

Discovery Report

FEMA Region V

Cuyahoga Watershed, Ohio

HUC 04110002



FEMA



Prepared by

The Ohio Department of Natural Resources

Project Area Community List

Community Name	CID
Akron, City Of	390523
Aquilla, Village of	390739
Aurora, City of	390454
Beachwood, City Of	390094
Bedford Heights, City Of	390096
Bedford, City Of	390095
Boston Heights, Village Of	390749
Brady Lake, Village of	390713
Brecksville, City Of	390098
Broadview Heights, City Of	390099
Brook Park, City Of	390102
Brooklyn Heights, Village Of	390101
Brooklyn, City Of	390100
Burton, Village of	390693
Cleveland, City Of	390104
Cuyahoga Falls, City Of	390526
Cuyahoga Heights, Village Of	390654
Fairlawn, City Of	390657
Garfield Heights, City Of	390109
Geauga County	390190
Glenwillow, Village Of	390735
Hartville, Village Of	390514
Highland Hills, Village Of	390127
Hudson, City Of	390660
Independence, City Of	390111
Kent, City of	390456
Lakemore, Village Of	390527
Linndale, Village Of	390069
Macedonia, City Of	390750
Mantua, Village of	390457
Maple Heights, City Of	390114
Medina County	390378

Community Name	CID
Middleburg Heights, City Of	390117
Middlefield, Village of	390192
Mogadore, Village Of	390528
Munroe Falls, City Of	390843
Newburgh Heights, Village Of	390119
North Randall, Village Of	390736
North Royalton, City Of	390121
Northfield, Village Of	390726
Oakwood, Village Of	390122
Orange, Village Of	390737
Parma Heights, City Of	390124
Parma, City Of	390123
Peninsula, Village Of	390530
Portage County	390453
Ravenna, City of	390458
Reminderville, Village Of	390855
Richfield, Village Of	390083
Seven Hills, City Of	390128
Shaker Heights, City Of	390129
Silver Lake, Village Of	390531
Solon, City Of	390130
Stark County	390780
Stow, City Of	390532
Streetsboro, City of	390797
Sugar Bush Knolls, Village Of	390768
Summit County	390781
Tallmadge, City Of	390533
Twinsburg, City Of	390534
Valley View, Village Of	390134
Walton Hills, Village Of	390636
Warrensville Heights, City Of	390135

Table of Contents

I.	Watershed Description.....	ii
II.	Project Description and Methodology.....	4
III.	Data Analysis.....	5
i.	Data that can be used for Flood Risk Products.....	7
ii.	Other Data and Information.....	8
IV.	Risk MAP Needs.....	15
i.	Floodplain Studies	15
ii.	Mitigation Projects.....	17
iii.	Compliance	19
iv.	Communications	19
V.	Close.....	19
VI.	Appendix – Discovery Files.....	20

List of Tables

I.	Table 1. NFIP Participation Status.....	3
II.	Table 2. Data Collection for Cuyahoga Watershed.....	6
III.	Table 3. USGS Gages.....	7
IV.	Table 4. Hazard Mitigation Plan Status.....	8
V.	Table 5. Number of Repetitive Loss Structures by community.....	9-10
VI.	Table 6: Community Assistance Visit status by community.....	12-13
VII.	Table 7. Map Modernization Activity.....	13
VIII.	Table 8. Mapping Needs.....	16-17
IX.	Table 9. Areas of Mitigation Interest (AOMI).....	17-18

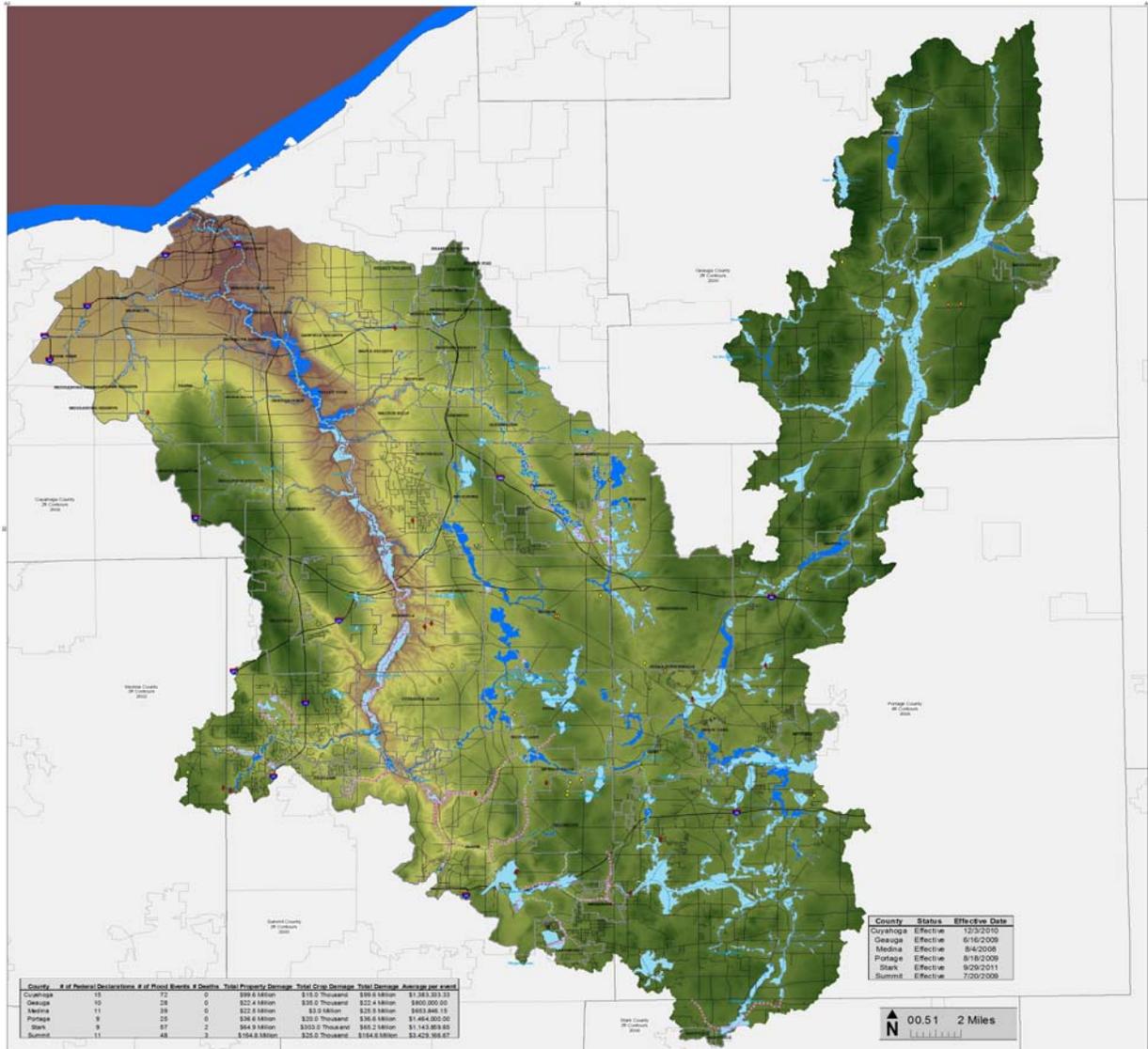
List of Figures

I.	Figure 1. Project Area Map.....	2
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I. **Watershed Description**

The Cuyahoga River Watershed is located in northeast Ohio, with a drainage area of 812 square miles. The 87 mile-long Cuyahoga River flows into Lake Erie in the City of Cleveland. The principal tributaries to the Cuyahoga River are Tinkers Creek, Breakneck Creek, Big Creek, East Branch Cuyahoga River and Bridge Creek. The headwaters originate in south central Geauga County and flow in a southwesterly direction through Portage County and then flows west and then north through Summit County and the river continues north into Cuyahoga County. The watershed also drains the majority of Summit County, along with small portions of Cuyahoga, Geauga, Portage, Medina and Stark Counties. The limits of the Discovery project area are presented in Figure 1. Table 1 includes the National Flood Insurance Program (NFIP) participation status of each community within the Cuyahoga Watershed.

Discovery Map: Cuyahoga Watershed



MAP SYMBOLOLOGY

Flood Hazard Area
 Zone A
 Zone AE

CNMS Data
 Validated
 Requires Assessment
 Not Valid

Dams
 Classification
 Class I Dam: greater than 10' or greater than 100,000 cu yd of storage
 Class II Dam: greater than 10' or greater than 100,000 cu yd of storage
 Class III Dam: greater than 10' or greater than 100,000 cu yd of storage

Other Symbols:
 USGS Gages
 LOMC Locations
 HUC8 Watershed Boundary
 HUC10 Watershed Boundary
 Lakes
 Municipal Boundaries
 Counties

Other Symbols:
 Potential Study Areas
 Past Claims Hot Spots
 Interstates
 Major Roads
 Streams / Rivers

WATERSHED LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM Discovery Map: Flood Risk

CUYAHOGA WATERSHED, OHIO

Drainage Area (sq. mi.) 811
 Studied Streams (mi.) 552
 Detailed Streams (mi.) 193
 Approximate Streams (mi.) 359



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Figure 1. Project Area Map

Table 1. NFIP Participation Status

County	Community	Participating
Cuyahoga	Beachwood	Y
	Bedford	Y
	Bedford Heights	Y
	Brecksville	Y
	Broadview Heights	Y
	Brook Park	Y
	Brooklyn	Y
	Brooklyn Heights	Y
	Cleveland	Y
	Cuyahoga County, Unincorporated	Y
	Cuyahoga Heights	Y
	Garfield Heights	Y
	Glenwillow	Y
	Highland Hills	N
	Independence	Y
	Lakewood	Y
	Linndale	N
	Maple Heights	Y
	Middleburg Heights	Y
	Newburgh Heights	N
	North Randall	N
	North Royalton	Y
	Oakwood	Y
	Orange	Y
	Parma	Y
	Parma Heights	Y
	Seven Hills	Y
	Shaker Heights	Y
	Solon	Y
	Valley View	Y
Walton Hills	Y	
Warrensville Heights	Y	

County	Community	Participating	
Geauga	Aquilla	Y	
	Burton	N	
	Geauga County, Unincorporated	Y	
	Middlefield	Y	
Medina	Medina County, Unincorporated	Y	
Portage	Aurora	Y	
	Brady Lake	Y	
	Kent	Y	
	Mantua	Y	
	Portage County, Unincorporated	Y	
	Ravenna	Y	
	Streetsboro	Y	
	Sugar Bush Knolls	N	
	Stark	Hartville	N
		Stark County, Unincorporated	Y
Summit	Akron	Y	
	Boston Heights	Y	
	Cuyahoga Falls	Y	
	Fairlawn	Y	
	Hudson	Y	
	Lakemore	Y	
	Macedonia	Y	
	Mogadore	Y	
	Munroe Falls	Y	
	Northfield	N	
	Peninsula	Y	
	Reminderville	N	
	Richfield	Y	
	Silver Lake	Y	
	Stow	Y	
	Summit County, Unincorporated	Y	
	Tallmadge	Y	
Twinsburg	Y		

II. Project Description and Methodology

Discovery is the process of data collection, including information exchange between all governmental levels of stakeholders, spatial data presentation, and cooperative discussion with stakeholders to better understand the area, decide whether a flood risk project is appropriate, and if so, to collaborate on the project planning in detail. At this time, Discovery processes and requirements are still being defined; however, draft guidance is available from the draft *Appendix I – Discovery (June 2011)*, the draft *Meetings Guidance for FEMA Personnel (June 2011)* and the *FY11 Discovery, Statement of Priorities (January 2011)*. In addition, there are several draft tools and templates at various stages of completion that were used to support the effort.

Region V initiated a Discovery project in July 2011 for the Cuyahoga Watershed. The Discovery process involved coordination with watershed stakeholders, data collection and analysis, a meeting with stakeholders in the watershed, and development of recommendations for Risk MAP projects based on an analysis of data and information gathered throughout the process.

The initial phase in the Discovery process was establishing a Project Team made up of local, state, and federal agencies. The Project Team for the Cuyahoga Watershed included representatives from:

- FEMA Region V, Risk Analysis Branch
- FEMA Region V, Floodplain Management and Insurance Branch
- FEMA Region V, Hazard Mitigation Assistance Branch
- Ohio Department of Natural Resources (ODNR)
- Ohio Emergency Management Agency (OEMA)

Project Team contact information and Project Team meeting minutes are provided in Appendix A. The Project Team worked together to compile the stakeholder list for the Cuyahoga watershed. Discovery Meeting invitations are presented in Appendix B. A list of the contacts made during this effort, including phone logs, notes from interviews, invitation lists, etc. are included in Appendices B and C to this document.

ODNR coordinated with community officials and other watershed stakeholders through written invitations, phone calls and follow-up emails. The coordination included giving community officials information about the Discovery process. Communities were asked to identify “Areas of Concern” which could be addressed during the Discovery Meeting (mapping needs, desired mitigation projects, etc.) and added to the Discovery Geodatabase and Final Discovery Map.

The second phase of the Discovery Project was the collection of relevant tabular and spatial data for all the communities within the watershed. The data was collected through

online resources, Federal and State sources, and interviews with cooperating communities. The collected data was used to evaluate both previous and current flooding concerns, while determining the vital areas requiring mapping needs. Section IV, Data Analysis, provides a more in-depth look at the collected data.

The third phase was to hold watershed-wide Discovery Meetings and facilitate discussion and data analysis of study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts. Two (2) watershed-wide Discovery Meetings were held on July 5, 2011 in Cleveland Heights and Hudson, Ohio. The discussion was stimulated using the Discovery Geodatabase display of relevant data. Attendees, including all affected communities and selected other stakeholders, cooperatively identified possible solutions for the Areas of Concern shown on the Discovery Meeting Map. Solutions included recommendations of floodplain studies, mitigation projects, compliance issues, and ideas on how to improve the local flood risk communication programs.

Copies of the Discovery Meeting Presentations, sign in sheets, handouts, meeting notes and meeting feedback forms are presented in Appendices, C, D, E and F, respectively.

The fourth phase of the Discovery effort involved an analysis of the data and information collected and discussed at the meeting, and recommendations as to the future relationship and activities between FEMA and the watershed communities. The Final Discovery Map, presented in Appendix G, indicates desired study areas and mitigation project locations, and the Discovery Report documents the results of data collection and conversation. If a Risk MAP project is to be initiated in this watershed, Discovery will be concluded with the finalization of a project scope and signed Project Charters, which indicate that all affected stakeholders agree to the terms of a funded project, including communication and data responsibilities.

III. Data Analysis

Discovery data collection entailed a massive collection of tabular and spatial data for all stakeholder communities from Federal, State and Local sources. A list of the data collected, the deliverable or product in which the data are included, and the source of the data is presented in Table 2. In addition, Data Analysis is divided between two sections: one section listing the data that can be used for Risk MAP products (regulatory and non-regulatory) and, one section listing the other data and information that helped the Project Team to form a more holistic understanding of this watershed.

Table 2. Data Collection for the Cuyahoga Watershed

Data Types	Deliverable/ Product	Source
Mitigation Plans Status	Table in Report	FEMA Regional Office, OEMA
Mitigation Projects	Table in Report	Data.gov: FEMA Hazard Mitigation Program Summary, OEMA
Repetitive Loss	Table in Report	Community Information System (CIS), OEMA
Declared Disasters	Discovery Maps	Data.gov: FEMA Disaster Declarations Summary
Past flood claims and repetitive loss properties	Table in Report	FEMA R5 and/or ODNR
HUC-8 Watershed	Discovery Map Geo-Database	USGS National Hydrography Dataset (NHD)
HUC-12 Watersheds	Discovery Map Geo-Database	National Resource Conservation Service (NRCS)
Jurisdictional Boundaries	Discovery Map Geo-Database	FEMA and ODNR
State lands	Discovery Map Geo-Database	Ohio Department of Natural Resources (ODNR)
Federal lands	Discovery Map Geo-Database	USGS National Atlas
Transportation Major and Minor	Discovery Map Geo-Database	FEMA
Stream lines	Discovery Map Geo-Database	National Hydrography Dataset (NHD) and FEMA
Study Needs	Discovery Map Geo-Database	Coordinated Needs Management System (CNMS)
Topographic data	Discovery Map Geo-Database	Ohio Statewide Imagery Program (OSIP)
HAZUS - Average Annualized Loss (AAL)	Discovery Map Geo-Database	STARR
Local mitigation plans	Discovery Map Geo-Database	OEMA
State mitigation plans	Discovery Map Geo-Database	ODPS - Ohio Emergency Management Agency (OEMA)
Regional flood control structures	Discovery Map Geo-Database	Ohio Department of Natural Resources (ODNR) and FEMA
Stream Gages	Discovery Map Geo-Database	U.S. Geological Survey (USGS)
Flooded Structures	Discovery Map Geo-Database	Ohio Department of Natural Resources (ODNR)
Effective study data	Discovery Map Geo-Database	FEMA's County DFIRM Data
Orthophotography	Discovery Map Geo-Database	Ohio Statewide Imagery Program (OSIP)
Contacts	Excel spreadsheet	Local websites, State/FEMA updates

i. Data that can be used for Flood Risk Products

Topographic and Imagery Data

As shown on the Final Discovery Map, LiDAR elevation data and digital orthophotography is available for the project area provided by the Ohio Geographically Referenced Information Program (OGRIP), as part of the Ohio Statewide Imagery Program (OSIP). The goal of OSIP I was to develop and maintain a seamless statewide base map. OSIP is an initiative partnered by several State Agencies (i.e. ODOT, ODNR) through OGRIP. Data from this project forms the foundation of the statewide base map, and was developed primarily to support multi-use applications, including homeland security, emergency management, economic development, and the business of government. The digital orthophotography consists of MrSID Images produced at 1-foot pixel resolution at a 30:1 compression ratio. The LiDAR elevation data consists of Digital Elevation Model (DEM) raster tiles acquired to meet +/- 1-foot vertical accuracy. This is suitable for rectification of digital orthophotography and for the creation of 2- and 5-foot contours (with the addition of 3D compiled breaklines). OSIP products within the Cuyahoga Watershed were collected during leaf-off conditions between 2006 and 2008. In February 2011, Ohio initiated a continuation of the OSIP program. OSIP II imagery will be acquired beginning in spring 2011 and continuing through 2014. For OSIP II county specific acquisition information as of May 9, 2011, see Appendix H.

USGS Gages

ODNR has identified several USGS stream gages in the watershed. The locations of the gages are shown on the Discovery Map and a summary is presented in Table 3.

Table 3. USGS Gages

Gage Number	Station Name and Location	Years of Record (Peaks)
4206000	Cuyahoga River at Old Portage OH	86
4206220	Yellow Creek at Botzum OH	19
4202000	Cuyahoga River at Hiram Rapids OH	73
4207200	Tinkers Creek at Bedford OH	47
4208000	Cuyahoga River at Independence OH	81
4208460	Mill Creek at Garfield Hts OH	7
4208504	Cuyahoga River near Newburgh Heights OH	3

Average Annualized Loss (AAL) Data

FEMA has conducted a Level 1 Hazus flood analysis to determine average annualized losses (AAL) for the project area. This analysis was based on USGS 30-meter DEM data and Hazus software default inventory data. The Hazus riverine hydrology analysis used default USGS regression equations to estimate the peak flows for selected return periods and the USGS topographic data to conduct normal depth calculations for flood depth grids. The loss estimation for the AAL data was then conducted to produce loss calculations at the U.S. census block level.

The AAL data is symbolized on the Discovery Map as varying levels of risk. During the Discovery meeting, the Level 1 analysis results will be validated by stakeholders to identify potential sites for Refined Analyses.

ii. Other Data and Information

Mitigation Plans/Status

Hazard Mitigation Plans (HMPs) are prepared to assist communities to reduce their risk to natural hazard events. The plans are used to develop strategies for risk reduction and to serve as a guide for all mitigation activities in the given county or community. The available HMPs obtained and reviewed for this Discovery Project are presented in Table 4.

Table 4. Hazard Mitigation Plan Status

County/Community	Hazus	Hazard Mitigation Plan	Issue Date	Expiration Date
Cuyahoga County	N	Y	1/21/2007	1/21/2012
Geauga County	N	Y*	12/22/2005	12/22/2010
Medina County	N	Y*	8/25/2006	8/25/2011
Portage County	N	Y	8/6/2007	8/6/2012
Stark County	N	Y*	6/23/2006	6/23/2011
Summit County	N	Y	4/9/2007	4/9/2012

**Hazard Mitigation plan is expired.*

Critical facilities are the facilities that can impact the delivery of vital services, cause greater damages to other sectors of a community, or put special populations at risk. The assessment of the flood risk posed to critical facilities within the watershed is an important aspect of the HMPs. Critical facilities that are located within the 1-percent-annual-chance floodplain were quantified and identified as at-risk structures. The exact number of critical facilities that are considered at-risk is not quantifiable due to the limited detail presented in the HMPs. The number of critical facilities estimated to be within the 1-percent-annual-chance floodplain was determined by overlaying Hazard Maps included in the HMP's with the latest flood hazard data. However, the risk of flood damage is limited by the detail and accuracy of the most recent flood map.

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

should also be important to a community because of the disruption and threat to residents' lives by the continual flooding.

Specific details regarding repetitive loss structures within the floodplain were not made available in the available HMPs. The locations of repetitive loss structures presented on the Discovery Map were determined by rectifying the HMP's Hazard Maps to the Discovery Map's base map data. The exact locations and numbers of repetitive loss structures have been summarized with caution due to the lack of detail in the HMPs and Hazard Maps. Areas that have suffered multiple repetitive losses are some of the most important areas of mitigation interest.

Table 5: Number of Repetitive Loss Structures by community

Community	County	# Rep Loss Structures
Beachwood	Cuyahoga	0
Bedford	Cuyahoga	0
Bedford Heights	Cuyahoga	25
Brecksville	Cuyahoga	2
Broadview Heights	Cuyahoga	2
Brook Park	Cuyahoga	0
Brooklyn	Cuyahoga	0
Brooklyn Heights	Cuyahoga	0
Cleveland	Cuyahoga	18
Cuyahoga County, Unincorporated	Cuyahoga	10
Cuyahoga Heights	Cuyahoga	0
Garfield Heights	Cuyahoga	11
Glenwillow	Cuyahoga	0
Highland Hills	Cuyahoga	0
Independence	Cuyahoga	96
Lakewood	Cuyahoga	11
Linndale	Cuyahoga	0
Maple Heights	Cuyahoga	0
Middleburg Heights	Cuyahoga	11
Newburgh Heights	Cuyahoga	0
North Randall	Cuyahoga	0
North Royalton	Cuyahoga	7
Oakwood	Cuyahoga	2
Orange	Cuyahoga	0
Parma	Cuyahoga	2
Parma Heights	Cuyahoga	0
Seven Hills	Cuyahoga	2
Shaker Heights	Cuyahoga	0
Solon	Cuyahoga	2
Valley View	Cuyahoga	149
Walton Hills	Cuyahoga	2
Warrensville Heights	Cuyahoga	0

Table 5 (Continued): Number of Repetitive Loss Structures by community

Community	County	# Rep Loss Structures
Aquilla	Geauga	0
Burton	Geauga	0
Geauga County, Unincorporated	Geauga	9
Middlefield	Geauga	0
Medina County, Unincorporated	Medina	13
Aurora	Portage	4
Brady Lake	Portage	0
Kent	Portage	0
Mantua	Portage	0
Portage County, Unincorporated	Portage	6
Ravenna	Portage	0
Streetsboro	Portage	0
Sugar Bush Knolls	Portage	0
Hartville	Stark	0
Stark County, Unincorporated	Stark	44
Akron	Summit	5
Boston Heights	Summit	0
Cuyahoga Falls	Summit	0
Fairlawn	Summit	2
Hudson	Summit	2
Lakemore	Summit	0
Macedonia	Summit	0
Mogadore	Summit	0
Munroe Falls	Summit	9
Northfield	Summit	0
Peninsula	Summit	0
Reminderville	Summit	0
Richfield	Summit	0
Silver Lake	Summit	0
Stow	Summit	6
Summit County, Unincorporated	Summit	25
Tallmadge	Summit	0
Twinsburg	Summit	0

Numerous locations of roads overtopping during flood events were identified during the data collection and Discovery Meeting process.

Numerous dams exist within the watershed, but are not mentioned in the HMPs as flood control structures. According to the ODNR database, sixteen (16) Class I dams are located within the watershed and owned/operated by state or federal agencies.

The overall goals of the reviewed HMP's were found to be consistent; however, specific methods for implementation of these goals and locations of specific projects were not readily available. These goals include:

- Educate the citizens of each county to increase awareness of flooding and where to seek safety during flood events
- Provide adequate shelters where citizens can seek safety from severe weather and flooding
- Improve the warning systems and radio communications throughout the county
- Expedite the cleanup process through coordination and equipment acquisition
- Update countywide NFIP maps
- Purchase or flood proof repetitive loss structures
- Develop map of infrastructure concerns

Some of the county's/community's HMPs included the locations and number of repetitive loss structures while other plans left this information out. This inconsistency in information holds true with the location and number of critical facilities found within the 1-percent-annual-chance floodplain.

Successful Mitigation Projects

There have been two recent mitigation projects in the watershed. In 2006, North Royalton was awarded a grant from FEMA for the acquisition of four residential structural that were located in the floodplain of Baldwin Creek. Areas of the Baldwin Creek have eroded and been filled in by soil to the extent where there is no recognizable channel of water. The creek's capacity and ability to drain and convey the flow of water has diminished. In 2010, Valley View was also awarded a pre-disaster mitigation grant to reduce future cost incurred from flood damages. This grant will allow thirteen homes to be elevated.

Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Study Needs

Analysis of the CNMS data for the Cuyahoga Watershed is finished. Analyzed studies have been identified as "VALID" or "UNVERIFIED". The current CNMS geospatial data is presented on the Final Discovery Map.

Community Rating System (CRS)

The Village of Orange and Medina County are the only communities in the Cuyahoga Watershed that participate in the CRS program.

Levees

No levees have been identified within the Cuyahoga watershed within FEMA's Mid-Term Levee Inventory database

Floodplain Management/Community Assistance Visits

FEMA uses a number of key tools to determine a community's compliance with the minimum regulations of the National Flood Insurance Program. Among them are Community Assistance Visits (CAVs), the Letter of Map Change (LOMC) process, and Submit-for-Rates. These tools help assess a community's implementation of their Flood Damage Reduction Regulations and identify any floodplain management deficiencies and violations. The CAV is a visit to a community by a FEMA staff member or staff of a state

agency on behalf of FEMA that serves the dual purpose of providing technical assistance to the community and assuring that the community is adequately enforcing its floodplain management regulations. Potential violations may be identified during the CAV visit as a result of touring the floodplain, inspecting community permit files, and meeting with local appointed and elected officials. For most recent CAV information, see Table 6.

Active CAV's are the communities that are currently going through the CAV process. Communities that have gone through a CAV and have provided all the necessary information to show they are in compliance are listed as Closed. FEMA CAV's can be indicative of unresolved issues and has been turned over to FEMA for follow up and possible enforcement action against the community if the outstanding issues are not resolved. Communities with FEMA referred CAV's include the Cities of Bedford Heights, Independence and Lakewood¹.

Violations can also be discovered when LOMR-F applications depict a non-compliant structure based on elevation data; or can be found through Submit-for-Rate requests, which occur when a structure applies for flood insurance but has been identified as being two or more feet below Base Flood Elevation (BFE). Elevation comparisons identified through LOMR-F applications and Submit-for-Rates imply structures were not built compliantly.¹

Communities with Submit-for-Rate issues include cities of Valley View, Aurora, Kent, Akron and Stow and the counties of Medina, Portage and Stark¹. If administrative problems or potential violations are identified, the community will be notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. FEMA or the state will work with the community to help them bring their program into compliance with NFIP requirements. In extreme cases where the community does not take action to bring itself into compliance, FEMA may initiate an enforcement action against the community. No Risk MAP needs regarding compliance were identified.

Table 6: Community Assistance Visit status by community

County	Community	CID	Recent CAV date	CAV Status*
Cuyahoga	Beachwood	390094	6/6/1995	-
	Bedford	390095	-	C
	Bedford Heights	390096	5/8/2006	F

*A= Active, C= Closed, F= Referred to FEMA, NP = Non Participating

¹ This list may not encompass all communities within the watershed with violations. Similarly, communities may have additional violations not addressed above

Table 6(Continued): Community Assistance Visit status by community

County	Community	CID	Recent CAV date	CAV Status*
Cuyahoga	Brecksville	390098	-	C
	Broadview Heights	390099	-	-
	Broadview Heights	390099	-	-
	Brook Park	390102	-	-
	Brooklyn	390100	-	-
	Brooklyn Heights	390101	7/12/1995	C
	Cleveland	390104	6/3/1998	-
	Cuyahoga County, Unincorporated	390766	-	-
	Cuyahoga Heights	390654	-	-
	Garfield Heights	390109	4/26/1990	-
	Glenwillow	390735	12/28/1995	-
	Highland Hills	390127	NP	NP
	Independence	390111	5/15/2006	F
	Lakewood	390112	7/21/1993	F
	Linndale	390069	NP	NP
	Maple Heights	390114	-	-
	Middleburg Heights	390117	-	-
	Newburgh Heights	390119	-	-
	North Randall	390736	NP	NP
	North Royalton	390121	10/27/2004	A
	Oakwood	390122	-	-
	Orange	390737	4/20/2000	C
	Parma	390123	-	-
	Parma Heights	390124	1/27/1999	C
	Seven Hills	390128	-	-
	Shaker Heights	390129	3/17/1994	-
Solon	390130	6/24/1994	-	
Valley View	390134	6/8/2006	C	
Walton Hills	390636	-	-	
Warrensville Heights	390135	6/29/1995	-	
Geauga	Aquilla	390739	11/6/1995	-
	Burton	390693	NP	NP
	Geauga County, Unincorporated	390190	12/9/1997	-
	Middlefield	390192	3/12/1991	-
Medina	Medina County, Unincorporated	390378	11/9/2005	C

*A= Active, C= Closed, F= Referred to FEMA, NP = Non Participating

Table 6(Continued): Community Assistance Visit status by community

County	Community	CID	Recent CAV date	CAV Status*
Portage	Aurora	390454	7/2/2009	C
	Brady Lake	390713	NP	NP
	Kent	390456	4/30/1996	-
	Mantua	390457	11/7/2002	F
	Portage County, Unincorporated	390453	5/2/2000	C
	Ravenna	390458	2/1/2001	C
	Streetsboro	390797	12/11/2003	C
	Sugar Bush Knolls	390768	NP	NP
Stark	Hartville	390514	NP	NP
	Stark County, Unincorporated	390780	3/15/2007	C
Summit	Akron	390523	5/3/2000	C
	Boston Heights	390749	4/20/1995	-
	Cuyahoga Falls	390526	4/20/1995	-
	Fairlawn	390657	9/24/2009	A
	Hudson	390660	9/28/2009	A
	Lakemore	390527	-	-
	Macedonia	390750	-	-
	Mogadore	390528	9/13/2001	C
	Munroe Falls	390843	4/8/1998	-
	Northfield	390726	NP	NP
	Peninsula	390530	8/1/2001	C
	Reminderville	390855	6/19/1995	-
	Richfield	390083	-	-
	Silver Lake	390531	5/10/2001	C
	Stow	390532	12/8/2000	C
	Summit County, Unincorporated	390781	9/30/2010	C
	Tallmadge	390533	12/14/1995	-
	Twinsburg	390534	11/21/1995	-

*A= Active, C= Closed, F= Referred to FEMA, NP = Non Participating

Regulatory Mapping

Cuyahoga Watershed communities have all had recent countywide map updates as part of FEMA’s Map Modernization Program. The effective dates of the most recent county-wide projects are presented on the Discovery Map and below in Table 7. The effective data is a combination of both detailed and approximate analysis with varying vintage dates.

Table 7. Map Modernization Activity

County	Status	Effective Date
Cuyahoga	Effective	12/3/2010
Geauga	Effective	6/16/2009
Medina	Effective	8/4/2008
Portage	Effective	8/18/2009
Stark	Effective	9/29/2011
Summit	Effective	7/20/2009

IV. Risk MAP Needs

The results of the data collection and analysis were thoroughly discussed at the Discovery Meeting. The following sections include issues and situations that exist in the Cuyahoga Watershed communities that can be considered Risk MAP Needs, to be addressed with Risk MAP projects. Details and background on all issues can be found in the interview notes, meeting notes, and other files included in the appendices.

i. Floodplain Studies

All of the counties located in the Cuyahoga Watershed have undergone recent countywide DFIRM projects; however, not all of these projects included new Zone A studies and some approximate flood hazards were digitally converted.

As shown on the Final Discovery Map, recent LiDAR and imagery data meeting FEMA's Guidelines and Specifications have been developed for the entire Discovery Project Area.

As shown on the Final Discovery Map, numerous study reaches have been classified as "UNVERIFIED" during the CNMS process.

At the Discovery Meeting, several areas were identified by community officials as needing an updated detailed or approximate study. The City of Kent is planning to update flood studies on Fish Creek and other rivers within the community. The community funded projects provide an opportunity to leverage the data for Risk MAP products.

Based on the results of the Stakeholder Coordination, Data Analysis and Discovery Meeting, proposed Study Areas in the Cuyahoga have been identified in Table 8. The specific locations of these Study Areas are presented on the Final Discovery Map. A complete list of mapping needs is located in Appendix G.

Table 8. Mapping Needs

FLOODING SOURCE	STUDY LENGTH (miles)	STUDY TYPE	PRIORITY
Tinkers Creek	8.53	Redelineated	Very High Priority
Kelsey Creek	1.95	Redelineated	Very High Priority
Plum Creek	4.64	Redelineated	Very High Priority
Tinkers Creek Tributary 2	3.05	Redelineated	Very High Priority
Cuyahoga River	7.49	Redelineated	Very High Priority
Cuyahoga River	0.46	Updated Approximate	High Priority
Cuyahoga River	4.38	Redelineated	High Priority
Cuyahoga River	10.06	Redelineated	High Priority
Cuyahoga River	6.39	Redelineated	Medium Priority
Cuyahoga River	1.83	Redelineated	Medium Priority
Springfield Lake Outlet	2.88	Redelineated	Medium Priority
Mud Brook Tributary 1	0.83	New Detailed	Medium Priority
Little Cuyahoga River	6.62	Redelineated	Medium Priority
Indian Creek	4.43	Updated Detailed	Medium Priority
Hudson Ditch	2.51	Redelineated	Medium Priority
Tinkers Creek	2.22	Redelineated	Medium Priority
Tinkers Creek	3.42	Redelineated	Medium Priority
Countrymans Creek/Big Creek Tributary	2.16	Redelineated	Medium Priority
Big Creek	3.62	Redelineated	Medium Priority
Cuyahoga River	0.10	Updated Approximate	Medium Priority
Cuyahoga River	0.12	Updated Approximate	Medium Priority
Cuyahoga River	0.13	Updated Approximate	Medium Priority
Cuyahoga River	0.15	Updated Approximate	Medium Priority
Cuyahoga River	0.16	Updated Approximate	Medium Priority
Cuyahoga River	0.16	Updated Approximate	Medium Priority
Cuyahoga River	0.33	Updated Approximate	Medium Priority
Cuyahoga River	6.70	Updated Approximate	Medium Priority
Cuyahoga River	7.66	Updated Approximate	Medium Priority
Little Cuyahoga River	1.66	Updated Approximate	Medium Priority
Little Cuyahoga River	1.70	Updated Approximate	Medium Priority
Sand Run	0.01	Updated Approximate	Medium Priority
Sand Run	2.75	Updated Approximate	Medium Priority
Tinkers Creek	3.06	Updated Approximate	Medium Priority
Walnut Creek	1.11	Updated Approximate	Medium Priority
Wingfoot Lake Outlet	0.44	Updated Approximate	Medium Priority
Unnamed	0.27	Updated Approximate	Medium Priority
Unnamed	0.38	Updated Approximate	Medium Priority

Table 8(Continued). Mapping Needs

FLOODING SOURCE	STUDY LENGTH (miles)	STUDY TYPE	PRIORITY
Unnamed	0.61	Updated Approximate	Medium Priority
Unnamed	0.70	Updated Approximate	Medium Priority
Pond Brook	1.24	Redelineated	Medium Priority
Cuyahoga River	1.41	Redelineated	Medium Priority
Tinkers Creek	0.50	Redelineated	Medium Priority
Tinkers Creek	1.28	Redelineated	Medium Priority
Mill Creek	2.11	Redelineated	Medium Priority

ii. Mitigation Projects

There is an ongoing mitigation project underway in Valley View which is situated along the Cuyahoga River. This grant was awarded in July 2010. Other areas of potential mitigation interest were also obtained from the local officials and those are in Table 9.

Table 9: Areas of Mitigation Interest (AOMI)

Community	County	Flooding Source	Comments
Portage County	Portage	Tinkers Creek	Flooding overtops road
Brecksville	Cuyahoga	Cuyahoga River	Flooding along Riverview Rd. between Snowville Rd. and the County line
Brecksville	Cuyahoga	Cuyahoga River	Culvert Issue near Riverview Rd and Vaughn Rd.
Twinsburg	Summit	Tinkers Creek	Ravenna Rd. is overtopped
Twinsburg	Summit	Tinkers Creek	Parking lot flooding
Twinsburg	Summit	Tinkers Creek	Mild flooding 2-3 structures
Reminderville	Portage	Aurora Pond	Repetitive Loss and Mitigation opportunities
Broadview Heights	Cuyahoga	Unnamed Stream	Repetitive flooding area
Oakwood	Cuyahoga	Unknown	Flooding on Macedonia Rd. near address 7647
Independence	Cuyahoga	Cuyahoga River	Flooding on Lower Brookside Rd. west of Riverview Rd.
Solon	Cuyahoga	Tinkers Creek Tributary 2	Flooding issue at entrance to treatment plant
Oakwood	Cuyahoga	Tinkers Creek	Flooding at Richmond Rd. on Tinkers Creek
Solon	Cuyahoga	Unknown	Flooding issue on SR 91 at Norfolk and Southern overpass
Parma	Cuyahoga	West Creek	Flooding near Ridgewood Rd.
Cleveland	Cuyahoga	Cuyahoga River	Canal Road Flooding issues
Valley View	Cuyahoga	Cuyahoga River	Repetitive flooding area- some of this area has been recently mitigated
Bedford	Cuyahoga	Wood Creek	Flooding near Broadway
Valley View	Cuyahoga	Cuyahoga River	Canal Road storm sewer system between I-480 and Fosdick Road overwhelmed by rain
Parma	Cuyahoga	Unknown	Repetitive flooded homes
Bedford Heights	Cuyahoga	Hawthorne Creek	Consistent Flooding at the termination of approximately 102" stormwater drain at 5626 Richmond Rd.

Table 9 (Continued): Areas of Mitigation Interest (AOMI)

Community	County	Flooding Source	Comments
Solon	Cuyahoga	Tinkers Creek Tributary 2	Industrial area- frequent flooding
Bedford	Cuyahoga	Wood Creek	Flooding along Cresswell Avenue
Valley View	Cuyahoga	Cuyahoga River	96" Storm sewer along I-480 is filled with silt
Parma	Cuyahoga	Big Creek	Cleveland Trailer Park flooding, GM retention pond issues
Solon	Cuyahoga	Hawthorne Creek	Flooding issue near Cannon Rd along Hawthorne Creek
Maple Heights	Cuyahoga	Wood Creek	Flooding on Waterbury St.
Solon	Cuyahoga	Tinkers Creek Tributary 2	US 422 Frequently floods
Independence	Cuyahoga	West Creek	Flooding on Fuhrmeyer/Schaaf Roads at West Creek
Brookpark	Cuyahoga	Unknown	Flooding issue near West 130th south of Brook Park Rd.
Brookpark	Cuyahoga	Unknown	Flooding issue near West 130th and I-480
Bedford Heights	Cuyahoga	Hawthorne Creek	Consistent Flooding on railroad right-of-way north and South of Fargo Ave.
Maple Heights	Cuyahoga	Unknown	Flooding on Clare St.
Bedford Heights	Cuyahoga	Bear Creek	Flooding at properties along Aurora Rd.
Maple Heights	Cuyahoga	Unknown	Flooding on Franklin St.
Solon	Cuyahoga	Unnamed Stream	Houses flooded- North Park Estates
Cleveland	Cuyahoga	Big Creek Tributary	Flooding on West 150th St. between Industrial and Brookpark
North Randall	Cuyahoga	Bear Creek	Periodic flooding on North Randall Dr.
North Randall	Cuyahoga	Bear Creek	Flooding on Northfield Rd. near Miles Rd.
North Randall	Cuyahoga	Bear Creek	Periodic flooding on Derbyshire Rd.
	Cuyahoga	Mill Creek	Flooding in 23000 block of Miles Rd.
Brooklyn Heights	Cuyahoga	Unknown	Flooding issue near Lancaster Culvert, Van Epps Road hill
Cleveland	Cuyahoga	Unknown	Flooding on West 130th St. between Gilmore to Brookpark
Cuyahoga Heights	Cuyahoga	Unknown	Flooding on I-71 North and South, north of Grant Ave.
Newburgh Heights	Cuyahoga	Unknown	Flooding Harvard Ave. between Washington Park Blvd and East 27th St.- Harvard Heat Treat Operation
Newburgh Heights	Cuyahoga	Unknown	Flooding at East 49th and Harvard
Newburgh Heights	Cuyahoga	Unknown	Flooding on North bound exit ramp at Harvard
Highland Hills	Cuyahoga	Mill Creek	Severe Erosion of Mill Creek and localized flooding.
Newburgh Heights	Cuyahoga	Unknown	Flooding on East 26th St.
Newburgh Heights	Cuyahoga	Unknown	Flooding on East 27/29 Streets
Newburgh Heights	Cuyahoga	Unknown	Flooding on East 42nd St. and McGregor
Cleveland	Cuyahoga	Mill Creek	Underpass flooding issue at Broadway Ave. and Harvard Ave.
Newburgh Heights	Cuyahoga	Unknown	Flooding at Brow Avenue and East 53rd St.
Cuyahoga Heights	Cuyahoga	Unknown	Flooding on I-77 South between Harvard and Grant
Newburgh Heights	Cuyahoga	Unknown	Flooding Bridgeview and Washington Park Blvd
Newburgh Heights	Cuyahoga	Unknown	Flooding on East 38th St.
Cleveland	Cuyahoga	Unknown	Flooding on West 143rd St. and Lorain Ave.
Cleveland	Cuyahoga	Unknown	Underpass flooding near East 79th St. and Bessemer Ave.
Cleveland	Cuyahoga	Unknown	Underpass flooding near East 75th and Colfax Ave.
Cleveland	Cuyahoga	Unknown	Underpass flooding at RTA bridge and East 79th St.

iii. Compliance

While communities have referred CAV's no Risk MAP needs regarding compliance issues were identified.

iv. Communications

Invitations to the Discovery meeting were sent on June 14, 2011 to the identified stakeholders within Cuyahoga watershed. The stakeholders were all interested in learning more about how to provide flood risk information to residents. Community representatives indicated the need to be informed of the results of the Discovery process and opportunities for public input during the process. The compilation of all the information and data gathered during the Discovery process was provided to the Cuyahoga watershed stakeholders on December 1, 2011.

v. Close

Community Stakeholders were interested in learning about the Discovery process and Risk MAP and how they can begin to develop resiliency to flood events. They identified several areas for map updates and areas in which they could use additional FEMA support. The information gathered in the Discovery process provided invaluable data for analysis and identifying the most flood-prone and at-risk areas. Local officials will now be more aware of risks in their area; therefore, state and federal agencies will be able to focus their resources on the most feasible projects. The local officials in the Cuyahoga Watershed would benefit from the implementation of Risk MAP projects.

vi. Appendix - Discovery Files

The Discovery Report appendices are stored digitally under their respective folders on the FEMA Mapping Information Platform (MIP).

The Discovery Report appendices and the Discovery GIS Geodatabase are also available for download from the following FTP site:

ftp://ftp.dnr.state.oh.us/Water/Public/Risk_MAP/Discovery/CuyahogaWS/

Appendix A - Project Team Contact Information & Meeting Minutes

Appendix B - Stakeholder Contact Information & Meeting Invitations

Appendix C - Discovery Meeting Presentations

Appendix D - Discovery Meeting Sign-In Sheets & Handouts

Appendix E - Discovery Meeting Notes & Comments

Appendix F - Discovery Meeting Participant Feedback

Appendix G - Discovery Maps & Mapping Needs

Appendix H - OSIP II Update