



FEMA



WDNR

Resilience Meeting: Lower Wisconsin Watershed

Boscobel & Sauk City, Wisconsin

**10:30am & 2:30pm
March 6, 2014**

RiskMAP
Increasing Resilience Together



Introductions

- **Risk MAP Project Team, Wisconsin Department of Natural Resources (WDNR)**
 - Colleen Hermans - GIS Lead
 - Gary Heinrichs - NFIP Coordinator
 - Chris Olds - Floodplain Engineer
 - Jordan Thole & Tanya Lourigan– Regional Engineers
- **Wisconsin Emergency Management (WEM)**
 - Katie Sommers & Kimberly Berginnis, Disaster Response and Recovery Planners

Agenda

- **Project status & Understanding your flood risk**
 - Colleen Hermans
- **Strategies to reduce that risk**
 - Chris Olds
- **Resources available**
 - Katie Sommers
- **How to communicate about flood risk & Next Steps**
 - Gary Heinrichs
- **Questions and Discussion**

Risk MAP Project Status

■ What is Risk MAP?

- Risk Mapping, Assessment, and Planning
- Builds off of Map Modernization

■ Where have we been?

- Participated in Discovery
 - Reviewed flood risk data gathered from across the watershed
 - Discussed your flooding history, development plans, flood risk concerns, stormwater management activities, and other daily operations that impact flood risk
 - Reviewed your mitigation planning and project activities and status
- Open Houses
 - Will be held in all Lower Wisconsin Watershed counties starting in May 2014
- Schedules for each project are on your handout



Meeting Objectives

- **To help you better understand:**
 - Your flood risk, as individual communities and as a watershed
 - Strategies you can use to reduce your risk
 - Resources available to help you implement those strategies
 - The importance of communicating flood risk to your constituents
 - How FEMA's flood risk products can be used as a tool to improve your job and your community's objectives

Understanding Your Flood Risk

Understanding Your Flood Risk

- **By understanding how your flood risks have changed, you can make informed decisions to reduce them**
- **WDNR developed your FEMA Risk MAP products based on:**
 - Data gathered from you during the “Discovery” process
 - Analyses associated with the development of the flood risk products
 - Engineering
 - Flood hazard mapping
 - Risk assessment

Program Product Comparisons

New 2011 Regulatory Products

DFIRM Database

- [-] FIRM_Spatial_Layers
 - [] S_BASE_INDEX
 - [] S_BFR
 - [] S_PRRM_PAN
 - [] S_FLD_HAZ_AR
 - [] S_FLD_HAZ_IN
 - [] S_GEN_STRUCTURE
 - [] S_LABEL_ID
 - [] S_PLS_AR
 - [] S_POL_AR
 - [] S_PROVL_BASIN
 - [] S_STTL_START
 - [] S_SUBMETTL_INFO
 - [] S_TRANSPORT_IN
 - [] S_WTR_AR
 - [] S_WTR_LIN
 - [] S_XS
 - [] ANNO_1200_ANNO
 - [] ANNO_1200_PANEL
 - [] ANNO_2400_ANNO
 - [] ANNO_2400_PANEL
 - [] ANNO_6800_ANNO
 - [] ANNO_6800_PANEL
 - [] COW_MAR
 - [] L_COMM_INFO
 - [] L_COMM_REVS
 - [] L_MT2_LCOMB
 - [] L_MTG_POC
 - [] L_PAN_REVS
 - [] L_POL_FIRM
 - [] L_SOURCE_CIT
 - [] L_S_ELEV
 - [] L_S_STRUCTURE
 - [] STUDY_INFO



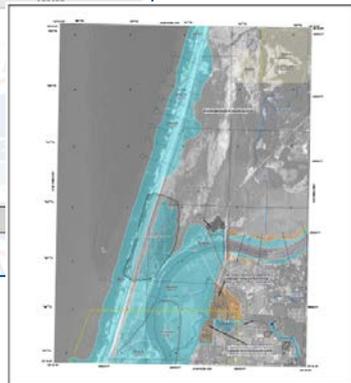
FLOOD INSURANCE STUDY
FEDERAL EMERGENCY MANAGEMENT AGENCY

**FLOOD COUNTY, USA
AND INCORPORATED AREAS**

COMMUNITY NAME	COMMUNITY NUMBER
FLOOD COUNTY UNINCORPORATED AREAS	123456
CITY OF COASTLAND	123457
TOWN OF FLOODVILLE	123458
CITY OF METROPOLIS	

EFFECTIVE:
DECEMBER 31, 9999

FLOOD INSURANCE STUDY NUMBER
1234567890



Community Name	Community Number
Flood County Unincorporated Areas	123456
City of Coastland	123457
Town of Floodville	123458
City of Metropolis	

Subject to statutory due-process requirements

Non-Regulatory Products

Flood Risk Database

- [] Community_Panel_Info
- [] L_Comm_Info
- [] L_MTL_LOMC
- [] L_Pan_Revis
- [] L_Pol_FIRM
- [] L_Siv_Model
- [] L_Siv_Start
- [] L_Wtr_Pan
- [] S_Bfe
- [] S_POC_Index
- [] S_Pan_Pan
- [] S_Gen_Struct
- [] S_Label_Id
- [] S_Label_Pt
- [] S_LCOMB
- [] S_Perm_Bnk
- [] S_Quad
- [] S_Siv_Pan
- [] S_Transport_Ar

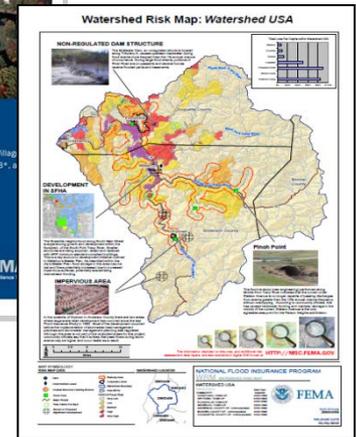


Flood Risk Report

For project areas including: Watershed USA, Village of Coastland, Village of Drytown, City of Floodville, Town of Waterloo, County A*, County B*, & County C*

Report Number 001
MM/DD/YYYY

FEMA RiskMAP

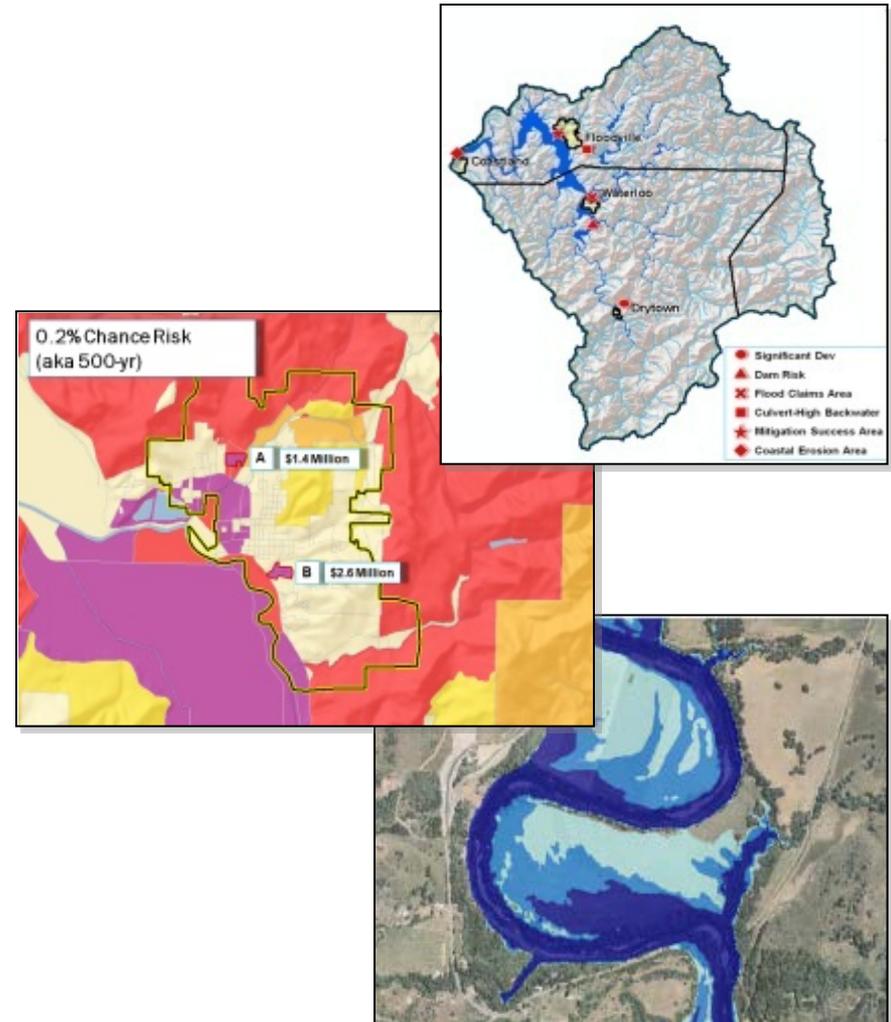


Not subject to statutory due-process requirements



Flood Risk Products

- Flood Risk Map
- Flood Risk Report
- Flood Risk Database
 - Changes Since Last FIRM
 - Depth and Analysis Grids
 - Flood Risk Assessment (HAZUS)

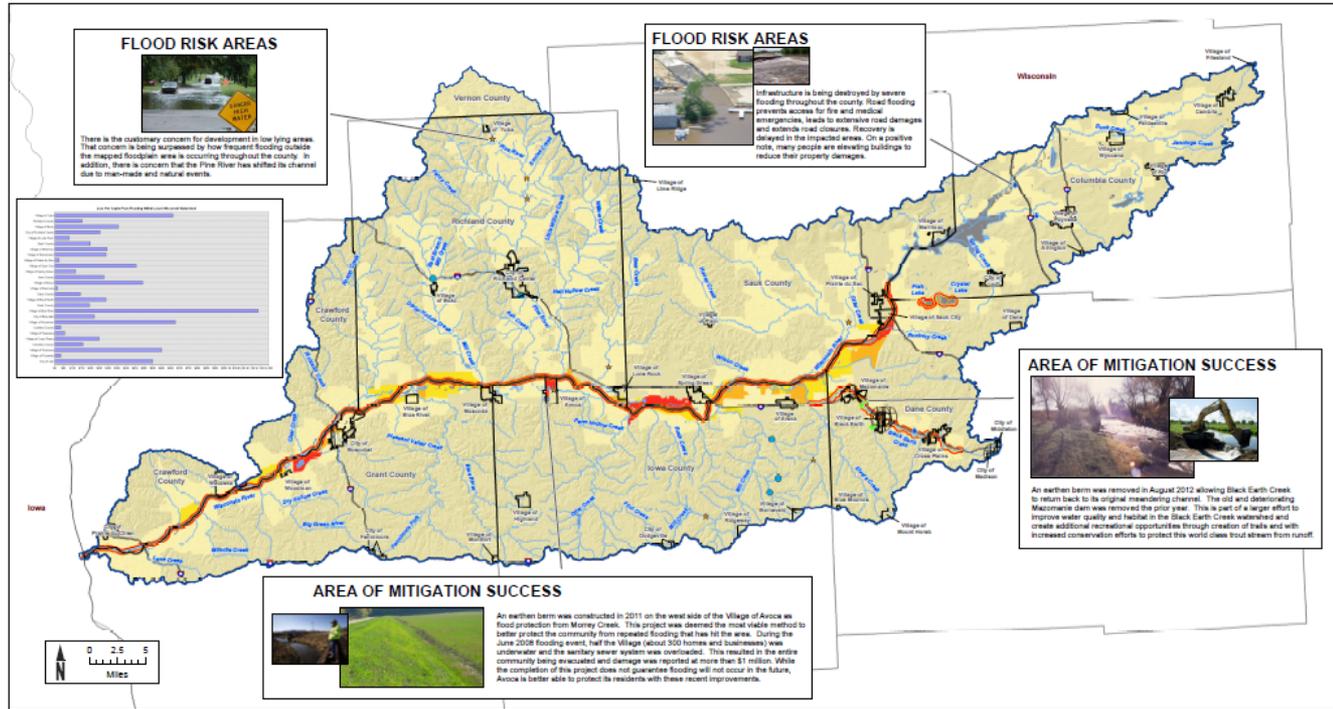


Flood Risk Map

Visually Promotes Risk Awareness

- Contains results of Risk MAP project non-regulatory datasets
- Promotes additional flood risk data not shown but located within the Flood Risk Database

Flood Risk Map: Lower Wisconsin Watershed, 07070005



MAP SYMBOLLOGY

Base Data	Flood Data	Flood Risk	Areas of Mitigation Interest
Corporate Limits	Rivers and Streams	Very Low	Areas of Mitigation Success
Major Roads	Restudy Area	Low	Other
Interstates		Medium	Dams
Watershed Boundary		High	Non-Levee Embankments
State Boundary		Very High	Other Flood Risk Areas
			Significant Land Use Change



Risk Mapping, Assessment, and Planning (Risk MAP)
 FRM FLOOD RISK MAP
 Lower Wisconsin Watershed, USA

HUC-8 Code: 07070005
 RELEASE DATE: 3/6/2014

For more information of data used for the non-regulatory map, please consult the Lower Wisconsin Watershed, USA Flood Risk Database and Flood Risk Report.

Flood Risk Report



Flood Risk Report

Lower Wisconsin Watershed, 07070005

Columbia County, Crawford County, Dane County, Grant County, Iowa County, Richland County, Sauk County

Wisconsin

Report Number 01

3/6/2014

Final



RiskMAP
Increasing Resilience Together

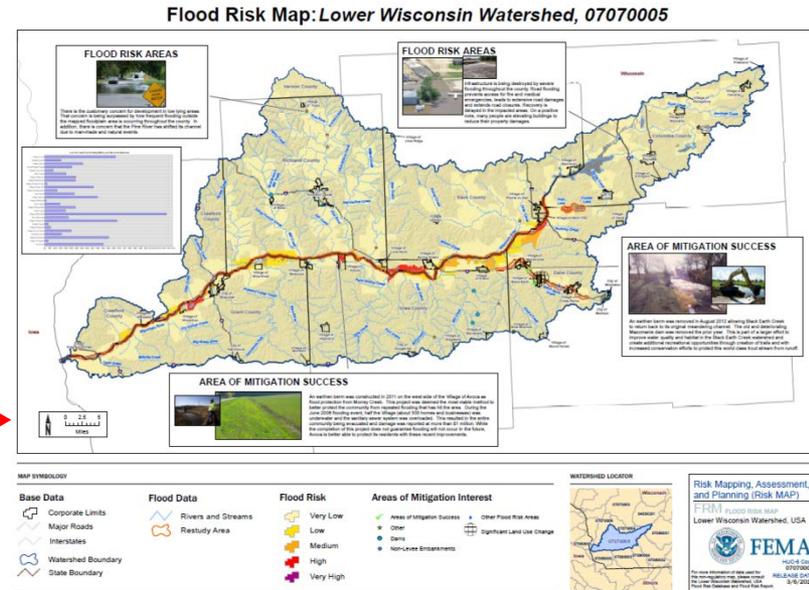
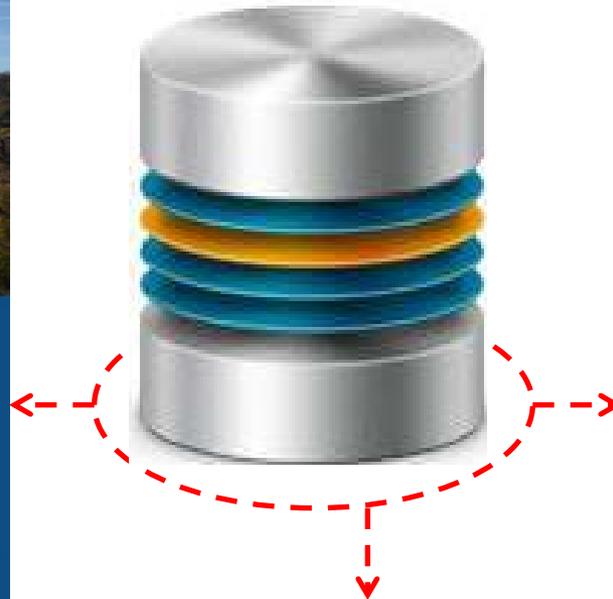
- **Background**
 - Purpose, Methods
 - Risk Reduction Practices
- **Project Results**
 - Changes Since Last FIRM
 - Depth & Analysis Grids
 - Flood Risk Assessment
 - Enhanced Analyses
- **Summarized by Locations**
 - Communities and Watersheds

Flood Risk Database

Flood Risk Report
 Lower Wisconsin Watershed, 07070005
 Columbia County, Crawford County, Dane County, Grant County, Iowa County, Richland County, Sauk County
 Wisconsin

Report Number 01
 3/6/2014

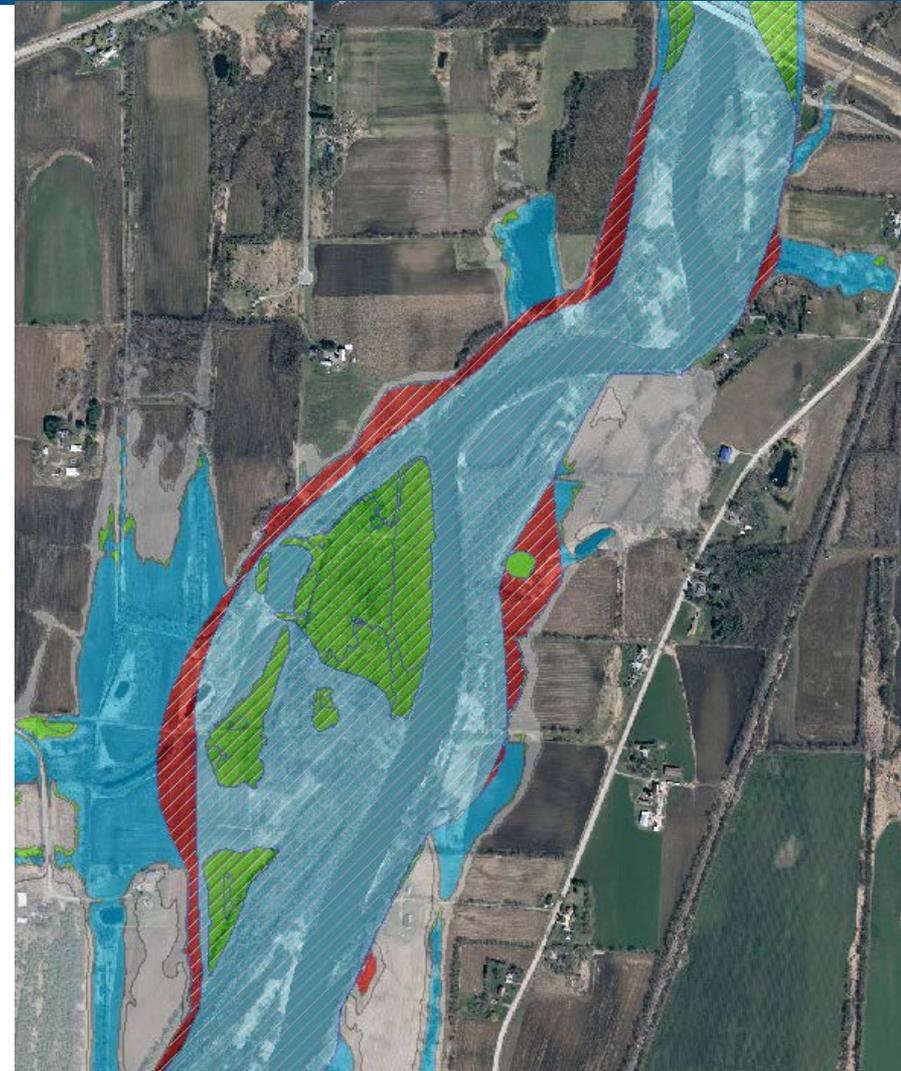
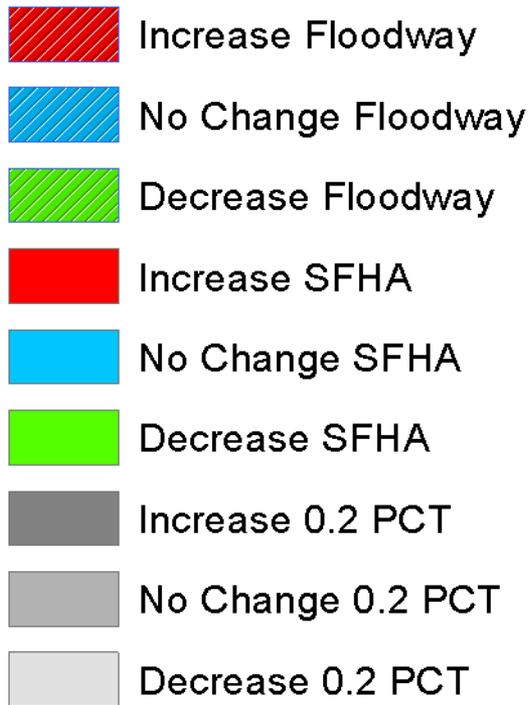
Final



Estimated Potential Losses for Flood Event Scenarios

	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized (\$/yr)	
	Estimated Value	% of Total	Dollar Losses ⁵	Loss Ratio ^{1,6}								
Residential Building/Contents	\$691,600,000	72%	\$52,800,000	8%	\$67,200,000	10%	\$74,500,000	11%	\$82,100,000	12%	\$6,100,000	1%
Commercial Building/Contents	\$152,000,000	16%	\$23,400,000	15%	\$30,100,000	20%	\$33,200,000	22%	\$37,300,000	25%	\$2,700,000	2%
Other Building/Contents	\$110,700,000	12%	\$4,600,000	4%	\$6,700,000	6%	\$8,000,000	7%	\$9,800,000	9%	\$600,000	1%
Total Building/Contents²	\$956,900,000	100%	\$81,100,000	8%	\$104,000,000	11%	\$116,000,000	12%	\$129,300,000	14%	\$16,700,000	2%
Business Disruption ³	N/A	N/A	\$1,100,000	N/A	\$1,500,000	N/A	\$1,700,000	N/A	\$2,000,000	N/A	\$100,000	N/A
TOTAL⁴	\$956,900,000	N/A	\$82,300,000	9%	\$107,300,000	11%	\$119,200,000	12%	\$134,300,000	14%	\$17,000,000	2%

Changes Since Last FIRM



Depth and Analysis Grids

■ Depth Grids

- Show the depth of flooding during 5 flood events
 - 10% depth grid, 4% depth grid, 2% depth grid, 1% depth grid, 0.2% depth grid

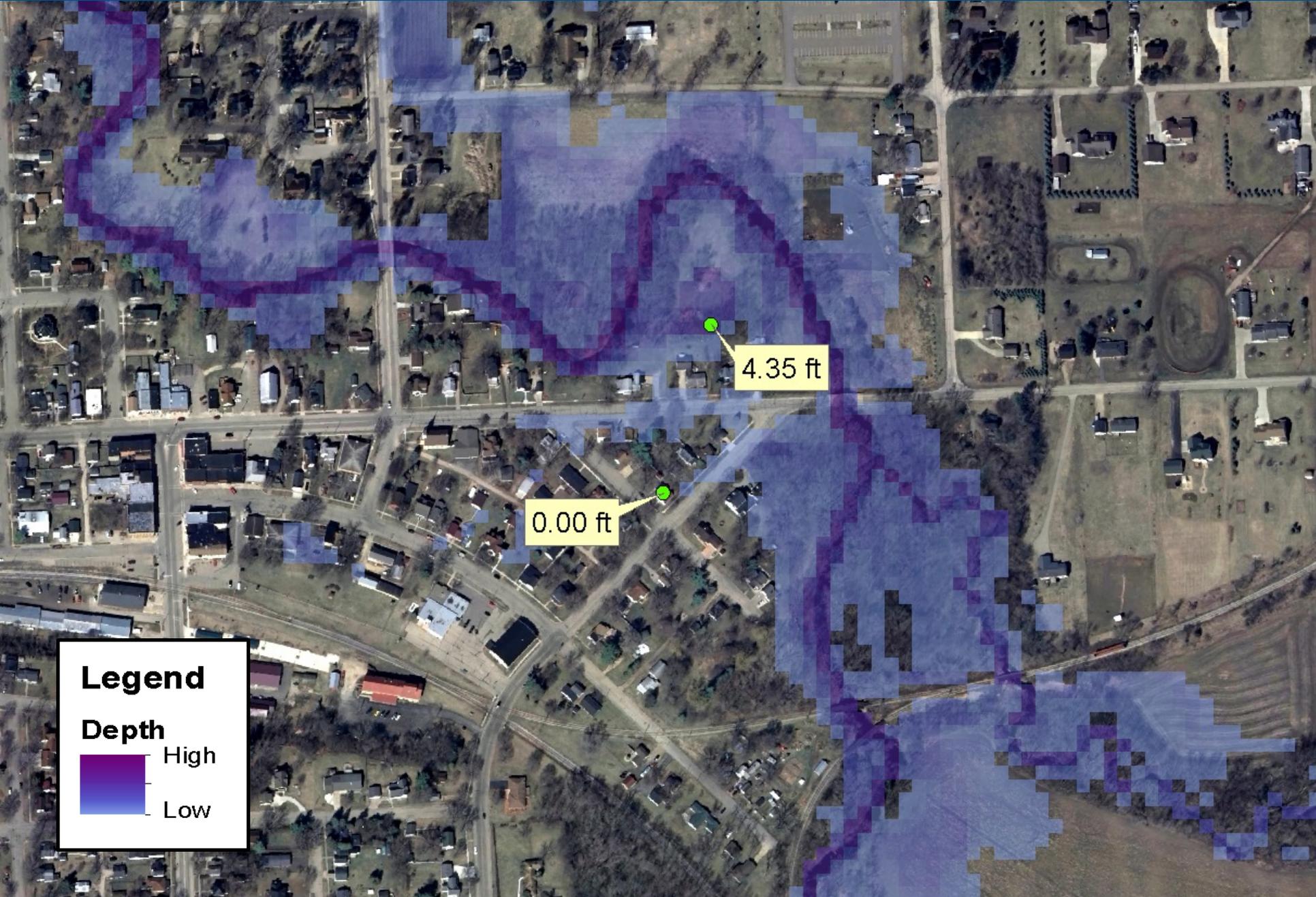
■ Percent Annual Chance Grid

- Shows the risk of flooding in a one year period

■ Percent 30-Year Chance Grid

- Shows the risk of flooding over a 30-year period

10% Depth Grid



Legend

Depth

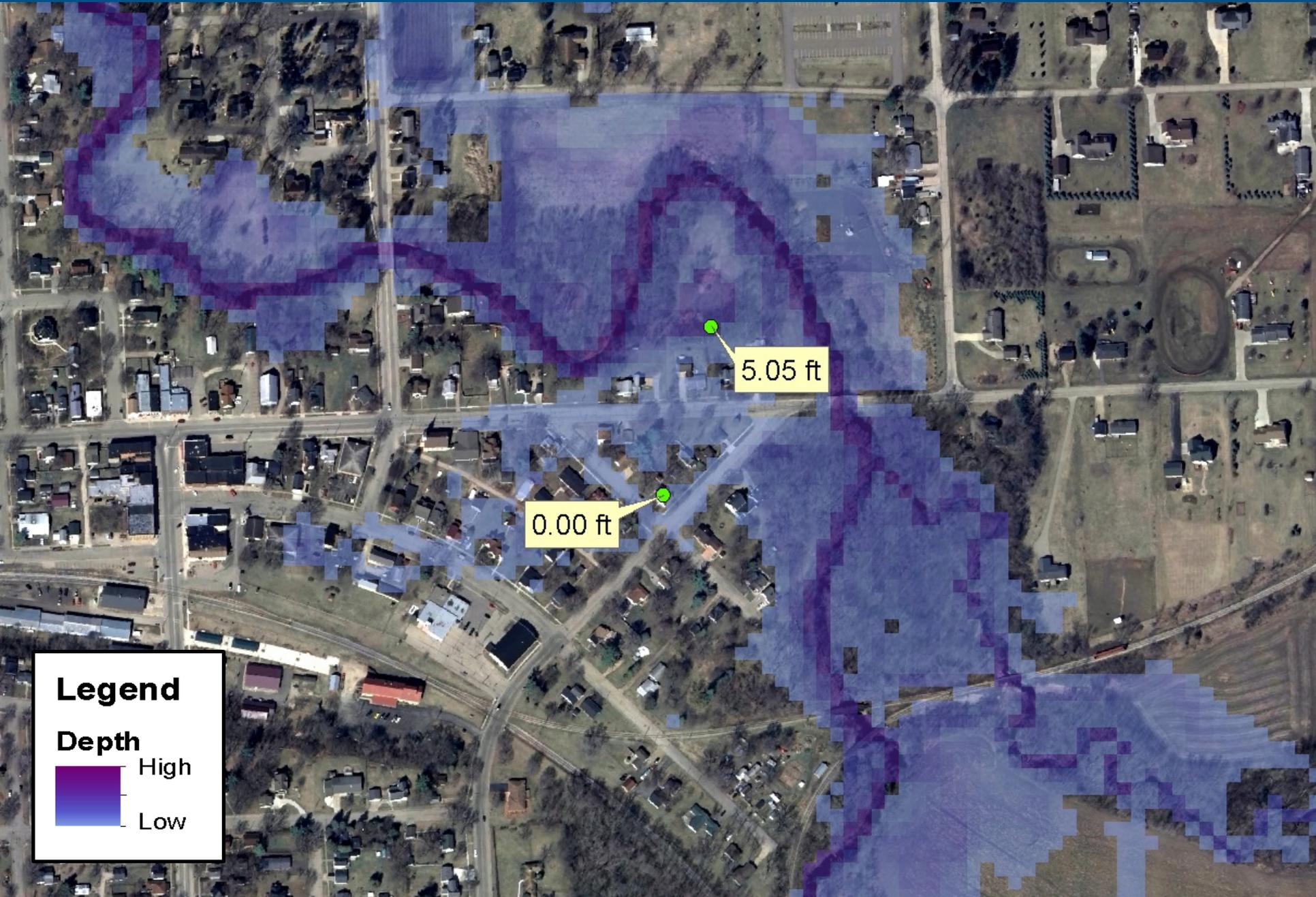
High

Low

4.35 ft

0.00 ft

4% Depth Grid



Legend

Depth

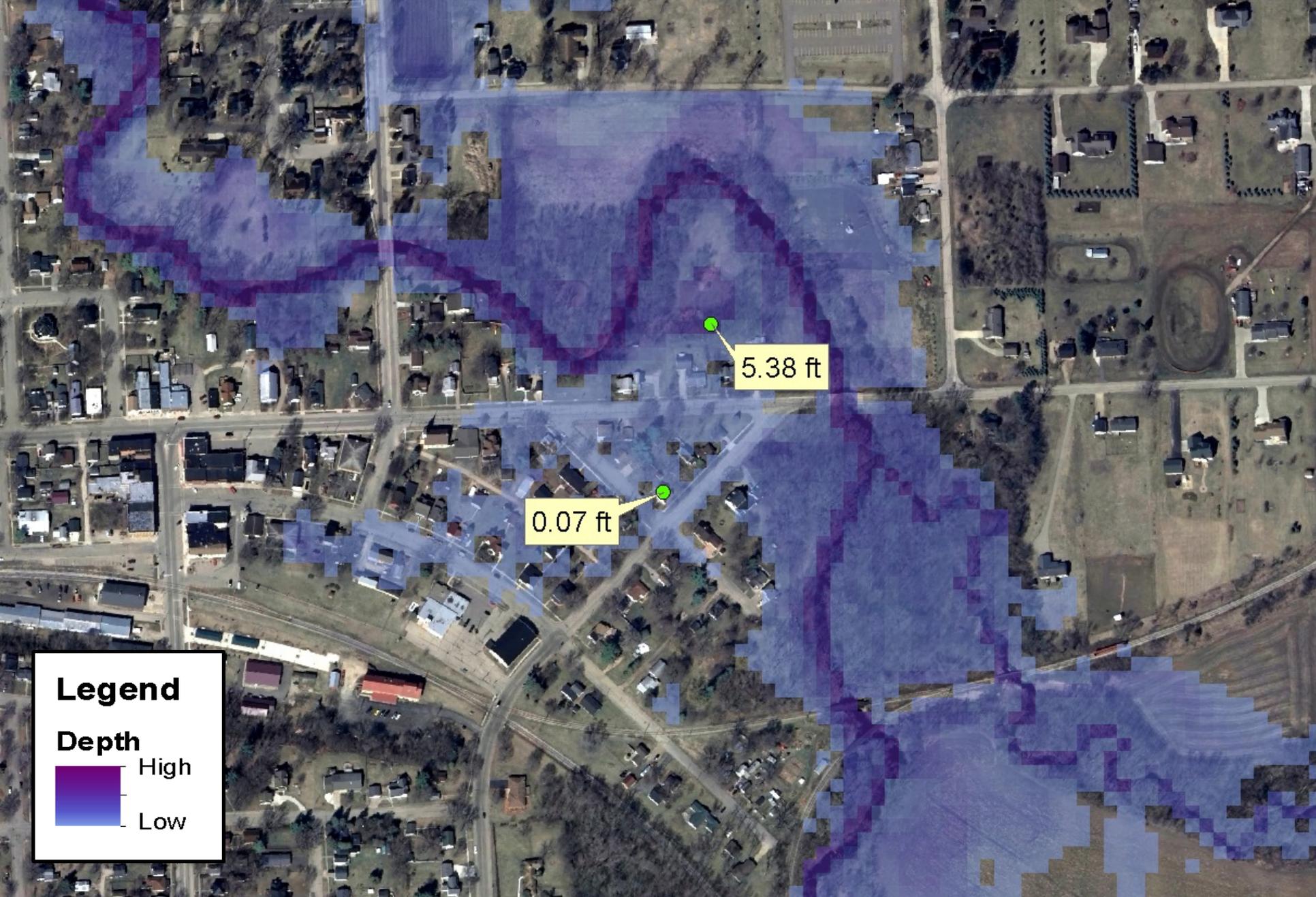
High

Low

0.00 ft

5.05 ft

2% Depth Grid



Legend

Depth

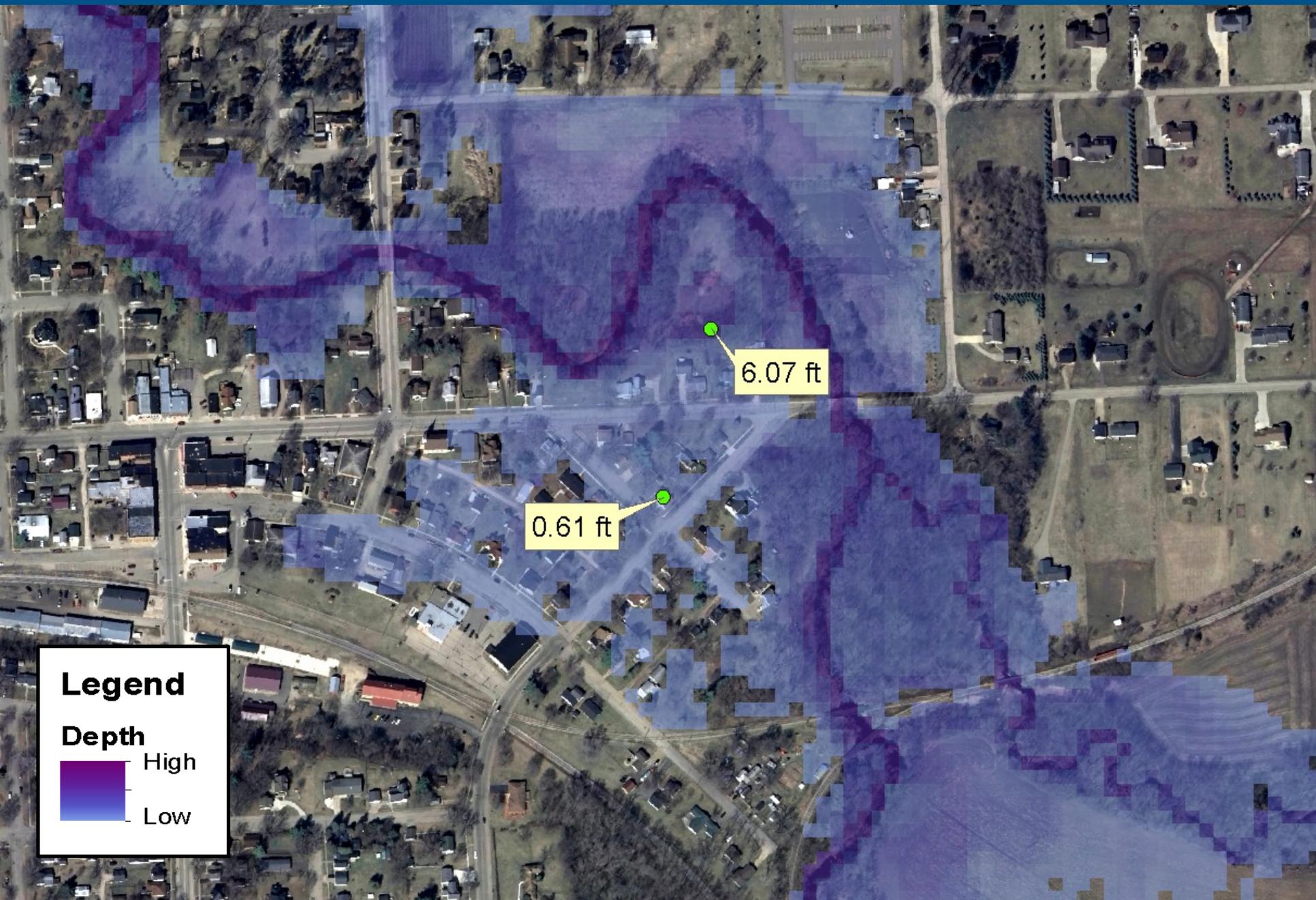
High

Low

0.07 ft

5.38 ft

1% Depth Grid

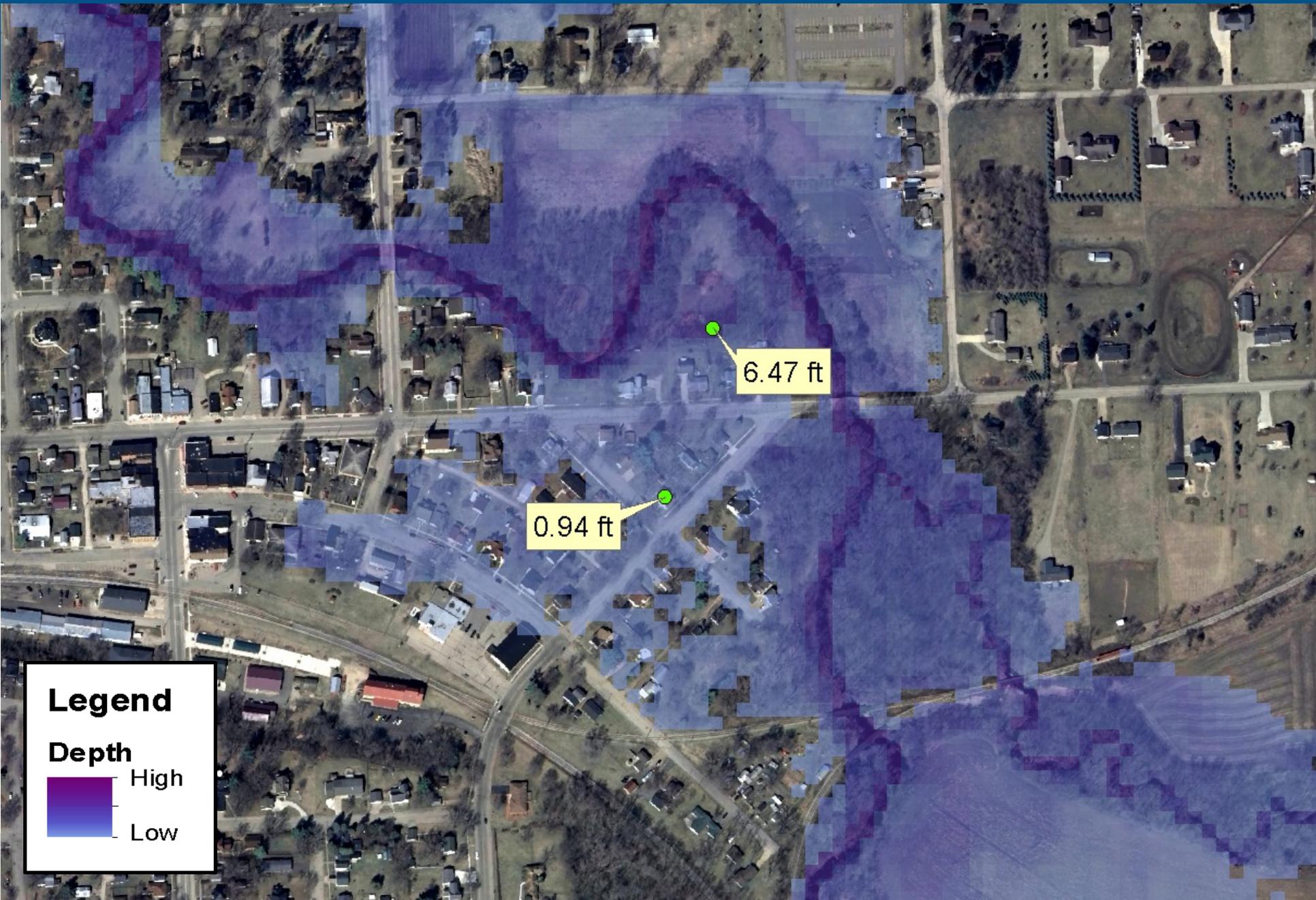


Legend

Depth



0.2% Depth Grid

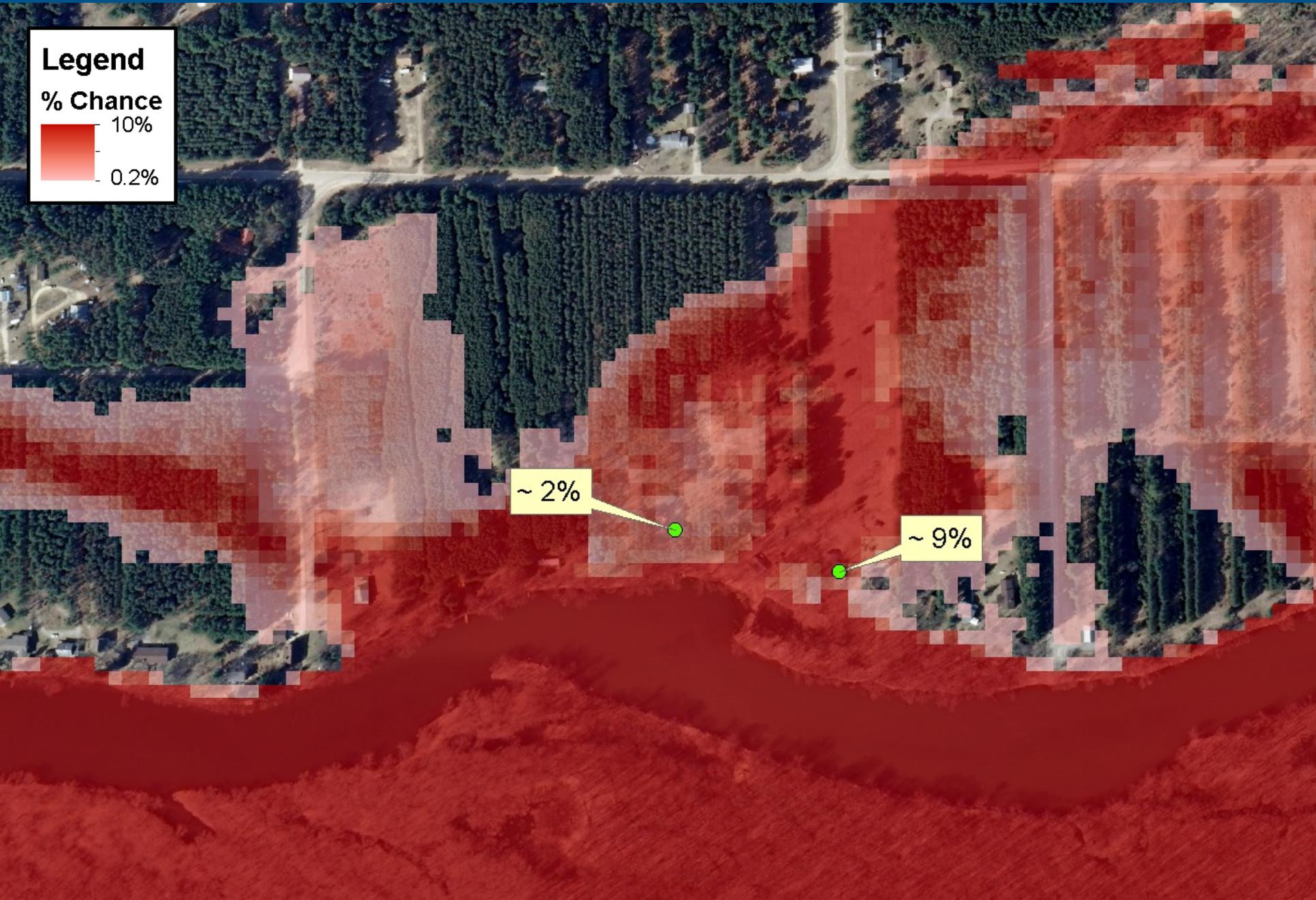


Legend

Depth



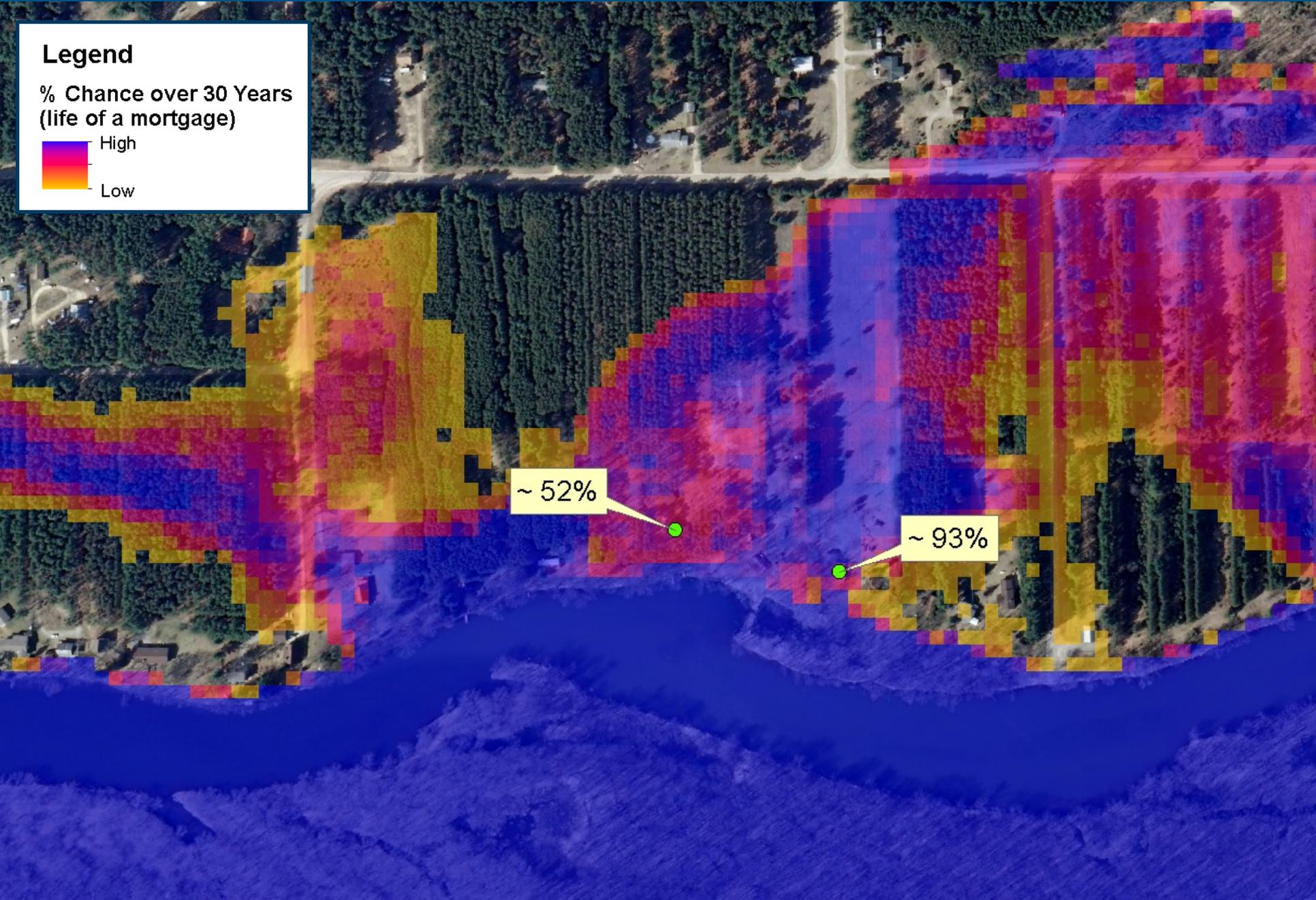
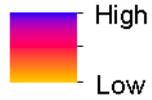
Percent Annual Chance Grid



Percent 30-year Chance Grid

Legend

% Chance over 30 Years
(life of a mortgage)



~ 52%

~ 93%



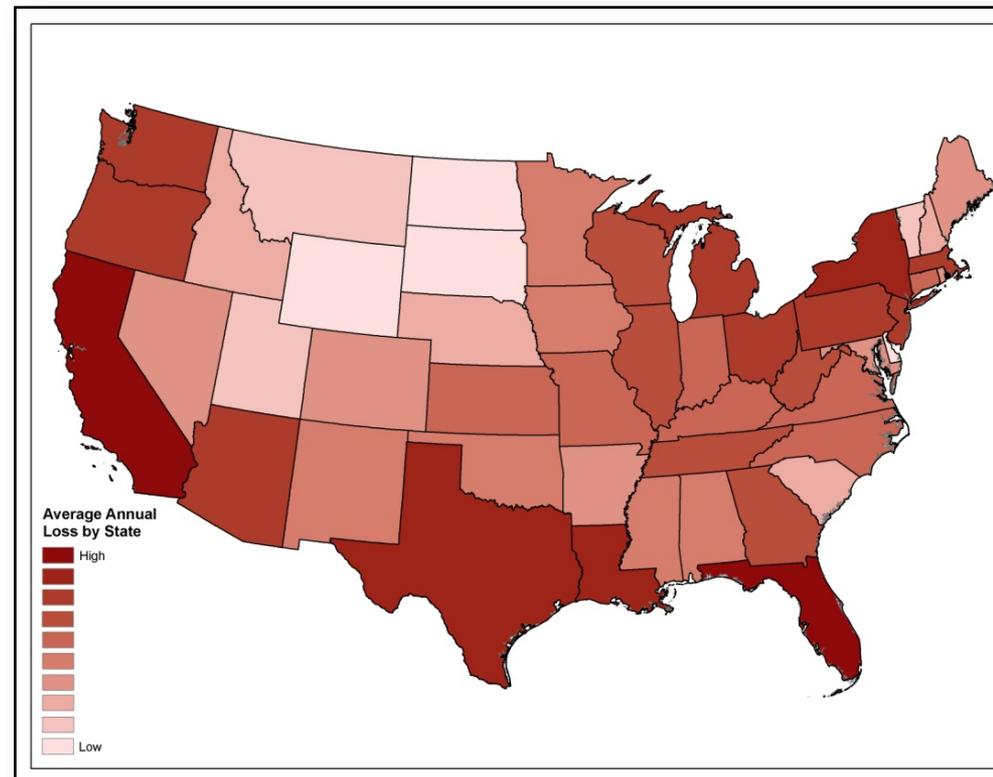
Flood Risk Assessment Data Purpose and Intended Uses

- **Identify Areas and Communicate Relative Flood Risk:**
 - Flood prone areas
 - Vulnerable people and property
- **Provide Flood Risk \$:**
 - Potential damage severity for different flood frequencies
 - Identify locations with possible cost effective mitigation options
- **Improve Estimates for Flood Risk \$:**
 - Losses from Average Annualized Loss (AAL) Study
 - Refined losses from new flood study depth grids
 - Refined general building stock data from local sources

Flood Risk Assessment Data

2010 AAL Study

- **2010 HAZUS-MH Flood Average Annualized Loss Estimation (AAL) was performed for the contiguous U.S. using MR4**
- **Inputs:**
 - County-wide study regions
 - 30 meter DEM
 - Default Census data
- **Final Output included:**
 - Total exposure
 - Average Annualized Loss
 - Annualized Loss Ratio



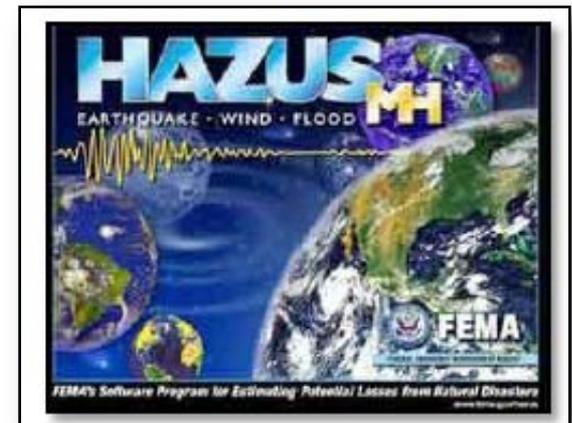
Flood Risk Assessment Data Refined HAZUS Analysis

■ Overview

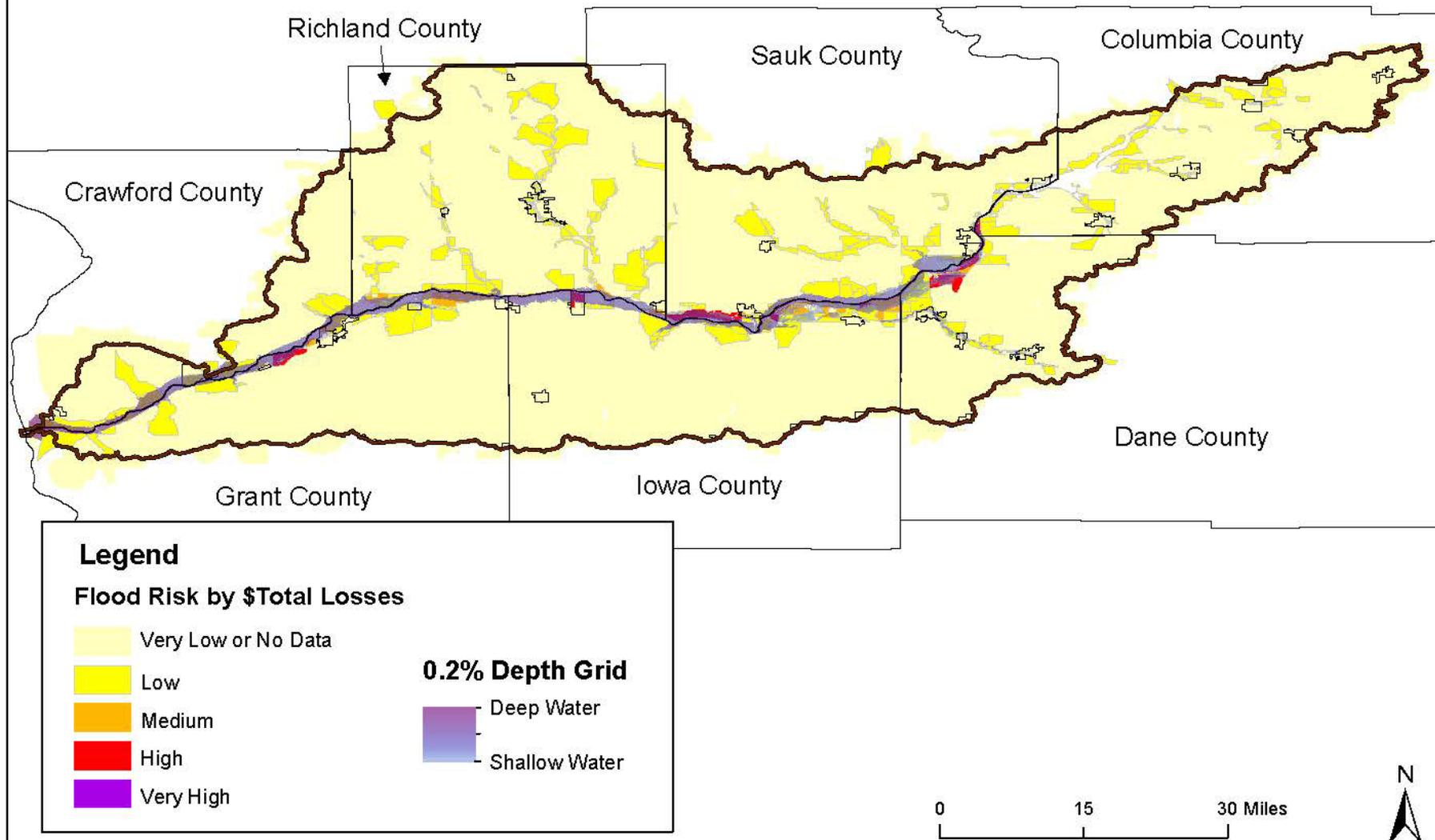
- Depth Grids from new study areas imported into HAZUS
- HAZUS run for each return period, losses estimated, and annualized
- HAZUS results exported and stored in Flood Risk Database

■ Estimation of Losses

- Dollar Losses
 - Residential, Commercial and Other Losses
- Percent Damage
 - Structure and Content Considerations
- Business Disruption



Lower Wisconsin Watershed: HAZUS Combined Average Annualized Loss (AAL)



10% Chance Risk (10-yr)

A \$535,000

**B
\$1.8Million**

Legend

Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High

0 0.5 1 Miles



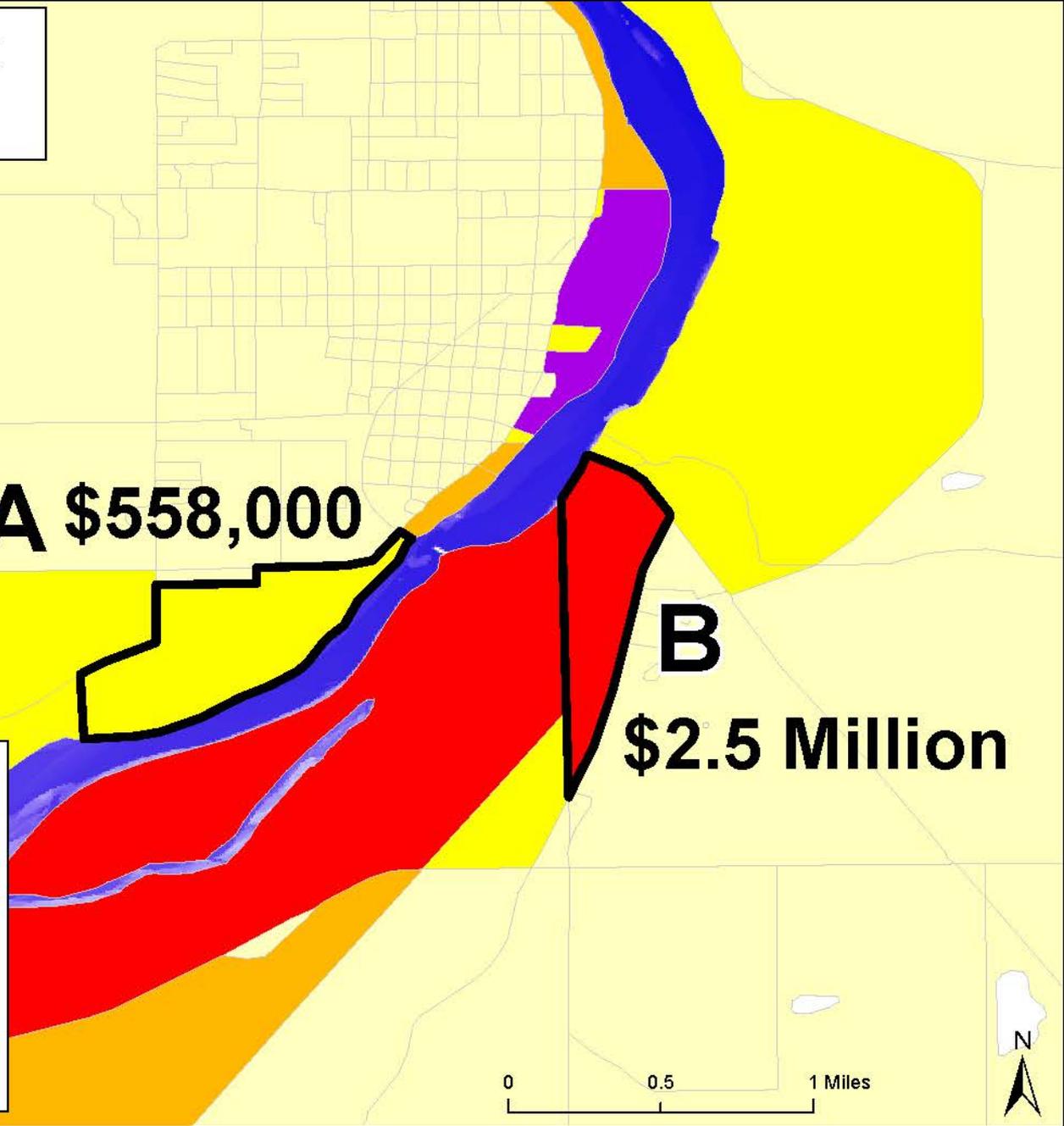
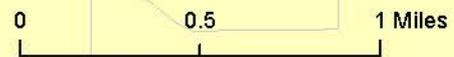
4% Chance Risk (25-yr)

A \$558,000

B \$2.5 Million

Legend
Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High



2% Chance Risk (50-yr)

A \$598,000

B \$3.5 Million

Legend

Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High

0 0.5 1 Miles



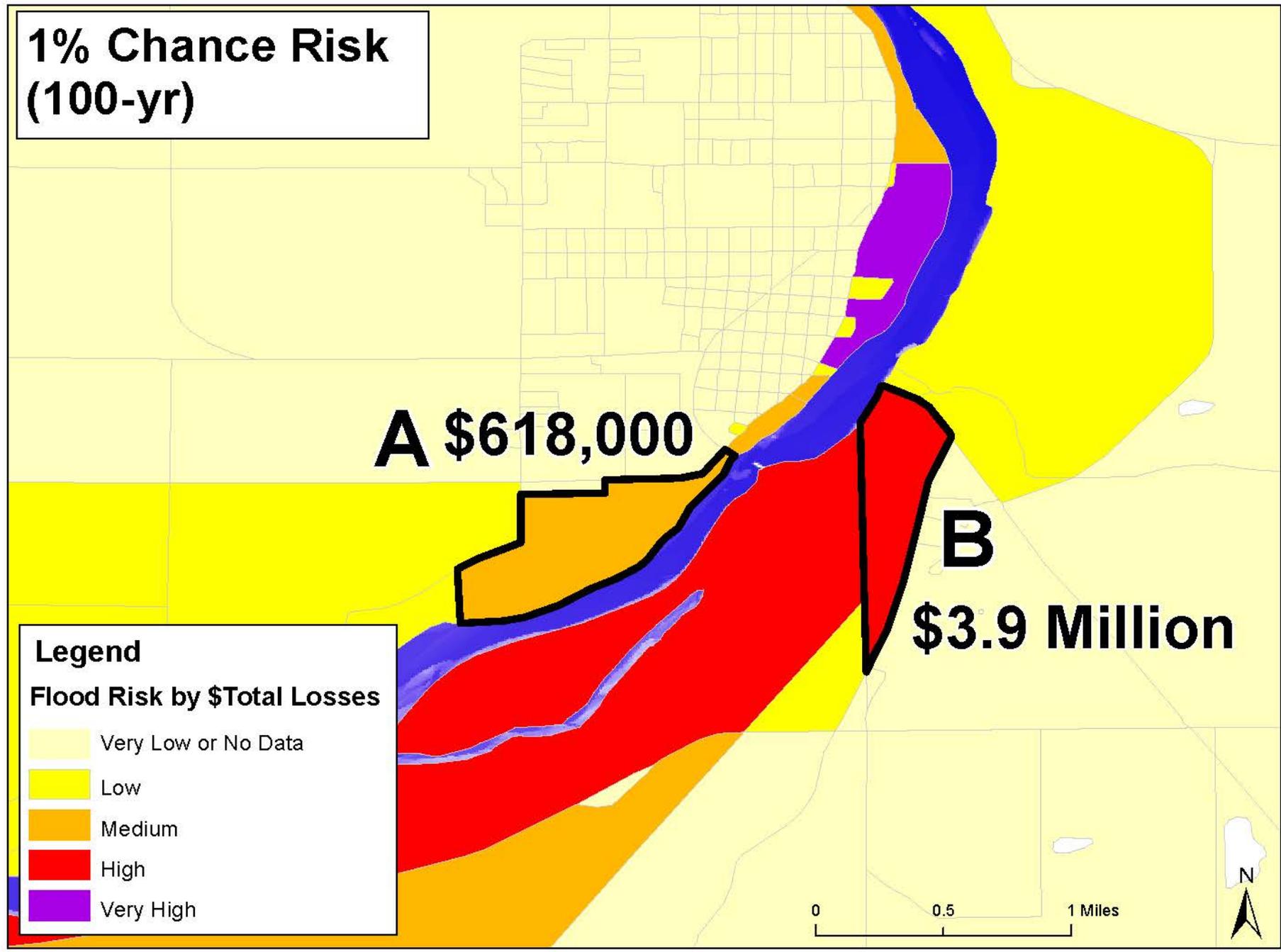
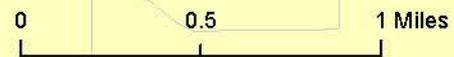
1% Chance Risk (100-yr)

A \$618,000

B \$3.9 Million

Legend
Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High



0.2% Chance Risk (500-yr)

A \$658,000

B \$4.7 Million

Legend

Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High

0 0.5 1 Miles



Annualized Risk

Annualized Loss = $(10\% - 4\%) * (\text{Loss } 10\% + \text{Loss } 4\%) / 2 +$
 $(4\% - 2\%) * (\text{Loss } 4\% + \text{Loss } 2\%) / 2 +$
 $(2\% - 1\%) * (\text{Loss } 2\% + \text{Loss } 1\%) / 2 +$
 $(1\% - 0.2\%) * (\text{Loss } 1\% + \text{Loss } 0.2\%) / 2 +$
 $0.2\% * \text{Loss } 0.2\%$

A \$57,000

B \$267,000

Legend

Flood Risk by \$Total Losses

- Very Low or No Data
- Low
- Medium
- High
- Very High

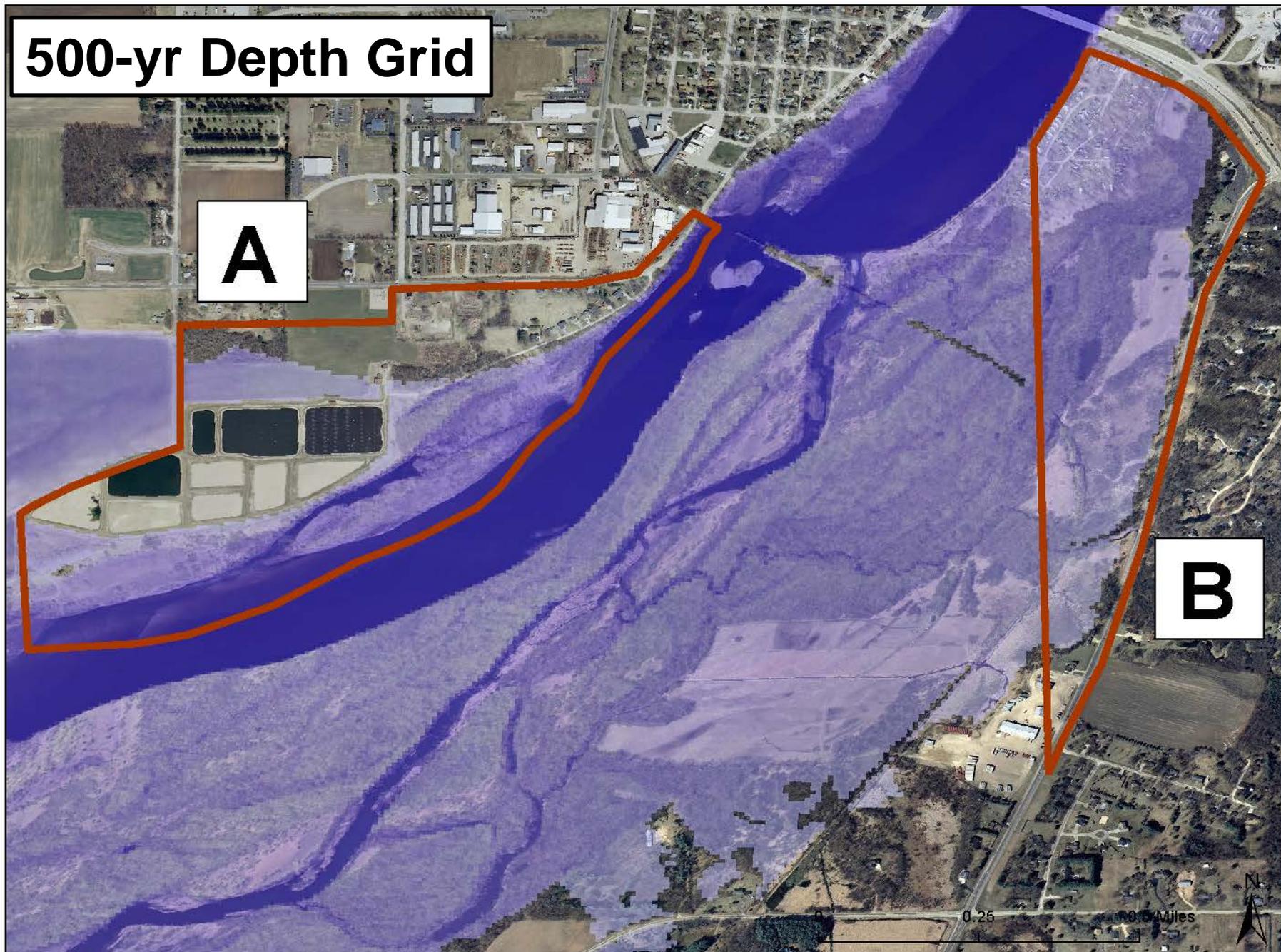
0 0.5 1 Miles



500-yr Depth Grid

A

B



Flood Risk Report Content – Community Summaries

HAZUS-MH Estimated Loss Information

Watershed USA’s flood risk analysis incorporates results from a FEMA performed HAZUS-MH analysis which accounts for newly modeled areas in the study area and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

	Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized (\$/yr)	
	Estimated Value	% of Total	Dollar Losses ⁵	Loss Ratio ^{1,6}								
Residential Building/Contents	\$11,000,000	28%	\$3,400,000	31%	\$3,900,000	35%	\$4,000,000	36%	\$4,300,000	39%	\$400,000	3%
Commercial Building/Contents	\$25,700,000	66%	\$7,300,000	28%	\$9,300,000	36%	\$10,100,000	39%	\$11,600,000	45%	\$800,000	3%
Other Building/Contents	\$2,100,000	5%	\$200,000	9%	\$200,000	10%	\$300,000	13%	\$400,000	19%	\$20,000	1%
Total Building/Contents ²	\$38,800,000	100%	\$10,900,000	28%	\$13,300,000	34%	\$14,300,000	37%	\$16,300,000	42%	\$1,400,000	4%
Business Disruption ³	\$0	N/A	\$200,000	N/A	\$300,000	N/A	\$300,000	N/A	\$400,000	N/A	\$20,000	N/A
TOTAL⁴	\$38,800,000	N/A	\$11,100,000	29%	\$13,600,000	35%	\$14,600,000	38%	\$16,600,000	43%	\$1,400,000	4%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

¹Loss ratio = Dollar Losses / Estimated Value

²Total Building/Contents Loss = Residential Building/Contents Loss + Commercial Building/Contents Loss + Other Building/Contents Loss.

³Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.

⁴Total Loss = Total Building/Contents + Business Disruption

⁵Losses shown are rounded to nearest \$10,000 for values under \$100,000 and to the nearest \$100,000 for values over \$100,000.

⁶Loss Ratios rounded to nearest integer percent.

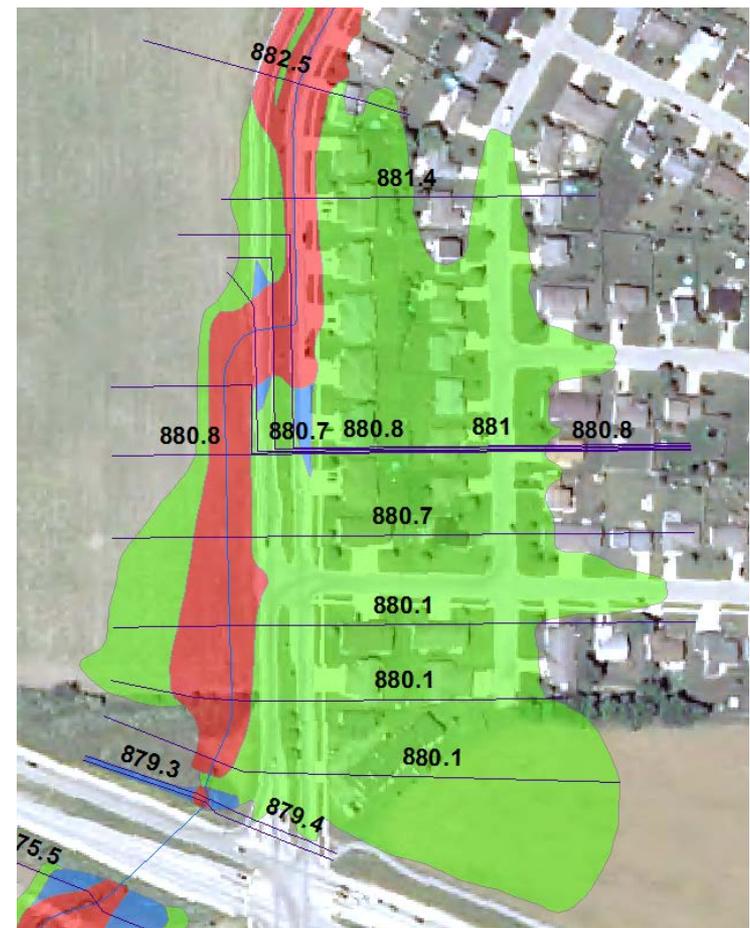
Strategies To Reduce Your Flood Risk

Strategies to Reduce Flood Risk

There are many strategies you can take to reduce your flood risk

- **Prevention**
 - Affects future development
 - Includes ordinances and building codes
- **Property protection**
 - Affects existing development
 - Includes elevation and acquisition
- **Public education and awareness**
 - Informs people about risk
 - Includes outreach activities
- **Natural resource protection**
 - Protects water quality
 - Protects Habitats
 - Restores resources
- **Emergency services protection**
 - Protects critical facilities
- **Structural projects**
 - Involves construction
 - Includes berms
 - Includes altering stream routes

Spotlight on a Local Best Practice



Red = Floodway

Blue = 100-year Floodfringe

Green = 500-year floodplain

Spotlight on a Local Best Practice



Mitigation Action Form



Date: _____

Contact Information

Please enter the primary contact associated with this Mitigation Action.

1. Full Name: _____

2. Email Address: _____

3. Title and Organization: _____

4. Jurisdiction Name(s): _____

Mitigation Action Information

5A. Describe your community's natural hazard and mitigation action/strategy:

5B. What is your community's progress on this action/strategy?

Project Information

6. Estimated Project Duration

- Less than 1 yr 2-3 yrs More than 5 yrs
 1-2 yrs 3-5 yrs

7. Estimated Project Cost

- Less than \$150,000 \$400,001 - \$750,000 Greater than \$1,000,000
 \$150,000-\$400,000 \$750,001 - \$1,000,000



← Scan this image with your smartphone to visit the Mitigation Action Collection website.

Mitigation Action Collection Form
<http://mat.msc.fema.gov/>
Version 01/10/2014



Mitigation Action Form



8. What is the estimated source or strategy for funding this project?

9. Additional Details

Enter any additional details about your project below.

You may return this form 4 ways:

- 1) Scan and email the form to Colleen.Hermans@Wisconsin.gov
- 2) Bring the completed form to the Resilience Meeting on March 6, 2014
- 3) Fax your form attn. Colleen Hermans WT/3 to 608-267-2800
- 4) Or, mail your form to:

Colleen Hermans WT/3
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921



Mitigation Action Form



Mitigation Action Types

Local Plans and Regulations

- **Zoning and Ordinances**
 - Easements
 - Erosion Overlay Districts
 - Setbacks
 - Open Space Preservation
 - Enclosure Limits
 - Other
- **Transfer of Development Rights**
- **Building Codes**
 - Enforcement
 - Higher Floodway Standards
 - Additional Freeboard (2 ft above BFE)
 - International Building Code
 - International Residential Code
 - Post Disaster Code Enforcement
 - Other
- **Establish Funding Source for Risk Reduction**
- **Incentives for Risk Reduction**
- **National Hazards Integrated into Other Plans**
 - Capital Improvement Plan
 - Comprehensive Plan
 - Master Plan
 - Site Plan
 - Stormwater Management
 - Coastal Zone Management
 - Floodplain Management

Natural Systems

- **Forest/Vegetation Management**
 - Xeriscaping
- **Fuel Reduction**
- **Open Space Preservation**
- **Protect and Restore Natural Functions**
 - Beach Nourishment
 - Reef of breakwater Restoration
 - Dune Rehabilitation/Protection
 - Ground Water Recharge
 - Sediment Trapping Vegetation
 - Wetland Restoration
 - Other

Soil Stabilization or Erosion Control

- Sloping/Grading
- Vegetation
- Terracing
- Rip Rap
- Geotextile Fabric
- Other

Stream Maintenance

Tree Management

Other

Structure and Infrastructure Projects

Acquisition

UHI Albedo Enhancement

- Green Roof
- Reflective Surfaces

Elevation

- Structure
- Utilities
- Other

Flood Control/Management

- Culvert Expansion/Modification
- Bridge Expansion/Modification
- Sediment Retention
- Detention/Retention Basin
- Dams/Levees
- Drainage Improvements
- Green Roofs
- Jetties
- Permeable Paving
- Rain Gardens
- Revetments
- Seawalls
- Other

Retrofit

- Structural
- Non-Structural
- Other

Safe Room Construction

Underground Utilities

Other



← Scan this image with your smartphone to visit the Mitigation Action Collection website.

Mitigation Action Collection Form

<http://mat.msc.fema.gov/>

Version 01/10/2014



Resources to Implement Your Strategies and Reduce Your Flood Risk

Please see the Wisconsin Emergency Management
Presentation for this section

Communication Roles and Responsibilities

Communicate About Your Risk

- **Flood risk awareness:**

- Leads to action
- Increases overall community resilience
- Builds support for implementing the mitigation plan

- **Your constituents:**

- Expect to hear about flood risk from officials, lenders, insurance agents, surveyors, and real estate agents
- Will talk about flood risk impacts with neighbors, friends and family



Communicate About Your Risk (cont.)

- **Risk MAP makes it easier to share flood risk information with your constituents:**
 - Draft letters to citizens
 - Draft media materials
 - Use the Risk MAP products to communicate risk
 - Flood Risk Report, broken down by community
 - Changes Since Last FIRM
 - HAZUS analysis
 - Depth & Analysis Grids
 - Local community meetings, workshops, neighborhood outreach
 - Have a Flood Risk section in your local library

What Next?

- **Mitigation action list**
- **Develop outreach plans**
- **Work together to coordinate on:**
 - Mitigation planning
 - Grant applications or technical assistance
 - Communication
- **Please pick up a CD with this data before you leave**
- **We will send a follow-up email with resources and links**



Questions & Discussion

- **Non-Reg Data, Scheduling:** Colleen Hermans
- **NFIP, Ordinance:** Gary Heinrichs
- **Engineering, Mitigation Action Form:** Chris Olds
- **Mitigation, Emergency Management:** Katie Sommers and & Kimberly Berginnis

Thanks for participating! We'll be communicating again soon.