



# Scioto County Ohio

## Natural Hazards Mitigation Plan



June 2020



Scioto County, Ohio  
**Natural Hazards Mitigation Plan**

Updated January 2020

**Table of Contents**

Executive Summary ..... 1

Section I – Introduction ..... 3

    A. Background & Purpose ..... 3

    B. Scope ..... 3

    C. Project Management ..... 3

    D. Relationship to the 2012 Mitigation Plan ..... 3

    E. The Mitigation Planning Process ..... 3

    F. Integration of Results into Other Mechanisms ..... 3

    G. Other Uses for This Plan ..... 4

    H. Sources Consulted ..... 4

    I. Mitigation Action Changes as a Result of This Update ..... 4

    J. Progress Made ..... 5

    K. Plan Organization ..... 5

Section II – The Planning Process ..... 7

    A. Inform and Involve Chief Elected Officials, Stakeholders and the Public ..... 7

    B. Form the Planning Team ..... 7

    C. Identify Participating Agencies ..... 7

    D. Meetings Held ..... 8

        1. Kick-Off Meeting ..... 8

        2. Planning Meeting for Hazards ..... 8

        3. Planning Meeting for Goals & Actions ..... 8

        4. Other Information Exchange ..... 8

    E. Gather Information ..... 9

    F. Draft the Updated Plan ..... 9

        1. Update Community Profile and Assets ..... 9

        2. Perform Hazard Analysis, Formulate Goals and Mitigation Actions ..... 9

            a. Hazard Identification ..... 9

            b. Hazard Profile, Vulnerability Assessment & Impacts ..... 9

            c. Goals & Mitigation Actions ..... 10

            d. Draft Plan ..... 11

    G. Submit Plan to Ohio EMA and FEMA ..... 11

    H. Adopt Plan ..... 11

    I. Receive Federal Approval ..... 11

    J. Present Plan to the Public ..... 11

    K. Monitor Plan Implementation ..... 11

    L. Keep Plan Up to Date ..... 11

Section III – Community Profile and Assets ..... 13

    A. Location and Geography ..... 13

    B. Land Use ..... 14

        1. Land Use/Land Cover ..... 14

        2. Major Waterways ..... 14

        3. Federal Lands ..... 14

- 4. State Lands ..... 14
- C. Climate ..... 15
- D. Jurisdictions and Populations ..... 15
- E. Demographics ..... 16
- F. Congregate Care Populations..... 17
- G. Major Transportation Routes..... 17
  - 1. Highways..... 17
    - a. Interstate Highways ..... 17
    - b. US Highways ..... 18
    - c. Ohio State Routes..... 18
  - 2. Airports ..... 18
  - 3. Railways ..... 18
  - 4. Waterways..... 18
- H. Public Transportation..... 18
- I. Structures Types and Values ..... 18
- J. Public Warning and Notifications Systems ..... 19
  - 1. NOAA Weather Radio All Hazards ..... 19
  - 2. Sirens ..... 19
  - 3. Public Safety Citizen-Direct Notification ..... 19
  - 4. Social Media..... 19
- K. Major Community Events..... 19
- L. Development Trends..... 19
- M. Authorities Affecting Mitigation Activities..... 20
  - 1. Zoning and Building Regulations ..... 20
  - 2. Floodplain Management..... 20
  - 3. National Flood Insurance Program (NFIP) ..... 20
  - 4. Scioto County Health Department ..... 20
- N. Mitigation Funding Sources ..... 21
  - 1. Operating Budgets..... 21
  - 2. Grants..... 21
    - a. Community Development Block Grant Program ..... 21
    - b. Hazard Mitigation Grant Program ..... 21
    - c. Pre-Disaster Mitigation Program ..... 21
    - d. Flood Mitigation Assistance Program..... 21
    - e. Other Mitigation Grants..... 21
- Section IV – Hazard Identification and Analysis ..... 23
  - A. Overview..... 23
  - B. Hazard Identification ..... 23
  - C. Hazard and Vulnerability Analysis Methodology..... 24
  - D. Hazard and Vulnerability Analysis Results ..... 25
    - 1. Hazard Analysis..... 25
    - 2. Vulnerability Analysis..... 26
- Section V – Hazard Profiles, Analyses and Vulnerable Assets..... 27
  - A. Flooding..... 27
    - 1. Description ..... 27
    - 2. Extent of Hazard..... 27
    - 3. Historical Occurrence ..... 28
    - 4. Probability of Future Occurrences ..... 30
    - 5. Affected Locations ..... 30

6. Analysis .....	31
7. Vulnerable Community Assets .....	31
B. Severe Winter Storms.....	33
1. Description .....	33
2. Extent of Hazard.....	34
3. Historical Occurrence .....	34
4. Probability of Future Occurrences .....	35
5. Affected Locations .....	35
6. Analysis .....	35
7. Vulnerable Community Assets .....	35
C. Severe Summer Storms (includes Windstorms and Hail) .....	37
1. Description .....	37
2. Extent of Hazard.....	37
3. Historical Occurrence .....	38
4. Probability of Future Occurrences .....	40
5. Affected Locations .....	40
6. Analysis .....	40
7. Vulnerable Community Assets .....	41
D. Tornadoes .....	42
1. Description .....	42
2. Extent of Hazard.....	42
3. Historical Occurrence .....	42
4. Probability of Future Occurrences .....	43
5. Affected Locations .....	44
6. Analysis .....	44
7. Vulnerable Community Assets .....	44
E. Earthquakes .....	45
1. Description .....	45
2. Extent of Hazard.....	45
3. Historical Occurrence .....	46
4. Probability of Future Occurrences .....	46
5. Affected Locations .....	46
6. Analysis .....	46
7. Vulnerable Community Assets .....	47
F. Droughts .....	48
1. Description .....	48
2. Extent of Hazard.....	48
3. Historical Occurrence .....	48
4. Probability of Future Occurrences .....	52
5. Affected Locations .....	52
6. Analysis .....	52
7. Vulnerable Community Assets .....	52
G. Landslides .....	53
1. Description .....	53
2. Extent of Hazard.....	53
3. Historical Occurrence .....	53
4. Probability of Future Occurrences .....	53
5. Affected Locations .....	53
6. Analysis .....	53

- 7. Vulnerable Community Assets ..... 53
- H. Land Subsidence..... 54
  - 1. Description ..... 54
  - 2. Extent of Hazard..... 54
  - 3. Historical Occurrence ..... 54
  - 4. Probability of Future Occurrences ..... 54
  - 5. Affected Locations ..... 55
  - 6. Analysis ..... 55
  - 1. Vulnerable Community Assets ..... 55
- I. Dam Failures..... 56
  - 1. Description ..... 56
  - 2. Extent of Hazard..... 57
  - 3. Historical Occurrence ..... 57
  - 4. Probability of Future Occurrences ..... 58
  - 5. Affected Locations ..... 58
  - 6. Analysis ..... 58
  - 7. Vulnerable Community Assets ..... 58
- Section VI – Mitigation Goals and Actions ..... 61
  - A. Overview..... 61
  - B. Identification and Analysis Methodology ..... 61
  - C. Goals ..... 61
  - D. Actions..... 61
  - E. Cost-Benefit Review ..... 62
    - 1. Review Benefits and Costs..... 62
    - 2. Prioritize Actions..... 62
- Section VII – Mitigation Action Analysis..... 65
  - A. Goal: Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure ..... 65
    - 1. Action: Replace antiquated floodwall pump station control systems..... 65
    - 2. Action: Anchor mobile homes and propane tanks ..... 66
    - 3. Action: Upgrade undersized/establish storm water drainage systems..... 67
    - 4. Action: Mitigate structures in flood-prone areas..... 68
    - 5. Action: Eliminate combined sewer system backflow..... 69
    - 6. Action: Remove debris in streams ..... 70
    - 7. Action: Reduce erosion of streams..... 71
    - 8. Action: Repair/Upgrade wastewater and water treatment plants ..... 72
    - 9. Action: Identify/resolve potential landslide locations..... 73
    - 10. Action: Reduce systematic problems caused by utility line ruptures..... 74
    - 11. Action: Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data ..... 75
    - 12. Action: Rehabilitate dams known to be of high hazard potential ..... 76
  - B. Goal: Provide timely warning ..... 77
    - 1. Action: Enhance public warning systems ..... 77
    - 2. Action: Increase rural broadband coverage ..... 78
  - C. Goal: Increase survivability of emergency communications ..... 79
    - 1. Action: Install generators at critical facilities ..... 79
  - D. Goal: Plan for safe development ..... 80
    - 1. Action: Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages ..... 80

- 2. Action: Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas..... 81
- 3. Action: Create rental housing inspection and permit program ..... 82
- 4. Action: Conduct a hydrologic and hydraulic (H&H) study of Scioto County ..... 83
- E. Goal: Create self sufficiency ..... 84
  - 1. Action: Establish community shelters ..... 84
  - 2. Action: Construct Safe Rooms - Community ..... 85
  - 3. Action: Construct Safe Rooms - Residential..... 86
  - 4. Action: Purchase stock of PPE for first responders ..... 87
- F. Goal: Increase public awareness ..... 88
  - 1. Action: Develop and implement an all-hazards public education program ..... 88
- Section VII – Supplemental Information ..... 89
  - A. Acronyms, Terms and Definitions ..... 89
  - B. Meetings, Announcements and Correspondence ..... 93
    - 1. May 30, 2019 – Commissioners’ Designation of Agent for This Project ..... 93
    - 2. August 29, 2019 – Kick Off Meeting and Public Announcement ..... 94
      - a. Invitation to Participate..... 94
      - b. Public Announcements ..... 95
      - c. Sign-In Sheet ..... 96
    - 3. October 24, 2019 – Planning Team Meeting – Hazards..... 97
      - a. Announcement..... 97
      - b. Sign-In Sheet ..... 97
      - c. Email to Nonattenders for Their Input. .... 98
    - 4. February 13, 2020 – Planning Team Meeting – Goals & Actions ..... 98
      - a. Announcement..... 98
      - b. Sign-In Sheet ..... 99
      - c. Follow Up Email for Attenders and Nonattenders Re Prioritization Input ..... 99
    - 5. April 28, 2020 – Village of New Boston Participation and Concurrence ..... 100
    - 6. April 28, 2020 – Village of Rarden Participation and Concurrence ..... 100
    - 7. April 28, 2020 – Village of South Webster Participation and Concurrence ..... 100
    - 8. April 29, 2020 – Village of Otway Participation and Concurrence ..... 101
  - C. Mitigation Actions by Jurisdiction..... 102
  - D. 2012 Mitigation Action Adjustments..... 107

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## Executive Summary

The Scioto County Mitigation Plan lays the road map to a safer community by identifying the natural hazards that may affect the county, assessing the impacts of these hazards on community assets – those things that are important to the residents of the county – and developing mitigation actions to lessen or eliminate the impacts on community assets.

Having a current mitigation plan allows the county to apply for mitigation funding – as it may become available. It also provides a mitigation action list for other sources of funding. Further, it provides information that may be used in other planning efforts and future development.

Through a quantitative process of analyzing hazards and impacts on our community, the Mitigation Planning Team identified 6 mitigation goals and developed 24 mitigation actions to achieve the goals. In summary, 25 actions were carried over from the previous plan, 8 actions were added, 1 action was completed, and 8 actions were deleted.

The following summarizes these efforts:

- Hazards Identified and Analyzed in Rank Order
  - Flooding
  - Severe Winter Storms
  - Severe Summer Storms/Thunderstorms
  - Tornadoes
  - Hazardous Material Release
  - Earthquakes
  - Droughts
  - Landslides
  - Infectious Disease
  - Terrorist Attack
  - Civil Unrest
  - Land Subsidence
  - Wildfires
  - Dam Failure
- Goals Identified and Mitigation Actions Developed, Analyzed and Prioritized
  - Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure
    - Replace antiquated floodwall pump station control systems
    - Anchor mobile homes and propane tanks
    - Upgrade undersized/establish storm water drainage systems
    - Mitigate structures in flood-prone areas
    - Eliminate combined sewer system backflow
    - Remove debris in streams
    - Reduce erosion of streams
    - Repair/Upgrade wastewater and water treatment plants
    - Identify/resolve potential landslide locations
    - Reduce systematic problems caused by utility line ruptures
    - Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
    - Rehabilitate dams known to be of high hazard potential

- Provide timely warning
  - Enhance public warning systems
  - Increase rural broadband coverage
- Increase survivability of emergency communications
  - Install generators at critical facilities
- Plan for safe development
  - Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
  - Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas
  - Create rental housing inspection and permit program
  - Conduct a hydrologic and hydraulic (H&H) study of Scioto County
- Create self sufficiency
  - Establish community shelters
  - Construct Safe Rooms - Community
  - Construct Safe Rooms - Residential
  - Purchase stock of PPE for first responders
- Increase public awareness
  - Develop and implement an all-hazards public education program

This plan will be reviewed and updated annually and undergo a complete review and rewrite within five years of adoption. Please address any questions, comments, mitigation action status or additional mitigation actions to the Scioto County Emergency Management Agency.

## Section I – Introduction

### A. Background & Purpose

There are two basic truths about hazards and community assets:

- *Hazards* will occur – there is little, if anything, we can do to prevent natural hazards from occurring.
- *Community assets* will be *impacted* by the occurrence of hazards to the extent of the assets' *vulnerabilities* to the hazards' *effects*.

Mitigation seeks to lessen or eliminate:

- The impact of hazards
- The vulnerability of assets to hazard impacts

As there are many impacts on community assets, impacts are ranked and mitigation actions cost-estimated using a quantitative analysis approach. Mitigation Actions may then be implemented in a cost-effective manner that resolves the greatest impact.

The purpose of this plan is to document the mitigation planning process conducted in Scioto County, Ohio, and provide that road map to a safer community.

### B. Scope

This plan covers Scioto County, Ohio, and all its political subdivisions and municipalities.

### C. Project Management

The Scioto County Emergency Management Agency (EMA) is the lead agency for this plan. RDI Solutions LLC was contracted to perform research, facilitate the process and assemble the plan to conform with the requirements of the Ohio Emergency Management Agency (Ohio EMA) and the Federal Emergency Management Agency (FEMA).

### D. Relationship to the 2012 Mitigation Plan

As this is an updated plan, the previously approved plan was the point of departure. All information in it was reviewed and updated as needed.

### E. The Mitigation Planning Process

The Scioto County Mitigation Planning Team worked together to update the 2012 Plan. The team used the Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook – March 2013*, as a guide.

Mitigation planning starts with profiling the community and identifying its assets – those things that are important to it. Next, hazards that potentially may affect these community assets are profiled – past and projected future occurrences and impacts. Then, mitigation actions are reviewed and updated, and new ones developed that can either lessen or eliminate the impact of a hazard or the vulnerability of a community asset to the impact of a hazard are developed. These mitigation actions form the basis for making the community a safer place to live, work and recreate.

Throughout the process, those who have a stake – elected and appointed government officials, agencies providing services to people, the public – as well as those with pertinent information are advised, consulted and their input incorporated into the plan. [Section II – The Planning Process](#) describes and summarizes the results of this process.

### F. Integration of Results into Other Mechanisms

The county's process to integrate the data, information, and hazard mitigation goals and actions in other planning mechanisms is accomplished through specifically including select

positions in the planning process and are members of the Mitigation Planning Team. These include, but are not limited to:

- Scioto County Commissioners
- Scioto County Floodplain Administrator
- Scioto County Planning Commission
- Scioto County EMA
- Scioto County Sheriff’s Office
- Scioto County Engineer’s Office

These individuals take information to their respective organizations that are charged with the development, maintenance, and on occasion, enforcement of rules, regulations, codes, ordinances, policies, plans, procedures and other administrative instruments. Information from the mitigation planning effort is presented to the leadership of these organizations, who then authorize the information to be added, to revise or update current administrative instruments. This allows for oversight, commitment of time, energy, and resources to change actions into projects.

**G. Other Uses for This Plan**

While this plan focuses on mitigation actions, the results of the information gathered and analysis performed can be used for other purposes including:

- Already-identified mitigation actions for funding through other sources
- Assessing risk for other purposes

**H. Sources Consulted**

Many sources were consulted in the planning process. The major sources are shown in the following table.

Source	Used to Provide Information on
Federal Emergency Management Agency (FEMA)	National Flood Insurance Program Previous Disasters
National Oceanic and Atmospheric Administration (NOAA)	Hazards U.S. Multi-Hazard Climate, Weather & Drought History and Trends
Ohio Department of Natural Resources (ODNR)	Dams, Waterways & Drought History and Conditions Landslide Characteristics
United States Geological Survey (USGS) & Scioto County Soil & Water Conservation District	Slopes & Soils Affecting Public Safety and County Assets
Ohio Emergency Management Agency (Ohio EMA)	Mitigation Plan State-Wide Hazards History and Trends
Scioto County Emergency Management Agency (EMA)	Emergency Operations Plan Previous Disasters, Emergencies & Other Incidents
Scioto County Auditor	Property Values & Types; Property Ownership
Scioto County Engineer’s Office	Impacted Roadways and Cost Estimates
Scioto County Sheriff’s Office	Public Safety Impacts: Location, Severity, Frequency
Scioto County Planning Commission	Planning Regulations and Development Trends

**I. Mitigation Action Changes as a Result of This Update**

The following table indicates the status of the actions. Note that the actions in the 2012 plan were not numerically prioritized.

2012 Action	Status
Replace antiquated floodwall pump station control systems	Unchanged
Anchor mobile homes and propane tanks	Unchanged
Upgrade undersized/establish storm water drainage systems	Unchanged
Mitigate structures in flood-prone areas	Unchanged
Eliminate combined sewer system backflow	Unchanged
Remove debris in streams	Unchanged
Reduce erosion of streams	Unchanged
Alter courses of waterways	Deleted
Construct firebreak lines to reduce wildfire risks	Deleted
Repair/Upgrade wastewater and water treatment plants	Unchanged
Identify/resolve potential landslide locations	Unchanged
Reduce systematic problems caused by utility line ruptures	Unchanged
Remove debris from February 2004 ice storm, which has increased hazards greatly	Completed
Enhance public warning systems	Unchanged
Install generators at critical facilities	Unchanged
Enhance capability to fight wildfires by purchasing additional fire apparatus	Deleted
Enhance capability to clean up after winter storms by purchasing additional equipment	Deleted
Update FIRMs	Deleted
Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages	Unchanged
Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas	Unchanged
Implement logging regulations on private land to reduce run-off and landslides	Deleted
Identify, inspect and analyze private dams that pose a threat to community assets	Deleted
Restrict land use in landslide-prone areas	Deleted
Establish community shelters	Unchanged
Develop and implement an all-hazards public education program	Unchanged

## J. Progress Made

As this plan is an update to the 2012 plan, progress can be measured. While only one of the existing actions have been completed, tangible progress has been made to decrease hazard impacts. As for the bulk of the costly mitigation actions, lack of funding has resulted in little progress.

## K. Plan Organization

This plan is organized into the following sections:

[Section I – Introduction.](#)

[Section II – The Planning Process.](#) This section details the planning process; it provides the summary information and conclusions as a result of hazard analysis and details mitigation goals developed.

[Section III – Community Profile and Assets.](#) This section provides detailed information about Scioto County and its Assets.

[Section IV – Hazard Identification and Analysis.](#) This section lists the hazards likely to affect Scioto County and details the analysis conducted on each. It also summarizes the rankings of hazards and impacts.

[Section V – Hazard Profiles, Analyses and Vulnerable Assets.](#) This section documents profiles and analyses conducted. It then details the impacts to vulnerable community assets.

[\*Section VI – Mitigation Goals and Actions.\*](#) This section lists and details the mitigation goals and actions updated or developed.

[\*Section VII – Mitigation Action Analysis.\*](#) This section details each action and its analysis.

[\*Section VIII – Supplemental Information.\*](#) This section includes information meaningful to the overall plan development but not included in the preceding sections.

## Section II – The Planning Process

This section describes and summarizes the steps and actions taken to update the 2012 Scioto County Mitigation Plan. Note that documentation for mentioned events/actions can be found in *Section VIII – Supplemental Information*.

### A. Inform and Involve Chief Elected Officials, Stakeholders and the Public

The Scioto County EMA Director met with the Board of County Commissioners on May 30, 2019, advising them of the mitigation plan update project and received their full support.

Request for public participation and input to the planning process was first announced on the Scioto County EMA Facebook page on August 29, 2019. The current plan and a full description of the update process was posted on Scioto County EMA web site. However, there was no participation by nor comments received from the public.

Throughout the plan development phase, stakeholders – businesses, industry, commercial ventures, private organizations, and the public – were invited to attend and participate in the Planning Team meetings. Locations, dates and times were made to the public and announcements were posted at meeting locations.

All were advised of the Kick-Off meeting where any questions they may have would be addressed.

### B. Form the Planning Team

The Scioto County EMA Director invited those individuals that were on the planning team to reconvene the team from the previous planning process along with additional individuals or organizations. This list included representatives from agencies involved in hazard mitigation activities, agencies with the authority to regulate development, and offices responsible for enforcing local ordinances were important members of the planning team. Emergency Management Agencies of adjacent counties were also invited to participate.

### C. Identify Participating Agencies

The following agencies and individuals participated in the development of this plan:

Community	Name	Position	Agency / Organization	Planning Team
State Gov	Darren Price		Ohio EMA	
State Gov	Luan Nguyen		Ohio EMA	
County Gov	Bryan Davis	Commissioner	Scioto Co Commissioners	
County Gov	Kim Carver	Director	Scioto County EMA	X
County Gov	Larry Mullins		Scioto County EMA	X
County Gov	Angie Malone	Manager	Scioto County Flood Plain Management	X
Engineering	Darren LeBrun	Engineer	Scioto County Engineer's Office	X
Engineering	Paul Sheets		Scioto County Engineer's Office	X
Conservation	Scott Lewis		Scioto County Soil & Water Conservation Dist	X
Water	Johnathan King		Scioto Co Reg Water Dist No 1	
Health/Medical	Angela Hobbs		Southern Ohio Med Center	X
Local Gov	Sam Sutherland		City of Portsmouth	X
Local Gov	Carolyn Hobbs		Morgan Twp	X

Community	Name	Position	Agency / Organization	Planning Team
Local Gov	Steve Hamilton		Village of New Boston	
Local Gov	William Williams	Mayor	Village of New Boston	
Local Gov	Denise Rpse	Mayor	Village of Otway	
Local Gov	Ronald Syrone	Mayor	Village of Rarden	
Local Gov	Todd Hollback	Mayor	Village of South Webster	
Health/Medical	Maly Dans		City of Portsmouth Health Dept	
Health/Medical	Josh Childers		King's Daughters' Med Center	
Fire	Bill Raison	Chief	City of Portsmouth Fire Dept	
Fire	Michael Sines		City of Portsmouth Fire Dept	
Fire	George Moore		Green Fire Dept Ohio Valley Firefighters' Assoc	
Law Enforcement	Debby Brewer		City of Portsmouth Police Dept	
Law Enforcement	Robert Ware	Chief	City of Portsmouth Police Dept	
Faith-Based	Dan Simon		Salvation Army	
Insurance	Sally Bias		Sherman-Kricker Insurance Agency	
NGO	Steve Sturgill		Community Action Org of Scioto County	
Real Estate	Renee Stacey		Greater Portsmouth Real Estate	
Education	Sandy Mers		South Central Ohio Educational Svc Center	
Consultant	David Pollinger	Consultant	RDI Solutions LLC	X

## D. Meetings Held

### 1. Kick-Off Meeting

The Planning Team conducted their Kick-Off meeting on August 29, 2019, at the Scioto County Emergency Operations Center. Staff from the Ohio EMA attended and presented an overview of mitigation as well as requirements and expectations for a successful planning process and approved plan.

### 2. Planning Meeting for Hazards

The Planning Team met on October 24, 2019 to identify and analyze hazards.

### 3. Planning Meeting for Goals & Actions

The Planning Team met on February 13, 2020 to establish goals, review actions from the 2012 plan, develop new actions and prioritize these actions.

### 4. Other Information Exchange

To maximize the effective use of time in meetings, drafted material was emailed to the Planning Team. Also, worksheets aimed at collecting information to be acted upon by the Planning Team were distributed ahead of the meetings. Information not available at meetings was gathered later and included in the planning process. Additionally, worksheets were sent to Planning Team members that could not attend as well as the various jurisdictions soliciting input on mitigation actions that would have application to them. Those returned were included in plan development. Phone calls were also used to clarify information gathered.

## **E. Gather Information**

The Planning Team invited each jurisdiction's governing body to its planning meetings to gather information unique to each jurisdiction. The team also contacted agencies that have a mitigation-related role. This included the Scioto County Health Department, Scioto County Soil & Water Conservation District, Scioto County Engineer's Office, Scioto County Auditor's Office, Scioto County Sheriff's Office and Scioto County EMA.

The Planning Team reviewed existing plans and reports including Scioto County's Emergency Operations Plan, Soil Report, plat maps, and Planning Commission regulations.

The Planning Team performed extensive research from online resources such as Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), US and Ohio Departments of Transportation (USDOT/ODOT) and Ohio Department of Natural Resources (ODNR). The source is identified where this information is presented in this plan.

## **F. Draft the Updated Plan**

### **1. Update Community Profile and Assets**

The Planning Team updated the community profile and its assets based on data collected and is presented in [Section III – Community Profile and Assets](#).

### **2. Perform Hazard Analysis, Formulate Goals and Mitigation Actions**

#### **a. Hazard Identification**

The Planning Team identified the following hazards, in rank order, considered to be credible threats to Scioto County's community assets.

- Flooding
- Severe Winter Storms
- Severe Summer Storms/Thunderstorms
- Windstorms/Tornadoes
- Hazardous Material Release
- Earthquakes
- Droughts
- Landslides
- Infectious Disease Outbreak
- Terrorist Attack
- Civil Unrest
- Land Subsidence
- Wildfires
- Dam Failure

Refer to [Section IV – Hazard Identification and Analysis](#) and for details.

#### **b. Hazard Profile, Vulnerability Assessment & Impacts**

The Planning Team collected and reviewed hazard information, assessed the impacts and the community's vulnerabilities. Refer to [Section V – Hazard Profiles, Analyses and Vulnerable Assets](#) for details.

**c. Goals & Mitigation Actions**

The Planning Team reviewed the vulnerabilities of impacted assets and decided on the following mitigation goals in priority order based on impact resolution.

The Planning Team selected the following goals:

- Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure
- Provide timely warning
- Increase survivability of emergency communications
- Plan for safe development
- Create self sufficiency
- Increase public awareness

The Planning Team first reviewed the current actions and found several issues that needed to be resolved as follows before continuing:

Issue	Count	Resolution
Normal maintenance item	1	Deleted
Not a mitigation action	2	Deleted
So close to another action as to be the same	8	Merged into another action
Not stated as an action or needed clarification	19	Restated

Refer to [Section VII – Supplemental Information](#) for a chart detailing these adjustments.

The Planning Team then reviewed the adjusted current mitigation actions and added several new ones. Using Cost Benefit Review procedures, the planning team prioritized the actions. The following table depicts the mitigation actions developed and selected and the priority assigned. Note that priorities from the previous Plan were modified based on the results of this approach.

Priority/Mitigation Action	
1	Replace antiquated floodwall pump station control systems
2	Enhance public warning systems
3	Repair/Upgrade wastewater and water treatment plants
4	Install generators at critical facilities
5	Purchase stock of PPE for first responders
6	Develop and implement an all-hazards public education program
7	Establish community shelters
8	Upgrade undersized/establish storm water drainage systems
9	Eliminate combined sewer system backflow
10	Reduce systematic problems caused by utility line ruptures
11	Identify/resolve potential landslide locations
12	Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
16	Reduce erosion of streams
17	Anchor mobile homes and propane tanks

Priority/Mitigation Action	
18	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
19	Conduct a hydrologic and hydraulic (H&H) study of Scioto County
20	Create rental housing inspection and permit program
21	Construct Safe Rooms - Community
22	Construct Safe Rooms - Residential
23	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
24	Rehabilitate dams known to be of high hazard potential

Refer to [Section VI – Mitigation Goals and Actions](#) and [Section VII – Mitigation Action Analysis](#) for details.

**d. Draft Plan**

The RDI Solutions consultant drafted the plan, responded to comments, and made appropriate changes.

**G. Submit Plan to Ohio EMA and FEMA**

The plan in its final form was submitted to Ohio EMA in June 2020.

On *Month Day, 2020*, FEMA determined this plan meets its requirements.

**H. Adopt Plan**

On *Month Day, 2020*, the Scioto County Board of Commissioners adopted this plan.

On *Month Day, 2020*, the City of Portsmouth adopted this plan.

On *Month Day, 2020*, the Village of New Boston adopted this plan.

On *Month Day, 2020*, the Village of Otway adopted this plan.

On *Month Day, 2020*, the Village of Rarden adopted this plan.

On *Month Day, 2020*, the Village of South Webster adopted this plan.

**I. Receive Federal Approval**

On *Month Day, 2020*, FEMA granted federal approval.

**J. Present Plan to the Public**

Upon receipt of federal approval, the plan was placed on the Scioto County EMA’s website and a public notice was placed on the Scioto County EMA web site as well as through a social media (Facebook) post inviting residents to review and comment on the plan.

Additionally, a copy of the updated plan was sent to the EMAs of adjacent counties.

**K. Monitor Plan Implementation**

The Scioto County EMA Director monitors the implementation of this plan by periodic contact with lead agencies and presents status to the Planning Team and commissioners at each annual review.

The Scioto County EMA Director also provides a copy of this plan to all stakeholders and agencies with authorities related to mitigation actions and coordinates with them to assist in integrating mitigation goals and actions into their plans and actions.

**L. Keep Plan Up to Date**

The Scioto County EMA Director monitors the implementation of this plan by having lead agencies provide updates as the status of their mitigation actions change.

The Scioto County EMA Director convenes the Planning Team annually to review the progress of this plan and propose any needed updates. This meeting is publicly announced

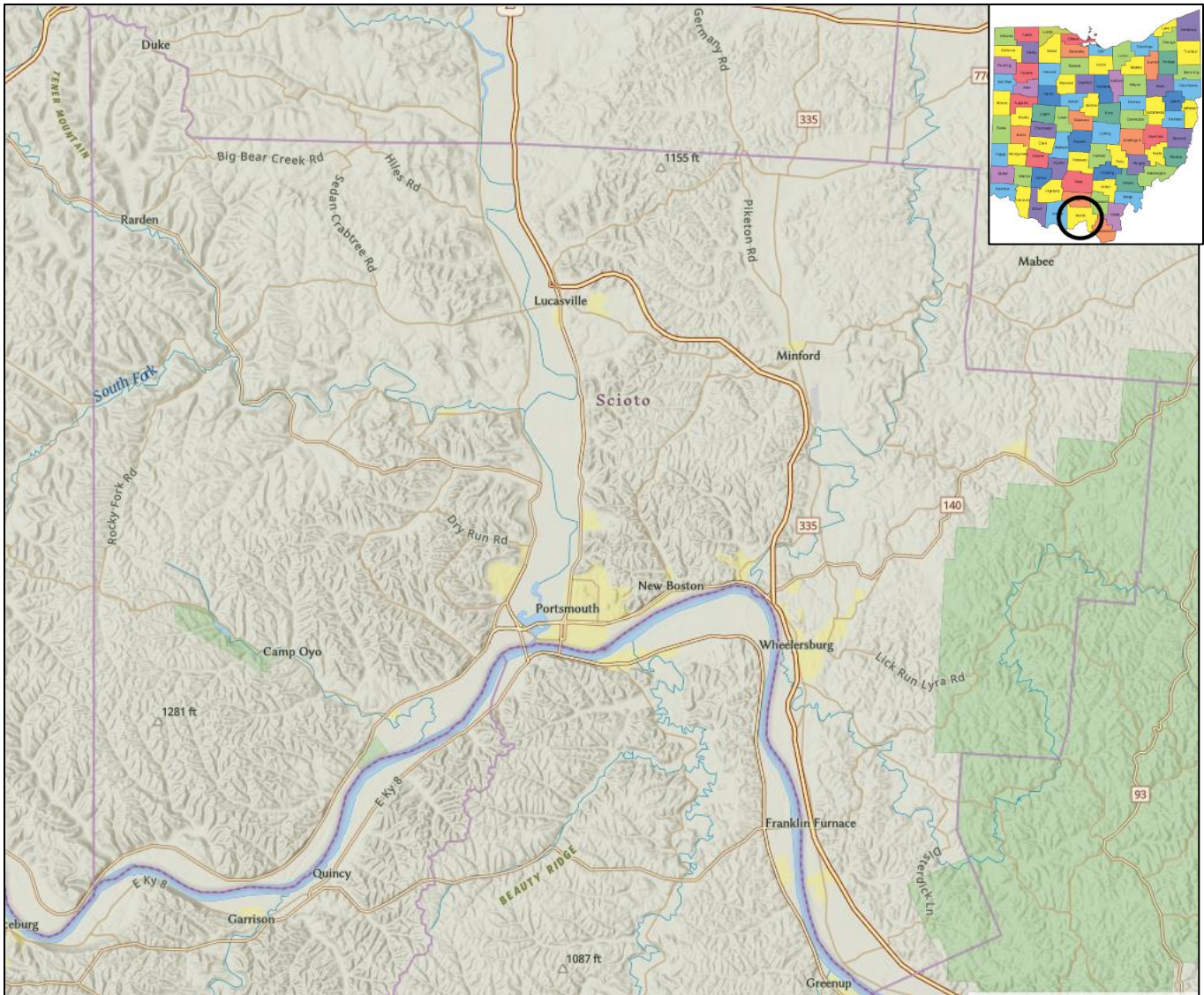
and is open to the public; notices are posted on the Scioto County EMA's web site and Facebook page. At this meeting, the team:

- Reviews the status of all mitigation actions.
- Assesses the progress toward achieving mitigation goals.
- Considers new related information as it becomes available. This includes recent hazard occurrences as well as changes in related planning documents. If this information would have an impact on goals or actions, the team proposes changes such as adding, changing or eliminating goals or mitigation actions.
- Presents proposed changes to the Board of County Commissioners and chief elected officials of affected jurisdictions for concurrence.
- Formally documents the proceedings, provides it to all stakeholders and makes it available with the current plan.

Once every five years, the Scioto County EMA initiates a formal plan update based on then current FEMA requirements and FEMA and Ohio EMA guidance.

The Scioto County EMA may process out-of-cycle updates by submitting changes to the Board of County Commissioners and the Ohio EMA.

### Section III – Community Profile and Assets



#### A. Location and Geography

Scioto County is located in the southern portion of the State of Ohio bordering the Ohio River. It covers approximately 612 square miles. It is bounded by:

- Adams County to the west
- Pike County to the north
- Jackson County to the northeast
- Lawrence County to the east
- Greenup County (Kentucky) to the south

**B. Land Use**

**1. Land Use/Land Cover**

The following chart depicts Scioto County’s land use and cover<sup>1</sup>:

Land Use/Land Cover	Percentage
Developed, Higher Intensity	1.20%
Developed, Lower Intensity	5.88%
Barren (strip mines, gravel pits, etc.)	.09%
Forest	70.10%
Shrub/Scrub and Grasslands	3.12%
Pasture/Hay	13.19%
Cultivated Crops	5.49%
Wetlands	.11%
Open Water	.82%

**2. Major Waterways**

*Scioto River* originates northwest of Columbus and flows southerly out of Pike County into the Ohio River at Portsmouth, roughly following US 23.

*Ohio River* establishes the southern border of Scioto County. While the Ohio River is not in Ohio, it has significant impact on the Ohio communities along the river.

There are numerous tributaries – both continuous and intermittent – feeding into these waterways.

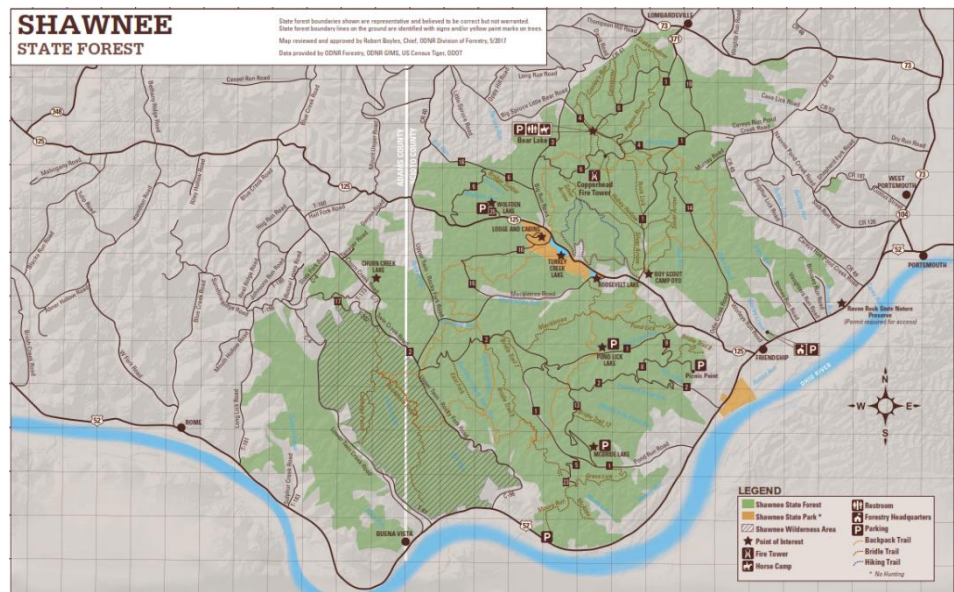
**3. Federal Lands**

A portion of *Wayne National Forest*<sup>2</sup> is located in eastern Scioto County, occupying large portions of Bloom and Vernon Townships. Refer to the map under *Jurisdictions and Populations* on a following page.

**4. State Lands<sup>3</sup>**

*Shawnee State Forest* is located west of Portsmouth. It occupies over 60,000 acres.

*Shawnee State Park* is located inside Shawnee State Forest. Refer to the light brown area on the map.



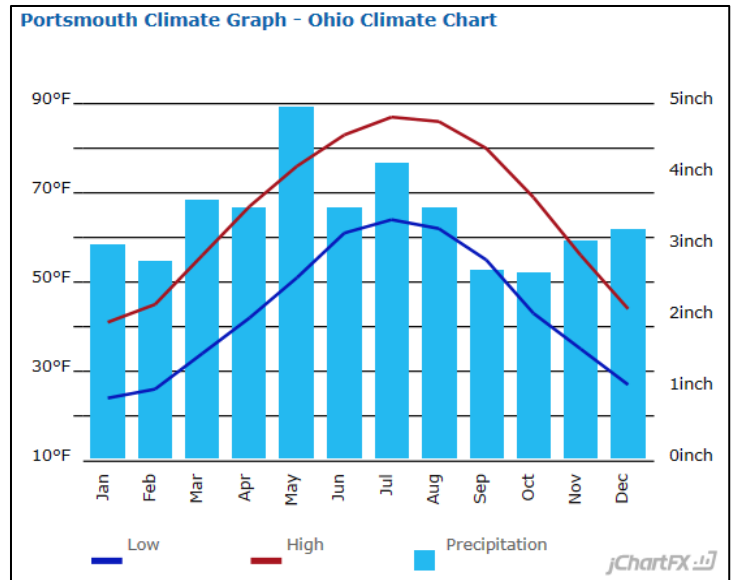
<sup>1</sup> <https://www.development.ohio.gov/files/research/C1074.pdf>

<sup>2</sup> <https://www.fs.usda.gov/wayne>

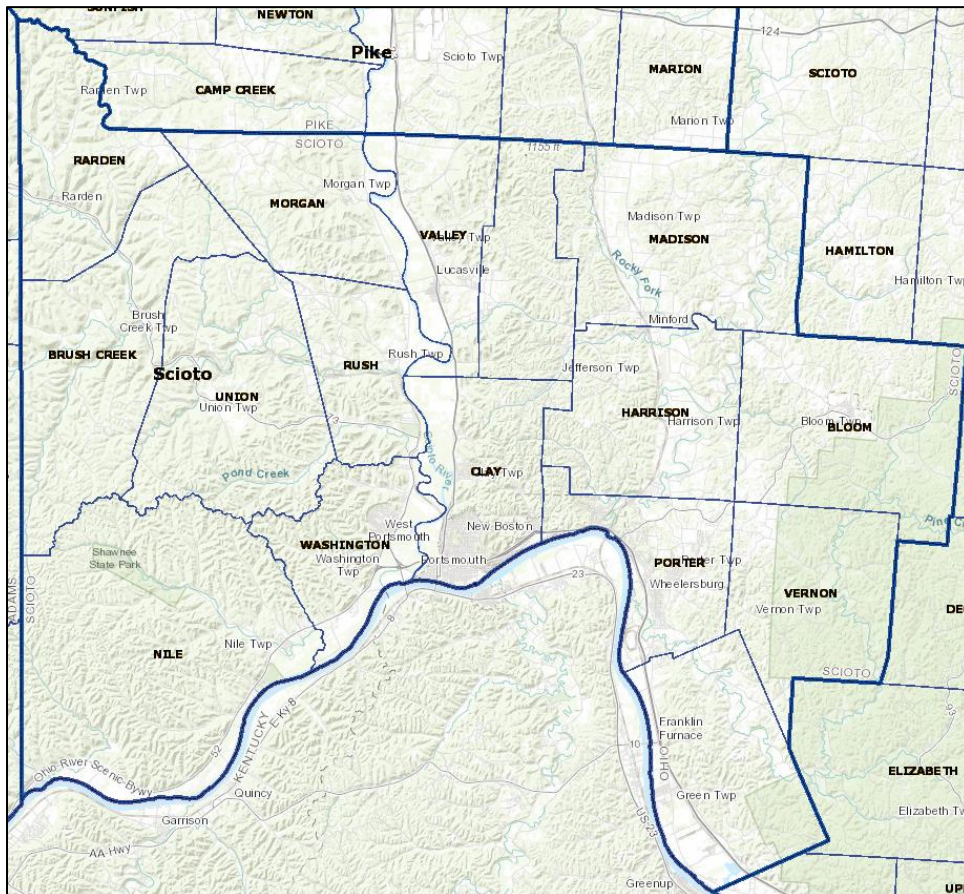
<sup>3</sup> <http://ohiodnr.gov/>

**C. Climate<sup>4</sup>**

The adjacent chart depicts climate information for Scioto County. The average high temperature is 65.8 degrees; average low is 44 degrees. The county has experienced temperature extremes from sub-zero in the winter to the mid-90s in the summer. The average annual precipitation is 41 inches. Of this, the average snowfall is 9 inches.



**D. Jurisdictions and Populations**



Scioto County is subdivided into sixteen townships, one city and five incorporated villages. Below are their unique features, identified vulnerabilities and populations. Populations are 2018 estimates calculated by the Ohio Department of Development<sup>5</sup>

<sup>4</sup> <https://www.usclimatedata.com/climate/chillicothe/ohio/united-states/usoh1954>

<sup>5</sup> <https://development.ohio.gov/files/research/P5027.pdf>

Jurisdiction	Population
<b>Townships:</b>	
Bloom Township	2,224
Brush Creek Township	1,041
Clay Township	3,467
Green Township	3,930
Harrison Township	4,264
Jefferson Township	2,609
Madison Township	3,845
Morgan Township	2,377
Nile Township	2,237
Porter Township	9,270
Rarden Township	1,024
Rush Township	2,966
Union Township	2,109
Valley Township	3,473
Vernon Township	1,993
Washington Township	5,183
<b>Township Total</b>	<b>52,012</b>
<b>Cities:</b>	
Portsmouth City	20,340
<b>City Total</b>	<b>20,340</b>
<b>Villages:</b>	
New Boston Village	2,112
Otway Village	81
Rarden Village	148
South Webster Village	809
<b>Village Total</b>	<b>52,012</b>
<b>Scioto County Total</b>	<b>75,502</b>

The highest concentrations of residents are in:

- The City of Portsmouth
- West Portsmouth, a Census-Designated Place in Washington Twp
- Villages of New Boston, South Webster, Rarden and Otway
- Townships of Porter and Valley.

## E. Demographics

The following information is a summary of information from the US Census Bureau<sup>6</sup>:

*Population Trend.* While the nation is growing at a 6% annual rate and Ohio at a 1.3% rate, Scioto County is losing population at a 5% rate.

*Diversity.* Except for ethnicity and primary language (Scioto County is approximately 13% more European American, 10% less African American and 17% less Hispanic), Scioto

<sup>6</sup> <https://www.census.gov/quickfacts/fact/table/Sciotocountyohio,oh,US/PST045218>

County’s diversity closely matches that of Ohio and the United States. This includes gender, age and family size.

*Home Ownership.* Scioto County’s home ownership rate is slightly higher than the state and national averages.

*Home Values.* The average value of homes in Scioto County is \$93,000, 31% less than the state average and 52% less than the national average.

*Education.* Scioto County students graduate high school close to the national average. The number of residents with post-high school degrees is a little more than one half of the state and national averages.

*Unemployment.* Scioto County’s unemployment rate is approximately 6.5%, similar to Ohio as a whole but about 1% above the national average.

*Income.* The per capita income is \$22,586, 12% lower than the state average and 28% lower than the national average. Twenty-three percent of Scioto County’s population live below the poverty line, 38% higher than the state and 48% higher than national levels.

For a [current] comprehensive analysis of Scioto County’s demographics, refer to the City-Data.com web site<sup>7</sup>.

**F. Congregate Care Populations<sup>8</sup>**

Congregate Care facilities house people that typically require some form of assistance for daily activities. Challenges for emergency responders include assisting with evacuation and sheltering those in these facilities. The following list reflects population in the major congregate facilities:

Facility Name	Location	Approximate Population
Best Care Nursing & Rehab Center of Wheelersburg	Wheelersburg	110
Bridgeport Health Care	Portsmouth	99
Concord Health & Rehab Center	Wheelersburg	93
Crystal Care Center of Franklin Furnace	Portsmouth	25
Crystal Care Center of Portsmouth	Portsmouth	25
Edgewood Manor of Lucasville	Lucasville	160
Heartland of Portsmouth	Portsmouth	121
Hill View Retirement Center	Portsmouth	72
Pristine Senior Living of Portsmouth	Portsmouth	95
Rest Haven Nursing Home	McDermott	23
Scioto County Jail	Portsmouth	225
Southern Ohio Correctional Facility	Lucasville	1400

**G. Major Transportation Routes**

**1. Highways**

**a. Interstate Highways**

The new I-73 will follow US 52 and US 23 with a segment bypassing Portsmouth – currently numbered OH 823.

<sup>7</sup> [http://www.city-data.com/county/Scioto\\_County-OH.html](http://www.city-data.com/county/Scioto_County-OH.html)

<sup>8</sup> Scioto County EMA

**b. US Highways**

US 23 traverses the county north-south from Pike County through Portsmouth across the Ohio River into Greenup County, Kentucky.

US 52 follows the Ohio River from Lawrence County in the south to Adams County in the east.

**c. Ohio State Routes**

Ohio State Routes (SRs) 73, 125, 139, 140, 239, 335 and 522 cross the county.

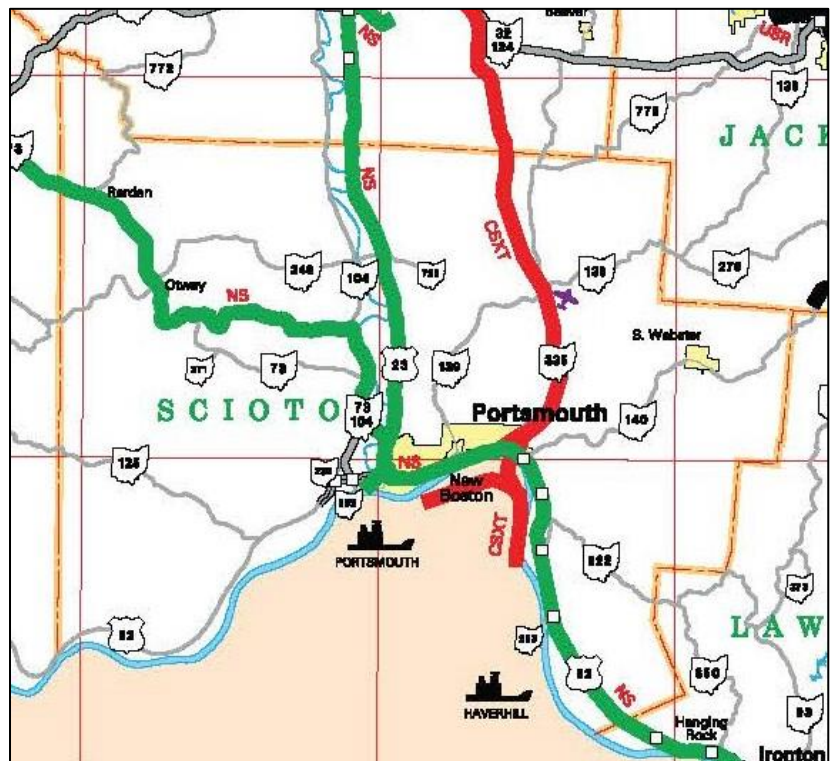
**2. Airports**

The *Greater Portsmouth Regional Airport* is in Harrison Township off of SR 335 in Minford. The runway is 5,001 feet long with Precision Approach Path Indicator (PAPI), Global Positioning Satellite (GPS) System, Very High Frequency Omni Range (VOR), Area Navigation (ARNA) and Automated Weather Operating System (AWOS) available for landings from 20-30 miles out, and lights for night operations. Airport landing craft capabilities range from large business jets such as the Gulfstream V (GV) to large military craft such as the C-130 Hercules.

**3. Railways**

Norfolk Southern operates a railway in Scioto County. From the south, it comes out of Lawrence County and follows US 52 into its Portsmouth railyard. It then follows US 23 north into Pike County. A line splits off at Rushtown going east across the Scioto River and through Otway and Rarden before entering Adams County.

CSX operates a railway that crosses the Ohio River at Sciotoville going north through Minford and into Pike County.



**4. Waterways**

The *Ohio River* carries a variety of freight along the full length of the county’s southern border.

**H. Public Transportation**

Access Scioto County provides on-request transportation for county residents.

**I. Structures Types and Values**

For the purposes of mitigation planning, structures are classified as follows:

- *Residential.* These include single and multi-family dwellings, apartments, condominiums and the like. Congregate care facilities, such as nursing homes, are not included here.

- *Nonresidential.* Any structure not classified as Residential or Critical.
- *Critical.* These include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities and are not included in the above counts.

For the purposes of this plan, structure values are stated related to the replacement value, not the appraised or market value.

The following summaries the structure counts and values used in this plan<sup>9</sup>:

Structure Type	Inventory	Average Replacement Value
Residential	30,412	\$189,004
Nonresidential	2,581	\$214,407
Critical	60	\$250,000

## J. Public Warning and Notifications Systems

### 1. NOAA Weather Radio All Hazards<sup>10</sup>

All county government facilities and local schools have EMA-provided weather/all hazard alert radios.

### 2. Sirens

Shawnee State University has a siren system that can be heard throughout Portsmouth.

Wheelersburg and West Portsmouth have weather warning sirens that can be heard in Porter and Washington Townships where the fire departments are located. They are activated through 911 Dispatch Office.

### 3. Public Safety Citizen-Direct Notification

City of Portsmouth Public Safety Division uses the Heads Up Applications available to residents for weather information and other emergency advisories.

### 4. Social Media

Scioto County EMA has an aggressive social media presence on Facebook, Twitter, Google and Yahoo sharing emergency public information including NWS products issued. Reach on average is over half of the county population.

## K. Major Community Events

The *Scioto County Fair* in Lucasville is the first full week of August each year and has an average attendance of approximately 8,000.

*Portsmouth River Days Festival* in Portsmouth is the last full week of August and has an average daily attendance of approximately 9,000.

*Swap Days* are held at the Scioto County Fairground in the Spring and Fall each year and draw an average attendance of 10,000.

## L. Development Trends

Land usage hasn't changed significantly in recent years.

<sup>9</sup> HAZUS Simulations discussed under Hazard Identification and Analysis

<sup>10</sup> <http://www.nws.noaa.gov/nwr/>

**M. Authorities Affecting Mitigation Activities**

**1. Zoning and Building Regulations**

Scioto County has a Planning Commission. All health and safety regulations follow State of Ohio laws. Below is a summary of the existence of regulations and available budgets for mitigation:

Jurisdiction	Planning Commission	Comprehensive Plans	Floodplain Regulations	Building Codes	Zoning Ordinances	Capital Budget for Mitigation	Public Works Budget for Mitigation
Scioto County (Covers Unincorporated Areas)	Yes	No	Yes	Ohio Building Codes	No	No	Operating Funds In-Kind Wages
City of Portsmouth	Yes	Yes	Yes	City Charter	Yes		
Village of New Boston	Yes	Yes	Yes	Ohio Building Codes	Yes		
Village of Otway	No	No	Yes		No		
Village of Rarden	No	No	Yes		No		
Village of South Webster	No	No	Yes		No		

**2. Floodplain Management**

Scioto County floodplain regulations are maintained by the county commissioners and mayors of those cities and villages with such regulations with authority delegated to their floodplain administrators. These regulations are the Special Purpose Flood Damage Reduction Regulations. Section 3.1 designates the position of Floodplain Administrator. Section 3.2 outlines the duties and responsibilities of this position. Duties include, but are not limited to enforcement of the regulations, routine monitoring of the flood zones and providing community assistance such as encouragement of owners to maintain flood insurance.

**3. National Flood Insurance Program (NFIP)**

The following table reflects participation and compliance with the NFIP<sup>11</sup>.

CID	Jurisdiction	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Sanction Date
390496	Scioto County	12/27/1974	6/19/1989	4/18/2011	6/19/1989	
390498	Portsmouth	5/31/1974	8/15/1983	4/18/2011	8/15/1983	
390497	New Boston	5/31/1974	9/4/2002	4/18/2011	1/26/1983	
390499	Rarden	8/23/1974	4/17/1989	4/18/2011	4/17/0989	
390913	Otway	These jurisdictions chose not to participate as they are in FEMA-designated Areas of Minimal Flood Hazard effective 7/22/2010				
390914	South Webster					

**4. Scioto County Health Department**

The Health Department monitors and enforces regulations for septic systems and potable wells as well as deals with public health issues.

<sup>11</sup> <https://www.fema.gov/cis/OH.html>

## **N. Mitigation Funding Sources**

### **1. Operating Budgets**

Funding for routine maintenance and improvements come from normal operating budgets. Mitigation Actions are considered when performing routine maintenance and improvements.

### **2. Grants**

#### **a. Community Development Block Grant Program<sup>12</sup>**

The US Department of Housing and Urban Development's (HUD) Community Development Block Grant (CDBG) program is a flexible program that provides communities with resources to address a wide range of unique community development needs.

#### **b. Hazard Mitigation Grant Program**

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Act, as amended. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under the Presidential major disaster declaration, in areas of the State requested by the Governor.

#### **c. Pre-Disaster Mitigation Program**

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 USC 5133. The PDM program is designed to assist States and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future major disaster declarations.

#### **d. Flood Mitigation Assistance Program**

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act (NFIA) of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

#### **e. Other Mitigation Grants**

Information on other grant programs is available on the Ohio EMA's *Mitigation Information Portal*.

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<sup>12</sup> [http://portal.hud.gov/hudportal/HUD?src=/program\\_offices/comm\\_planning/communitydevelopment/programs](http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs)

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## Section IV – Hazard Identification and Analysis

### A. Overview

The Scioto County Mitigation Planning Team identified hazards of credible threat and analyzed their impact using qualitative and quantitative methods. The team used the *FEMA Local Mitigation Planning Handbook, March 2013*, as a guide for conducting analysis.

### B. Hazard Identification

The Planning Team chose the natural hazards the Ohio EMA identified as those likely to impact the state of Ohio (as documented in the *2019 State of Ohio Hazard Mitigation Plan (SOHMP)*<sup>13</sup>, page 2-3) as the starting point for hazard identification. It then, based on a review of the community profile and historical records of hazards affecting southeast Ohio, selected the natural hazards it considered to be credible threats to Scioto County’s assets. Ten of these hazards were identified for Hazard and Vulnerability Analysis.

Hazard from SOHMP	Significant Impact on Assets
Flooding (includes areal, riverine and flash flooding)	<b>Yes</b>
Winter Storms (includes snow, ice and sleet)	<b>Yes</b>
Severe Summer Storms (includes windstorms and hail)	<b>Yes</b>
Tornado	<b>Yes</b>
Drought	<b>Yes</b>
Earthquake	<b>Yes</b>
Dam/Levee Failure	<b>Yes</b>
Invasive Species	No – Day-to-day operations deals with these
Landslide (includes mudslides)	<b>Yes</b>
Land Subsidence (includes abandoned mines)	<b>Yes</b>
Wildfire	<b>Yes</b>
Coastal Erosion	No – No coastline

The Planning Team identified the following additional hazards that have had or would have significant impact on Scioto County:

- *Infectious Disease Outbreak.* The biological hazard would potentially have immeasurable impact. Illness and even deaths would cause a ripple effect all aspects of personal lives – physical, social, economic – as well as the community as a whole – medical assets, economic, policies and procedures, security to name a few. This hazard was included in the ranking of hazards but not in hazard analysis, hazard profile and action development. While out of the scope of this plan, it is being addressed in other ongoing national, state, regional and local efforts.
- *Hazardous Materials Release.* This technological hazard has had impact on Scioto County in past with the potential to have major impact. This hazard was included in the ranking of hazards, hazard analysis, hazard profile and action development.
- *Civil Unrest and Terrorist Attack.* While these man-made hazards have not had a significant impact on Scioto County in past, there is the potential to have a major impact. These hazards were included in the ranking of hazards but not in hazard

<sup>13</sup> <https://sharpp.dps.ohio.gov/OhioSHARPP/Planning.aspx#SOHMP>

analysis, hazard profile and action development as other programs and funding streams address this hazard.

**C. Hazard and Vulnerability Analysis Methodology**

The Planning Team profiled each of the ten hazards selected. It collected and reviewed hazard information, assessed the impacts and the vulnerabilities of the community’s assets. Events recorded in National Centers for Environmental Information (NCEI)<sup>14</sup> data base as well as locally added events were considered occurrences. Criteria for NCEI event inclusion and categorization are contained in the *National Weather Service Instruction 10-1605*<sup>15</sup>

The team assigned risk factor values based on the criteria and adjusting factors established by the Ohio EMA.

Risk Factor	Criteria	Adjusting Factor
Frequency	If a hazard/event does not apply it is given a value of NA. If a hazard/event resulted in no local disaster declarations, it scored a one. If the hazard/event resulted in one – two local disaster declarations, it has a Low Probability of occurrence and scored a two. If it resulted in three – five declarations, it has a Medium Probability and numerical score of three. If the hazard/event resulted in six – eight local disaster declarations, it has a High Probability and scored a four. If the hazard/event resulted in nine or more declarations, it should receive an Excessive Probability rating and a score of five. It is important to note that frequency was considered a key factor in determining the hazard profile. To that end, an Adjusted Frequency score was added for this factor and multiplied by 1.5 to weight the score more importantly than other factors.	1.5
Response	Average Response Duration may be defined as "time on the ground" or the time-period of response to a hazard, or event. Transportation accidents may last a few hours whereas a tire fire may last a week or a flood several weeks. Duration, therefore, may not always be indicative of the degree of damage but it remains an important planning factor.	1
Onset	Average Speed of Onset may affect all other factors due to lack of warning or time to prepare for impact. The lead-time required protecting lives and property varies greatly with each event. For instance, a winter storm may develop so slowly that there is time to alert crews and emplace plows, but flash floods can occur with no warning.	1
Magnitude	Average Magnitude is the geographic dispersion of the hazard. For instance, how much of your community would be impacted by a flood or hazardous material incident? Similar to the Frequency, this factor is deemed more important and therefore received a weighted value of 1.25 above the raw score. The score is based on the percent of land area impacted by an event.	1.25
Business	The Impact on Business refers to enduring economic impact of the hazard on the community by an event. A score of one compares to a shutdown of critical facilities for less than 24 hours. Two equals a complete shutdown of critical facilities for one week. A score of three means a complete shutdown of critical facilities for at least two weeks. A score of four equals a complete shutdown of critical facilities for 30 days or more. This factor was developed and in keeping	1

<sup>14</sup> <http://www.NCEI.noaa.gov/stormevents/>

<sup>15</sup> <https://www.ncdc.noaa.gov/stormevents/pd01016005curr.pdf>

Risk Factor	Criteria	Adjusting Factor
	with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	
Human	This factor relates to the number of lives potentially lost to a particular hazard agent. This factor can vary between jurisdictions based on economic, geographic, and demographics of the particular populations. Therefore, some generalization need be inflected on this factor. This factor was developed and in keeping with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	1
Property	This factor relates to the amount of property potentially lost to a particular hazard agent. This factor can vary between jurisdictions based on economics, geographic amount owned, and demographics of the particular populations. Therefore, some generalization need be inflected on this factor. This factor was developed and in keeping with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	1

The team then estimated countywide structures at risk and associated damages for typical events using the following formula:

Structure Type	Inven- tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
<b>Residential</b>	30,412	189,024	25%	7,603	5%	380	5%	\$3,591,464
<b>Nonresidential</b>	2,582	684,737	20%	516	10%	52	10%	\$3,560,632
<b>Critical</b>	59	684,737	5%	3	5%	0	0%	\$0

The team estimated the percent of total or actual numbers of structures at risk, the percent of these or actual number of damaged in a typical event and the percent of structure or actual structural damage. Knowing the inventory and average value, total damages incurred for a typical event were then calculated.

#### D. Hazard and Vulnerability Analysis Results

The following summarizes the analysis results. Details are contained in *Section V – Hazard Profiles, Analyses and Vulnerable Assets*.

##### 1. Hazard Analysis

The following table consolidates and ranks the analysis of each hazard:

Hazard	Frequency	Response	Onset	Magnitude	Business Impact	Human Impact	Property Impact	Adjusted Total
Flooding	7.5	3	2	2.5	2	1	1	19
Severe Winter Storms	4.5	3	2	3.75	2	2	1	18.25
Severe Summer Storms/Thunderstorms	3	3	3	5	1	1	1	17
Tornadoes	3	3	4	2.5	2	1	1	16.5
Hazardous Material Release	1.5	2	4	1.25	2	3	1	14.75
Earthquakes	1.5	3	2	2.5	2	1	2	14
Droughts	3	1	1	5	2	0	1	13

Hazard	Frequency	Response	Onset	Magnitude	Business Impact	Human Impact	Property Impact	Adjusted Total
Landslides	1.5	3	4	1.25	2	0	1	12.75
Infectious Disease	1.5	5	1	1.25	1	3	0	12.75
Terrorist Attack	1.5	3	2	0	1	3	1	11.5
Civil Unrest	1.5	2	3	0	1	2	1	10.5
Land Subsidence	1.5	2	4	1.25	0	0	1	9.75
Wildfires	1.5	4	2	1.25	0	1	0	9.75
Dam Failure	1.5	3	1	0	0	1	1	7.5

## 2. Vulnerability Analysis

The following table consolidates the property impact analysis of each vulnerability:

Hazard	Structures at Risk				Damage in Millions of Dollars			
	Residential (Res)	Non-Res	Critical	Total	Res	Non-Res	Critical	Total
Floods	30,412	2582	59	33,053	85.790	4.815	14.445	105.050
Severe Winter Storms	304	26	0	330	0.144	0.044	0.000	0.188
Severe Summer Storms/ Thunderstorms	608	52	1	661	0.057	0.018	0.000	0.076
Tornadoes	0	0	0	0	0.473	0.411	0.000	0.883
Hazardous Material Release	0	0	0	0	0.000	0.000	0.000	0.000
Earthquakes	30,412	2582	59	33,053	85.790	19.168	0.092	105.050
Droughts	0	0	0	0	0.000	0.000	0.000	0.000
Landslides	0	0	0	0	0.000	0.000	0.000	0.000
Land Subsidence	7	0	0	7	1.323	0.000	0.000	1.323
Wildfires	0	0	0	0	0.000	0.000	0.000	0.000
Dam Failure	0	0	0	0	0.000	0.000	0.000	0.000

## Section V – Hazard Profiles, Analyses and Vulnerable Assets

### A. Flooding

#### 1. Description

Flooding is an overflowing of water onto land that is normally dry. Floods can happen during heavy rains, when ocean waves come on shore, when snow melts too fast, or when dams or levees break. Flooding may happen with only a few inches of water, or it may cover a house to the rooftop. They can occur quickly or over a long period and may last days, weeks, or longer. Floods are the most common and widespread of all weather-related natural disasters.

Flash floods are the most dangerous kind of floods because they combine the destructive power of a flood with incredible speed and unpredictability. Flash floods occur when excessive water fills normally dry creeks or riverbeds along with currently flowing creeks and rivers, causing rapid rises of water in a short amount of time. They can happen with little or no warning.

Areas near rivers are at risk from flash floods. Embankments, known as levees, are often built along rivers and are used to prevent high water from flooding bordering land. In 1993, many levees failed along the Mississippi River, resulting in devastating flash floods. The city of New Orleans experienced massive devastating flooding days after Hurricane Katrina came onshore in 2005 due to the failure of levees designed to protect the city.

Mountains and steep hills produce rapid runoff, which causes streams to rise quickly. Rocks and clay soils do not allow much water to infiltrate the ground. Saturated soil also can lead rapidly to flash flooding. Vacationing or recreating along streams or rivers can be a risk if there are thunderstorms in the area. A creek only 6 inches deep in mountainous areas can swell to a 10-foot deep raging river in less than an hour if a thunderstorm lingers over an area for an extended period of time.

Additional high-risk locations include low water cross, recent burn [or logging] areas in mountains, and urban areas from pavement and roofs which concentrate rainfall runoff.

Ice jams and snowmelt can help cause flash floods. A deep snowpack increases runoff produced by melting snow. Heavy spring rains falling on melting snowpack can produce disastrous flash flooding. Melting snowpack may also contribute to flash floods produced by ice jams on creeks and rivers. Thick layers of ice often form on streams and rivers during the winter. Melting snow and/or warm rain running into the streams may lift and break this ice, allowing large chunks of ice to jam against bridges or other structures. This causes the water to rapidly rise behind the ice jam. If the water is suddenly released, serious flash flooding could occur downstream. Huge chunks of ice can be pushed onto the shore and through houses and buildings.

#### 2. Extent of Hazard

The severity of flooding is measured in terms of inches of rain per hour, total inches per occurrence and the effect on community assets.

Significant events as recorded by NCEI and local sources are considered occurrences.

Major occurrences are those that caused injuries, deaths or total damage \$5,000 or greater.

### 3. Historical Occurrence

The following major occurrences were recorded by the National Centers for Environmental Information (NCEI)<sup>16</sup> and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Flood	3/1/1993	0	0	101	0
Flash Flood	1/1/1995	0	0	75	0
Flash Flood	5/1/1995	0	0	25	0
Flash Flood	8/1/1995	0	3	923	0
Flood	1/17/1996	0	0	20	0
Flood	1/23/1996	0	1	1000	0
Flash Flood	1/24/1996	0	0	10	0
Flood	4/30/1996	0	0	5	0
Flood	5/1/1996	0	0	10	0
Flash Flood	5/4/1996	0	0	5	0
Flash Flood	5/15/1996	0	2	1250	0
Flash Flood	8/21/1996	0	0	15	0
Flash Flood	3/1/1997	0	0	3000	0
Flood	3/2/1997	0	0	20000	0
Flash Flood	3/3/1997	0	0	5	0
Flash Flood	5/19/1997	0	0	10	0
Flash Flood	6/2/1997	0	0	50	0
Flash Flood	6/14/1998	0	0	50	0
Flash Flood	2/13/2000	0	0	10	0
Flash Flood	2/18/2000	0	0	1000	0
Flood	2/20/2000	2	2	20	0
Flash Flood	8/24/2000	0	0	25	0
Flash Flood	12/16/2000	0	0	10	0
Flash Flood	5/17/2001	0	0	25	0
Flash Flood	5/18/2001	0	2	40	0
Flash Flood	5/21/2001	0	0	10	0
Flash Flood	5/10/2003	0	0	50	0
Flash Flood	5/11/2004	0	0	8	0
Flash Flood	9/17/2004	0	0	5	0
Flash Flood	1/1/2005	0	0	450	0

<sup>16</sup> <http://www.NCEI.noaa.gov/stormevents/>

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Flash Flood	10/4/2006	0	0	5	0
Flash Flood	7/10/2007	0	0	6	0
Flash Flood	6/4/2008	0	0	25	0
Flash Flood	7/11/2009	0	0	17	0
Flash Flood	5/2/2010	0	0	30	0
Flash Flood	7/17/2010	0	0	15	0
Flash Flood	7/21/2010	4	1	300	0
Flash Flood	4/23/2011	0	0	15	0
Flood	5/10/2011	0	1	3000	0
Flash Flood	5/10/2011	0	0	202	0
Flash Flood	4/26/2016	0	0	10	0

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
<b>All Events</b>	24	99	0.1	0.0	81	0	413%	3
<b>Major Events</b>	24	36	0.2	0.1	223	0	150%	8

- Flood – January 3, 1997**

Heavy rainfall on the 1st and 2nd brought the Scioto River out of its banks. At Piketon, the river crested at 28.0 feet at 800 am on the 3rd causing serious flooding of agricultural land. Also, significant backwater flooding occurred in area creeks. Flood stage is 18.0 feet. At Circleville, the river crested at 14.9 feet at 315 pm on the 3rd causing flooding of bottomland areas near Circleville and all across Pickaway county. Flood stage is 14.0 feet.
- Flood – February 3, 1997**

Heavy rainfall occurred across Southern Ohio and Northern Kentucky on the 1st and 2nd with areas along the Ohio river receiving up to 12 inches of rainfall. The river rose rapidly reaching a crest of 59.8 feet at Portsmouth at 1000 pm on the 4th. Flood stage is 50.0 feet. Further downstream at Meldahl Dam, the river crested at 61.3 feet at 700 pm on the 6th. Flood stage is 51.0 feet. In Cincinnati, the river crested at 64.7 feet at 1100 pm on the 5th. Many towns were flooded from Portsmouth to Cincinnati and thousands of people were evacuated from their homes for several days.
- Flash Flood – February 18, 2000**

Widespread 2 to 4-inch rains with locally higher amounts contributed to serious flooding across the county. Over 100 roads were closed including State Route 73,

over 100 basements were flooded, 50 homes were flooded on the main floors, and over 100 people were evacuated due to high water.

- **Flash Flood – May 18, 2001**

Several roads were closed due to the heavy rainfall and some people were trapped in their vehicles.

- **Flash Flood – October 5, 2003**

Numerous homes were flooded in and around Minford. US 23 was closed due to high water near the county fairgrounds. A mudslide closed US 52 near Stout.

- **Flash Flood – July 21, 2010**

Training thunderstorms moved across northern Kentucky and south-central Ohio beginning during the late evening hours and continuing into the overnight hours.

Multiple homes were flooded in the area due to heavy rainfall. Two homes were destroyed, two homes sustained major damage, and several homes received minor damage. In addition, there were multiple water rescues. There was one fatality during the event. The fatality was a female who was outside trying to get to higher ground when she was swept away in the flash flooding. In addition to the fatality, there were four injuries. All of the flooding reports and the fatality occurred in the Franklin Furnace area.

#### 4. Probability of Future Occurrences

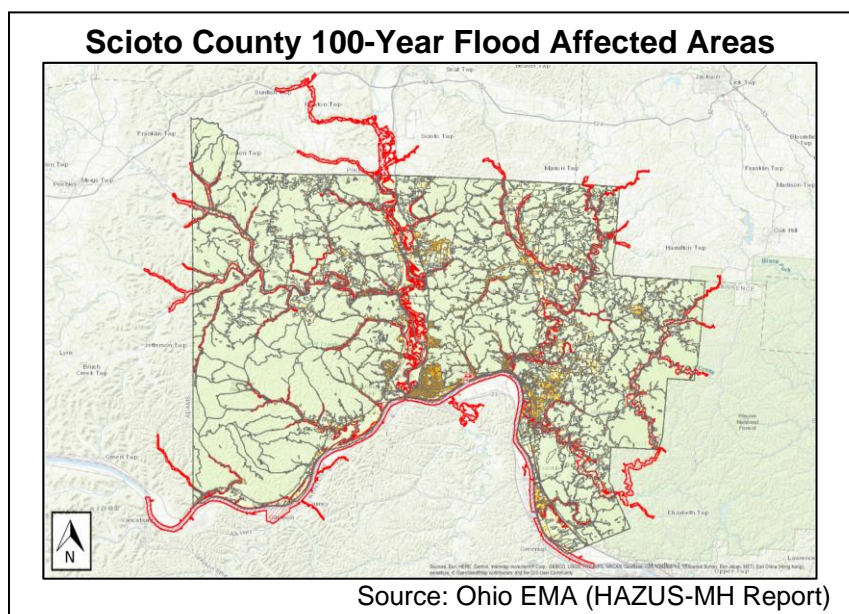
With 99 occurrences in the past 24 years, the probability of such an occurrence in a given year is 413% or an average of one every 3 months.

With 36 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 24 years, the probability of such an occurrence in a given year is 150% or an average of one every 8 months. There is a 18% probability of an occurrence with damages exceeding \$1,000,000.

#### 5. Affected Locations

Flooding affects the entire county, primarily in the flood plains. There are mapped flood plain areas primarily along the Scioto River basin and its and the Ohio River tributaries.

However, areas not identified as being in a flood plain can experience flooding as well. The National Flood Insurance Administration estimates that one-third of the claims that they receive are for structures located outside of a mapped flood plain.



The FEMA HAZUS – Multi-Hazard Risk Assessment Program simulation<sup>17</sup> results for a 100-year flood affecting Scioto County was used to estimate damages and impact on community assets.

A **Repetitive Loss Property** is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP.

A **Severe Repetitive Loss (SRL) Property** any NFIP-insured residential property that has met at least 1 of the following paid flood loss criteria since 1978, regardless of ownership:

- 4 or more separate claim payments of more than \$5,000 each (including building and contents payments); or
- 2 or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.<sup>18</sup>

Repetitive loss properties are the biggest draw on the National Flood Insurance Fund. Community leaders and residents are also concerned with the repetitive loss problem because residents' lives are disrupted and may be threatened by the continual flooding. The primary objective of the repetitive loss properties strategy is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties.<sup>19</sup>

There are 26 repetitive loss structures in Scioto County. Loss information through August 2018 is summarized below:<sup>20</sup>

Community	Nbr	RFC		Building	Contents	Total	SRL
		Structures	Losses				
Scioto County	390496	23	52	\$472,149	\$105,600	\$577,749	1
Portsmouth	390498	3	6	\$47,019	\$4,096.00	\$51,115	0

## 6. Analysis

Factor	Ranking
Frequency	Excessive: 9+ Declarations
Response	< 1 Week
Onset	12-24 Hours
Magnitude	10-25% Land Area
Business	1 Week
Human	Minor Injuries
Property	< 10% Damaged

## 7. Vulnerable Community Assets

Asset	Impact
People	Major flooding potentially affects a large portion of the population, either directly or indirectly. This includes structural damages, isolation from essential services, need for relocation or sheltering, injuries and possibly death. Casualities. HAZUS-MH estimates no casualties.

<sup>17</sup> Provided by Ohio EMA, available in Scioto County EMA Office

<sup>18</sup> [https://www.fema.gov/pdf/nfip/manual201205/content/20\\_srl.pdf](https://www.fema.gov/pdf/nfip/manual201205/content/20_srl.pdf)

<sup>19</sup> [https://www.fema.gov/txt/rebuild/repetitive\\_loss\\_faqs.txt](https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt)

<sup>20</sup> Ohio EMA – 6/2/2020

Asset	Impact
	Displaced and Sheltered. HAZUS-HM estimates 3,581 people would be displaced and 108 of the these would seek shelter in public shelters.
Economy	Flooded businesses would be out of business until clean up and repairs are completed and damaged inventory replaced. HAZUS-MH 100-year flood simulation estimates \$373.34 million in economic losses.
Infrastructure	The primary vulnerable infrastructure assets are roads, culverts and bridges, damaged by erosion. HAZUS-MH doesn't simulate these damages. There is potential for contaminating water supplies and inundating wastewater treatment facilities.
Structures	The Planning Team used the results of FEMA's HAZUS-MH simulation of a 100-year flood to quantify structural damages. HAZUS-MH estimates the following structural damages. The critical facility impact is loss of use.

Structure Type	Inven- tory	Average Value	%	At Risk Number	%	Damaged Number	%	Damages Total
Residential	30,412	\$189,024	100	30,412		437		\$85,790,000
Nonresidential	2,582	\$684,737	100	2,582		1		\$4,815,000
Critical	59	\$684,737	100	59		3		\$14,445,000

## B. Severe Winter Storms

### 1. Description

A winter storm is an event in which the main types of precipitation are snow, sleet or freezing rain. Winter Storm hazards include wind chill, ice storms, heavy snow, and blizzard conditions.

Most deaths from winter storms are not directly related to the storm itself.

- People die in traffic accidents on icy roads.
- People die of heart attacks while shoveling snow.
- People die of hypothermia from prolonged exposure to cold.

Everyone is potentially at-risk during winter storms. The actual threat to you depends on your specific situation. Recent observations show that:

Of injuries related to ice and snow:

- About 70% occur in automobiles.
- About 25% are people caught out in the storm.
- Majority are males over 40 years old.

Of injuries related to exposure to cold:

- 50% are people over 60 years old.
- Over 75% are males.
- About 20% occur in the home.

Three basic ingredients are necessary to make a winter storm:

- Cold air. Below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.
- Lift. Something to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountainside.
- Moisture. To form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.

The severity may be measured in inches of snow or ice, but it's more the combination of freezing precipitation with the ambient and precipitation conditions just before the storm as well as the duration of freezing temperatures with temperatures hovering around freezing being an enhancer to the severity.

Wet Snow and Freezing Rain can weigh down power lines, tree limbs and roofs of structures. Wet snow compacts and can be difficult to dispose of.

Ice results from rain freezing or snow compacting. In addition to the effects of wet snow and freezing rain, ice can build up over time. As the temperature drops, it becomes harder and difficult to remove with snow plows; heavy equipment is usually needed. As the temperature rises above freezing, ice left on gravel roads, as are most township roads, will melt and seep into the roadbed causing the "bottom to drop out."

Dry Snow is usually not a significant problem as it can be plowed away.

There may also be flooding if the snow/ice accumulation is significant and the temperatures warm quickly.

Severe winter storms are those winter storms that have a significant impact. Source: NOAA<sup>21</sup>.

**2. Extent of Hazard**

The severity of winter storms is measured in terms of snowfall, wind and temperature. Generally, a severe winter storm adds at least 6 new inches of snow, has winds of 40 mph or greater, causes ice accumulation of ½ inch or more or has a wind chill factor or less than 0 degrees.

Significant events as recorded by NCEI and local sources are considered occurrences.

Major occurrences are those that caused injuries, deaths or total damage \$5,000 or greater.

**3. Historical Occurrence**

The following major occurrences were recorded by the National Centers for Environmental Information (NCEI)<sup>22</sup> and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Winter Storm	1/6/1996	0	0	500	0
Cold/Wind Chill	2/1/1996	0	0	20	0
Winter Storm	2/16/2003	0	0	1500	0

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	24	95	0	0	21.274	0	396%	3
Major Events	24	3	0	0	673.67	0	13%	96

• **Winter Storm – 6/1/1996**

The Blizzard of '96 developed near the Gulf Coast and moved up the East Coast. This massive system produced the greatest total and 24-hour snowfall at Greater Cincinnati/Northern Kentucky airport. This one storm brought 14.3 inches of snowfall to the airport which normally receives 23 inches for an entire season. The heaviest snow fell near the Ohio river in the extreme south. The worst blizzard conditions occurred over West Central areas as dry and powdery snow was blown around by high winds causing whiteouts. Some areas had more than 30 continuous hours of snowfall, and many people in Southern Ohio felt this was the worst winter storm since

<sup>21</sup> <http://www.nssl.noaa.gov/education/svrwx101/winter/>

<sup>22</sup> <http://www.NCEI.noaa.gov/stormevents/>

the Blizzard of '78. In Fayette county, the airport reported a wind gust to 56 mph during the height of the storm. By the end of the storm many homes and businesses had their roof collapse or partially collapse from the weight of the new snow, and snow from a storm earlier in the week. By late in the day on the 7th arctic air was pouring into the region.

- **Winter Storm – 2/16/2003**

Warm, moist air on southerly winds were brought to the Ohio River valley during the early morning hours. Cold air in place at the surface allowed most of this precipitation to fall as freezing rain. Most areas received a quarter to a half inch of ice accumulation.

- **Cold/Wind Chill – 1/2/1996**

Arctic high pressure brought the coldest air of the season to the Ohio Valley. Cincinnati broke its record low on the 4th with a temperature of 11 below zero. Cincinnati also experienced its record low maximum temperatures of 7 and 6 degrees on the 3rd and 4th respectively. The extreme cold was entrenched for 5 days, freezing and bursting numerous water pipes. There were at least 2 house fires indirectly related to the cold weather, as space heaters, which were thawing frozen water lines, caught on fire. On the 5th, six thousand customers were without power near Portsmouth as overuse caused outages. AAA motor club had an extremely high number of calls during this cold wave when cars would not start.

**4. Probability of Future Occurrences**

With 89 occurrences in the past 23 years, the probability of such an occurrence in a given year is 387%% or an average of one every 3 months.

With 3 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 23 years, the probability of such an occurrence in a given year is 13% or an average of one every 92 months.

**5. Affected Locations**

Severe winter storms affect the entire county.

**6. Analysis**

Factor	Ranking
Frequency	Medium: 3-5 Declarations
Response	< 1 Week
Onset	12-24 Hours
Magnitude	25-50% Land Area
Business	1 Week
Human	Some Injuries
Property	< 10% Damaged

**7. Vulnerable Community Assets**

Asset	Impact
People	The primary impact on people would be isolation and not being able to travel at least on primary routes for about 12 hours after the storm subsided. People living on township roads may be affected for several days to a week. Injuries may occur from traveling in hazardous conditions, home fires from using auxiliary heat sources, lack of heat and building/roof collapse.
Economy	Loss of power would affect businesses both in loss of sales and refrigeration.

Asset	Impact
Infrastructure	The primary vulnerable infrastructure assets are roads – covered to the point of not being passable and the roadbed being damaged by thawing. Electric and communications lines and poles may be damaged by heavy snow and ice.
Structures	Older structures and those with flat roofs would be most at risk by the weight of snow and ice on their roofs. The following table shows the Planning Team's damage estimates.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	30,412	\$189,024	2	608	10	61	5	\$574,860
Nonresidential	2,582	\$684,737	1	26	10	3	6	\$106,079
Critical	59	\$684,737	0	0	5	0	0	\$0

## **C. Severe Summer Storms (includes Windstorms and Hail)**

### **1. Description**

A thunderstorm is a rain shower during which you hear thunder. Since thunder comes from lightning, all thunderstorms have lightning. A thunderstorm is the result of convection. Usually created by surface heating, convection is upward atmospheric motion that transports whatever is in the air along with it—especially any moisture available.

Damaging winds are often called “straight-line” winds to differentiate the damage they cause from tornado damage. Strong thunderstorm winds can come from a number of different processes. Most thunderstorm winds that cause damage at the ground are a result of outflow generated by a thunderstorm downdraft. Damaging winds are classified as those exceeding 50-60 mph.

A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

Damage from severe thunderstorm winds account for half of all severe reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles.

Since most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft, anyone living in thunderstorm-prone areas of the world is at risk for experiencing this hazard. People living in mobile homes are especially at risk for injury and death. Even anchored mobile homes can be seriously damaged when winds gust over 80 mph.

Severe windstorms can have a devastating effect on a community. Winds can cause trees to fall and structures to fail. These can cascade into other impacts such as downed power lines, interrupting travel and power, and trees blocking roads and causing damage to close-by structures.

Hail is often produced by severe thunderstorms. Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes and cars, and can be deadly to livestock and people.

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Hailstorms frequently accompany thunderstorms, so their locations and spatial extents overlap. Hail can cause substantial damage to vehicles, roofs, landscaping, and other areas of the built environment. U.S. agriculture is typically the area most affected by hail storms, which cause severe crop damage even during minor events.

Hail is usually pea-sized to marble-sized, but big thunderstorms can produce big hail.

### **2. Extent of Hazard**

A thunderstorm is classified as “severe” when it contains one or more of the following: hail one inch or greater, winds gusting in excess of 50 knots (57.5 mph), or a tornado. Additionally, rainfall rates greater than 2 inches per hour or one that produces hail indicates a severe thunderstorm.

The severity of hailstorms is measured in hail size. Hail of .75-inch diameter is considered to be damaging.

Significant events as recorded by NCEI and local sources are considered occurrences.

Major occurrences are those that caused injuries, deaths or total damage \$5,000 or greater.

### 3. Historical Occurrence

The following major occurrences were recorded by the National Centers for Environmental Information (NCEI)<sup>23</sup> and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Thunderstorm Wind	4/15/1994	0	0	55	0
Thunderstorm Wind	4/28/1994	0	0	5	0
Thunderstorm Wind	6/21/1994	0	0	50	0
Hail	9/25/1994	0	0	5	50
Thunderstorm Wind	6/29/1995	0	0	20	0
Thunderstorm Wind	5/4/1996	0	0	5	0
Thunderstorm Wind	5/8/1996	0	0	10	0
Thunderstorm Wind	6/7/1996	0	0	5	0
Thunderstorm Wind	6/24/1996	0	0	5	0
Thunderstorm Wind	8/15/1996	0	0	5	0
Thunderstorm Wind	8/21/1996	0	0	10	0
Thunderstorm Wind	11/7/1996	0	0	5	0
Thunderstorm Wind	7/2/1997	0	0	5	0
Thunderstorm Wind	8/17/1997	0	0	16	0
Thunderstorm Wind	5/21/1998	0	0	5	0
Thunderstorm Wind	7/19/1998	0	0	20	0
Thunderstorm Wind	8/25/1998	0	0	5	0
Thunderstorm Wind	11/10/1998	0	0	5	0
Thunderstorm Wind	8/24/1999	0	0	5	0
Thunderstorm Wind	4/20/2000	0	0	5	0
Hail	7/28/2000	0	0	5	0
Thunderstorm Wind	7/28/2000	0	0	25	0
Thunderstorm Wind	8/9/2000	0	0	60	0
Thunderstorm Wind	9/20/2000	0	0	5	0
Thunderstorm Wind	11/9/2000	0	0	10	0
Thunderstorm Wind	4/6/2001	0	0	10	0
Thunderstorm Wind	10/24/2001	0	0	5	0
High Wind	3/9/2002	0	0	12	0

<sup>23</sup> <http://www.NCEI.noaa.gov/stormevents/>

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Thunderstorm Wind	6/4/2002	0	0	5	0
Hail	5/26/2004	0	0	20	0
Thunderstorm Wind	4/22/2005	0	0	20	0
Thunderstorm Wind	5/19/2005	0	0	5	0
Thunderstorm Wind	6/14/2005	0	0	6	0
Thunderstorm Wind	6/30/2005	0	0	10	0
High Wind	12/1/2006	0	0	6	0
Thunderstorm Wind	6/13/2007	0	0	5	0
Hail	8/3/2007	0	0	5	0
Thunderstorm Wind	8/25/2007	0	0	5	0
Thunderstorm Wind	2/6/2008	0	0	15	0
Thunderstorm Wind	6/4/2008	0	0	9	0
Hail	6/10/2008	0	0	6	0
Thunderstorm Wind	6/10/2008	0	0	9	0
High Wind	9/14/2008	0	0	9000	0
Thunderstorm Wind	2/11/2009	0	0	38	0
Thunderstorm Wind	6/14/2009	0	0	8	0
Thunderstorm Wind	7/11/2009	0	0	66	0
Thunderstorm Wind	8/5/2010	0	0	5	0
Thunderstorm Wind	3/23/2011	0	1	3	0
Thunderstorm Wind	5/22/2011	0	0	11	0
Thunderstorm Wind	6/21/2011	0	0	5	0
Thunderstorm Wind	6/29/2012	0	0	163	0
Thunderstorm Wind	7/4/2013	0	0	25	0
Thunderstorm Wind	7/10/2013	0	0	44	0
Thunderstorm Wind	9/2/2013	0	0	5	0
Thunderstorm Wind	9/12/2013	0	0	5	0
Thunderstorm Wind	12/22/2013	0	0	41	0
Thunderstorm Wind	6/4/2014	0	0	10	0
Thunderstorm Wind	6/10/2014	1	0	61	0
Thunderstorm Wind	5/11/2015	0	0	13	0
Thunderstorm Wind	7/7/2015	0	0	6	0
Thunderstorm Wind	7/13/2015	0	0	23	0
Thunderstorm Wind	7/14/2015	0	0	8	0
Thunderstorm Wind	7/8/2016	0	0	7.5	0

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Thunderstorm Wind	7/14/2016	0	0	10	0
Thunderstorm Wind	3/1/2017	0	0	10	0
Thunderstorm Wind	6/13/2018	0	0	5	0
Thunderstorm Wind	7/2/2018	0	0	5	0
Thunderstorm Wind	5/17/2019	1	0	70	0
Thunderstorm Wind	6/16/2019	0	0	6	0
Thunderstorm Wind	1/11/2020	0	0	40	0

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	52	253	0.0	0.0	41.2	0.2	487%	2
Major Events	52	70	0.0	0.0	148.8	0.7	135%	9

**4. Probability of Future Occurrences**

With 72 occurrences in the past 49 years, the probability of such an occurrence in a given year is 147% or an average of one every 8 months.

With 5 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 49 years, the probability of such an occurrence in a given year is 10% or an average of one every 118 months.

**5. Affected Locations**

Severe summer storms affect the entire county.

**6. Analysis**

Factor	Ranking
Frequency	Low: 1-2 Declarations
Response	< 1 Week
Onset	6-12 Hours
Magnitude	> 50% Land Area
Business	< 24 Hours
Human	Minor Injuries
Property	< 10% Damaged

**7. Vulnerable Community Assets**

Asset	Impact
People	The primary impact on people would be isolation and not being able to travel at least on primary routes for several hours – perhaps more on township roads that may be washed out. In some cases county roads, state routes and US highways may also be rendered impassible due to erosion damage. Injuries are possible from hail and other falling objects.
Economy	Loss of power affect businesses both in loss of sales and refrigeration.
Infrastructure	The primary vulnerable infrastructure assets are roads, culverts and bridges, damaged by erosion. Lightning may adversely affect electrical and communications systems.
Structures	The following table shows the Planning Team's damage estimates.

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	30,412	\$189,024	4	1,216	1	12	5	\$114,972
Nonresidential	2,582	\$684,737	3	77	1	1	5	\$26,520
Critical	59	\$684,737	2	1	1	0	5	\$404

**D. Tornadoes**

**1. Description**

A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

Tornadoes can have a devastating effect on a community. Tornadoes can cause trees to fall and structures to fail. These can cascade into other impacts such as downed power lines, interrupting travel and power, and trees blocking roads and causing damage to close-by structures.

**2. Extent of Hazard**

The severity of tornadoes is measured by the damaged it caused and relates it back to estimated three-second wind speed. The Enhanced Fujita Scale is used to rate tornadoes.

Significant events as recorded by NCEI and local sources are considered occurrences.

Major occurrences are those that caused injuries, deaths or total damage \$5,000 or greater.

EF 0	65-85 mph
EF 1	86-110 mph
EF 2	111-135 mph
EF 3	136-165 mph
EF 4	166-200 mph
EF 5	Over 200 mph

**3. Historical Occurrence**

The following major occurrences were recorded by the National Centers for Environmental Information (NCEI)<sup>24</sup> and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Tornado	4/8/1965	0	0	250	0
Tornado	4/23/1968	76	7	2750	0
Tornado	4/8/1980	1	0	250	0
Tornado	6/16/1982	0	0	25	0
Tornado	5/16/1990	0	0	250	0
Tornado	2/21/1993	0	0	500	0
Tornado	4/15/1994	0	0	500	0
Tornado	5/4/1996	0	0	25	0
Tornado	5/8/1996	0	0	5	0
Tornado	8/9/2000	0	0	300	0
Tornado	5/19/2005	0	0	20	0
Tornado	3/2/2012	0	0	180	10
Tornado	6/4/2014	0	0	100	0

<sup>24</sup> <http://www.NCEI.noaa.gov/stormevents/>

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	49	13	5.9	0.5	396.54	0.7692	27%	45
Major Events	49	13	5.9	0.5	396.54	0.7692	27%	45

- **Tornado – 2/21/1993**

A tornado first touched down near Davis Road and County Road 41. The storm moved northeast across this hilly area damaging several home roofs, portions of barn roofs, and downed many trees. Several mobile homes were completely destroyed. Shawnee Greenhouse sustained severe damage. Two homes were completely destroyed.

- **Tornado – 9/8/2000**

Two clusters of thunderstorms caused significant damage on the 9th. During the morning hours, a large bow echo raced across the area causing widespread wind damage. During the afternoon and evening hours, a large cluster of storms formed causing widespread wind damage and hail along with some flooding.

Hundreds of trees were knocked down across the county, including around 100 in West Portsmouth alone. Nearly every road in the county with a ridge had trees across the road. Quarter size hail also fell around Mc Dermott.

- **High Wind – 9/14/2008**

The remnants of hurricane Ike raced northeast through the Midwest and merged with a frontal boundary across the lower Ohio Valley Sunday morning. Abundant sunshine promoted deep mixing of the atmosphere, and warm, dry air aloft translated down to the surface. Gusty winds in excess of 70 mph persisted for a period of several hours, causing significant damage and widespread power outages.

Strong winds of 40 to 50 miles per hour were sustained for several hours. Wind gusts over 60 mph were common. Widespread damage occurred across the region, from trees being blown down on powerlines, to significant crop losses and structural damage.

- **Thunderstorm Wind – 3/23/2011**

An upper level jet stream tracking through the Ohio Valley combined with low pressure at the surface to produce severe thunderstorms during the afternoon of March 23rd. Several supercells developed producing large hail. There were also a few thunderstorm line segments with damaging wind gusts ahead of drier air rapidly advancing from the west. A second round of thunderstorms occurred closer to the main cold front during the evening of March 23rd to just after midnight on March 24th.

Numerous trees were reported down due to damaging thunderstorm winds.

#### 4. Probability of Future Occurrences

With 13 occurrences in the past 5349 years, the probability of such an occurrence in a given year is 27% or an average of one every 45 months.

With 67 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 53 years, the probability of such an occurrence in a given year is 126% or an average of one every 9 months.

**5. Affected Locations**

Tornadoes affect the entire county.

**6. Analysis**

Factor	Ranking
Frequency	Low: 1-2 Declarations
Response	< 1 Week
Onset	< 6 Hours
Magnitude	10-25% Land Area
Business	1 Week
Human	Minor Injuries
Property	< 10% Damaged

**7. Vulnerable Community Assets**

Asset	Impact
People	People in damaged structures may be injured.
Economy	Loss of power affect businesses both in loss of sales and regrigeration.
Infrastructure	Electricity is likely to be out in localized areas for a period of time. As this time increases, other utilities dependent on power will also likely fail.
Structures	Buildings under construction and in conditions susceptible to high winds could be damaged or destroyed. Additionally, buildings adjacent to large trees may be damaged by falling trees. The following table shows the Planning Team's damage estimates.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	30,412	\$189,024	3	912	1	9	25	\$431,145
Nonresidential	2,582	\$684,737	3	77	1	1	10	\$453,040
Critical	59	\$684,737	2	1	0	0		\$0

## E. Earthquakes

### 1. Description

An earthquake is caused by a sudden slip on a fault. The tectonic plates are always slowly moving, but they get stuck at their edges due to friction. When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the earth's crust and cause the shaking that we feel. Source: USGS<sup>25</sup>

Ohio is located near the New Madrid fault. Scioto County is in the part of Ohio that is designated with a Modified Mercalli Intensity (MMI) of VIII, which anticipates moderate damage. In spite of this, there has been little seismic activity near Scioto County.

### 2. Extent of Hazard

Earthquakes are typically measured on the Richter scale. The analyzed profile is a magnitude 5.0 earthquake with the epicenter in the City of Portsmouth scenario as modeled by the *Hazards U.S. Multi-Hazard* (HAZUS-MH) simulation performed and provided by Ohio EMA. The HAZUS-MH report used in this analysis is available from the Scioto County EMA.

The impact of earthquakes is measured on the Modified Mercalli Scale. The table at the right depicts the scale and its relationship to the Richter Scale.

Any recorded earthquake of magnitude 3 or more is considered an occurrence.

Modified Mercalli Scale		Richter Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibration like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some may awaken; dishes, windows, doors disturbed; autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up in air	7

<sup>25</sup> <http://www.usgs.gov/faq/categories/9827/3343>

**3. Historical Occurrence**

This ODNR map extends back into the 1800s, showing seismic activity in Scioto County on March 20, 2019 (Magnitude 2.1) and nearby in Pike County on December 21, 2014 (Magnitude 2)<sup>26</sup>.



**4. Probability of Future Occurrences**

The USGS reports a 2% probability that Scioto County will be faced with a peak ground acceleration (PGA) of .06 within 50 years. While the USGS hasn't drawn a direct correlation between PGA and magnitude, the Laboratorio de Ingeniería Sísmica, Instituto de Investigaciones en Ingeniería, Universidad de Costa Rica<sup>27</sup>, published research<sup>28</sup> estimating this relationship. A PGA of 2 to 3 relates to a Modified Mercalli Intensity of II and magnitude of 2, characterized as "Felt only by a few persons at rest, especially on upper floors of buildings." Source: USGS<sup>29</sup>.

There is less than a 1% probability of a significant damaging occurrence in any given year.

**5. Affected Locations**

Earthquakes would affect the entire county.

**6. Analysis**

Factor	Ranking
Frequency	None: No Declarations
Response	< 1 Week
Onset	12-24 Hours
Magnitude	10-25% Land Area
Business	1 Week
Human	Minor Injuries
Property	10-25% Damaged

<sup>26</sup> <https://gis.ohiodnr.gov/MapView/?config=earthquakes>

<sup>27</sup> <http://www.lis.ucr.ac.cr/index.php?id=Inicio>

<sup>28</sup> [http://www.researchgate.net/profile/Lepolt\\_Linkimer/publication/228755080\\_Relationship\\_between\\_peak\\_ground\\_acceleration\\_and\\_Modified\\_Mercalli\\_intensity\\_in\\_Costa\\_Rica/links/0c960528bc84924b44\\_000000.pdf](http://www.researchgate.net/profile/Lepolt_Linkimer/publication/228755080_Relationship_between_peak_ground_acceleration_and_Modified_Mercalli_intensity_in_Costa_Rica/links/0c960528bc84924b44_000000.pdf)

<sup>29</sup> <http://earthquake.usgs.gov/learn/topics/mercalli.php>

### 7. Vulnerable Community Assets

Asset	Impact
People	<p>Casualties. HAZUS-MH 5 magnitude simulation estimates that 180 people would receive minor injuries, 41 people would receive greater non-life-threatening injuries, 6 people would receive life-threatening injuries and 10 people would die.</p> <p>Displaced and Sheltered. HAZUS-HM estimates less than 2% of households would be displaced and 72% of the these (343) would seek shelter in public shelters.</p> <p>Electric Service. HAZUS-MH estimates that 46% of households would lose electricity at onset. After one week, 11% would still be without electricity. Less than 2% would still be without electricity after one month.</p> <p>Potable Water. HAZUS-MH estimates that less than 1% of households would lose potable at onset. Within one week, all would be restored.</p>
Economy	HAZUS-MH estimates a total economic loss of \$899.72 million.
Infrastructure	HAZUS-HM estimates all infrastructure would unaffected or operational within one day with the exception 1 bridge which would be operational within 1 week . It also estimates that 6 wastewater treatment systems would have moderate damage; all would be operational within 1 week. 5 of 6 communication systems would have be damaged and be restored in 1 day.
Structures	The Planning Team used the results of FEMA’s HAZUS-MH simulation of an earthquake of 5 magnitude, 5 km deep centered on Chillicothe. HAZUS-MH estimates the following structural damages.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total
			%	Number	%	Number	
Residential	30,412	\$189,024	100	30,412		9,500	\$85,790,000
Nonresidential	2,582	\$684,737	100	2,582		1,455	\$19,167,790
Critical	59	\$684,737	100	59		7	\$92,210

## F. Droughts

### 1. Description

Drought is characterized by a period of extreme dry weather usually complicated by warm temperatures. It is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones, from very wet to very dry. Drought is a temporary aberration from normal climatic conditions; thus, it can vary significantly from one region to another. Drought is different than aridity, which is a permanent feature of climate in regions where low precipitation is the norm, as in a desert. Human factors, such as water demand and water management, can exacerbate the impact that drought has on a region. Because of the interplay between a natural drought event and various human factors, drought means different things to different people. In practice, drought is defined in a number of ways that reflect various perspectives and interests. Below are three commonly used definitions:

*Meteorological Drought* is usually defined based on the degree of dryness (in comparison to some “normal” or average) and the duration of the dry period. Drought onset generally occurs with a meteorological drought.

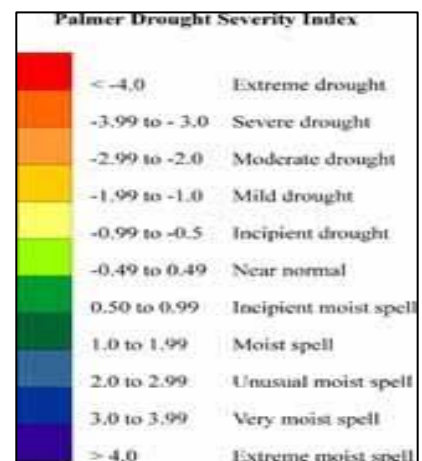
*Agricultural Drought* links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, soil water deficits, reduced ground water or reservoir levels needed for irrigation, and so forth.

*Hydrological Drought* usually occurs following periods of extended precipitation shortfalls that impact water supply (i.e., streamflow, reservoir and lake levels, ground water), potentially resulting in significant societal impacts. Because regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Source: NOAA<sup>30</sup>

### 2. Extent of Hazard

Drought severity is measured using the Palmer Drought Severity Index (PDSI). The PDSI uses readily available temperature and precipitation data to estimate relative dryness. It is a standardized index that spans -10 (dry) to +10 (wet). It has been reasonably successful at quantifying long-term drought. This table translates PDSI indices to plain language.

Droughts declared by the federal or state officials are considered occurrences.



### 3. Historical Occurrence

The following occurrences caused damage to community assets. Available narratives of major events follow. Primary Source: National Centers for Environmental Information (NCEI)<sup>31</sup>.

- **1988-1989 North American Drought**

The Western United States experienced a lengthy drought in the late 1980s. Much of California endured one of its longest droughts ever observed from late 1986 through

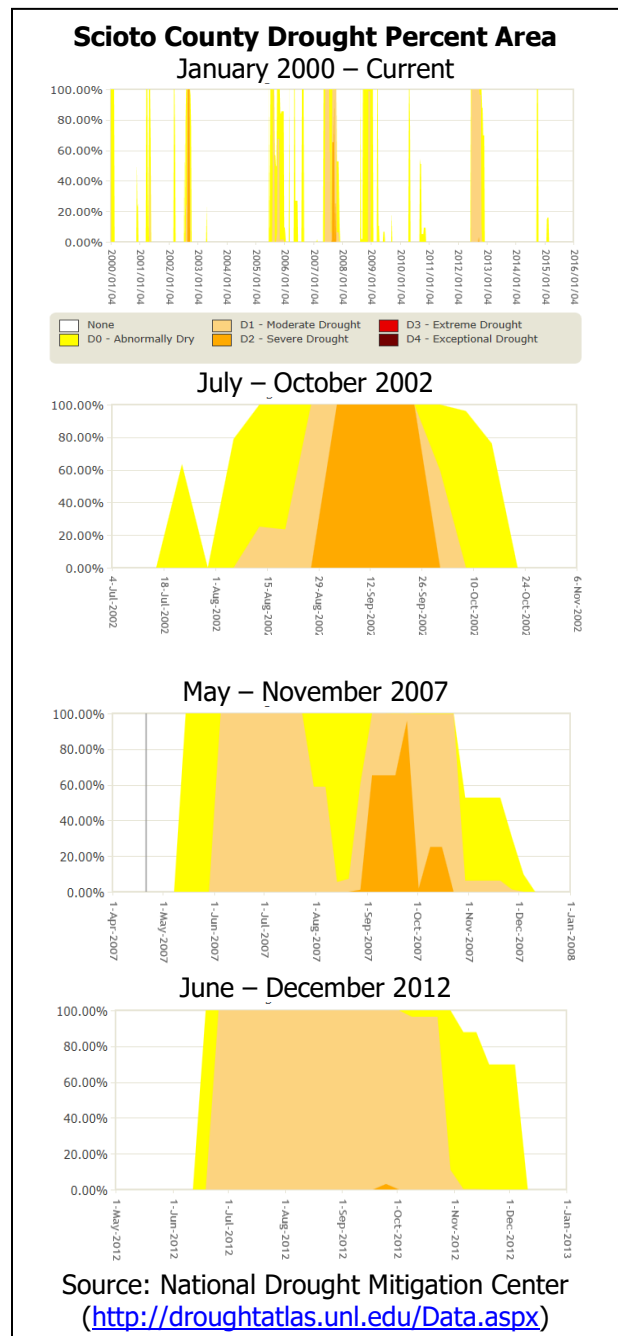
<sup>30</sup> <http://www.nws.noaa.gov/os/brochures/climate/DroughtPublic2.pdf>

<sup>31</sup> <http://www.NCEI.noaa.gov/stormevents/>

early 1991. Drought worsened in 1988 as much of the United States also suffered from severe drought. In California, the five-year drought ended in late 1991 as a significant El Niño event in the Pacific Ocean (and the eruption of Mount Pinatubo in June 1991) most likely caused unusual persistent heavy rains.

Following a milder drought in the Southeastern United States and California in 1987, this drought overspread the Mid-Atlantic states, Southeastern United States, Midwestern United States, northern Great Plains, and Western United States. Heat waves accompanied this widespread, unusually intense drought and killed around 4,800 to 17,000 Americans. The heat also killed livestock across the United States. Farmers perhaps cultivated marginally arable land, contributing to the damage from this drought. Pumping groundwater near depletion also contributed to damage. The drought destroyed crops almost nationwide; lawns of residents went brown, and many cities declared water restrictions. Wildfires in Yellowstone National Park burned many trees and created exceptional destruction in the area. This very catastrophic drought for multiple reasons continued across the Upper Midwest and northern Great Plains states during 1989, not officially ending until 1990. The conditions continued into 1989 and 1990, although the drought ended in some states, thanks to normal rainfalls returning to some portions of the United States. Dry conditions, however, increased again during 1989, affecting Iowa, Missouri, eastern Nebraska, Kansas and certain portions of Colorado. The drought also affected Canada in certain divisions.

The drought of 1988 ranks as the worst drought since the Dust Bowl a half-century earlier in the United States; estimates in 2008 put damages from the drought between \$80 billion and almost \$120 billion in damage (2008 USD). The state of Minnesota alone saw \$1.2 billion in crop losses. The drought of 1988 caused more devastation comparable to that which Hurricane Andrew in 1992 and Hurricane Katrina wrought. In Canada, drought-related losses added to \$1.8 billion (1988 Canadian dollars).



Source: Project Gutenberg Self-Publishing Press<sup>32</sup>

- **Summer 1999 Drought**

Drought conditions existed in Scioto County for a five-month period during the summer of 1999.

*May 1999.* After a dry April, drought conditions resurfaced again during May, after being alleviated during the winter months. Total rains during May were only 1.25 to 2.5 inches. The community of Scioto had only 1.3 inches for the entire month, McArthur had 1.5 inches, while South Point measured 1.9 inches.

*June 1999.* The drought continued to spread and strengthen in southeast Ohio. A deterioration in stream flow and soil moisture was noted. Some showers at the end of the month temporarily helped the topsoil and the crops. Only 1 to 2 inches of rain fell in most areas during the entire month of June. Nelsonville observed the minimum, with just a half inch of rain. Temperatures peaked in the mid and upper 90s during the second week of the month. Beverly registered 98 degrees, while South Point had 97 degrees on the 10th.

*July 1999.* The drought strengthened during the first half of the month, then eased slightly during the last 2 weeks. The worst drought conditions remained in Athens, Lawrence, Gallia, Meigs, and Scioto Counties. In Lawrence County, an emergency drought declaration was issued. Delivery of water to residents with dry or contaminated wells continued in Lawrence County. The town of Rio Grande in Gallia County had to connect to another water system when their source was depleted. In Scioto County, filling stations were set-up for families that had problems with their wells.

The extreme heat depleted much of the moisture from the scattered showers. Preliminary data indicated Beverly of Washington County and South Point of Lawrence County both reached 102 degrees on the 30th.

*August 1999.* The drought eased during the month of August across southeast Ohio. Monthly rains were 3 to 6 inches. Temperatures were not as hot, as those felt during July. However, the drought still lingered at month's end.

*September 1999.* Drought severity either increased or remain about constant during the month. The rainfall during September was mostly between 1 to 2 inches. Yet, South Point of Lawrence County had even less rain, with just three quarters of an inch.

*October 1999.* The drought severity eased as monthly rainfall was near normal. Amounts of 2.5 to 3.0 inches were common. Ground water shortages were still a concern at the end of the month.

- **Summer 2002 Drought**

Two months moderate; two months severe. The emerging drought from August peaked during the first 2 weeks of September, as hot and dry conditions lingered. Rains of 1.5 to 2 inches, plus cooler temperatures, dampened the drought by the fourth week of the month.

- **Fall 2007 Drought**

Three months moderate; one month severe. In September, drought conditions crept north, as the month averaged warmer and drier than normal. The monthly rainfall was mostly between 1 and 2 inches.

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<sup>32</sup> [http://self.gutenberg.org/articles/1988%E2%80%939389\\_North\\_American\\_drought](http://self.gutenberg.org/articles/1988%E2%80%939389_North_American_drought)

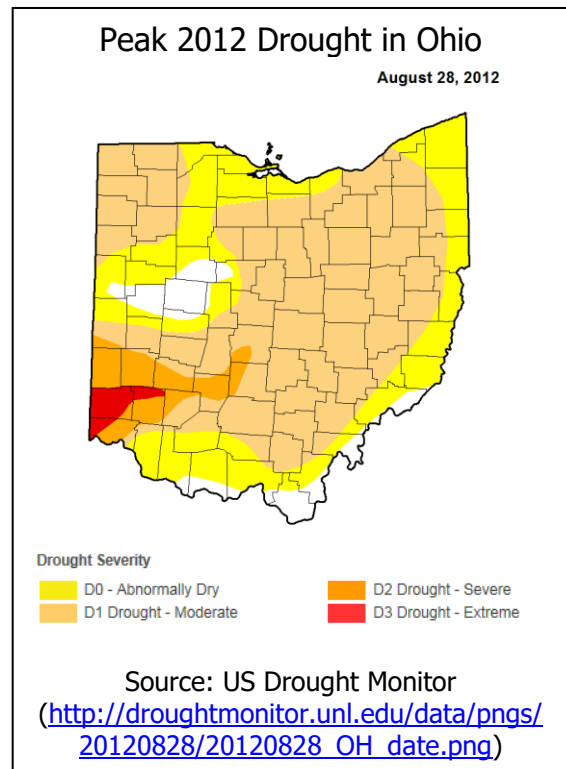
A rare October heat wave, during the 1st and 2nd weeks of the month, helped peak the severity of the drought. On the 11th, Gallia County declared an emergency due to a water shortage. With the lowering of the water table, wells were becoming less productive. Morgan County officials reported that their wildlife was being stressed from the lack of available water. Deer were dying from the effects of the drought and a dry weather disease.

Much needed and widespread rain finally arrived on the 23rd and the 24th. Rain amounts of 2 to 3 inches were common. As the growing season ended and the autumn foliage peaked, drought conditions began to abate or ease.

After peaking in early October, drought conditions continued to ease during the month of November. Monthly rainfall of 3 to 4 inches was common. By the end of November, the drought of 2007 was also coming to an end across southeast Ohio.

- **2012 North American Drought**

The 2012-2013 North American Drought was an expansion of the 2010-2012 United States drought which began in the spring of 2012, when the lack of snow in the United States caused very little melt water to absorb into the soil. The drought includes most of the United States and included Ohio. Among many counties, Scioto County was designated with moderate drought conditions by mid-June. It has been equaled to similar effects as droughts in the 1930s and 1950s but it has not been in place as long. However, the drought has inflicted, and is expected to continue to inflict, catastrophic economic ramifications. In most measures, the drought has exceeded the 1988-1989 North American Drought, which is the most recent comparable drought.



On July 30, 2012, the Governor of Ohio sent a memorandum to the United States Department of Agriculture’s (USDA) Ohio State Executive Director requesting primary county natural disaster designations for eligible counties due to agricultural losses caused by drought and additional disasters during the 2012 crop year. The USDA reviewed and Loss Assessment Reports and determined that there were sufficient production losses in 85 counties to warrant a Secretarial disaster designation. On September 5, 2012, Scioto County was one of those designated counties. Source: Ohio EMA.

*The 2012 North American Drought is the largest drought since the 1950’s as reported by NOAA’s National Climatic Data Center National Drought Report of 15 August 2012<sup>33</sup>. At its peak in Ohio, Scioto County experienced “Moderate Drought Severity” for four months. The University of Illinois at Urbana-Champaign reported a slightly*

<sup>33</sup> <http://www.NCEI.noaa.gov/sotc/drought/201207#det-reg>

elevated crop insurance loss ratio of 1.02 for 2012, indicating little insurance-reported crop loss during this period<sup>34</sup>. Scioto County had no reported crop losses. Source: NCEI<sup>35</sup>

**4. Probability of Future Occurrences**

With five major occurrences in the past 28 years, the probability of an occurrence in a given year is 18%. None resulted in recorded damages; the probability of a damaging occurrence in a given year is close to 0%.

**5. Affected Locations**

Drought affects the entire county. The Scioto County Health Department estimates that less than 5% of the county’s population uses private wells and that the county can provide for the needs of this population during a drought. Public water supplies are generally considered to be adequate to withstand periods of drought. The greatest impact would be on water supplies for livestock and crops.

**6. Analysis**

Factor	Ranking	Notes
Frequency	Low: 1-2 Declarations	
Response	< 1/2 Day	
Onset	> 24 Hours	
Magnitude	> 50% Land Area	
Business	1 Week	
Human	No Impact	
Property	< 10% Damaged	Erosion

**7. Vulnerable Community Assets**

Asset	Impact
People	People relying on private wells may need to find alternate sources of potable water. Less than 5% are on private well water.
Economy	Agricultural impact - crops and livestock. Water-dependent businesses such as car washes.
Infrastructure	No impact.
Structures	No impact.

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	30,412	\$189,024		0		0		\$0
Nonresidential	2,582	\$684,737		0		0		\$0
Critical	59	\$684,737		0		0		\$0

<sup>34</sup> <http://farmdocdaily.illinois.edu/2013/03/drought-crop-insurance-loss-2012.html>

<sup>35</sup> <http://www.NCEI.noaa.gov/stormevents/>

**G. Landslides**

**1. Description**

Landslides are a downslope movement of earth. They may be quick, moving in seconds, or take a varying amount of time to move.

According to the Ohio Department of Natural Resources<sup>36</sup>, the causes of landslides are steep slopes; jointed rocks; fine-grained, permeable rock or sediment; and clay or shale units subject to lubrication (ground water).

**2. Extent of Hazard**

Landslides are measured by a count of occurrences that cause damage or restrict travel.

**3. Historical Occurrence**

Landslides generally occur during or after heavy rain and sometimes result in blocked roadways. Any landslide that impacts people, structures or infrastructure (such as roads) is considered an occurrence.

**4. Probability of Future Occurrences**

Landslides do occur in Scioto County but their impact on community assets is minimal. Therefore, the estimated risk of the future occurrence of an impacting landslide is once in twenty years or 5% in a given year.

**5. Affected Locations**

There are no reports of damage to structures from landslides.

**6. Analysis**

Factor	Ranking	Notes
Frequency	None: No Declarations	Flooding
Response	< 1 Week	
Onset	< 6 Hours	
Magnitude	10% Land Area	
Business	1 Week	
Human	No Impact	
Property	< 10% Damaged	

**7. Vulnerable Community Assets**

Asset	Impact
People	No impact.
Economy	Little or no measurable impact.
Infrastructure	Roads below and above slides would be impacted.
Structures	Minimal impact.

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	30,412	\$189,024		0		0		\$0
Nonresidential	2,582	\$684,737		0		0		\$0
Critical	59	\$684,737		0		0		\$0

<sup>36</sup> <http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof08.pdf>

## H. Land Subsidence

### 1. Description

Subsidence, in the context of underground mining, is the lowering of Earth's surface due to collapse of bedrock and unconsolidated materials (sand, gravel, silt, and clay) into underground mine voids. Mine subsidence can damage the foundations of homes, buildings and roads, disrupt underground utilities, and can be a potential risk to human life.

Ohio's history of underground mining dates to 1800 (pre-Statehood). Commodities mined underground have included coal, clay, limestone, gypsum, conglomerate and, in one unusual instance, even sand and gravel. While underground mining has occurred across the state, the vast majority of underground mining has occurred in the coal- and clay-producing regions of eastern Ohio. The heyday of underground mining activity occurred in the late 1800s through early 1900s, when more than 1,110 underground mines were in operation and more than 50,000 Ohioans were employed in underground mining operations.

An unfortunate consequence of more than two-hundred years of mining underground is mine subsidence—a geologic hazard that can strike with little or no warning and can result in very costly property. Source: ODNR<sup>37</sup>

### 2. Extent of Hazard

Land subsidence is measured by a count of occurrences that cause damage to structures or restrict travel.

### 3. Historical Occurrence

Landslides generally occur during or after heavy rain and sometimes result in blocked roadways. Any landslide that impacts people, structures or infrastructure (such as roads) is considered an occurrence.

### 4. Probability of Future Occurrences

Land subsidence has occurred in Scioto County but impact on community assets has been minimal. Therefore, the estimated risk of the future occurrence of impacting subsidence is once in twenty years or 5% in a given year.

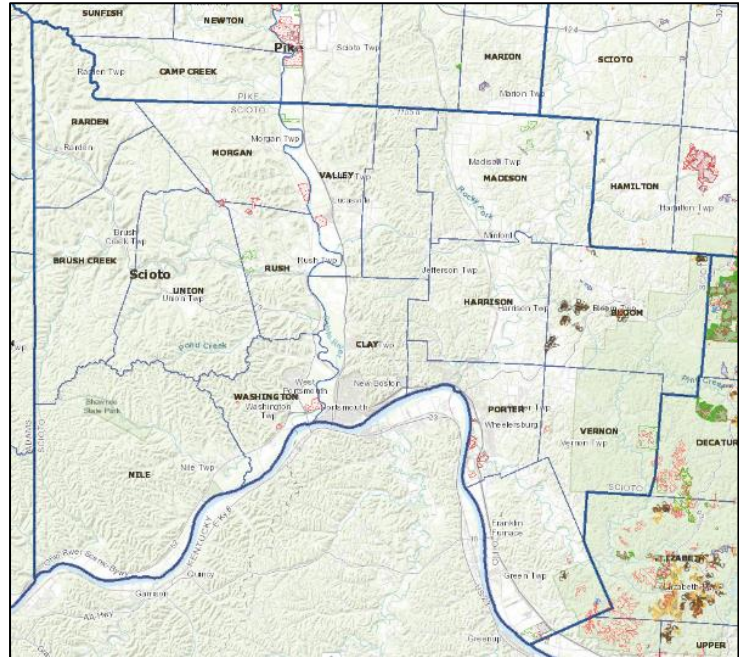
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<sup>37</sup> <http://geosurvey.ohiodnr.gov/geologic-hazards/abandoned-underground-mines/aum-home>

### 5. Affected Locations

This map highlights abandoned underground mines.<sup>38</sup> The Scioto County Engineer has identified seven residential structures that are situated above underground mines:

- 1347 Disterdick Rd – Trailer
- 1153 Gephart Rd – House & Trailer
- 1458 Gephart Rd – House
- 1683 Gephart Rd – House
- 287 Haines Rd – House
- 5202 Tick Ridge Rd – House
- 1745 Webster Hope Rd – House



### 6. Analysis

Factor	Ranking	Notes
Frequency	None: No Declarations	Flooding
Response	< 1 Week	
Onset	< 6 Hours	
Magnitude	10% Land Area	
Business	1 Week	
Human	No Impact	
Property	< 10% Damaged	

#### 1. Vulnerable Community Assets

Asset	Impact
People	People inside subsiding structures may receive minor injuries.
Economy	No impact.
Infrastructure	No impact.
Structures	There are currently 7 residential structures situated over underground mines. These would be damaged beyond repair if the land were to subside.

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	30,412	\$189,024		7		7	100	\$1,323,168
Nonresidential	2,582	\$684,737		0		0		\$0
Critical	59	\$684,737		0		0		\$0

<sup>38</sup> <https://gis.ohiodnr.gov/MapViewer/?config=OhioMines>

## I. Dam Failures

### 1. Description

A dam is a barrier that impounds water or underground streams. The reservoirs created by dams not only suppress floods but provide water for various needs to include irrigation, human consumption, industrial use, aquaculture and navigability. Hydropower is often used in conjunction with dams to generate electricity. A dam can also be used to collect water or for storage of water which can be evenly distributed between locations. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees (also known as dikes) are used to manage or prevent water flow into specific land regions. Source: Wikipedia<sup>39</sup>

A dam failure is partial, complete or catastrophic release of water held behind a dam that results in down-stream flash flooding. In Ohio, dams are classified by size and potential impact of failure: Class I, II, III and IV. Refer to OAC 1501:21-13-01(A)<sup>40</sup>

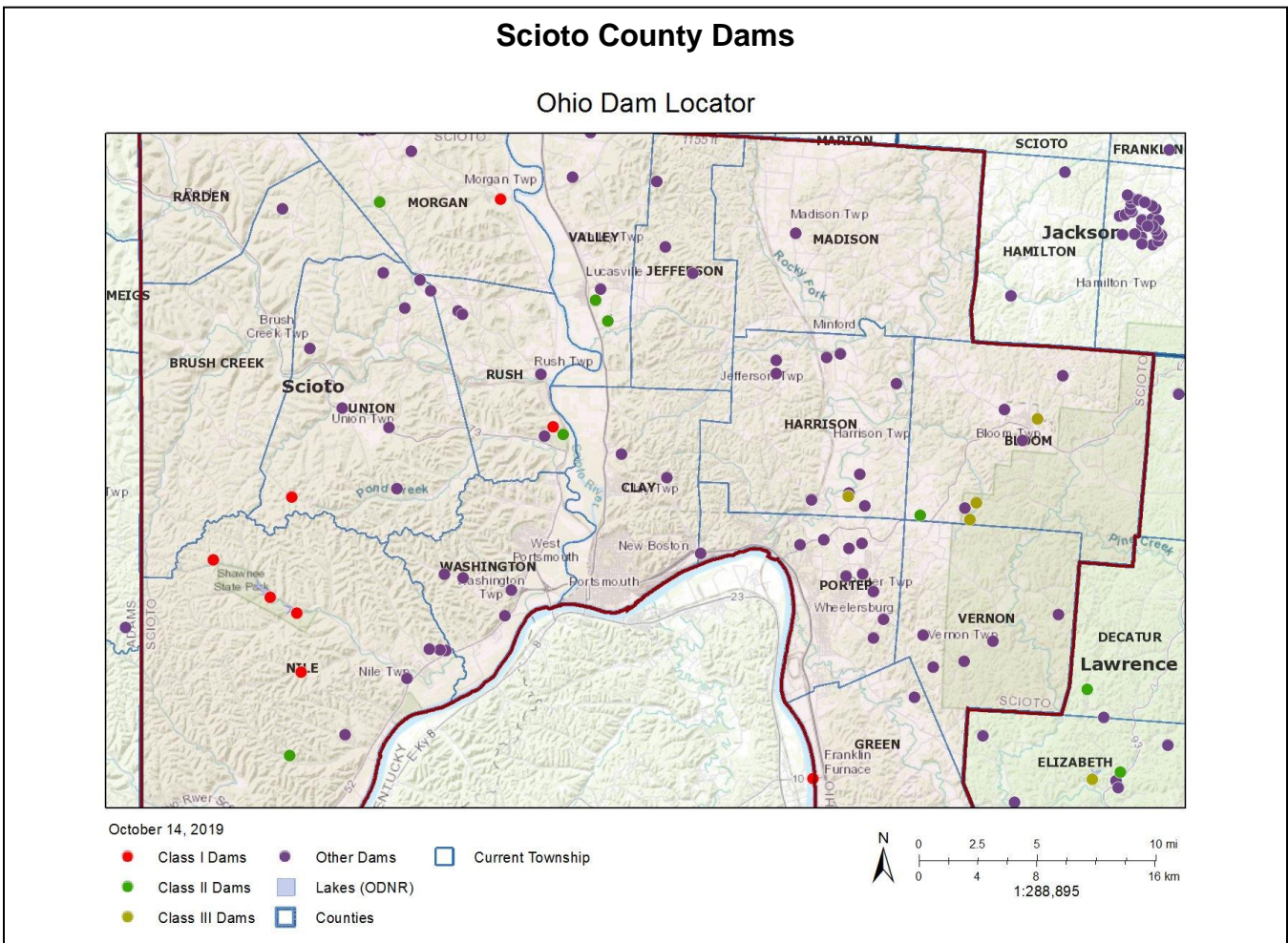
The following Class I and II dams in Scioto County that are rated in the High or Significant Hazard Class as listed in the US Army Corps of Engineers' National Inventory of Dams<sup>41</sup>:

Class	Dam Name	NIDID	Hazard Potential	River	City/ Distance (mi)	Emergency Action Plan Approval Date
I	Bear Creek Lake Dam	OH00498	High	Left Fork of Bear Creek	Arion 8.7	6/8/2018
I	Big Bear Lake Dam	OH00291	High	Bear Creek	Lucasville 3.8	Not Approved
I	Kinskey Lake Dam	OH02376	High	Scioto River	Rosemount 2.5	Not Approved
I	Pond Lick Lake Dam	OH02385	High	Pond Lick Run	Friendship 4.6	6/8/2018
I	Roosevelt Lake Dam	OH00286	High	Turkey Creek	Friendship 5	4/6/2017
I	Turkey Creek Lake Dam	OH00644	High	Turkey Creek	Friendship 5.9	1/27/2017
I	Wolfden Lake Dam	OH02390	High	Wolfden Run	Friendship 8.5	6/8/2018
II	Deemer Lake Dam	OH02378	Significant	Wards Run	Slocum 3.4	Not Approved
II	Elks Country Club Lake Dam	OH00290	Significant	Scioto River	Rosemount 6.4	Not Approved
II	Lake Emma Dam	OH02380	High	East Branch McCullough Creek	Crabtree 2.3	Not Approved
II	Lake Margaret Dam	OH00289	Significant	Candy Run	Rushtown	6/21/ 2018
II	McBride Lake Dam	OH02381	Significant	McBride Run	Garrison 8	Not Approved
II	Scioto County Sludge Lagoon	OH02387	Significant	Candy Run	Lucasville	Not Approved

<sup>39</sup> <https://en.wikipedia.org/wiki/Dam>

<sup>40</sup> <http://codes.ohio.gov/oac/1501:21-13-01>

<sup>41</sup> <https://nid.sec.usace.army.mil/ords/f?p=105:18:7533098219673::NO:::>



## 2. Extent of Hazard

An occurrence would be indicated by a failure of a Class I or II dam.

## 3. Historical Occurrence

There have been no Class I or II dam failures in Scioto County. According to the Stanford University's National Performance of Dam Program (NPDP) Dam Incident database<sup>42</sup>, the following incidents have occurred:

Dam Name	Incident Date	Incident Type
Bear Creek Lake Dam	2/28/1997	Inflow Flood - Hydrologic Event
Big Bear Lake Dam	2/28/1997	Inflow Flood - Hydrologic Event
Big Bear Lake Dam	6/16/1998	Undermining/Displacement
Big Pine Lake Dam	12/14/1998	Concrete Deterioration
Elks Country Club Lake Dam	3/13/1995	Seepage; Piping; Concrete Deterioration
Lake Margaret Dam	2/28/1997	Inflow Flood - Hydrologic Event
Pond Lick Lake Dam	1/22/1997	Inadequate Spillway Capacity
Pond Lick Lake Dam	2/28/1997	Inflow Flood - Hydrologic Event
Roosevelt Lake Dam	2/28/1997	Inflow Flood - Hydrologic Event
Scioto County Sludge Lagoon	3/13/1995	Seepage

<sup>42</sup> [http://npdp.stanford.edu/dam\\_incidents](http://npdp.stanford.edu/dam_incidents)

#### 4. Probability of Future Occurrences

In the American Society of Civil Engineers *2009 Ohio Infrastructure Report Card – Dams Fact Sheet*<sup>43</sup>, Ohio dams received a grade of C. One third of Ohio’s dams were rated Poor or worse and 60% were rated Fair or worse. Based on these high-level ratings, no direct conclusions could be drawn about the failure of Scioto County’s Class I and II dams. Because of this report, the planning team couldn’t assign a value of zero; the probability of a failure in a given year is less than 1%.

#### 5. Affected Locations

Areas affected by failure of Scioto County’s Class I dams follow.

- Friendship, Nile Twp – Turkey Creek:
  - *Pond Lick Lake Dam*. Several houses are located downstream of the Pond Lick Lake Dam. In the event of a dam failure, areas along Morgan Fork and Sunfish Creek would experience a flood wave and may become inundated.
  - *Roosevelt Lake Dam*. No schools or hospitals are located within the inundation areas indicated on the maps prepared for its EAP. A major flood caused by a sudden breach of the dam is estimated to inundate several houses located downstream of the Roosevelt Lake Dam. In the event of a dam failure, areas along Morgan Fork and Sunfish Creek would experience a flood wave and may become inundated.
  - *Turkey Creek Lake Dam*. Upstream of Roosevelt Lake.
  - *Wolfden Lake Dam*. Upstream of Turkey Creek Lake.
- Union Twp:
  - *Bear Creek Lake Dam*. Several houses are located downstream.
  - *Kinsky Lake Dam*. Several houses are located downstream. The outflow travels approximately one-third of a mile before emptying into the Scioto River basin.
- North of Lucasville, west side of Scioto River:
  - *Big Bear Lake Dam*. Approximately a dozen homes are located just below the dam. The outflow travels approximately one-half mile before emptying into the Scioto River basin.

#### 6. Analysis

Factor	Ranking	Notes
Frequency	None: No Declarations	
Response	< 1 Week	
Onset	> 24 Hours	
Magnitude	No Impact	
Business	No Impact	
Human	Minor Injuries	
Property	< 10% Damaged	

#### 7. Vulnerable Community Assets

Asset	Impact
People	Little or no impact.
Economy	Little or no impact.

<sup>43</sup> [http://ohioasce.org/sites/default/files/2009 Dams Fact Sheet.pdf](http://ohioasce.org/sites/default/files/2009%20Dams%20Fact%20Sheet.pdf)

Asset	Impact
Infrastructure	Little or no impact
Structures	Review of inundation maps and data yielded the following estimates:

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	30,412	\$189,024		36	50	18	10	\$340,243
Nonresidential	2,582	\$684,737		0		0		\$0
Critical	59	\$684,737		0		0		\$0

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## Section VI – Mitigation Goals and Actions

### A. Overview

The Scioto County Mitigation Planning Team identified hazards of credible threat and analyzed their impact using qualitative and quantitative methods. The team used the *FEMA Local Mitigation Planning Handbook, March 2013*, as a guide for conducting analysis.

### B. Identification and Analysis Methodology

The Planning Team profiled each hazard. It collected and reviewed hazard information, assessed the impacts and the vulnerabilities of the community’s assets. The team assigned risk factor values based on the criteria and adjusting factors established by the Ohio EMA.

The team then estimated structures at risk and associated damages.

### C. Goals

The Planning Team selected the following mitigation goals:

- Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure
- Provide timely warning
- Increase survivability of emergency communications
- Plan for safe development
- Create self sufficiency
- Increase public awareness

### D. Actions

The Planning Team then reviewed the thirty-six actions from the previous mitigation plan, noted eight as duplicate actions and two as not mitigation actions and one as normal maintenance, identified one as completed, deleted eight, and added eight new actions.

Goal/Action	Status	Note
<b>Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure</b>		
Replace antiquated floodwall pump station control systems	Unchanged	
Anchor mobile homes and propane tanks	Unchanged	
Upgrade undersized/establish storm water drainage systems	Unchanged	
Mitigate structures in flood-prone areas	Unchanged	
Eliminate combined sewer system backflow	Unchanged	
Remove debris in streams	Unchanged	
Reduce erosion of streams	Unchanged	
Alter courses of waterways	Deleted	1
Construct firebreak lines to reduce wildfire risks	Deleted	2
Repair/Upgrade wastewater and water treatment plants	Unchanged	
Identify/resolve potential landslide locations	Unchanged	
Reduce systematic problems caused by utility line ruptures	Unchanged	
Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data	New	
Rehabilitate dams known to be of high hazard potential	New	
Remove debris from February 2004 ice storm, which has increased hazards greatly	Completed	
<b>Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure</b>		

Goal/Action	Status	Note
Enhance public warning systems	Unchanged	
Increase rural broadband coverage	New	
<b>Increase survivability of emergency communications</b>		
Install generators at critical facilities	Unchanged	
Enhance capability to fight wildfires by purchasing additional fire apparatus	Deleted	3
Enhance capability to clean up after winter storms by purchasing additional equipment	Deleted	3
<b>Plan for safe development</b>		
Update FIRMs	Deleted	4
Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages	Unchanged	
Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas	Unchanged	
Implement logging regulations on private land to reduce run-off and landslides	Deleted	1
Identify, inspect and analyze private dams that pose a threat to community assets	Deleted	2
Restrict land use in landslide-prone areas	Deleted	1
Create rental housing inspection and permit program	New	
Conduct a hydrologic and hydraulic (H&H) study of Scioto County	New	
<b>Create self sufficiency</b>		
Establish community shelters	Unchanged	
Construct Safe Rooms - Community	New	
Construct Safe Rooms - Residential	New	
Purchase stock of PPE for first responders	New	
<b>Increase public awareness</b>		
Develop and implement an all-hazards public education program	Unchanged	

Notes. Rationale for deleting actions:

1. Not feasible or currently applicable
2. Handled by state/federal agencies
3. Individual agency responsibility
4. Updated by FEMA

## E. Cost-Benefit Review

Cost-Benefit Review is used to determine the relative feasibility of mitigation actions, thus establishing a prioritized list. The Planning Team used *Using Benefit-Cost Review in Mitigation Planning – State and Local Mitigation Planning How-To Guide Number Five – FEMA 386-5, May 2007*<sup>44</sup>, to conduct this review. Using qualitative methods (Method A), this Cost-Benefit Review methodology was emphasized in the prioritization process.

### 1. Review Benefits and Costs

This step is documented with each selected mitigation action. Refer to *Section VII – Mitigation Action Analysis*.

### 2. Prioritize Actions

The following summarizes the benefits and costs of each mitigation action and reflects the priority assigned by the Planning Team. Guiding criteria was:

- Impact on public safety (isolation and injuries)
- Impact on property damage

<sup>44</sup> [http://www.fema.gov/media-library-data/20130726-1606-20490-3557/how\\_to\\_5\\_final\\_may\\_2007.pdf](http://www.fema.gov/media-library-data/20130726-1606-20490-3557/how_to_5_final_may_2007.pdf)

- Impact on other mitigation actions
- Acceptability of implementation by elected officials and voters
- Monetary costs

Pri	Mitigation Action	Benefits	Costs
1	Replace antiquated floodwall pump station control systems	Flooding prevention	Unknown
2	Enhance public warning systems	Increased public awareness Increased public safety	Unknown
3	Repair/Upgrade wastewater and water treatment plants	Increased public health/safety Decreased response and recovery costs	\$40m
4	Install generators at critical facilities	Increased public safety Increased self-sufficiency	\$250k per site x 4 sites
5	Purchase stock of PPE for first responders	Increased safety of first responders Increased self-sufficiency	Initial cost
6	Develop and implement an all-hazards public education program	Increased public safety Increased self-sufficiency Decreased response and recovery costs	EMA/LEPC availability
7	Establish community shelters	Locally-accessible shelters Increased public safety Increased self-sufficiency	\$100k per site
8	Upgrade undersized/establish storm water drainage systems	Increased public safety Decreased damage to infrastructure	\$400k per site - est 3 sites
9	Eliminate combined sewer system backflow	Properly functioning sewer system Increased public health/safety	\$12.5m per site - 2 sites
10	Reduce systematic problems caused by utility line ruptures	Reduced utility interruption Increased public safety Decreased response and recovery costs	\$10m per site Utility company buy-in
11	Identify/resolve potential landslide locations	Increased public safety Decreased damage to infrastructure	\$400k per site
12	Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas	Increased public safety Decreased response and recovery costs	Elected official buy-in Community buy-in
13	Increase rural broadband coverage	Increased public safety	Unknown
14	Mitigate structures in flood-prone areas	Decreased isolation Increased public safety Decreased response and recovery costs Community-owned green space Decreased response and recovery costs	\$250k per structure Elected official buy-in and funding Property owner buy-in
15	Remove debris in streams	Free-flowing streams Reduced local flooding	\$2.5m Land owner buy-in
16	Reduce erosion of streams	Decreased damage to infrastructure	\$2m
17	Anchor mobile homes and propane tanks	Increased public safety	\$5m Homeowner buy-in

Pri	Mitigation Action	Benefits	Costs
18	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages	Increased public safety Decreased response and recovery costs	Elected official buy-in Community buy-in
19	Conduct a hydrologic and hydraulic (H&H) study of Scioto County	Understanding countywide water flow Understanding impact (positive and negative) and effectiveness of water management projects	\$500k
20	Create rental housing inspection and permit program	Increased public safety Decreased response and recovery costs	Elected official buy-in Community buy-in
21	Construct Safe Rooms - Community	Increased public safety	Project costs (~\$1m) Community buy-in
22	Construct Safe Rooms - Residential	Increased public safety Decreased response and recovery costs	Community education Home-owner buy-in and funding
23	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data	Reduced people, businesses, other assets at risk	Dam owner buy in Study costs
24	Rehabilitate dams known to be of high hazard potential	Reduced people, businesses, other assets at risk	Dam owner buy in Study costs Rehabilitation costs

**Section VII – Mitigation Action Analysis**

**A. Goal: Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure**

**1. Action: Replace antiquated floodwall pump station control systems**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
1	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Flooding

*Jurisdiction(s) Affected:* Portsmouth City

*Project Lead(s):* City of Portsmouth Engineer

*Funding Resource(s):* Community Development Block Grant, Flood Mitigation Assistance Grant, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant

*Mitigation Action Type(s):* Retrofit, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Casualties	Unknown	Fewer	Not quantifiable
People - Stranded/isolated	Unknown	Fewer	Not quantifiable
Structures - Flooded	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Flooding prevention

<b>Costs</b>
Unknown

**2. Action: Anchor mobile homes and propane tanks**

Anchor mobile homes and tanks to protect them from high winds/tornadoes and flooding.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>17</b>	6/30/2020	6/30/2025	\$50m	Unchanged

*Hazards Addressed:* Dam Failure, Hazardous Material Release, Flooding, Tornado

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant

*Mitigation Action Type(s):* Retrofit

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Casualties	Unknown	Fewer	Not quantifiable
People - Property loss	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Increased public safety

<b>Costs</b>
\$5m Homeowner buy-in

**3. Action: Upgrade undersized/establish storm water drainage systems**

Ensure storm water drainage systems can handle expected volumes of water. Primarily in Rosemount, West Portsmouth and Wheelersburg.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>8</b>	6/30/2020	6/30/2025	\$12m	Unchanged

*Hazards Addressed:* Dam Failure, Flooding

*Jurisdiction(s) Affected:* Clay Township, Porter Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Minor Localized Flood Reduction, Planning, Retrofit, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Stranded/isolated	Unknown	Fewer	Not quantifiable
Roadways - damaged or destroyed - sites	3	0	-3

<b>Benefits</b>
Increased public safety Decreased damage to infrastructure

<b>Costs</b>
\$400k per site - est 3 sites

**4. Action: Mitigate structures in flood-prone areas**

Mitigate chronically-flooded/damaged dwellings of willing residents to break the damage-repair-damage-repair cycle through actions such as acquisition and elevation.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>14</b>	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Flooding, Dam Failure

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Flood Plain Managers

*Funding Resource(s):* Community Development Block Grant, Flood Mitigation Assistance Grant, Hazard Mitigation Grant Program, Local Funds, Pre-Disaster Mitigation Grant, Repetitive Flood Claims Program, State Funds

*Mitigation Action Type(s):* Acquisition, Elevation, Planning, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Casualties, homeless (families)	26	0	-26
People - personal property loss	Unknown	Less	Not quantifiable
Structures - damaged/destroyed	26	0	-26

<b>Benefits</b>
Decreased isolation
Increased public safety
Decreased response and recovery costs
Community-owned green space
Decreased response and recovery costs

<b>Costs</b>
\$250k per structure
Elected official buy-in and funding
Property owner buy-in

**5. Action: Eliminate combined sewer system backflow**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>9</b>	6/30/2020	6/30/2025	\$250m	Unchanged

*Hazards Addressed:* Dam Failure, Severe Summer Storms/Thunderstorms, Flooding

*Jurisdiction(s) Affected:* Portsmouth City, New Boston Village

*Project Lead(s):* City of Portsmouth Engineer, Village of New Boston Mayor

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Minor Localized Flood Reduction, Planning, Reconstruction, Retrofit, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Unsanitary conditions	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Properly functioning sewer system Increased public health/safety

<b>Costs</b>
\$12.5m per site - 2 sites

**6. Action: Remove debris in streams**

Remove debris from creeks that causes creeks to overflow their banks and back up water. Obtain permits.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>15</b>	6/30/2020	6/30/2025	\$25m	Unchanged

*Hazards Addressed:* Dam Failure, Severe Summer Storms/Thunderstorms, Flooding

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Debris Removal

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Isolated	Unknown	Fewer	Not quantifiable
Infrastructure Repair	Unknown	Less Cost	Not quantifiable

<b>Benefits</b>
Free-flowing streams Reduced local flooding

<b>Costs</b>
\$2.5m Land owner buy-in

**7. Action: Reduce erosion of streams**

Reinforce stream banks to reduce erosion and undermining of roadways and bridge support structures.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>16</b>	6/30/2020	6/30/2025	\$20m	Unchanged

*Hazards Addressed:* Flooding

*Jurisdiction(s) Affected:* Nile Township

*Project Lead(s):* Nile Twp Trustees

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Retrofit, Reconstruction, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
Roadways - damaged or destroyed - sites	1	0	-1

<b>Benefits</b>
Decreased damage to infrastructure

<b>Costs</b>
\$2m

**8. Action: Repair/Upgrade wastewater and water treatment plants**

Upgrade plants to be able to handle expected volumes of storm water.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>3</b>	6/30/2020	6/30/2025	\$400m	Unchanged

*Hazards Addressed:* Flooding

*Jurisdiction(s) Affected:* Portsmouth City

*Project Lead(s):* City of Portsmouth Engineer

*Funding Resource(s):*

*Mitigation Action Type(s):*

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Unsanitary conditions	Unknown	Fewer	Not quantifiable
People - Loss of potable water	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Increased public health/safety Decreased response and recovery costs

<b>Costs</b>
\$40m

**9. Action: Identify/resolve potential landslide locations**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
11	6/30/2020	6/30/2025	\$16m	Unchanged

*Hazards Addressed:* Landslides

*Jurisdiction(s) Affected:* Scioto County, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Reconstruction, Retrofit, Soil Stabilization

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
Structures - damaged	Unknown	0	Not quantifiable
Roadways - damaged - sites	Unknown	0	Not quantifiable

<b>Benefits</b>
Increased public safety Decreased damage to infrastructure

<b>Costs</b>
\$400k per site

**10. Action: Reduce systematic problems caused by utility line ruptures**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>10</b>	6/30/2020	6/30/2025	\$500m	Unchanged

*Hazards Addressed:* Severe Winter Storms, Flooding, Earthquakes

*Jurisdiction(s) Affected:* Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Retrofit, Reconstruction, Planning

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Loss of service	Unknown	Fewer	Not quantifiable
Structures - damaged	Unknown	0	Not quantifiable
Roadways - damaged - sites	Unknown	0	Not quantifiable

<b>Benefits</b>
Reduced utility interruption
Increased public safety
Decreased response and recovery costs

<b>Costs</b>
\$10m per site
Utility company buy-in

**11. Action: Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data**

Ensure there is current inundation data on all Class I and Class II dams; update EAPs on required dams.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>23</b>	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Dam Failure, Flooding, Earthquakes, Severe Summer Storms/Thunderstorms

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Jurisdictional Flood Plain Managers

*Funding Resource(s):* Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds

*Mitigation Action Type(s):* Planning, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People in inundation zones - Lack of warning	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Reduced people, businesses, other assets at risk

<b>Costs</b>
Dam owner buy in Study costs

**12. Action: Rehabilitate dams known to be of high hazard potential**

Rehabilitate dams to ensure integrity.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>24</b>	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Flooding, Dam Failure, Earthquakes, Severe Summer Storms/Thunderstorms

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Dam owners

*Funding Resource(s):* Hazard Mitigation Grant Program, In-Kind (Work or Labor), Pre-Disaster Mitigation Grant

*Mitigation Action Type(s):* Planning, Reconstruction, Soil Stabilization, Stormwater

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People in inundation zones - Casualties	Unknown	Fewer	Not quantifiable
People in inundation zones - Lack of warning	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Reduced people, businesses, other assets at risk

<b>Costs</b>
Dam owner buy in
Study costs
Rehabilitation costs

**B. Goal: Provide timely warning**

**1. Action: Enhance public warning systems**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
2	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Flooding, Earthquakes, Hazardous Material Release, Terrorist Attack, Severe Winter Storms, Severe Summer Storms/Thunderstorms, Dam Failure, Civil Unrest, Tornado, Land Subsidence, Wildfires, Infectious Disease, Landslides, Droughts

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Scioto County EMA

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Communications

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Unaware of emergency situations	Unknown	Fewer	Not quantifiable
People - Casualties	Unknown	Fewer	Not quantifiable
People - Stranded/isolated	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Increased public awareness Increased public safety

<b>Costs</b>
Unknown

**2. Action: Increase rural broadband coverage**

Increase broadband coverage to facilitate emergency notifications.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>13</b>	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Infectious Disease, Civil Unrest, Landslides, Flooding, Wildfires, Dam Failure, Land Subsidence, Terrorist Attack, Droughts, Earthquakes, Hazardous Material Release, Tornado, Severe Summer Storms/Thunderstorms, Severe Winter Storms

*Jurisdiction(s) Affected:* Scioto County, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant, State Funds, Commercial

*Mitigation Action Type(s):* Planning, Communications

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Unaware of emergency situations	Unknown	Fewer	Not quantifiable

<b>Benefits</b>
Increased public safety

<b>Costs</b>
Unknown

**C. Goal: Increase survivability of emergency communications**

**1. Action: Install generators at critical facilities**

Provide backup power for critical facilities such as community buildings, water treatment plants & lift stations, fire departments and police departments that do not have this capability.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
4	6/30/2020	6/30/2025	\$10m	Unchanged

*Hazards Addressed:* Land Subsidence, Tornado, Flooding, Severe Winter Storms, Severe Summer Storms/Thunderstorms, Wildfires, Terrorist Attack, Earthquakes, Dam Failure, Civil Unrest, Infectious Disease, Landslides, Droughts, Hazardous Material Release

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Facility Agency Heads

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Generators

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People - Not receiving emergency support	Unknown	Fewer	Not quantifiable
Critical Facilities - Loss of power	4	0	-4

<b>Benefits</b>
Increased public safety Increased self-sufficiency

<b>Costs</b>
\$250k per site x 4 sites

**D. Goal: Plan for safe development**

**1. Action: Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>18</b>	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Flooding

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* In-Kind (Work or Labor), Local Funds

*Mitigation Action Type(s):* Planning

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
Structures Outside Flood Zones - Flood damage	Unknown	Unknown	Not quantifiable

<b>Benefits</b>
Increased public safety Decreased response and recovery costs

<b>Costs</b>
Elected official buy-in Community buy-in

**2. Action: Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>12</b>	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Land Subsidence, Landslides, Flooding

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* In-Kind (Work or Labor), Local Funds

*Mitigation Action Type(s):* Planning

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
Structures - Flood damage	Unknown	Unknown	Not quantifiable

<b>Benefits</b>
Increased public safety Decreased response and recovery costs

<b>Costs</b>
Elected official buy-in Community buy-in

**3. Action: Create rental housing inspection and permit program**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>20</b>	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Tornado, Land Subsidence, Flooding, Dam Failure

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* In-Kind (Work or Labor), Local Funds

*Mitigation Action Type(s):* Planning

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People Renting Housing - Unkown Hazards	Unknown	Unknown	Not quantifiable

**Benefits**

Increased public safety Decreased response and recovery costs
--

**Costs**

Elected official buy-in Community buy-in
---

**4. Action: Conduct a hydrologic and hydraulic (H&H) study of Scioto County**

Understand the flow of water to ensure infrastructure is sized correctly to handle floodwaters, while not inadvertently increasing flooding up or down stream. Priority area is Rosemount.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>19</b>	6/30/2020	6/30/2025	\$500k	New

*Hazards Addressed:* Flooding

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Scioto County Engineer

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
All Assets - Flooding	Unknown	Known	Not quantifiable

<b>Benefits</b>
Understanding countywide water flow Understing impact (positive and negative) and effectiveness of water management projects

<b>Costs</b>
\$500k

**E. Goal: Create self sufficiency**

**1. Action: Establish community shelters**

Identify/retrofit existing structures or build new structures to provide each community with a shelter that provides heating/cooling and essential facilities.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>7</b>	6/30/2020	6/30/2025	\$10m	Unchanged

*Hazards Addressed:* Tornado, Hazardous Material Release, Flooding, Severe Winter Storms, Severe Summer Storms/Thunderstorms

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Reconstruction, Retrofit, Storm Shelter

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People in vulnerable structures	Unknown	Fewer vulnerable people	Unknown

<b>Benefits</b>
Locally-accessible shelters Increased public safety Increased self-sufficiency

<b>Costs</b>
\$100k per site

**2. Action: Construct Safe Rooms - Community**

A safe room is an extreme-wind shelter or space that provides protection to people during a tornado or other severe weather.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>21</b>	6/30/2020	6/30/2025	\$10m	New

*Hazards Addressed:* Tornado, Severe Summer Storms/Thunderstorms

*Jurisdiction(s) Affected:* Scioto County, Portsmouth City, New Boston Village, Otway Village, Rarden Village, South Webster Village, Bloom Township, Brush Creek Township, Clay Township, Green Township, Harrison Township, Jefferson Township, Madison Township, Morgan Township, Nile Township, Porter Township, Rarden Township, Rush Township, Union Township, Valley Township, Vernon Township, Washington Township

*Project Lead(s):* Jurisdictional Chief Elected Officials

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Storm Shelter, Planning, Reconstruction, Retrofit

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People in vulnerable structures	Unknown	Fewer vulnerable people	Unknown

<b>Benefits</b>
Increased public safety

<b>Costs</b>
Project costs (~\$1m) Community buy-in

**3. Action: Construct Safe Rooms - Residential**

A safe room is an extreme-wind shelter or space that provides protection to people during a tornado or other severe weather.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
<b>22</b>	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Tornado, Severe Summer Storms/Thunderstorms

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Scioto County EMA

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Storm Shelter, Planning, Retrofit, Reconstruction

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
People in vulnerable structures	Unknown	Fewer vulnerable people	Unknown

<b>Benefits</b>
Increased public safety Decreased response and recovery costs

<b>Costs</b>
Community education Home-owner buy-in and funding

**4. Action: Purchase stock of PPE for first responders**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
5	6/30/2020	6/30/2025	Unknown	New

*Hazards Addressed:* Infectious Disease, Hazardous Material Release, Terrorist Attack

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Scioto County Health Department

*Funding Resource(s):* Community Development Block Grant, Hazard Mitigation Grant Program, Local Funds, Pre-Disaster Mitigation Grant, State Funds

*Mitigation Action Type(s):* Planning, Equipment & Supplies

<b>Vulnerability</b>	<b>Before Implementation</b>	<b>After Implementation</b>	<b>Difference</b>
Unprotected first responders	All	Fewer	Unknown

<b>Benefits</b>
Increased safety of first responders Increased self-sufficiency

<b>Costs</b>
Initial cost

**F. Goal: Increase public awareness**

**1. Action: Develop and implement an all-hazards public education program**

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
6	6/30/2020	6/30/2025	Unknown	Unchanged

*Hazards Addressed:* Earthquakes, Hazardous Material Release, Terrorist Attack, Droughts, Land Subsidence, Severe Summer Storms/Thunderstorms, Severe Winter Storms, Flooding, Landslides, Dam Failure, Wildfires, Civil Unrest, Tornado, Infectious Disease

*Jurisdiction(s) Affected:* Scioto County

*Project Lead(s):* Scioto County EMA

*Funding Resource(s):* In-Kind (Work or Labor), Local Funds

*Mitigation Action Type(s):* Planning, Public Education

<i>Vulnerability</i>	<i>Before Implementation</i>	<i>After Implementation</i>	<i>Difference</i>
People - Unprepared	80%	50%	-30%

<b>Benefits</b>
Increased public safety
Increased self-sufficiency
Decreased response and recovery costs

<b>Costs</b>
EMA/LEPC availability

## Section VII – Supplemental Information

### A. Acronyms, Terms and Definitions

Term	Acronym	Description
<b>Community Development Block Grant Program</b>	CDBC	The Community Development Block Grant program is a flexible program that provides communities with resources to address a wide range of unique community development needs.
<b>Community Asset</b>		The people, structures, facilities, and systems that have value to the community
<b>Dam - Class I</b>		Dams having a total storage volume greater than five thousand acre-feet or a height of greater than sixty feet shall be placed in class I. A dam shall be placed in class I when sudden failure of the dam would result in one of the following conditions: (a) Probable loss of human life. (b) Structural collapse of at least one residence or one commercial or industrial business. Reference: OAC 1501:21-13-01(A)(1)
<b>Dam - Class II</b>		Dams having a total storage volume greater than five hundred acre-feet or a height of greater than forty feet shall be placed in class II. A dam shall be placed in class II when sudden failure of the dam would result in at least one of the following conditions, but loss of human life is not probable. (a) Disruption of a public water supply or wastewater treatment facility, release of health hazardous industrial or commercial waste, or other health hazards. (b) Flooding of residential, commercial, industrial, or publicly owned structures. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. (c) Flooding of high-value property. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. (d) Damage or disruption to major roads including but not limited to interstate and state highways, and the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by the chief. (e) Damage or disruption to railroads or public utilities. (f) Damage to downstream class I, II or III dams or levees, or other dams or levees of high value. Damage to dams or levees can include, but is not limited to, overtopping of the structure. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. Reference: OAC 1501:21-13-01(A)(2)
<b>Dam - Class III</b>		Dams having a total storage volume greater than fifty acre-feet or a height of greater than twenty-five feet shall be placed in class III. A dam shall be placed in class III when sudden failure of the dam would result in at least one of the following conditions, but loss of human life is not probable. (a) Property losses including but not limited to rural buildings not otherwise described in paragraph (A) of this rule, and class IV dams and levees not otherwise listed as high-value property in paragraph (A) of this rule. At the

Term	Acronym	Description
		<p>request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property.</p> <p>(b) Damage or disruption to local roads including but not limited to roads not otherwise listed as major roads in paragraph (A) of this rule.</p> <p>Reference: OAC 1501:21-13-01(A)(3)</p>
<b>Dam - Class IV</b>		<p>Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less may be placed in class IV. When sudden failure of the dam would result in property losses restricted mainly to the dam and rural lands, and loss of human life is not probable, the dam may be placed in class IV. Class IV dams are exempt from the permit requirements of section 1521.06 of the Revised Code pursuant to paragraph (C) of rule 1501:21-19-01 of the Administrative Code.</p> <p>Reference: OAC 1501:21-13-01(A)(4)</p>
<b>Emergency Management Agency</b>	EMA	
<b>Federal Emergency Management Agency</b>	FEMA	<p>FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards.</p>
<b>Hazards U.S. Multi-Hazard</b>	HAZUS-MH	<p>The Hazards U.S. Multi-Hazard is a nationally applicable standardized method that estimates potential losses from earthquakes, hurricane winds, and Flooding. HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display hazard data and estimates of damage and economic loss to buildings and infrastructure.</p>
<b>Impact</b>		<p>The consequences or effects of a hazard on the community and its assets</p>
<b>Mitigation</b>		<p>Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect. Mitigation measures may be implemented prior to, during, or after an incident. Mitigation measures are often informed by lessons learned from prior incidents. Mitigation involves ongoing actions to reduce exposure to, probability of, or potential loss from hazards. Measures may include zoning and building codes, floodplain buyouts, and analysis of hazard related data to determine where it is safe to build or locate temporary facilities. Mitigation can include efforts to educate governments, businesses, and the public on measures they can take to reduce loss and injury.</p>
<b>Modified Mercalli Intensity Scale</b>		<p>The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced at that place.</p> <p>The lower numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage.</p>


Term	Acronym	Description
<b>Natural Hazard</b>		Source of harm or difficulty created by a meteorological, environmental, or geological event
<b>National Flood Insurance Program</b>	NFIP	The National Flood Insurance Program is aimed at reducing the impact of flooding on private and public structures. This is achieved by providing affordable insurance for property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of Risk Insurance in general, and National Flood Insurance in particular.
<b>National Oceanic and Atmospheric Administration</b>	NOAA	Science, Service, and Stewardship. Mission: To understand and predict changes in climate, weather, oceans, and coasts, To share that knowledge and information with others, and To conserve and manage coastal and marine ecosystems and resources.
<b>National Weather Service</b>	NWS	The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.
<b>Ohio Department of Natural Resources</b>	ODNR	
<b>Per Capita</b>		Per unit of population.
<b>Repetitive Loss Property</b>		Any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. The property may or may not be currently insured by the NFIP.
<b>Risk</b>		The potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.
<b>Risk Assessment</b>		Product or process that collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.
<b>Severe Repetitive Loss Property</b>		A residential property that is covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
<b>Threat or Human-Caused Incident</b>		Intentional actions of an adversary, such as a threatened or actual chemical or biological attack or cyber event

Term	Acronym	Description
<b>United States Geological Survey</b>	USGS	The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.
<b>United States Department of Housing and Urban Development</b>	USHUD	HUD's mission is to create strong, sustainable, inclusive communities and quality affordable homes for all. HUD is working to strengthen the housing market to bolster the economy and protect consumers; meet the need for quality affordable rental homes; utilize housing as a platform for improving quality of life; build inclusive and sustainable communities free from discrimination and transform the way HUD does business.
<b>Vulnerability</b>		Characteristics of community assets that make them susceptible to damage from a given hazard

**B. Meetings, Announcements and Correspondence**

The Planning Team held public meetings to officially brief chief elected officials, gather data for inclusion in the updated plan, and make decisions on elements of the plan. The following are announcements and rosters of Planning Team meetings:

**1. May 30, 2019 – Commissioners’ Designation of Agent for This Project**

<p>COMMISSIONERS  <b>Mike Crabtree</b>  <b>Bryan Davis</b>  <b>Cathy Coleman</b></p>	<p>Clerk          Jenn Kish</p>	<p><b>Resolution</b></p>	<p><b>Distribution</b>          Auditor          Emergency Mgt.          File</p>
		<p><b>SCIOTO COUNTY COMMISSIONERS</b></p>	
		<p>Adopted <u>May 30, 2019</u></p>	
		<p>Subject <b>IN THE MATTER OF RESOLUTION          DESIGNATING THE AUTHORIZED          REPRESENTATIVE FOR THE BOARD          OF SCIOTO COUNTY COMMISSIONERS          AND SCIOTO COUNTY IN THE PLANNING          PROCESS FOR AN UPDATE TO THE HAZARD          MITIGATION PLAN GRANT FOR SCIOTO COUNTY          RE: EMERGENCY MANAGEMENT AGENCY</b></p>	
		<p>It was moved by Mr. Davis and seconded by Mr. Crabtree that the following resolution be adopted:</p>	
		<p><b>RESOLUTION</b></p>	
		<p><b>WHEREAS</b>, the Scioto County Commissioners of Scioto County that Kimberly Kay Carver, Scioto County EMA Director is hereby authorized to execute for and in behalf of Scioto County, a public entity established under the laws of the State of Ohio; and</p>	
		<p><b>WHEREAS</b>, this application and to file it in the appropriate State office for the purpose of obtaining certain Federal financial assistance und the Disaster Relief Act (Public Law 288, 23<sup>rd</sup> Congress) or otherwise available from the President’s Disaster Relief Fund;</p>	
		<p><b>NOW, THEREFORE, BE IT RESOLVED</b> that a public entity established under the laws of the State of Ohio, hereby authorized its agent to provide to the State and to the Federal Emergency Management Agency (FEMA) for all matters pertaining to such Federal disaster assistance the assurances and agreements as listed in the Grant Agreement.</p>	
		<p>As to such action, each member voted as follows:</p>	
		<p>Mr. Davis “aye”</p>	<p>Mr. Crabtree “aye”</p>
		<p><b>CERTIFICATION</b></p>	
		<p>I, Jenn Kish, the duly appointed and acting Clerk of the Board of County Commissioners, Scioto County, Ohio, do hereby certify that the above is a true and correct copy of a resolution adopted on May 30, 2019, Commissioners’ Journal 90 &amp; Page 416.</p>	
		<p>By:           Jenn Kish, Clerk</p>	

## 2. August 29, 2019 – Kick Off Meeting and Public Announcement

### a. Invitation to Participate

<b>From:</b>	Scioto EMA <sciotoema@frontier.com>
<b>Sent:</b>	Friday, August 9, 2019 12:39 PM
<b>To:</b>	bdavis@solechoiceinc.com; braison@portsmouthfd.org; Bryan Smith; carla.emmons@sciotocounty.net; chris.smith@portsmouthoh.org; Dan Simco; Darren Price; darren.lebrun@sciotocounty.net; Debby.Basham@oh.nacdnet.net; Denise Rose; dhobbs001@frontier.com; Flood Plain Mgr ; green.fire.dept@gmail.com; HodgeA@somc.org; jking@water1.org; jvandeusen@shawnee.edu; Idmullins3477@yahoo.com; Lorie Haukedahl; Luan Nguyen; Luanne Valentine; mayscr@centrusenergy.com; nbmayor1973@yahoo.com; RDI; Renee Storey; Robert Horton; Ron Syrone; nware@portsmouthohiopolice.com; Sally Bias; Sandy Mers; shawn.sparks@sciotocountysheriff.com; SSutherland@portsmouthoh.org; Steve Sturgill
<b>Subject:</b>	Scioto County Hazard Mitigation Plan Update Committee Kick Off Meeting

Scioto County Hazard Mitigation Plan Update Committee  
 Kick Off Meeting  
 Thursday August 29<sup>th</sup>, 2019  
 10:00 AM  
 Scioto County Emergency Operations Center

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I have reached out to most of you regarding the need for Scioto County Emergency Management Agency to update their Hazard Mitigation Plan once every five years. That five year renewal period is now. A committee is required to be involved in the update process. Scioto EMA will be updating information contained in the plan with your help through a series of (4) meetings at the EOC to review hazard analysis and cost recovery information. The plan must be adopted by jurisdictions for them to be eligible for Federal Disaster Recovery Funds if a Federal Declaration is issued. Scioto County Commissioners will adopt a resolution for all townships and unincorporated areas. Each Village will need to adopt the resolution accepting the completed plan update as well.

Information will be shared in 4 brief meetings and through emails to this group to keep all informed, even if you cannot make one of the meetings. You can also send your authorized representative if you are unable to attend any of the meetings. This first meeting is to kick off the plan update process and familiarize new officials with the plan requirements.

If you haven't been here before, the Scioto County Emergency Operations Center (EOC) is located at 729 6<sup>th</sup> Street in the lower suite (basement). This is the former Life Ambulance HQ and former Chabot Building now housed by ASCEND group programs and the EOC in the basement. Park in the rear in the parking lot and come in the rear glass door marked Emergency Operations Center then come down the stairs to the basement and the EOC.

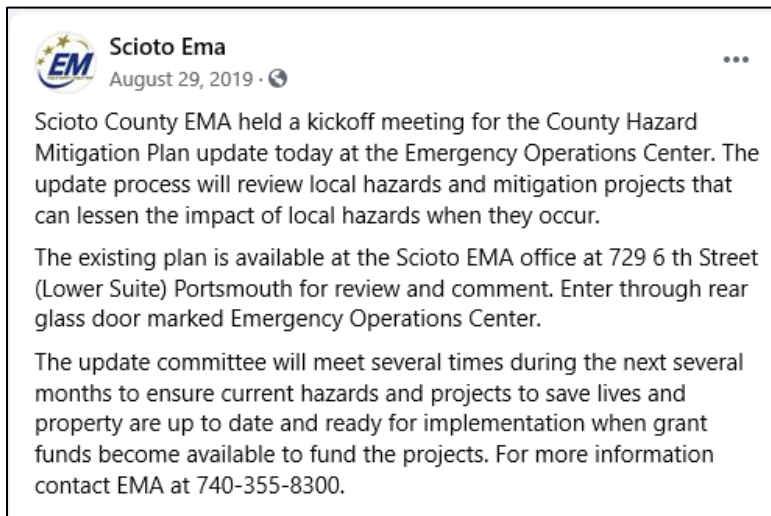
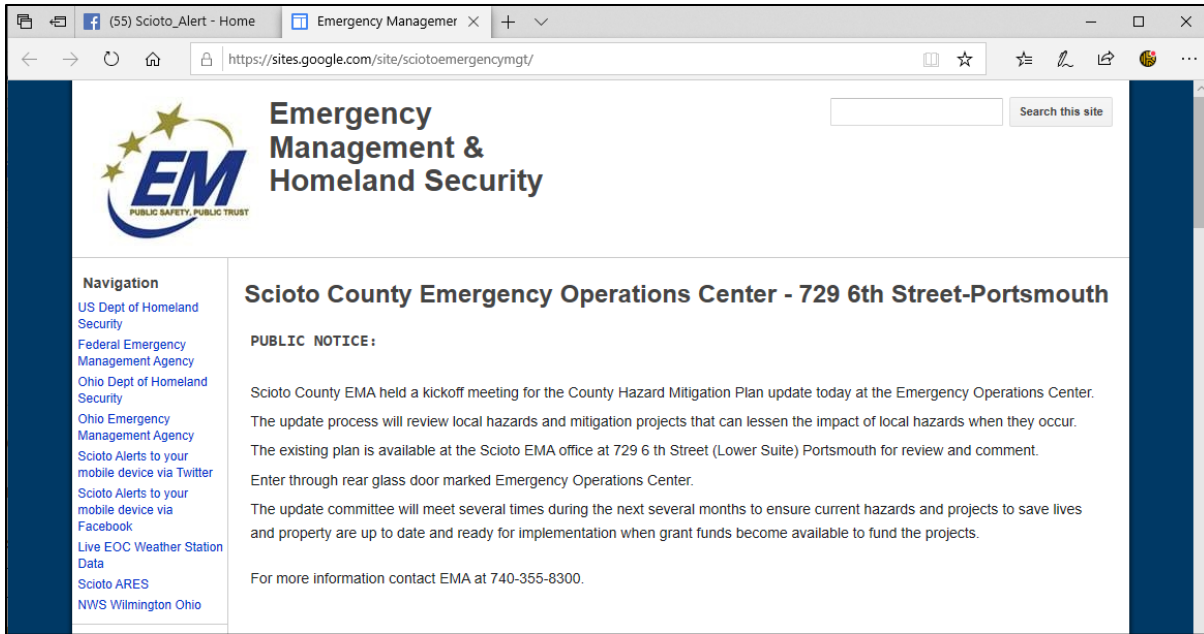
Please call if you have any questions at all about the plan, the process and why you are important to the planning process, or if you get lost

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finding the EOC on the morning of the meeting. Your help is greatly appreciated. This plan update approval by the Federal Emergency Management Agency will ensure citizens are able to get financial assistance in times of emergencies and that the jurisdictional governments can get recovery funds to rebuild infrastructure when federal disaster declaration criteria are met.

Kim Carver, Director  
 Scioto County Emergency Management Agency  
 740-355-8300 Office

**b. Public Announcements**



**c. Sign-In Sheet**

Sign In Log for HAZ MITIGATION PLAN KICK OFF  
 Date 8-29-19 10 AM  
 Location EOC

Name	Address AGENCY	Telephone	Email
Kim Carver	SCIOTO EMA	740-355-8300	<del>kimcarver</del> Sciotema@frontier.com
Sandy Mers	South Central Ohio ESC	740-354-0266	sandy.mers@scoesc.org
DARREN PRICE	Ohio EMA	614-296-3474	DPRICE@ps.ohio.gov
Larry Mullins	ASC/EMA	740-464-9118	lmullins@scioto-county.net
Cecily A Hobbs	Morgan Jump	740-935-5130	hobbs001@frontier.com
Steve Hamill	Village of New Berlin	740-821-6425	steve.hamill@nyb.org
Angela Hodge	SOMC	740-352-6258	ahodge@somc.org
Paul W Sheets	OFFICE SCIOTO COUNTY ENGINEERS	740-259-5541	Paul.Sheets@engsco.org
DAN SIMCO	SALVATION ARMY	740-353-2400	dan.simco@usa.salvationarmy.org
Sam Southard	City of Portsmouth	(740) 354-8807	southard@portsmouthoh.org
Steve Stungis	CEO Scioto County	740 354 7541 #318	sstungis@scioto-county.org
Jody Box	Sherman Truck	740 354-4444	jbox@shermantruck.com
GEORGE MOORE	GREEN FD	740-464-6071	green.fire.dept@gmail.com
SCOTT LEWIS	SCIOTO SUCD	740-259-9231 EXT. 4	scott.lewis@scsnet.net
Molly Davis	PCHD/SHD	740-354-8931	mollydavis@portsmouthoh.org

HAZ MIT PLAN KICK OFF PG 2

Sign In Log for \_\_\_\_\_  
 Date \_\_\_\_\_  
 Location \_\_\_\_\_

Name	Address AGENCY	Telephone	Email
Rick Wilson	PORTSMOUTH FIRE		
Luan Nguyen	OHIO EMA		
Angie Malone	Scioto County Floodplain		
ROBERT WARE	PORTSMOUTH PD		
Kim Stang	Greater Portsmouth Board Real Estate		
Bryan Davis	Commissioners		
Jonathan King	Scioto Co Reg. Water Dist No 1		

### 3. October 24, 2019 – Planning Team Meeting – Hazards

#### a. Announcement

**From:** Scioto EMA <sciotoema@frontier.com>  
**Sent:** Wednesday, October 2, 2019 10:25 AM  
**To:** bdavis@solechoiceinc.com; braison@portsmouthfd.org; Bryan Smith; carla.emmons@sciotocounty.net; chris.smith@portsmouthoh.org; Dan Simco; Darren Price; darren.lebrun@sciotocounty.net; Debby.Basham@oh.nacdn.net; Denise Rose; dhobbs001@frontier.com; Flood Plain Mgr ; green.fire.dept@gmail.com; HodgeA@somc.org; jking@water1.org; jvandeusen@shawnee.edu; ldmullins3477@yahoo.com; Lorie Haukedahl; Luan Nguyen; Luanne Valentine; mayscr@centrusenergy.com; nbmayor1973@yahoo.com; RDI; Renee Storey; Robert Horton; Ron Syrone; rware@portsmouthohiopolice.com; Sally Bias; Sandy Mers; shawn.sparks@sciotocountysheriff.com; SSutherland@portsmouthoh.org; Steve Sturgill  
**Subject:** Scioto County Hazard Mitigation Plan Update Committee Meeting Notice

Good Morning!

The second of four meetings for the Scioto County Hazard Mitigation Plan Update Committee will be held Thursday October 24<sup>th</sup>, 2019 at 11:00 AM at the Scioto County Emergency Operations Center at 729 6<sup>th</sup> Street Lower Suite Portsmouth. Enter through the rear glass door marked Emergency Operations Center and park in the rear parking lot.

A week before the meeting we will email you a section of the plan to review prior to the meetings to see if there are any additions or deletions.

Thanks for helping us with this endeavor!

Kim Carver  
 Scioto EMA  
 740-355-8300 Office

#### b. Sign-In Sheet

Scioto Hazard Mitigation Plan Meeting # 2			
		Oct. 24, 2019	11 AM
		Scioto ECC	
Name	Agency	Telephone	Email
Kim Carver	Scioto EMA	740 355 8300	sciotoema@frontier.com
Darren Price	Ohio EMA	614-296-3474	DPRICE@DPS.OHIO.GOV
Larry Mullins	ASC/Scioto EMA	740-464-9118	lmullins@sciotocounty.net
George Moore	GREEN FD / OVFA	740 464-6071	green.fire.dept@gmail.com
Jonathan King	Scioto Co Reg Water Dist	740-254-2301	jking@water1.org
MIMI LEWIS	Portsmouth City Health	740-354-8954	mimi.lewis@portsmouthoh.org
Dan Simco	SALVATION Army	740-353-2400	dan.simco@usa.salvationarmy.org
SCOTT LEWIS	Scioto SWCD	740-254-9231	scott.lewis@oh.nacdn.net
Darren LeBrun	Scioto County Engineer	740-253-5541	darren.lebrun@sciotocountyengineer.org
Angie Malone	Scioto County Floodplain	740-353-9435	amalane@sciotocounty.net
Sally Bias	Sherman-Ricker Ins	740-354-4444	s.bias@shermanricker.com
Bryan Smith	Scioto County Comm	740-727-2911	bdavis@sciotocounty.net
Steve Sturgill	CAO Scioto	740 354 7541	

**c. Email to Nonattenders for Their Input.**

**From:** RDI Solutions <main@rdisolutions.org>  
**Sent:** Thursday, October 31, 2019 10:00 AM  
**To:** 'Scioto EMA'; 'bdavis@solechoiceinc.com'; 'braison@portsmouthfd.org'; 'Bryan Smith'; 'carla.emmons@sciotocounty.net'; 'chris.smith@portsmouthoh.org'; 'Dan Simco'; 'Darren Price'; 'darren.lebrun@sciotocounty.net'; 'Debby.Basham@oh.nacdnet.net'; 'Denise Rose'; 'dhobbs001@frontier.com'; 'Flood Plain Mgr'; 'green.fire.dept@gmail.com'; 'HodgeA@somc.org'; 'jking@water1.org'; 'jvandeusen@shawnee.edu'; 'ldmullins3477@yahoo.com'; 'Lorie Haukedahl'; 'Luan Nguyen'; 'Luanne Valentine'; 'mayscr@centrusenergy.com'; 'nbmayor1973@yahoo.com'; 'Renee Storey'; 'Robert Horton'; 'Ron Syrone'; 'rware@portsmouthohiopolic.com'; 'Sally Bias'; 'Sandy Mers'; 'shawn.sparks@sciotocountysheriff.com'; 'SSutherland@portsmouthoh.org'; 'Steve Sturgill'  
**Subject:** RE: Hazard Analysis Scoring and Ranking

Good Morning all,  
 Just to clarify where we are and what to do with the hazard rankings particularly for those unable to participate in the last meeting ...  
 The goal is to prioritize the hazards impacting the county using the Ohio EMA ranking criteria. We found that using the results of using this criteria didn't necessarily reflect the common-sense knowledge.  
 To resolve the disparity and yield results that are useful to the county and satisfy the needs of the Ohio EMA here's what we're going to do:  
 Using the second table - the results of the ranking effort:  
 - Rank the hazards in descending order according to what you perceive to have the greatest IMPACT on Scioto County. Focus on the top 5 or so. Putting numbers in the margin works. Just to get you started, "Flooding" will probably still be #1.  
 - Next, if you see individual ranking numbers that are driving the ranking in the wrong direction, circle the number. For example: if you think "Wildfires" is ranked too high, the 4 in Onset is driving the ranking ... circle the 4. Rationale: while fires occur with little notice, the potential for fires in many areas may be known, giving more notice of onset. This is an optional step that will help us adjust the individual rankings to come to the desired conclusion.  
 - Finally, please complete and return your results to me and Kim Carver before heading to Grandma's for Thanksgiving Dinner. This will give us time to process your inputs to see if we can reconcile the information without having to meet again to continue the group effort.  
 Thanks for your interest and concern for the citizens of Scioto County by participating in this effort.  
 Aloha  
 DaveP

**4. February 13, 2020 – Planning Team Meeting – Goals & Actions**

**a. Announcement**

**From:** Scioto EMA <scitoema@frontier.com>  
**Sent:** Thursday, January 16, 2020 10:57 AM  
**To:** bdavis@solechoiceinc.com; braison@portsmouthfd.org; Bryan Smith; Carla Emmons; chris.smith@portsmouthoh.org; Dan Simco; Darren Price; Darren LeBrun; Debby.Basham@oh.nacdnet.net; Denise Rose; dhobbs001@frontier.com; Flood Plain Mgr; green.fire.dept@gmail.com; HodgeA@somc.org; jking@water1.org; jvandeusen@shawnee.edu; ldmullins3477@yahoo.com; Lorie Haukedahl; Luan Nguyen; Luanne Valentine; mayscr@centrusenergy.com; nbmayor1973@yahoo.com; RDI; Renee Storey; Robert Horton; Ron Syrone; PPD Captain; Sally Bias; Sandy Mers; shawn.sparks@sciotocountysheriff.com; SSutherland@portsmouthoh.org; Steve Sturgill  
**Subject:** Hazard Mitigation Plan Update Committee Meeting February 13 at 10 AM at Scioto EOC

**The next meeting for the Scioto County Hazard Mitigation Plan Update Committee will be held February 13<sup>th</sup> at 10:00 AM at the Scioto County Emergency Operations Center at 729 6<sup>th</sup> Street Lower Suite Portsmouth. Enter through the rear glass door marked Emergency Center and park in the rear parking lot.**

**I will be emailing a document for review prior to the meeting.**

**Thanks for helping us with this endeavor!**

**Kim Carver  
 Scioto EMA  
 740-355-8300 Office**

**b. Sign-In Sheet**

Hazard Mitigation Plan Update Committee		Meeting #3	Scioto EOC	February 13, 2020	10 AM
Name	Agency	Telephone	Email		
Kim Carver	Scioto EMA	740 355 8300	sciotoema@frontier.com		
Angie Malone	Scioto County Floodplain	(740) 353-9435	amalone@sciotocounty.net		
Josh Childers	KDNC	(606) 585-2394	josh.childers@kdnc.kent.edu		
DARREN PRICE	Ohio EMA	(614) 296-3474	DPRICE@DPS.OHIO.GOV		
Kim Storey	GPABR	740 935 2543	storey203@osu.edu		
Sally Bias	Sherman Krieger	740 354 4444	sbias@shermankrieger.com		
Larry Mullins	Scioto EMA	740-464-9118	lmullins@sciotocounty.net		
SAM SUTHERLAND	City of Portsmouth	(740) 354-8807	ssutherland@portsmouthoh.org		
Carolyn A. Hobbs	Scioto County Township Associat	740-259-0933	dhobbs001@frontier.com		
Darren LeBrun	Scioto County Engineer	740-259-5541	darren.lebrun@sciotocountyengineer.org		
Molly Davis	PCRID	740-354-8831	molly.davis@rieraumich.org		
Debby Brewer	Portsmouth PD	740 354 5538	dbrewer@portsmouthohio.com		
BZIC PEARSON	PORTSMOUTH FD	740 354 1200			
Michael Sines	Portsmouth FD	740 - 354-1200			
SCOTT LEWIS	Scioto SWCD	740-254-9231	scott.lewis@oh.nachet.net		

**c. Follow Up Email for Attenders and Nonattenders Re Prioritization Input**

**From:** Scioto EMA <sciotoema@frontier.com>  
**Sent:** Thursday, March 26, 2020 4:15 PM  
**To:** bdavis@solechoiceinc.com; braison@portsmouthfd.org; Bryan Smith; Carla Emmons; chris.smith@portsmouthoh.org; Dan Simco; Darren Price; Darren LeBrun; Debby.Basham@oh.nacdn.net; Denise Rose; dhobbs001@frontier.com; Flood Plain Mgr ; green.fire.dept@gmail.com; HodgeA@somc.org; jking@water1.org; jvandeusen@shawnee.edu; Idmullins3477@yahoo.com; Lorie Haukedahl; Luan Nguyen; Luanne Valentine; mayscr@centrusenergy.com; nbmayor1973@yahoo.com; RDI; Renee Storey; Robert Horton; Ron Syrone; PPD Captain; Sally Bias; Sandy Mers; shawn.sparks@sciotoountysheriff.com; SSutherland@portsmouthoh.org; Steve Sturgill RDI; sciotoema@frontier.com  
**Cc:**  
**Subject:** Mitigation Action Prioritization for Scioto County Hazard Mitigation Plan  
**Attachments:** Word Document Mitigation Actions Prioritization.docx; PDF Mitigation Actions Prioritization.pdf

Hello Scioto County Hazard Mitigation Plan Update Team Members!

Been awhile since we last spoke. While we have had the last actual face to face meeting we said we would need to head down the home stretch in updating the Scioto County Hazard Mitigation Plan, we did say we would communicate via email a few more times to gather a little more information and advice.

Attached is a request to help us prioritize Hazard Mitigation Project areas. Please rank the project areas as you feel are most important from 1-10, with 1 being more important.

See attached letter for more information. I am including the form in WORD which is easy to just complete and send back to Dave at RDI or Scioto EMA at [sciotoema@frontier.com](mailto:sciotoema@frontier.com) and if you have questions feel free to email them back as well. I am also attaching the PDF version in case you want to print it and fill it out and scan back to computer and email.

Hope everyone is doing good and is well. And thanks as always for your help.

Kim Carver  
 Scioto EMA  
 740-355-8300

**5. April 28, 2020 – Village of New Boston Participation and Concurrence**

**From:** William Williams [<mailto:nbmayor1973@yahoo.com>]

**Sent:** Tuesday, April 28, 2020 2:03 PM

**To:** Scioto EMA

**Subject:** Re: Scioto County Hazard Mitigation Plan Approval by Mayors

On behalf of the Village of New Boston, I fully accept and agree with the hazard and mitigation committee's study concerning risks to our Scioto County, Ohio.

Please do not hesitate to contact me if additional information is needed.

Mayor Williams  
New Boston

**6. April 28, 2020 – Village of Rarden Participation and Concurrence**

**From:** Pam Syroney [<mailto:pamnsy@yahoo.com>]

**Sent:** Tuesday, April 28, 2020 2:54 PM

**To:** Scioto EMA

**Subject:** Re: Scioto County Hazard Mitigation Plan Approval by Mayors

To whom it may concern

This is Ronald L. Syroney, the mayor of Rarden Village. We the village accepts the Committees work and hereby signs off on the plan that is required for Disaster and Mitigation Grants from FEMA for Scioto County Jurisdictions.

Thank you for all your hard work and updates.

Ronald L. Syroney

**7. April 28, 2020 – Village of South Webster Participation and Concurrence**

**From:** Todd Hollback [<mailto:thollback@gmail.com>]

**Sent:** Tuesday, April 28, 2020 10:42 PM

**To:** Scioto EMA

**Subject:** Re: Scioto County Hazard Mitigation Plan Approval by Mayors

Hi Kim,

As Mayor of the Village of South Webster, I concur with the work being done by the committee and look forward to presenting it to the Village Council for review and approval.

Best regards,  
Todd Hollback  
740-778-2521

**8. April 29, 2020 – Village of Otway Participation and Concurrence**

**From:** Karl Rose [<mailto:kkrose38@gmail.com>]  
**Sent:** Wednesday, April 29, 2020 11:40 AM  
**To:** Scioto EMA  
**Subject:** Re: FW: Scioto County Hazard Mitigation Plan Approval by Mayors

Kim Carver,

We completely concur with the work of the committee.  
Thank you so much for all you have done.

Mayor of Otway  
Denise M. Rose

**C. Mitigation Actions by Jurisdiction**

Jurisdiction/Priority/Action	
<b>Scioto County</b>	
2	Enhance public warning systems
4	Install generators at critical facilities
5	Purchase stock of PPE for first responders
6	Develop and implement an all-hazards public education program
7	Establish community shelters
11	Identify/resolve potential landslide locations
12	Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
18	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
19	Conduct a hydrologic and hydraulic (H&H) study of Scioto County
20	Create rental housing inspection and permit program
21	Construct Safe Rooms - Community
22	Construct Safe Rooms - Residential
23	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
24	Rehabilitate dams known to be of high hazard potential
<b>City of Portsmouth</b>	
1	Replace antiquated floodwall pump station control systems
3	Repair/Upgrade wastewater and water treatment plants
7	Establish community shelters
9	Eliminate combined sewer system backflow
10	Reduce systematic problems caused by utility line ruptures
12	Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
18	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
20	Create rental housing inspection and permit program
21	Construct Safe Rooms - Community
<b>Village of New Boston</b>	
7	Establish community shelters
9	Eliminate combined sewer system backflow
10	Reduce systematic problems caused by utility line ruptures
12	Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
18	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
20	Create rental housing inspection and permit program

<b>21</b>	Construct Safe Rooms - Community
<b>Village of Otway</b>	
<b>7</b>	Establish community shelters
<b>10</b>	Reduce systematic problems caused by utility line ruptures
<b>12</b>	Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>18</b>	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
<b>20</b>	Create rental housing inspection and permit program
<b>21</b>	Construct Safe Rooms - Community
<b>Village of Rarden</b>	
<b>7</b>	Establish community shelters
<b>10</b>	Reduce systematic problems caused by utility line ruptures
<b>12</b>	Encourage jurisdictions to establish zones/building codes to control landuse in at-risk areas
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>18</b>	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
<b>20</b>	Create rental housing inspection and permit program
<b>21</b>	Construct Safe Rooms - Community
<b>Village of South Webster</b>	
<b>7</b>	Establish community shelters
<b>10</b>	Reduce systematic problems caused by utility line ruptures
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>18</b>	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
<b>20</b>	Create rental housing inspection and permit program
<b>21</b>	Construct Safe Rooms - Community
<b>Bloom Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Brush Creek Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks

<b>21</b>	Construct Safe Rooms - Community
<b>Clay Township</b>	
<b>7</b>	Establish community shelters
<b>8</b>	Upgrade undersized/establish storm water drainage systems
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Green Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Harrison Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Jefferson Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Madison Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Morgan Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams

17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Nile Township</b>	
7	Establish community shelters
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
16	Reduce erosion of streams
17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Porter Township</b>	
7	Establish community shelters
8	Upgrade undersized/establish storm water drainage systems
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Rarden Township</b>	
7	Establish community shelters
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Rush Township</b>	
7	Establish community shelters
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Union Township</b>	
7	Establish community shelters
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage
14	Mitigate structures in flood-prone areas
15	Remove debris in streams
17	Anchor mobile homes and propane tanks
21	Construct Safe Rooms - Community
<b>Valley Township</b>	
7	Establish community shelters
11	Identify/resolve potential landslide locations
13	Increase rural broadband coverage

<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Vernon Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community
<b>Washington Township</b>	
<b>7</b>	Establish community shelters
<b>11</b>	Identify/resolve potential landslide locations
<b>13</b>	Increase rural broadband coverage
<b>14</b>	Mitigate structures in flood-prone areas
<b>15</b>	Remove debris in streams
<b>17</b>	Anchor mobile homes and propane tanks
<b>21</b>	Construct Safe Rooms - Community

**D. 2012 Mitigation Action Adjustments**

Original 2012 Action	Action Taken	Updated Plan Action/[Delete Rationale]
Control systems for pump stations of floodwalls need replaced (systems are original from 1939 and can no longer be repaired due to lack of replacement parts; debris in pumps will cause the controls to burn up and/or fail)	Restated	Replace antiquated floodwall pump station control systems
Encourage residential building codes in county (only Portsmouth has codes)	Restated	Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas
There are many streams that are mapped as approximate A Zones that need to be studied to get 100-year elevations	Restated	Update FIRMs
Identify landslide, mined areas and problem soils so that land use can be restricted	Restated	Restrict land use in landslide-prone areas
Investigate the creation of zoning codes in county (only Portsmouth has codes)	Deleted Merged	Encourage jurisdictions to establish zones/building codes to control land use in at-risk areas
Mobile homes not anchored or elevated	Restated	Anchor mobile homes and propane tanks
Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages	None	Adopt higher flood standards than NFIP minimums due to historical flood events and to reduce future damages
Private dams are out there and have not been identified or inspected	Restated	Identify, inspect and analyze private dams that pose a threat to community assets
Upgrade undersized storm water drainage systems	Restated	Upgrade undersized/establish storm water drainage systems
Correct or eliminate septic systems in the floodplain	Deleted Merged	Mitigate structures in flood-prone areas
Elevate buildings in floodplains	Restated	Mitigate structures in flood-prone areas
Implement logging regulations on private land to reduce run-off and landslides	None	Implement logging regulations on private land to reduce run-off and landslides
Older structures and older mobile homes are more vulnerable because they do not meet today's manufacturing standards and building codes	Deleted	[Not an action]
Enforcement needed for arsonists to reduce wildfires	Deleted	[Not an action]
Improve flood protection of commercial buildings	Deleted Merged	Mitigate structures in flood-prone areas
Anchor propane tanks	Deleted Merged	Anchor mobile homes and propane tanks
Improve maintenance and inspection of dams	Deleted Merged	Identify, inspect and analyze private dams that pose a threat to community assets
Reduced combined sewer systems back flow into structures	Restated	Eliminate combined sewer system backflow
Maintain overhead utility lines	Deleted	[Normal Maintenance]
Reduce systematic problems caused by utility line ruptures	Restated	Eliminate combined sewer system backflow
More education of population needed for flood/winter storms, earthquakes, fire prevention/tornado/drought/thunderstorm wind damage prevention	Restated	Develop and implement an all-hazards public education program
Increase the number of weather warning radios among population-tornado	Restated	Enhance public warning systems
Remove debris in streams	None	Remove debris in streams

Original 2012 Action	Action Taken	Updated Plan Action/[Delete Rationale]
Reduce erosion of streams	None	Reduce erosion of streams
Watercourse alteration	None	Alter courses of waterways
Remove debris from February 2004 ice storm, which has increased hazards greatly	None	Remove debris from February 2004 ice storm, which has increased hazards greatly
Construct firebreak lines to reduce wildfire risks	None	Construct firebreak lines to reduce wildfire risks
Additional equipment is needed for cleanup of winter storms	Restated	Enhance capability to clean up after winter storms by purchasing additional equipment
Improve flood warning process to more quickly inform residents and businesses	Deleted Merged	Enhance public warning systems
Retrofit or relocate Critical facilities that are located in the floodplain	Deleted Merged	Mitigate structures in flood-prone areas
Improve tornado warning system as funds permit	Deleted Merged	Enhance public warning systems
Organize resources (money and equipment) to repair landslides	Restated	Identify/resolve potential landslide locations
Update wastewater and water treatment plants, which are located in floodplain	Restated	Repair/Upgrade wastewater and water treatment plants
Enhance communications systems to reduce failures (lack of generators, towers falling down)	Restated	Install generators at critical facilities
More equipment needed for wildfires	Restated	Enhance capability to fight wildfires by purchasing additional fire apparatus
Create public shelters for disaster victims	Restated	Establish community shelters