areas of concern, based on past events, educate land owners of potential problems, and decide what to do in the event of a severe drought.	7	19	23	22	19	2	15.3
Increase public awareness of how droughts can lead to wildfires.	19	16	27	17	19	2	16.7
Coordinate with FSA to increase awareness of Crop Insurance.	17	13	26	27	19	2	17.3

The three highest rating activities within the drought hazard category include:

- *Increase awareness of urban/rural interface and the damage potential of such interface.*
- *Coordinate with FSA to increase awareness of Crop Insurance.*
- *Increase public awareness of how droughts can lead to wildfires.*

8.1.5 Matrix results for Earthquakes

Champaign County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Totals
Earthquakes							
No Action.	1	6	19	8	1	1	6.0
Increase public awareness by developing an innovative Public Service Announcement (PSA).	11	26	22	17	23	1	16.7
Evaluate infrasturcture and coordinate with agencies responsible to determine areas of concern.	11	19	16	11	19	1	12.8

The two highest rating activities within the earthquake hazard category include:

- *Increase public awareness by developing an innovative Public Service Announcement (PSA)*
- *Evaluate infrastructure and coordinate with agencies responsible to determine areas of concern.*

8.2 Mitigation Alternatives for Each Participating Community

Each of the seven participating communities was required to select a mitigation alternative or alternatives for their community to support. Individual communities are responsible for implementing these activities.

Christiansburg

- Provide an alternate power source, such as back-up generators, for critical facilities serving as shelters that must have continuous power to preserve and protect human life.
- Provide an alternate power source, such as back-up generators for the communities water works station.

Woodstock

- Provide an alternate power source, such as back-up generators, for critical facilities serving as shelters that must have continuous power to preserve and protect human life.

Mutual

- Provide an alternate power source, such as back-up generators, for critical facilities serving as shelters that must have continuous power to preserve and protect human life.

Urbana

Improved Wastewater flow control:

- Purchase large mobile trash pumps and power units to control flooding of lift stations should fixed pumps become crippled or flow exceeds fixed pump capacities due to severe storms/flooding (SS/F).
- Develop plans and improve plumbing at wastewater treatment plant to allow for by-pass of primary treatment area should flow exceed current capabilities due to SS/F.
- Implement an equalizing basin to control excessive flow to Waste Treatment plant due to SS/F.
- Improve preventive maintenance program and provide equipment for cleaning out sanitary/storm sewer lines that plug/limit flow during SS/F.

Improve potable water delivery

- Install clear well at new well field in the event fixed pumps/power units are compromised due to SS/F or if water is unavailable due to drought.
- Purchase standby pumps/power units for well fields in the event they become compromised due to SS/F.

Provide additional shelters

- Construct storm shelter at City Park to protect life and provide safety during SS/F.

Improve storm water flow

- Plan development for improving flow in Dugan Run.

- Replace existing culverts.

North Lewisburg

- Provide an alternate power source, such as back-up generators, for critical facilities serving as shelters that must have continuous power to preserve and protect human life.

Mechanicsburg

- Provide an alternate power source, such as back-up generators, for critical facilities serving as shelters that must have continuous power to preserve and protect human life.

St. Paris

- Evaluate centralizing the County's 911 system since there are two 911 systems in place.

8.3 Action Plan

The culmination of Champaign County's Natural Hazard Mitigation Plan is an Action Plan. The general direction of the overall program is outline in this document. Specific activities pursuant to the general direction are detailed in the Action Plan that is placed in Appendix J for ease of access. The overall direction of the Action Plan is to give the Core Group an easily accessible document to ascertain how they are doing on implementing their chosen Mitigation Alternatives.

8.4 Mitigation Plan Maintenance and Schedule

The Core Group, in conjunction with the Champaign County EMA/Office of Homeland Security, will establish methods for monitoring and evaluating the Countywide All Natural Hazard Mitigation Plan for the County and its participating incorporated jurisdictions on a five-year cycle. The Core Group will initially meet on a yearly basis, as determined by the Champaign County EMA/Office of Homeland Security's Director, once the Mitigation Plan has been approved by the State of Ohio and FEMA. The Core Group will evaluate the Mitigation Plan and act as a forum for hazard mitigation issues. The Core Group's detailed Action Plan will act as a guide in evaluating the Mitigation Plan. The Action plan will also provide a method for monitoring the Mitigation Plan, as well as a schedule for the implementation of the mitigation alternatives. The success of the Mitigation Plan depends upon the efforts of the Core Group to become involved with other planning efforts in the community. Communities will be able to use the plan for a variety of activities, including implementing specific mitigation projects, as well as implementing changes in the daily operation of the local government. To ensure the success of an ongoing program, it is critical that the plan remains relevant to the County's growth and development. Thus, it is important for the County to conduct periodic evaluations and make revisions as needed, as well as incorporate changes into other planning documents in the County.

During the first review, the County will consider re-structuring the Drought section of the Plan to include three headings, one each for urban, suburban and rural areas. The Champaign County EMA will also refer to the Mitigation Plan wherever feasible within the existing documents that support mitigation and growth within Champaign County.

The Core Group will review the goals and action items on a yearly basis, as needed, to determine their relevance to changing situations in Champaign County and ensure that they are addressing current and expected conditions. They will also review the risk assessment portion of the mitigation plan to determine if this information should be updated or modified, given any new available data.

The public will be involved on a continuous basis. This will be accomplished by the development of a website whereby the mitigation action items that are slated for development that current year will be highlighted, and the public will be encouraged to participate in the continued development of the Mitigation Plan. There will also be a formalized press release developed for their annual review process.

8.5 Local Planning Mechanisms

There are several local planning mechanisms in place within the County, which are described in detail, in Section 7.2 Preventative Measurers. This section of the Mitigation Plan describes existing plans and efforts in the community, when they were adopted and what the document does for the community.

Within three years of the formal adoption of the Mitigation Plan, the Core Group will strive to incorporate into the process of existing planning mechanisms any local policies recommended for revision by the Action Plan developed as part of this effort. The County utilizes comprehensive land use planning, development standards, and building codes, as well as various other regulatory mechanisms to guide and control development in the community. For instance, Champaign County facilitates the OBOA (Ohio Building Officials Association) Residential Code and the OBC (Ohio Building Code) commercial code. The Champaign County Building Code Department, in conjunction with the Core Group will evaluate the consideration for updates to the code on a regular cycle so that new buildings and infrastructure will have the protection needed within higher risk areas. Since the County has autonomy over these various tools, the County can augment them as necessary to address applicable hazard mitigation requirements. However, as a community that exists in a rural area, many of these processes may also affect neighboring communities and development. To ensure that altering these standards does not negatively affect adjacent communities, Champaign County will seek consistency and collaboration with its counterpart regulatory documents from surrounding jurisdictions. After adoption of the *Champaign County All Natural Hazard Mitigation Plan*, the Core Group should encourage its incorporated jurisdictions to be aware of the hazards that are affected by the planning and development decisions they may make and implement. The Champaign County All Natural Hazard Mitigation Core Group will conduct periodic reviews of the planning documents described in Section 7.2. The Core Group will also analyze any plan amendments, and provide technical assistance if needed to any incorporated jurisdiction participating in this effort.

8.6 Resolution of Adoption

The Champaign County Commissioners as well as the incorporated areas of Urbana, Saint Paris, Christiansburg, Mutual, Mechanicsburg, North Lewisburg and Woodstock, will be passing a Resolution of Support for the Champaign County Countywide All Natural Hazards Mitigation Plan after contingent approval from the State of Ohio Emergency Management Agency as well as the Federal Emergency Management Agency.

An example of the Resolution of Adoption that will be presented to the Commissioners as well as the participating incorporated jurisdictions is provided on the following pages.

RESOLUTION NO._____

ADOPTION OF THE CHAMPAIGN COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN COUNTY NATURAL HAZARDS MITIGATION PLAN AND ESTABLISHMENT OF A CHAMPAIGN COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN COUNTY HAZARD MITIGATION CORE GROUP

WHEREAS, on_____, the Champaign County Commissioners passed Resolution No. _____adopting the CHAMPAIGN COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN (the Mitigation Plan) pursuant to _____which established goals to minimize and reduce stormwater damages to existing structures and land use in order to maximize the protection of public health, safety, and welfare, and identify and develop revenue sources to complete the goals and objectives; and

WHEREAS, the mission of the Champaign County Countywide All Natural Hazards Mitigation Plan Core Group is: "To develop a working document that fulfills the mandates of the Federal Disaster Mitigation Act of 2000, and satisfies the requirements of FEMA and the Ohio EMA, as well as meets the needs of all of Champaign County. Further, by researching and planning for future natural hazards and implementing appropriate mitigation techniques, all of Champaign County can save lives and protect property, reduce the cost of disasters and provide for a rapid and efficient recovery by coordinating response efforts, and increasing the educational awareness of natural hazard events and their effects on the people, property, and resources of all Champaign County."; and

WHEREAS, on December 9th, 2003, the Champaign County Commission President approved the development of a Mitigation Plan; and

WHEREAS, a Mitigation Plan for Champaign County will be required beginning in November 1st, 2004 to receive any state or federal mitigation funding such as flood prone property improvement or buyout funds; and

WHEREAS, the County of Champaign County is subject to flooding, tornadoes, winter storms, and other natural hazards that can damage property, close businesses, disrupt traffic, and present a public health and safety hazard; and

WHEREAS the Mitigation Planning Core Group, comprised of representatives from the County, municipalities and stakeholder organizations, has prepared a recommended Mitigation Plan that reviews the options to protect people and reduce damage from these natural hazards; and

WHEREAS, the recommended Mitigation Plan has been widely circulated for review by the County's residents and federal, state and regional agencies and has been supported by those reviewers.

NOW, THEREFORE BE IT RESOLVED by the Champaign County Commissioners that:

1. CHAMPAIGN COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN is hereby adopted as an official plan of Champaign County.

2. The Mitigation Planning Core Group is hereby established as a permanent advisory body. It shall be composed of representatives from the existing Mitigation Planning Core Group, as recommended by the Champaign County Emergency Management and Homeland Security Office. This includes those municipalities that pass a resolution to adopt for the Mitigation Plan.

3. The Core Group shall meet as often as necessary to prepare or review mitigation activities and progress toward implementing the Mitigation Plan. It shall meet at least once each year to review the status of ongoing projects.

4. The schedule of Core Group meetings shall be posted in appropriate places. All meetings of the Core Group shall be open to the public.

5. By November 30 each year, the Core Group shall prepare an annual evaluation report on the Mitigation Plan for the County Board of Commissioners and the municipalities.

The report will cover the following points:

a. A review of the original plan.

b. A review of any natural disasters that occurred during the previous calendar year.

c. A review of the action items in the original plan, including how much was accomplished during the previous year.

d. A discussion of why any action items were not completed or why implementation is behind schedule.

e. Recommendations for new projects or revised action items. Such recommendations shall be subject to approval by the County Board of Commissioners and the affected municipality's governing boards as amendments to the adopted plan.

6. The director of each County office identified as "responsible agency" for the Mitigation Plan's action items shall ensure that the action item is implemented by the listed deadline subject to fiscal and staff time constraints.

Passed by the Champaign County Board of Commissioners on

Vote:

Yes ____

No ____

ORDINANCE NO._____

AN ORDINANCE APPROVING AND ADOPTING THE COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN PREPARED BY EMH&T, INC.

WHEREAS, the _____ County Commissioners have approved the aforementioned plan by resolution, and

WHEREAS, the Plan will fulfill the mandates of the Federal Disaster Mitigation Act of 2000, satisfies the requirements of FEMA and Ohio EMA, and meets the needs of _____ County,

NOW, THEREFORE, Be it ordained by the Council of the City/Village of _____, State of Ohio:

SECTION 1: That the Countywide All Natural Hazards Mitigation Plan as prepared by EMH&T, Inc., and approved by the _____ County Commissioners, is hereby approved and adopted.

SECTION 2: That this Ordinance shall take effect and be enforced from and after the earliest period allowed by law.

ADOPTED: _____, 2005.

ATTEST: _____ _____

Clerk of Council President of Council

Date filed with Mayor: _____, 2005.

Date approved by Mayor: _____, 2005.

_____

Mayor

Approved as to form: _____

Director of Law