



# Hazard Mitigation Plan

## Macon County, Illinois

Risk Analysis Meeting

August 17, 2012





# Introductions

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Jim Root – Planning Lead  
Coordinator, Macon County EMA  
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John Menninger, PE – Plan Consultant  
Stantec Consulting Services, Inc.  
[John.Menninger@stantec.com](mailto:John.Menninger@stantec.com)



# Meeting Agenda

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## Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Risk Analysis Overview
5. Hazard Profiles
6. Vulnerability Rankings
7. Mitigation Project Development



# Hazard Mitigation Plan - Goals

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## Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Macon County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

## Today's Meeting Goal

1. Review Hazard Profiles and Initial Vulnerability Rankings
2. Begin Development of Mitigation Actions



# Hazard Mitigation Plan - Overview

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## Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance





# Data Needs Inventory

Community / Agency	Contact	Provided Information	Data Supplied	Data Received
City of Decatur	Mark Smith	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
City of Macon	Edward Aukamp	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
City of Maroa	Vincent Sims	N		N
Macon County	Jim Root / Melissa VanDolah / Joshua Tanner	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects. GIS data layers & property/building information.	Y
Village of Argenta	Dena Bowman	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
Village of Blue Mound	Tom Bingaman	Y	Tom Contacted John Menninger on 6/29/12. He will provide information.	N
Village of Forsyth	Harold Gilbert / Charles Hunsinger	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
Village of Harristown	Gordon Schrishuhn	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
Village of Long Creek	Cheryl Smith	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
Village of Mount Zion	Doug Dunn	Y	Provided a list of Critical Facilities.	Y
Village of Niantic	Lewis Claypool / Randy Hiser	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y
Village of Oreana	Dan Lightner	N		N
Village of Warrensburg	Stephen Mills / Keith Hackl	Y	Provided General Info., Historical Hazards, Critical Facilities, Planning Documents, Mitigation Projects.	Y



# Critical Facilities

Community	Critical Facilities					Transportation			Utilities					Community Facilities / Government	Levees	Industry/ Manufacturing / Commerce Centers	Total
	Emergency Center and/or Warning Sirens	Schools	Police Station	Fire Stations	Medical / Nursing Facilities	Airports	Bridge	Dams	Electric Facility / Lines / Phone	Oil / Gas Facility / Pipeline	Water Treatment Plants	Water Sources	Wastewater Treatment Plants / Facilities (Pump Stations)				
City of Decatur	0	41	1	3	2	1	100	2	0	0	2	1	1	1	1		156
City of Macon	0	1		1	0	0	3	0	2	0	1	4	4	3	0		19
City of Maroa	0	3	1	1	0	0	2	0	0	0					0		7
Macon County	0	0	0	0	0	3	335	0	0	0					1		339
Village of Argenta	0	3	1	0	0	0	0	0	0	0	1				0		5
Village of Blue Mound	0	2	0	1	0	0	0	0	0	0					0		3
Village of Forsyth	4	1	0	1	5	0	2	0	2	0	1	4	4	2	0	1	27
Village of Harristown	3	2	0	1	0	0	6	0	0	1	1	3	5	1	0		23
Village of Long Creek	2	0	0	1	0	0	7	0	0	0		1		2	0		13
Village of Mount Zion	0	5	1	1	2	0	4	0	0	2				4	0	1	20
Village of Niantic	0	1	0	1	0	0	1	0	0	0					0		3
Village of Oreana	0	1	0	1	0	0	1	0	0	0					0		3
Village of Warrensburg	1	3	1	1	0	0	1	0	1	0	1	4	3	2	0		18
City of Decatur	10	63	5	13	9	4	462	2	5	3	7	17	17	15	2	2	636

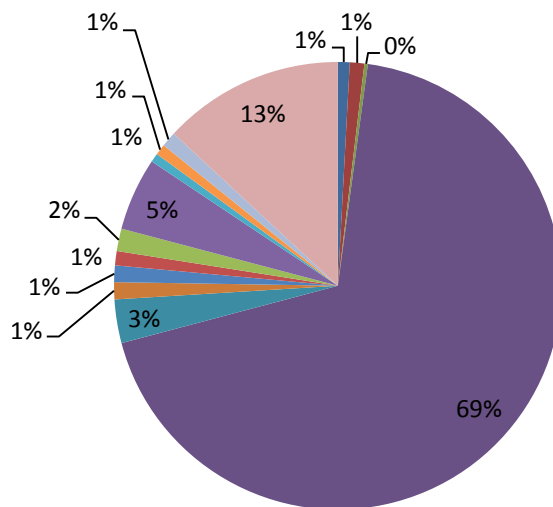


# Hazard Risk Analysis

## Population Vulnerability – County-wide

### Population

- Argenta village
- Blue Mound village
- Boody CDP
- Decatur city
- Forsyth village
- Harristown village
- Long Creek village
- Macon city
- Maroa city
- Mount Zion village
- Niantic village
- Oreana village
- Warrensburg village
- Macon County (Unincorporated)







# Hazard Risk Analysis

## Population Vulnerability – County-wide

2000 – 2010 US Census						
FIPS Code		Municipalities/CDPs within a County	2000 Census Total Population	2010 Census Total Population	2000-2010 Change	2000-2010 % Change
CO	PLACE					
115		Macon County	114,706	110,768	-3,938	-3.4
115	1972	Argenta, Village of	921	947	26	2.8
115	6756	Blue Mound, Village of	1,129	1,158	29	2.6
115	7315	Boody CDP	X	276	N/A	N/A
115	18823	Decatur, City of	81,860	76,122	-5,738	-7.0
115	27091	Forsyth, Village of	2,434	3,490	1,056	43.4
115	33227	Harristown, Village of	1,338	1,367	29	2.2
115	44498	Long Creek, Village of	1,364	1,328	-36	-2.6
115	45941	Macon, City of	1,213	1,138	-75	-6.2
115	47072	Maroa, City of	1,654	1,801	147	8.9
115	51206	Mount Zion, Village of	4,845	5,833	988	20.4
115	52961	Niantic, Village of	738	707	-31	-4.2
115	56471	Oreana, Village of	892	875	-17	-1.9
115	78916	Warrensburg, Village of	1,289	1,210	-79	-6.1

Source: <http://www2.illinois.gov/census/Pages/Census2010Data.aspx>

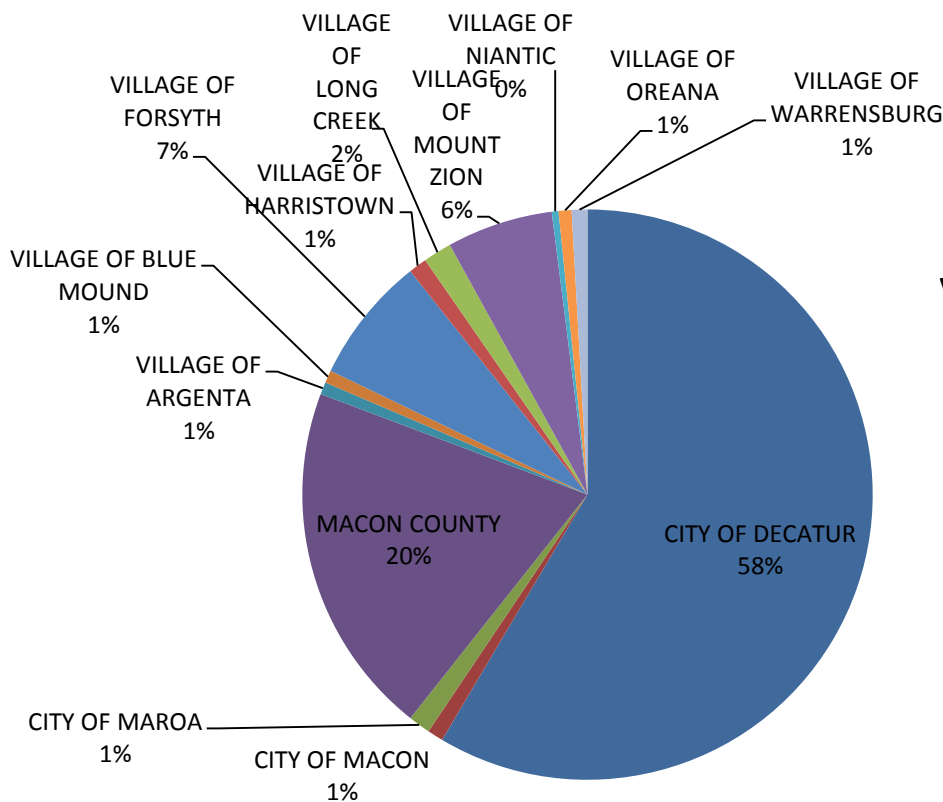
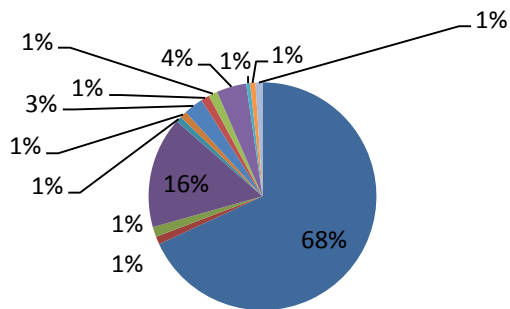


# Hazard Risk Analysis

## Structural Vulnerability – County-wide \*

### Building Count\*

- CITY OF DECATUR
- CITY OF MACON
- CITY OF MAROA
- MACON COUNTY
- VILLAGE OF ARGENTA
- VILLAGE OF BLUE MOUND
- VILLAGE OF FORSYTH
- VILLAGE OF HARRISTOWN



### Building Value (\$)\*



# Hazard Risk Analysis

## Structural Vulnerability – County-wide

Community	Residential		Commercial		Industrial		Religion/Government / Education = Exempt PUC/90 ; Unknown PUC; or Railroad PUC/5000		Agricultural		Total	
	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*
City of Decatur	29,162	584,836,956	1,592	193,495,404	173	55,234,551	1,286	250,574	20	1,929,603	32,233	835,747,088
City of Macon	462	10,718,077	40	1,732,477	2	170,767	19	0	4	151,913	527	12,773,234
City of Maroa	602	16,401,810	47	1,167,834	2	233,578	18	0	3	43,765	672	17,846,987
Macon County	6,151	231,210,448	180	11,538,910	60	8,782,490	129	69,896	963	35,087,628	7,483	286,689,372
Village of Argenta	360	9,275,464	16	528,534	2	24,105	8	0	1	88,907	387	9,917,010
Village of Blue Mound	411	9,458,230	31	720,847	4	15,356	14	0	0	0	460	10,194,433
Village of Forsyth	1,208	72,321,047	75	30,047,217	1	130,992	23	57,942	0	0	1,307	102,557,198
Village of Harristown	529	13,568,989	18	1,211,409	1	17,104	13	0	2	0	563	14,797,502
Village of Long Creek	538	19,838,321	43	2,618,287	3	128,537	15	0	11	473,092	610	23,058,237
Village of Mount Zion	1,861	77,004,043	103	8,599,349	2	1,615	28	102,774	4	199,601	1,998	85,907,382
Village of Niantic	227	4,649,204	19	679,788	2	10,657	10	0	4	144,138	262	5,483,787
Village of Oreana	339	9,675,428	10	337,546	2	428,390	8	0	0	0	359	10,441,364
Village of Warrensburg	426	11,544,306	23	799,291	7	388,430	13	0	1	0	470	12,732,027
Total	42,276	1,070,502,323	2,197	253,476,893	261	65,566,572	1,584	481,186	1,013	38,118,647	47,331	1,428,145,621

\* Number and Value taken from Assessors building values. Value based on Parcel, which meant multiple structures with the same Parcel Number were not duplicated within the table. Total Addresses within Macon County is 56,163 ( Provided by Macon County GIS department.)



# Hazard Risk Analysis

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## Hazards of Concern

1. Flooding
2. Severe Thunderstorms
3. Severe Winter Storms
4. Tornadoes
5. Drought
6. Extreme Heat
7. Earthquakes
8. Dam / Levee Failure
9. Nuclear / Hazardous Materials Accident

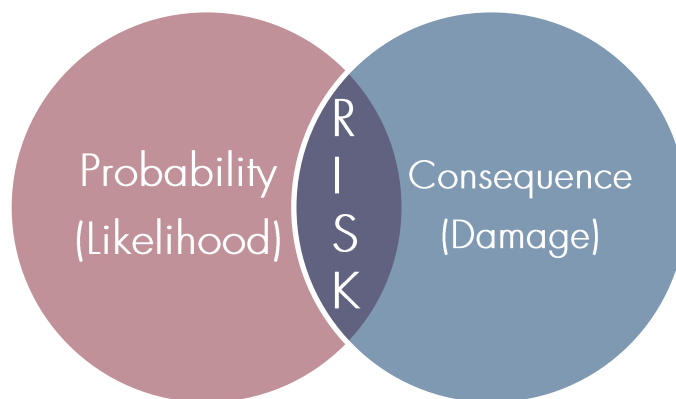


# Hazard Risk Analysis

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## Methodology

1. Calculate Event Probabilities
2. Determine Potential Impacts
  - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities





# Hazard Risk Analysis

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## Data Sources

### 1. FEMA's HAZUS-MH

- Flooding and Earthquakes

### 2. Historic Events

- Tornadoes, Severe Storms, Extreme Heat

### 3. Additional Studies

- Drought

### 4. Qualitative Assessments

- Dam Failure, Nuclear and Haz. Materials



# Hazard Risk Analysis – Flooding

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## Summary of Events & Future Probability

- 29 Events from 1992 -2011
  - Damages: Unavailable
  - Life Loss: 0
  - Injuries: 0
- Annual Chance of Occurrence = 75%
- HAZUS-MH:
  - Average Annualized Loss: \$32,399,000
  - Need Better Data to Refine Analysis



# Hazard Risk Analysis – Flooding

## Streams & Communities Affected

Stream	Communities Affected	Stream Miles Mapped
Big Creek	Long Creek, Macon County (Uninc.), Mount Zion	6.3
Big Creek Arm of Lake Decatur	Decatur, Macon County (Uninc.)	2.7
Big Creek Arm of Lake Decatur (Lake Shoreline)	Decatur, Macon County (Uninc.), Mount Zion	6.1
Dry Branch	Macon County (Uninc.)	4.4
Finley Creek	Decatur, Macon County (Uninc.), Mount Zion	11.5
Friends Creek	Argenta, Macon County (Uninc.)	15.1
Friends Creek Ditch	Macon County (Uninc.)	5.4
Independence Branch	Macon County (Uninc.)	1.1
Lake Decatur (Lake Shoreline)	Decatur, Macon County (Uninc.)	26.9
Long Creek	Decatur, Long Creek, Macon County (Uninc.)	1.7
Long Creek (East of Big Creek)	Long Creek, Macon County (Uninc.)	6.3
Long Creek Tributary	Long Creek, Decatur, Macon County (Uninc.)	2.9
Long Grove Creek	Macon County (Uninc.)	3.0
Long Point Slough	Macon County (Uninc.)	0.8

Stream	Communities Affected	Stream Miles Mapped
Mosquito Creek	Macon County (Uninc.)	5.3
North Fork	Macon County (Uninc.), Maroa	15.4
Sand Creek	Decatur, Macon County (Uninc.)	7.5
Sangamon River	Decatur, Macon County (Uninc.)	36.7
South Fork	Macon County (Uninc.)	3.0
South Spring Creek	Decatur, Macon County (Uninc.)	5.6
Spring Creek	Decatur, Macon County (Uninc.)	14.7
Spring Creek Tributary	Decatur, Macon County (Uninc.)	0.9
Stevens Creek	Decatur, Forsyth, Macon County (Uninc.)	19.9
Stevens Creek Tributary A	Decatur, Macon County (Uninc.)	1.4
Stevens Creek Tributary B	Decatur, Macon County (Uninc.)	1.6
Tributary to Sangamon River	Decatur, Macon County (Uninc.)	1.0
Willow Branch	Macon County (Uninc.)	1.1





# Critical Facilities – At Risk of Flooding

Community	Critical Facilities					Transportation			Utilities					Community Facilities / Government	Levees	Industry/ Manufacturing / Commerce Centers	Total
	Emergency Center and/or Warning Sirens	Schools	Police Station	Fire Stations	Medical / Nursing Facilities	Airports	Bridge	Dams	Electric Facility / Lines / Phone	Oil / Gas Facility / Pipeline	Water Treatment Plants	Water Sources	Wastewater Treatment Plants / Facilities (Pump Stations)				
City of Decatur		2					28						1		1		32
City of Macon															2		2
City of Maroa							3										3
Macon County							117			7							124
Village of Argenta							0										0
Village of Blue Mound							0										0
Village of Forsyth							1						1				2
Village of Harristown							0										0
Village of Long Creek							1										1
Village of Mount Zion							1										1
Village of Niantic							0										0
Village of Oreana							0										0
Village of Warrensburg							0										0
City of Decatur	0	2	0	0	0	0	151	0	0	7	0	0	2	0	3	0	165

\* There are 7 major pipelines running through the county; only 2 communities do not have a pipeline, Village of Niantic & City of Macon.

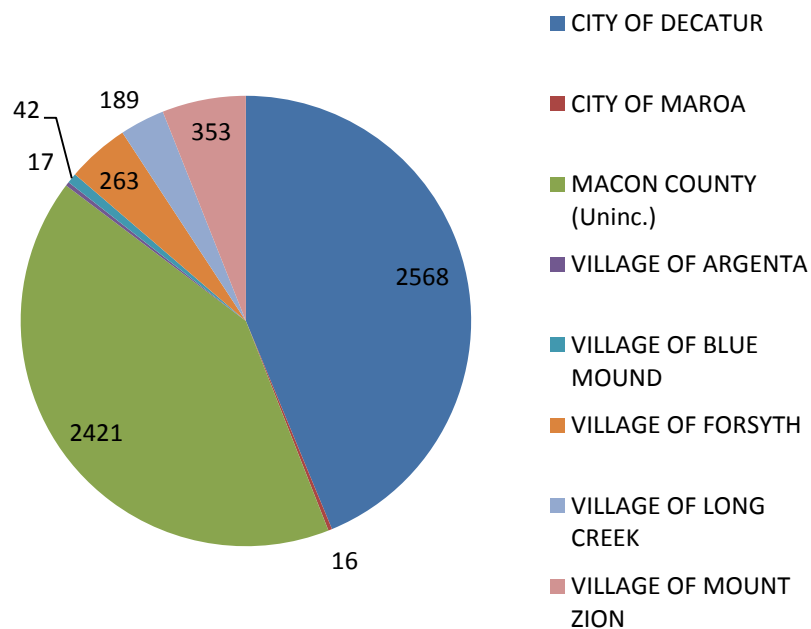


# Hazard Risk Analysis – Flooding

## Population Vulnerability – Community

Community	# of 2010 Census Blocks *	2010 Census Population *	Total Population	Percentage Inside Community
City of Decatur	483	2568	76,122	3
City of Macon	0	0	1,138	0
City of Maroa	12	16	1,801	1
Macon County	764	2421	14,792	16
Village of Argenta	5	17	947	2
Village of Blue Mound	7	42	1,158	4
Village of Forsyth	19	263	3,490	8
Village of Harristown	0	0	1,367	0
Village of Long Creek	39	189	1,328	14
Village of Mount Zion	26	353	5,833	6
Village of Niantic	0	0	707	0
Village of Oreana	0	0	875	0
Village of Warrensburg	0	0	1,210	0

\* Flood Vulnerable Population - (Population Identified using a weighted area calculation. The portion of the Census Block within a community that intersected the Floodplain was given an area percentage. )



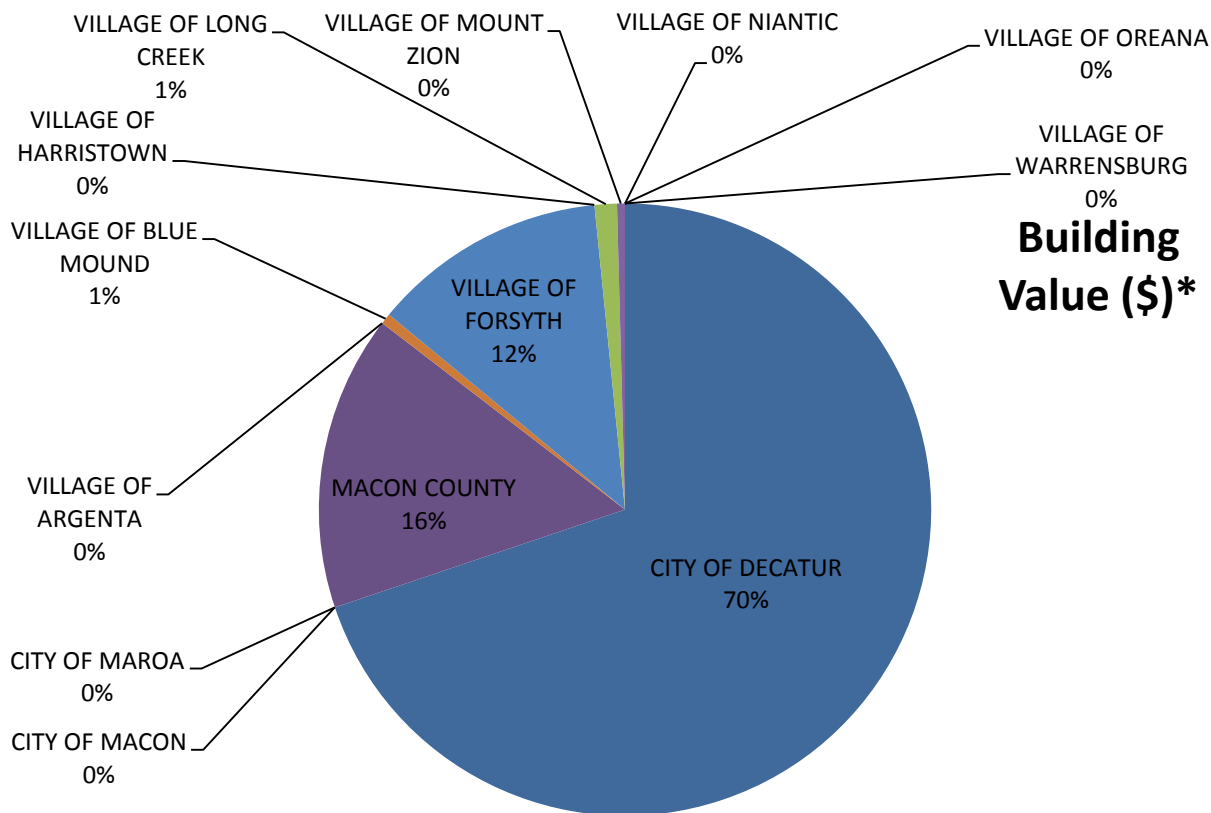
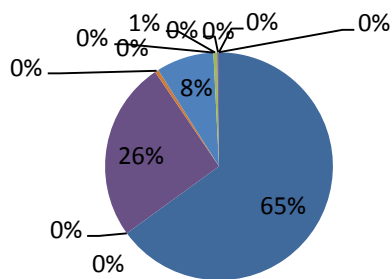


# Hazard Risk Analysis – Flooding

## Structural Vulnerability – Community

### Building Count\*

- CITY OF DECATUR
- CITY OF MACON
- CITY OF MAROA
- MACON COUNTY
- VILLAGE OF ARGENTA
- VILLAGE OF BLUE MOUND
- VILLAGE OF FORSYTH
- VILLAGE OF HARRISTOWN



### Building Value (\$)\*



# Hazard Risk Analysis – Flooding

## Structural Vulnerability – Community

Structural Vulnerability by Type for the Floodplains Only												
Community	Residential		Commercial		Industrial		Religion/Government/Education = Exempt PUC/90 ; Unknown PUC; or Railroad PUC/5000		Agricultural		Total	
	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*	Number*	Value (\$)*
City of Decatur	204	9,486,529	7	428,045	3	1,658,491	32	0	1	0	247	11,573,065
City of Macon	0	0	0	0	0	0	0	0	0	0	0	0
City of Maroa	0	0	0	0	0	0	0	0	0	0	0	0
Macon County	71	1,626,742	7	490,020	1	0	4	0	14	469,084	97	2,585,846
Village of Argenta	0	0	0	0	0	0	0	0	0	0	0	0
Village of Blue Mound	2	93,611	0	0	0	0	0	0	0	0	2	93,611
Village of Forsyth	31	2,057,887	0	0	0	0	0	0	0	0	31	2,057,887
Village of Harristown	0	0	0	0	0	0	0	0	0	0	0	0
Village of Long Creek	2	195,049	0	0	0	0	0	0	0	0	2	195,049
Village of Mount Zion	1	69,210	0	0	0	0	0	0	0	0	1	69,210
Village of Niantic	0	0	0	0	0	0	0	0	0	0	0	0
Village of Oreana	0	0	0	0	0	0	0	0	0	0	0	0
Village of Warrensburg	0	0	0	0	0	0	0	0	0	0	0	0
Total	311	13,529,028	14	918,065	4	1,658,491	36	0	15	469,084	380	16,574,668



# Hazard Risk Analysis – Severe Storms

## Summary of Events & Future Probability

- 134 Events from 1992 -2011
  - Damages: \$3,542,000
  - Life Loss: 1
  - Injuries: 13
- Annual Chance of Occurrence = 95%
- Annualized Risk
  - Damages: \$177,100
  - Life Loss: 0.05
  - Injuries: 0.65

### Ind. Annual Probabilities

Hail: 85%

Wind: 95%

Lightning: 7%

# Hazard Risk Analysis – Severe Winter Storm



## Summary of Events & Future Probability

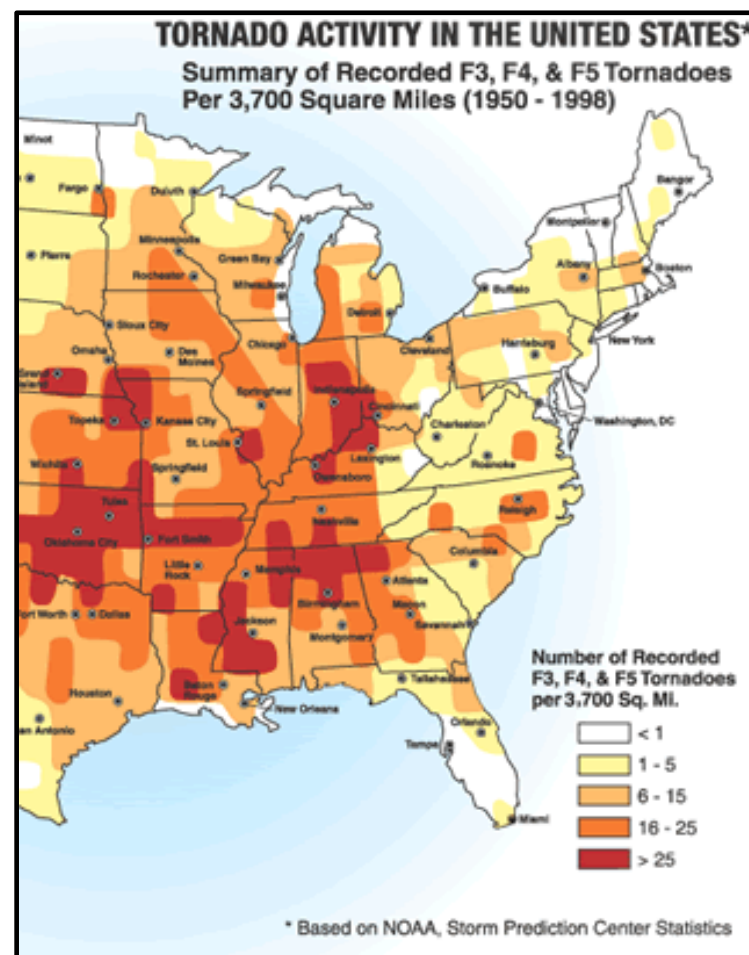
- 31 Events from 1992 -2011
  - Damages\*: \$600,000
  - Life Loss\*: 10
  - Injuries\*: 35
- Annual Chance of Occurrence = 65%

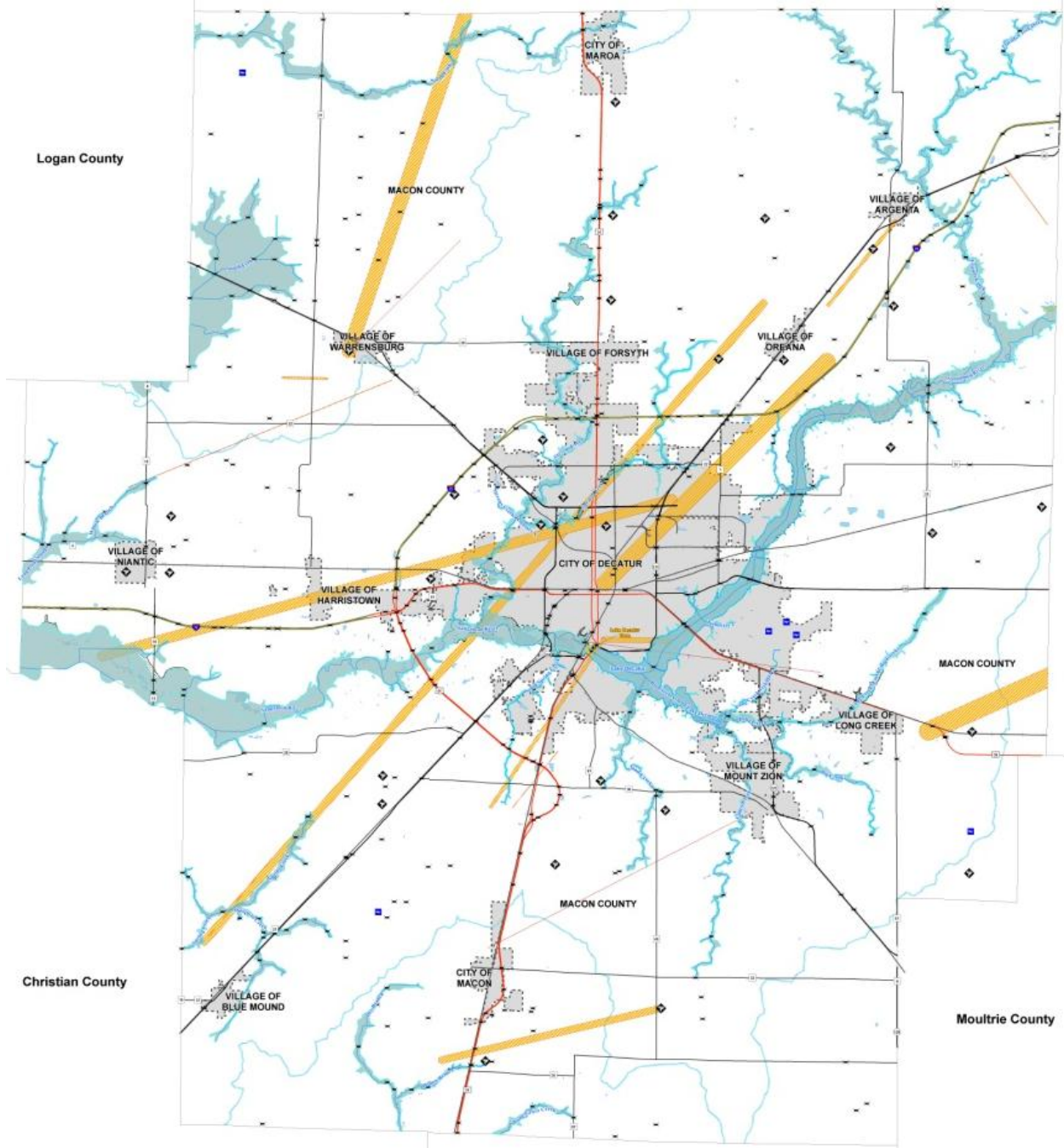
\* Event data based on regional totals. Specific impacts to Macon County unknown.

# Hazard Risk Analysis – Tornadoes

## Summary of Events & Future Probability

- 32 Events from 1956 -2011
  - Damages<sup>1</sup>: \$19,108,000
  - Life Loss<sup>1</sup>: 1
  - Injuries<sup>1</sup>: 73
  
- Annual Chance of Occurrence = 40%
  
- Annualized Risk
  - Damages: \$347,400
  - Life Loss: 0.02
  - Injuries: 1.33





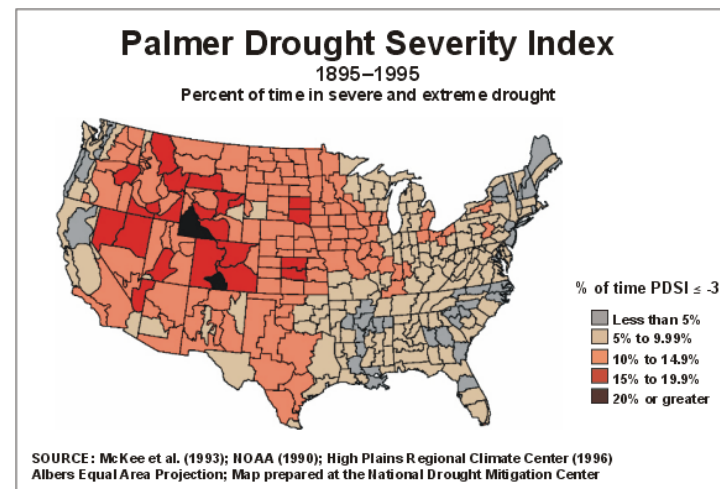




# Hazard Risk Analysis – Drought

## Summary of Events & Future Probability

- 7 Events from 1914 -2011 (2012 Event Currently Ongoing)
  - Damages: Unknown
- Annual Chance of Occurrence = 10 -15% (PSDI)
- Illinois State Water Survey (June, 2012)
  - Water Supply System: At-Risk
  - ~ 0.4% Annual Chance Impact to South Water Plant Intakes
  - ~ 10% Annual Chance Impact to ADM Intake at Reas Bridge





# Hazard Risk Analysis – Extreme Heat

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## Summary of Events & Future Probability

- 9 Events from 1992 -2011
  - Damages\* : \$ 0
  - Life Loss\* : 10
  - Injuries\* : 0
  
- Annual Chance of Occurrence = 27%

\* Event data based on regional totals. Specific impacts to Macon County unknown.



# Hazard Risk Analysis – Earthquakes

## Summary of Events & Future Probability

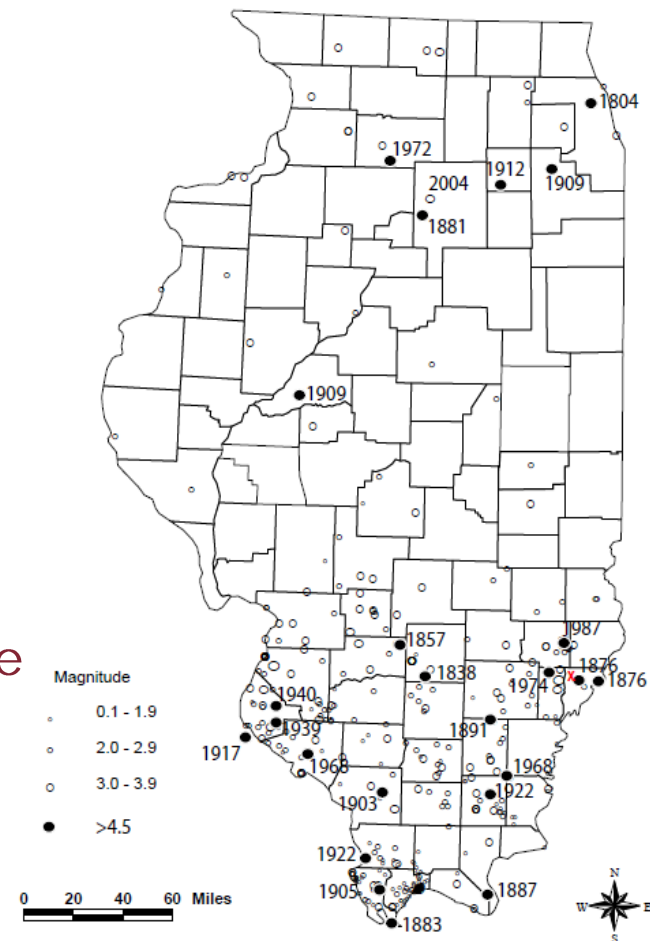
- 0 Earthquakes from 1795 -2004
  - Damages<sup>1</sup>: \$ 0
  - Life Loss<sup>1</sup>: 0
  - Injuries<sup>1</sup>: 0
- Annual Chance of Occurrence = Minimal
- HAZUS – MH:
  - Hypothetical Earthquake: 5.2 Magnitude
  - Estimated Damages: \$30,000

### Earthquakes In Illinois

1795 - 2004

Illinois State Geological Survey

There have been approximately 465 seismic events in Illinois including the 4-19-08 event. The red X represents the 4-19-08 event.



# Hazard Risk Analysis – Dam / Levee Failure ( Lake Decatur Dam)

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## Summary of Events & Future Probability

- No Historical Record
- Dam and Levee Breach Analyses Not Available
- Probability of Occurrence: Low
- Potential Impacts:
  - Loss of Drinking Water Source
  - Damage to Critical Infrastructure
    - Sewage Treatment Plant
    - Downstream Bridges

# Hazard Risk Analysis – Hazard Material / Nuclear Accidents

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## Summary of Events & Future Probability

- No Detailed Historical Record of Accidents
- Probability of Occurrence: Unknown
- Potential Impacts:
  - Hazardous materials are stored throughout the County
  - Additionally multiple pipelines, rail corridors and transportation routes bisect the County
  - Impacts associated with nuclear accident unknown



# Hazard Risk Analysis – Prioritization

<b>Historical/Probability</b>	
<b>Low (1)</b>	0 to 10 occurrences in the last 50 years
<b>Medium (2)</b>	11 to 50 occurrences in the last 50 years
<b>High (3)</b>	More than 50 occurrences in the last 50 years

<b>Vulnerability</b>	
<b>Low (1)</b>	Less than 10% of the total population of the jurisdiction
<b>Medium (2)</b>	10% to 25% of the total population of the jurisdiction
<b>High (3)</b>	More than 25% of the total population of the jurisdiction

<b>Severity of Impact</b>	
<b>Low (1)</b>	Minor injuries (under 50) & property damage (under \$1,000,000), or less than 24 hour shutdown of essential facilities
<b>Medium (2)</b>	Serious injury (more than 50), major property damage (structural stability) (\$1,000,001 to \$15,000,000), or 24 to 72 hour shutdown of essential facilities
<b>High (3)</b>	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than \$15,000,000), or more than 3 days of shutdown for essential facilities



# Hazard Risk Analysis – Prioritization

Community	Severe Storm	Flooding	Severe Winter Storm	Drought*	Extreme Heat*	Earthquakes*	Tornadoes	Dam/Levee Failure*	Hazard Material / Nuclear Accidents*
CITY OF DECATUR	7	4	6	7	3	5	5	4	4
CITY OF MACON	7	3	4	3	3	3	6	3	3
CITY OF MAROA	7	3	4	3	3	3	6	3	3
MACON COUNTY	6	6	5	4	4	4	5	4	4
VILLAGE OF ARGENTA	7	3	4	3	3	3	6	3	3
VILLAGE OF BLUE MOUND	7	3	4	3	3	3	6	3	3
VILLAGE OF FORSYTH	7	4	4	3	3	3	6	3	3
VILLAGE OF HARRISTOWN	7	3	4	3	3	3	6	4	3
VILLAGE OF LONG CREEK	7	3	4	3	3	3	6	3	3
VILLAGE OF MOUNT ZION	7	3	4	3	3	3	6	3	3
VILLAGE OF NIANTIC	7	3	4	3	3	3	6	3	3
VILLAGE OF OREANA	7	3	4	3	3	3	6	3	3
VILLAGE OF WARRENSBURG	7	3	4	3	3	3	6	3	3

Low	3
Guarded	4
Elevated	5-6
High	7-8
Severe	9



# Mitigation Project Development

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## Mitigation Goals

1. Preventative Action
2. Property Protection
3. Emergency Services
4. Structural Projects
5. Public Information





# Mitigation Project Worksheet

## MACON COUNTY HAZARD MITIGATION PLAN

Mitigation Strategy  
August 17, 2012

Community Name \_\_\_\_\_ Contact Name \_\_\_\_\_ Contact Phone No. \_\_\_\_\_

### Mitigation Goals:

1. **Preventative Activities.** Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. **Property Protection.** Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. **Emergency Services.** Reduce impacts through response and recovery activities that are implemented during a disaster.
4. **Structural Projects.** Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. **Public Information.** Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits <sup>†</sup>	Estimated Costs <sup>†</sup>
<i>Example</i>	2	<i>Purchase homes in the 100 year floodplain and convert the space to a park</i>	<i>County Planning Department – Bob Jones, Director</i>	<i>HMGP &amp; General Funds</i>	<i>5 years</i>	<i>Medium</i>	<i>Medium</i>
1.							
2.							
3.							



# Next Steps

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## Communities / Stakeholders

1. Review and Provide Input on Hazard Prioritization
2. Continue Development of Mitigation Goals

## Planning Team

1. Follow Up Calls for Each Community
2. Complete Risk Analysis
3. Develop Mitigation Projects



# Questions

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