Kentucky Risk MAP: Integration of Mapping and Mitigation

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What is Risk MAP?

- **It's not Map Mod II**
- **Risk Mapping Assessment and Planning**
- **Through more accurate flood hazard maps, risk assessment tools, and outreach support, Risk MAP builds on Map Modernization and strengthens local ability to make informed decisions about reducing risk from natural hazards.**
- **Risk MAP will focus on products and services beyond the traditional Flood Insurance Rate Map (FIRM).**

Map Mod vs. Risk MAP

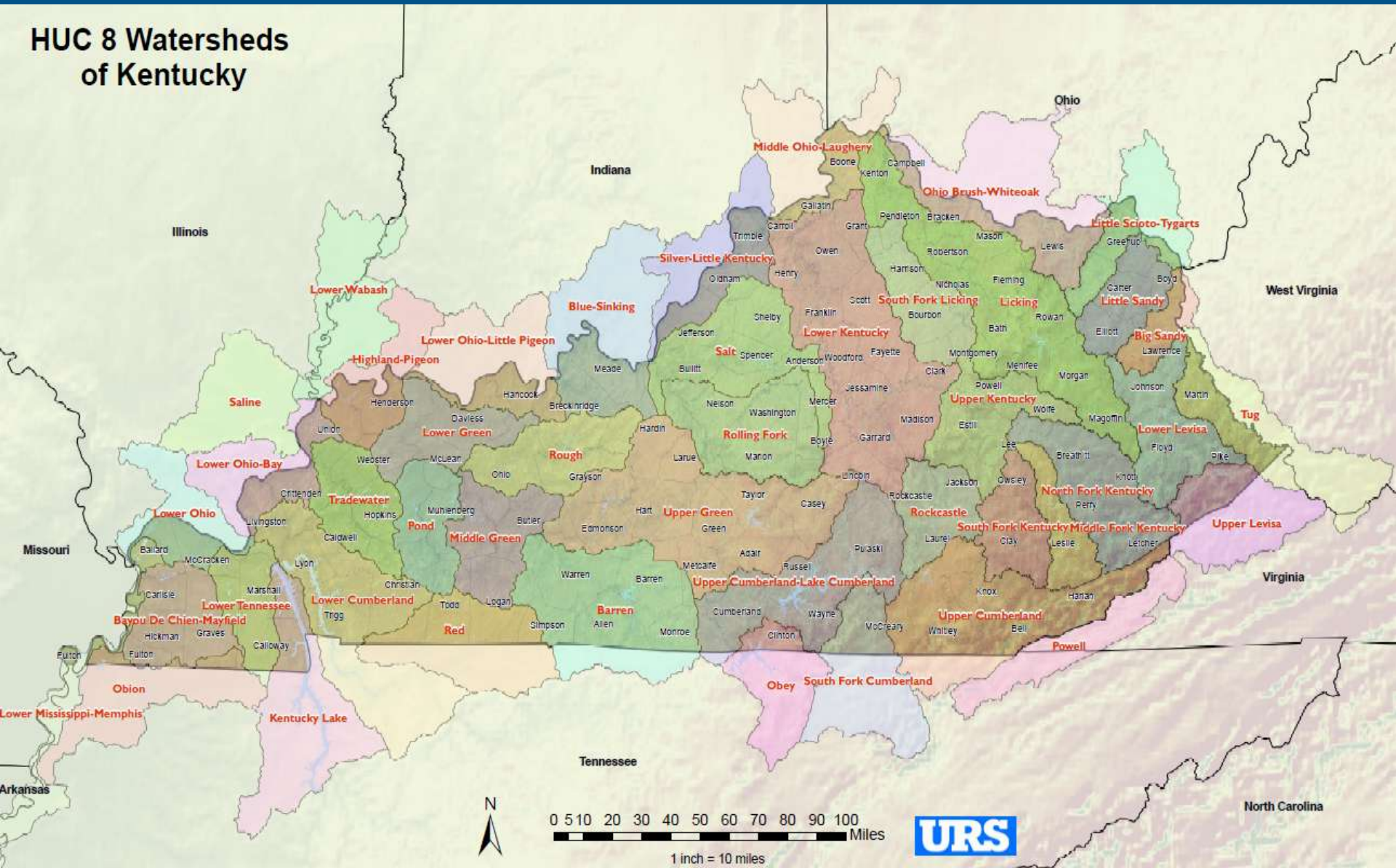
- **Map Mod**
  - Goal was to revise state's inventory of FIRMs
  - Created regulatory products
    - FIRM
    - FIS
    - DFIRM Database
  - Used best available data
    - Topography
    - Flood Studies from various sources
  - Engineering conducted on countywide basis
  - Outreach/communication limited

- **Risk MAP**
  - Enhanced analyses in high risk, high need areas
  - Regulatory products and non-regulatory products
    - Changes since last FIRM
    - Depth Grids
    - Risk Assessment (HAZUS)
    - Areas of Mitigation Interest
  - If the risk and need is present, new data generated to support enhanced analyses
    - Topography (LIDAR)
    - New flood studies with recurrence intervals
  - Engineering conducted on a HUC 8 watershed basis
  - Focus on Risk Communication

Map Mod vs. Risk MAP

- **Map Mod**
  - 5-year program with specific performance metrics
  - KY has new inventory of digital Flood Insurance Rate Maps
- **Risk MAP**
  - State empowerment; local and state needs met
  - Goal is to understand flood risk, communicate that risk and to promote actions that **reduce** risk

Kentucky HUC 8 Watersheds



Risk MAP Process

- **Project Prioritization**
  - Based on need and risk
- **Discovery**
  - Establish wide range of stakeholders (floodplain administrators, EM directors, planning departments, GIS specialists, public works, transportation, politicians)
- **Elevation Data**
  - Leverage existing where possible
  - Collect new LIDAR where needed
- **Watershed-based engineering analyses and mapping**
- **Risk Assessment**
  - HAZUS
- **Mitigation Planning**
- **Risk Communication**
- **ACTION**

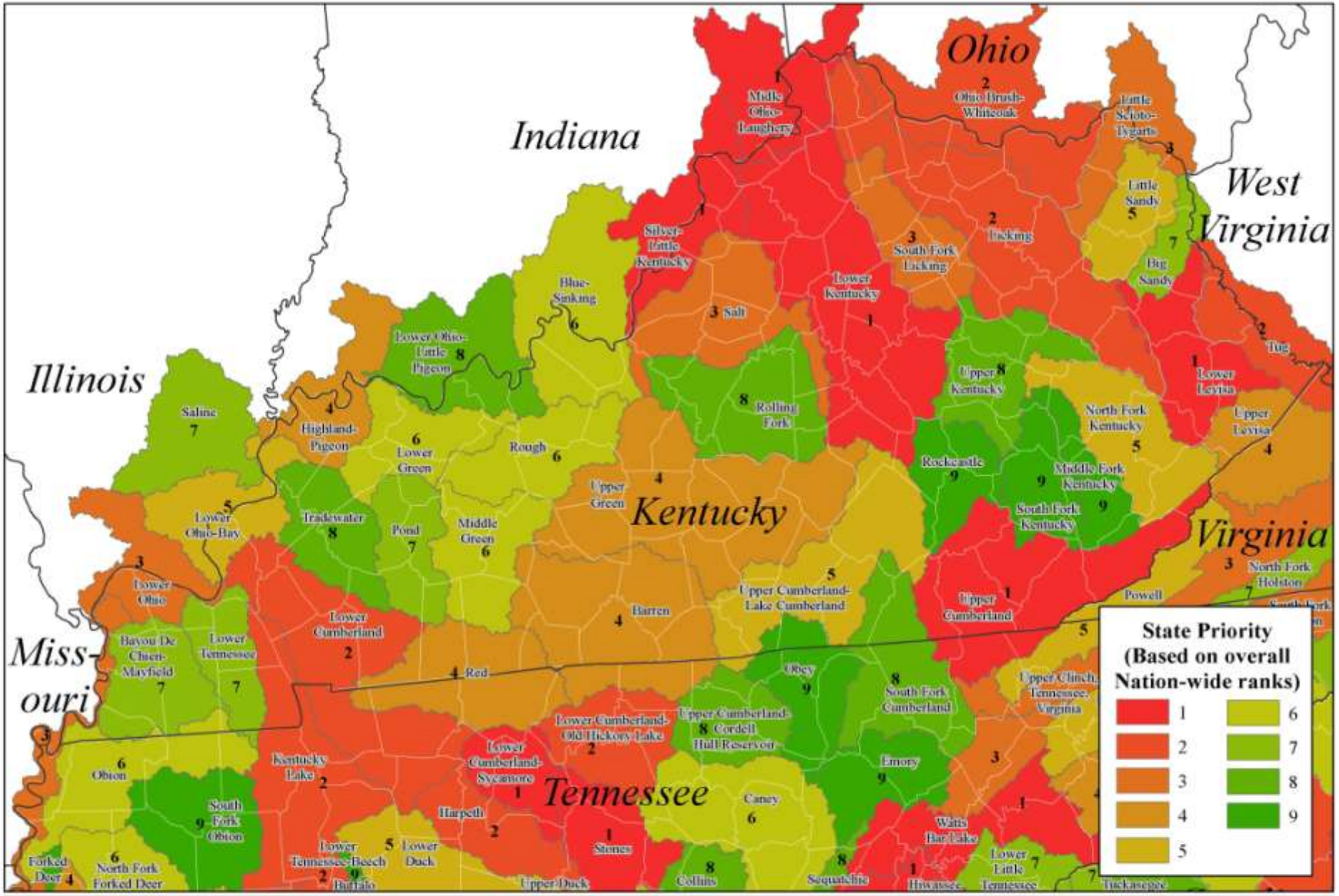
Need

Coordinated Needs Management Strategy (CNMS)

- **Defines an approach and structure for the identification and management of flood hazard mapping needs that will support data-driven planning and flood map updates**
- **Tracks the lifecycle of needs specifying opportunities to capture needs and proposing methods for their evaluation to inform planning, tracking and reporting processes.**
- **Establishes geospatially enabled, effective means for users to enter, monitor, and update floodplain study inventories.**
- **Used to document the areas across KY where flood studies meet FEMA's current validity standards**
- **Flood study validity determined by identifying critical and secondary deficiencies**
  - One or more critical deficiency or four or more secondary deficiencies classify a flood study as "invalid"

Risk

- **Determined by multitude of factors including:**
  1. Population Density
  2. History of repetitive losses/flood insurance claims/flood disaster
  3. High growth areas
  4. NFIP flood insurance policy base
  5. Number of stream miles
  6. Large or increasing numbers of LOMCs
- **Baseline risk assessment conducted by FEMA in 2010 based on an Annualized Average Loss (AAL) HAZUS study**



FY 2011 Planning

State CNMS Validation Priorities Based on National Ranking

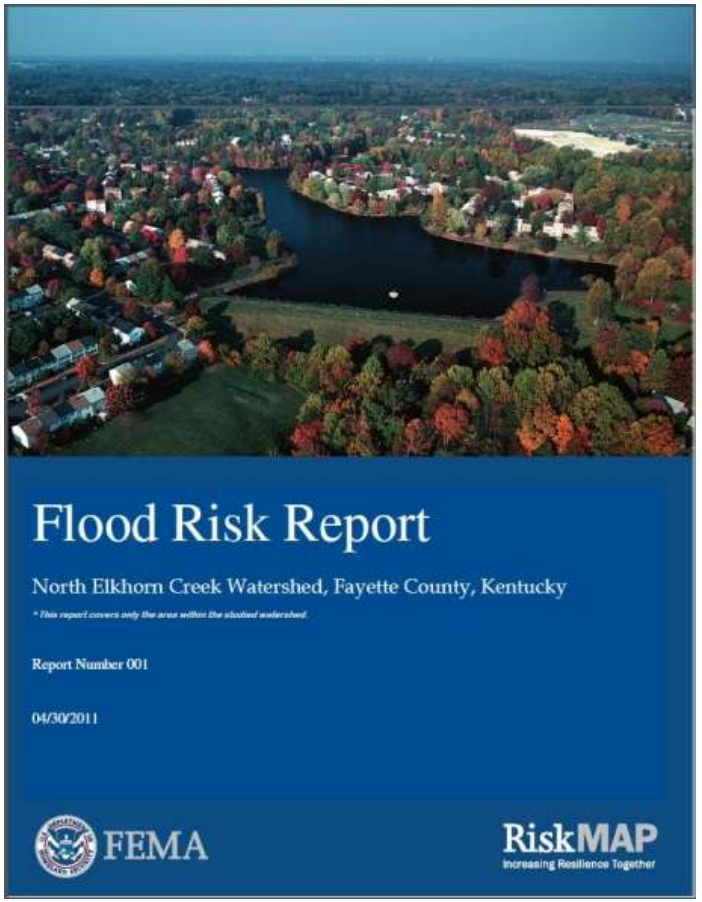
**** Priority based on risk subject to change***

Flood Risk Products

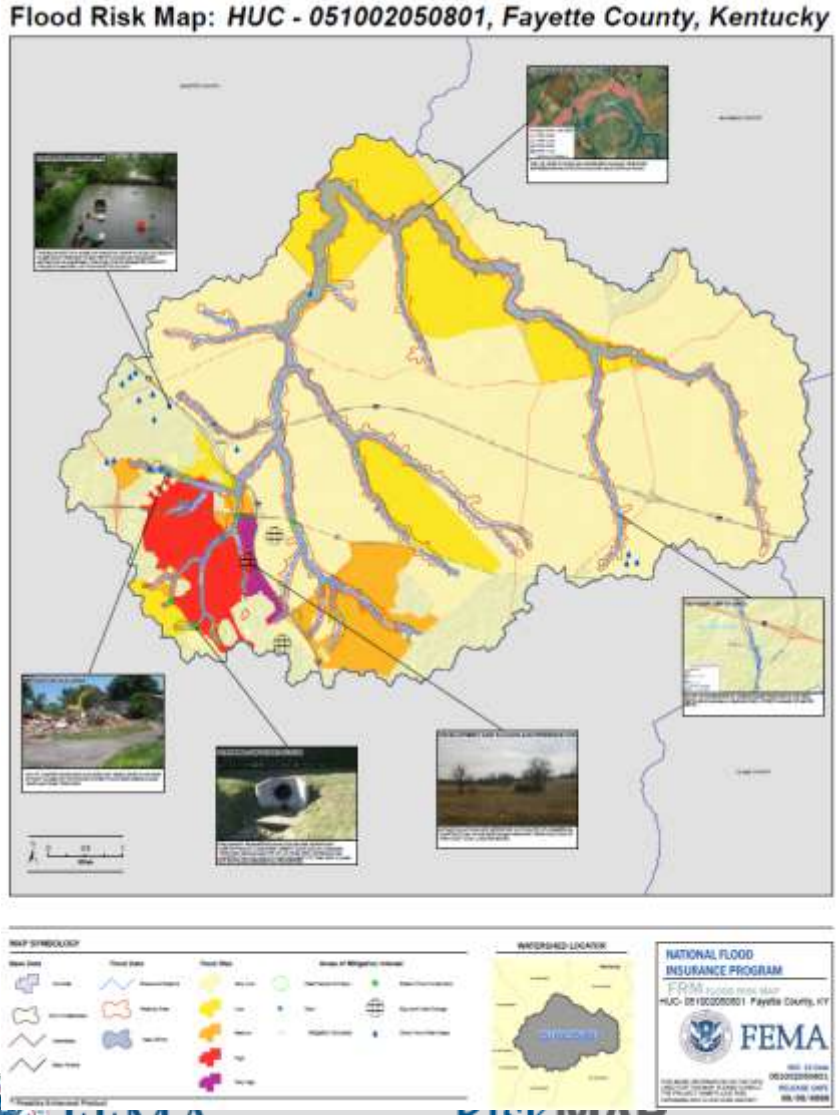
- Risk MAP will provide state and community officials with three Flood Risk Products to help them gain a more holistic understanding of flood risk and its potential impact on communities and individuals.
  - **Flood risk report**
  - **Flood risk map**
  - **Flood risk database**
- These products are comparable to the Flood Insurance Study (FIS), Flood Insurance Rate Map (FIRM), and Digital Flood Insurance Rate Map (DFIRM) Database that users are accustomed to but provide additional information for mitigation and planning purposes.
- The components of the flood risk report and map are all compiled in the flood risk database

Flood Risk Report

- Provides stakeholders with a comprehensive understanding of flood hazard and risk exposure within their community, watershed, or other geographic area.
- Provides risk assessment information at the project level, placing emphasis on risk reduction activities that may have impacts beyond the specific stream area or community
- Provides risk assessment information that can be incorporated into mitigation plans



Flood Risk Map



- **Depicts flood risk data for jurisdictions within the project area, emphasizing that risk reduction activities may have an impact beyond the site**
- **Project-wide (e.g. watershed, levee area, or other distinct geographic area) base map information reflecting community boundaries, major roads, and streams**
- **Composite HAZUS losses based on updated flood engineering**
- **Areas of Mitigation Interest**
- **New study areas**

Flood Risk Database
(blue = enhanced)

Products will be developed based on the needs of the watershed

Changes Since Last FIRM

- **Horizontal Changes and Results**
- **Structure/Population counts impacted by change**

Depth & Analysis Grids

- **Depth (10, 04, 02, 01, 0.2 percent chance)**
- **Percent Annual Chance**
- **Percent 30-Year Grid**
- **Delivery of Water Surface Elevation (multi-freq)**
- **Water Surface Elevation Change Grid (1%)**
- **Velocity Grids, Annualized Depth, Top and Toe of Levee**
- **Multi Freq Grids for Levee areas, etc.**

Flood Risk Assessment

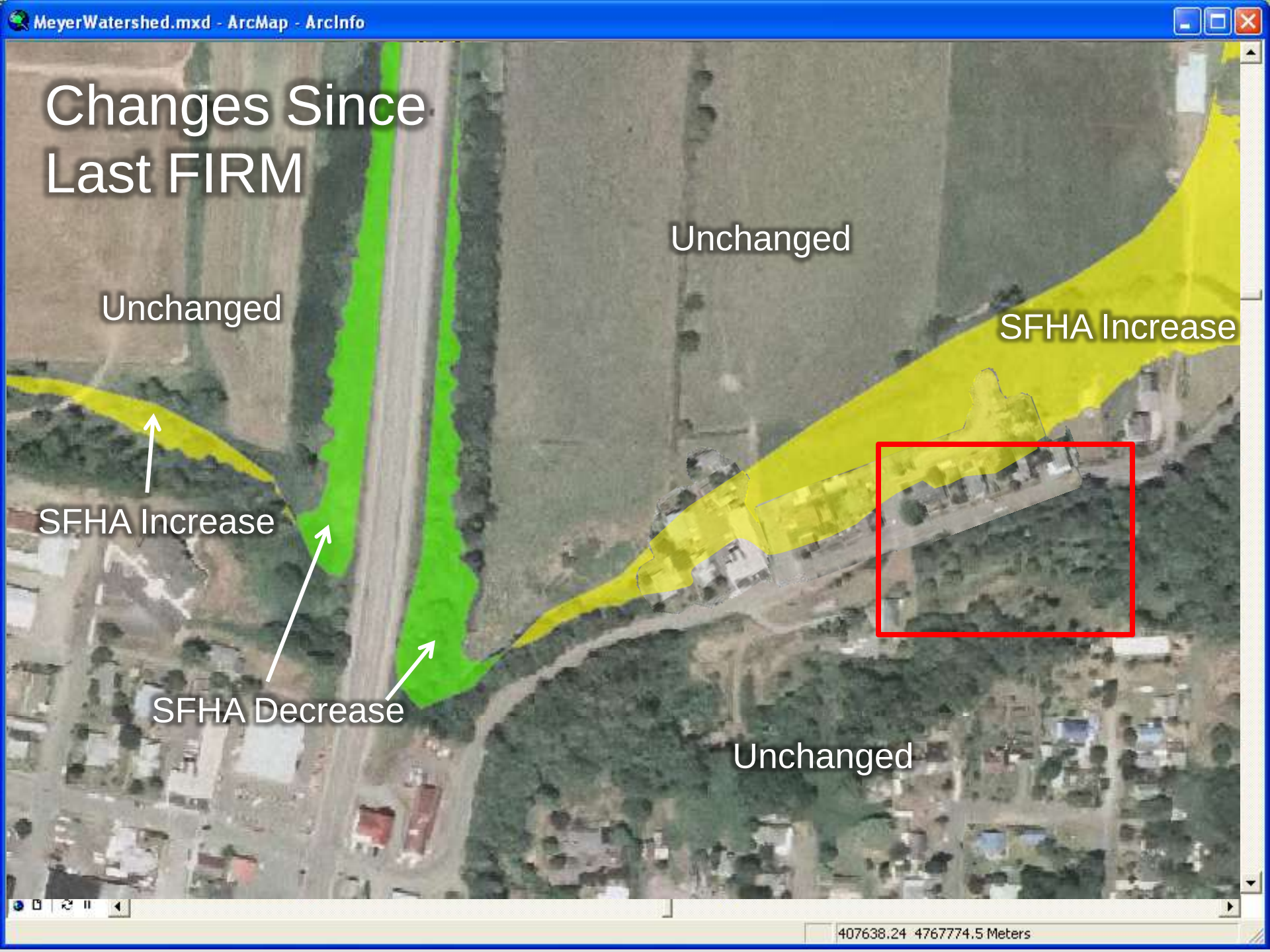
- **Average Annualized Loss – 2010**
- **Refined Flood Risk Assessment**
- **HAZUS or Non-HAZUS with improved data/assumptions**

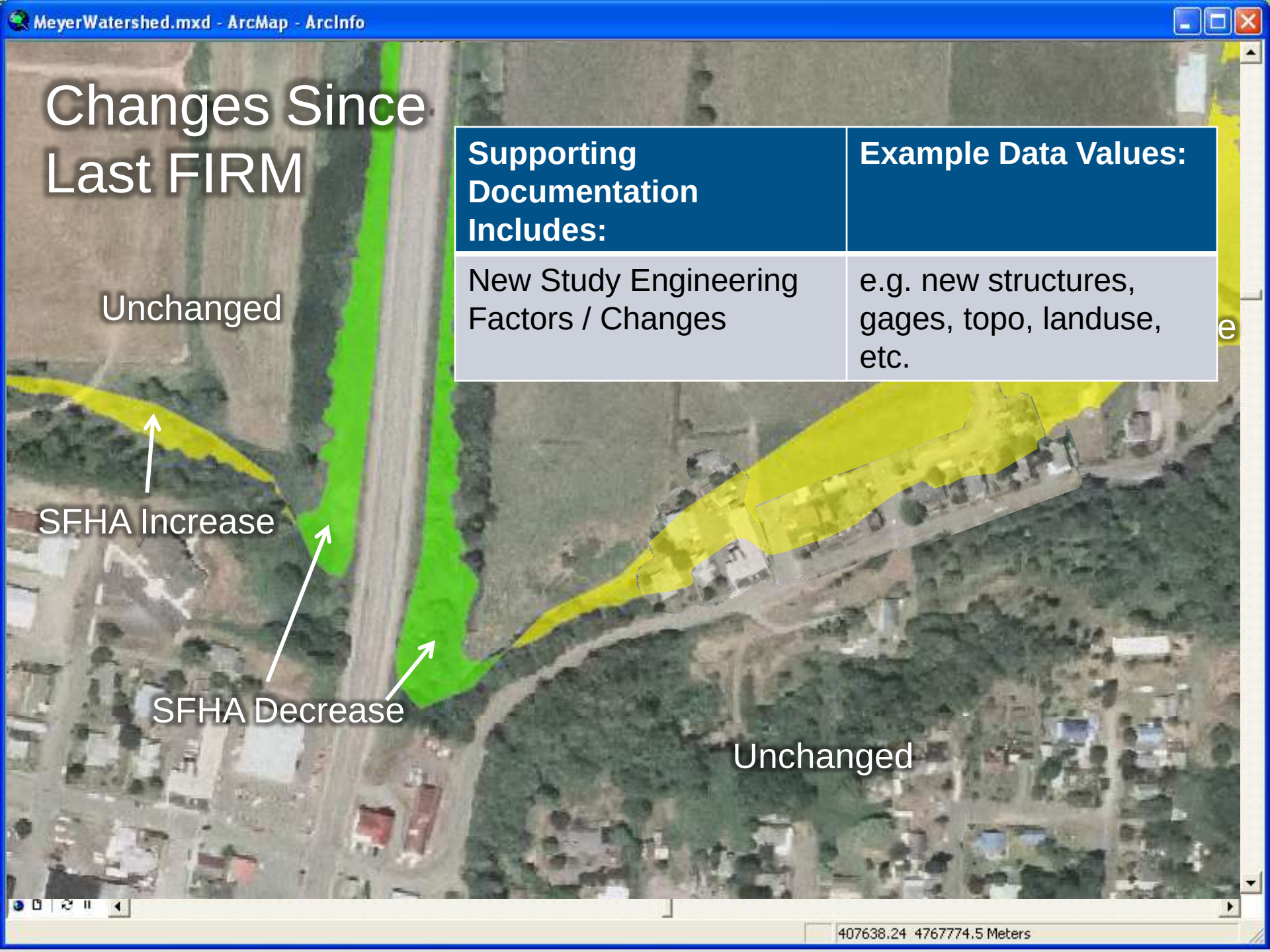
Areas of Mitigation Interest

- **Areas of Mitigation Opportunity or Awareness**

Changes Since Last FIRM

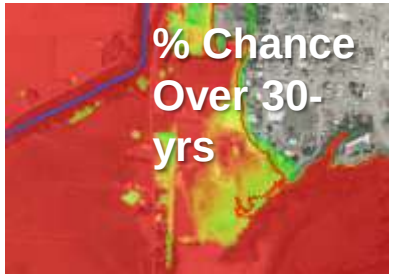
- **Goals:**
  - Help communities understand changes to their flood maps
  - Identify sources and areas of SFHA Increase/Decrease & Zone Changes
  - Produce a spatial layer that can be used to quickly identify building/structures that are at risk but were previously unidentified
- **Additional Value:**
  - Identification of areas subject to appeal periods


MeyerWatershed.mxd - ArcMap - ArcInfo
Changes Since Last FIRM
Unchanged
Unchanged
SFHA Increase
SFHA Increase
SFHA Decrease
Unchanged
407638.24 4767774.5 Meters


MeyerWatershed.mxd - ArcMap - ArcInfo
Changes Since Last FIRM
Supporting Documentation Includes:
Example Data Values:
New Study Engineering Factors / Changes
e.g. new structures, gages, topo, landuse, etc.
Unchanged
SFHA Increase
SFHA Decrease
Unchanged
407638.24 4767774.5 Meters

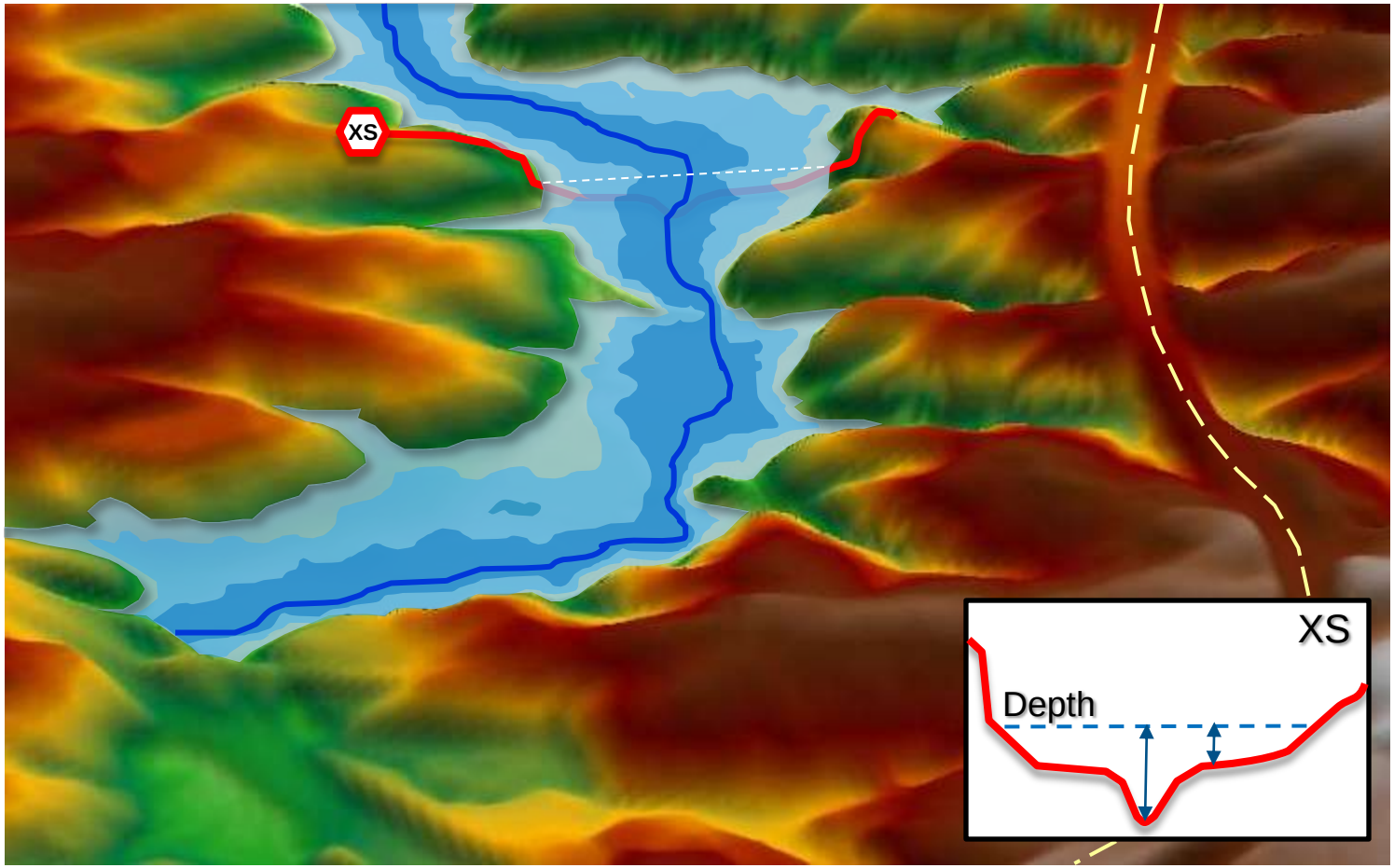
Multi-Frequency Depth (& Other) Grids

- **Goals:**
  - Help communities better understand their likelihood of flooding beyond just the “1 percent annual chance” floodplain
  - Produce data that can feed into HAZUS
  - Provide location-specific results within the floodplain that communities can leverage for additional analysis
  - Provide information that can feed into Benefit-Cost Analyses



Flood Depth Grids

- **Depth Grid Calculated as Difference between WSE and Ground**



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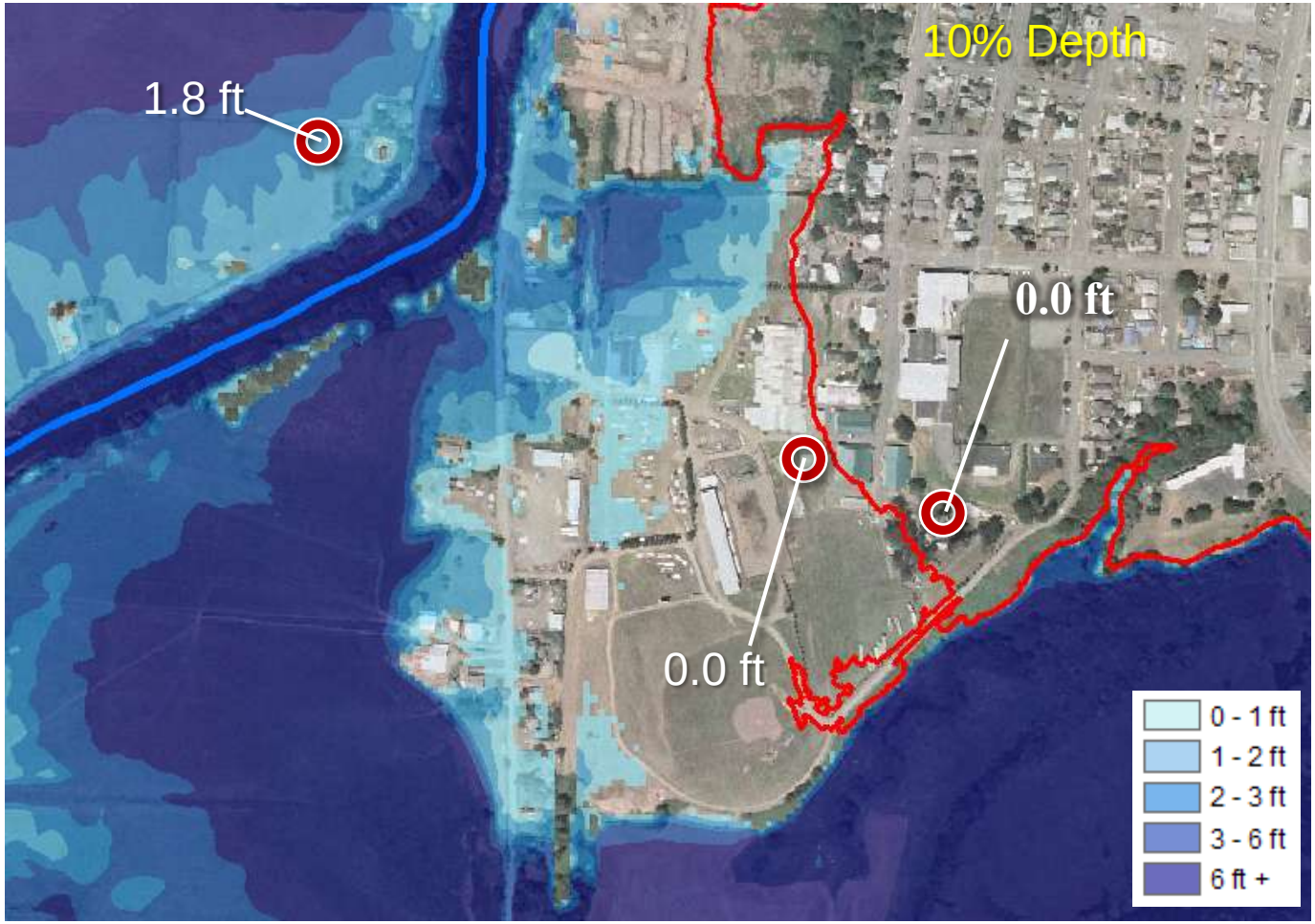

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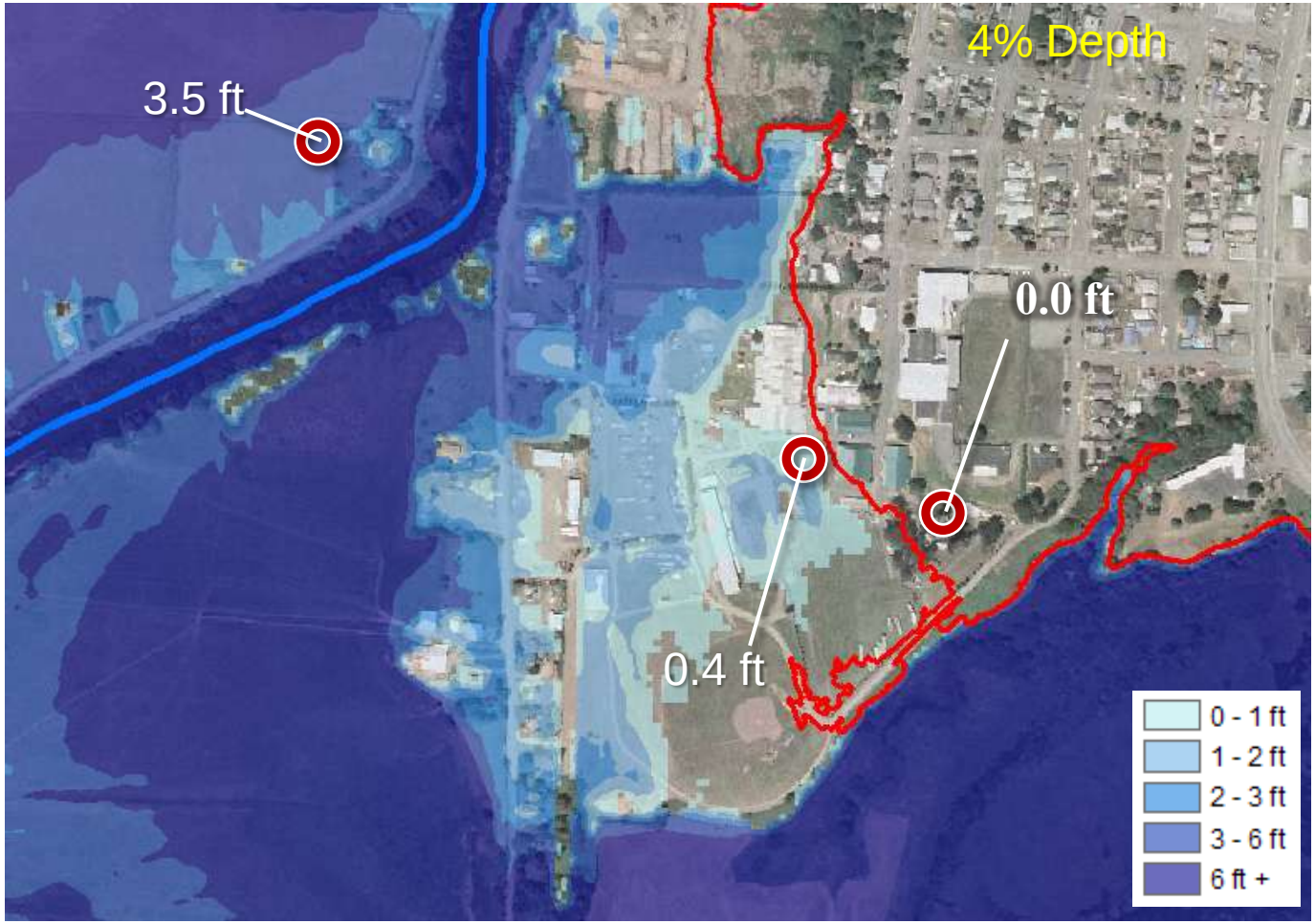

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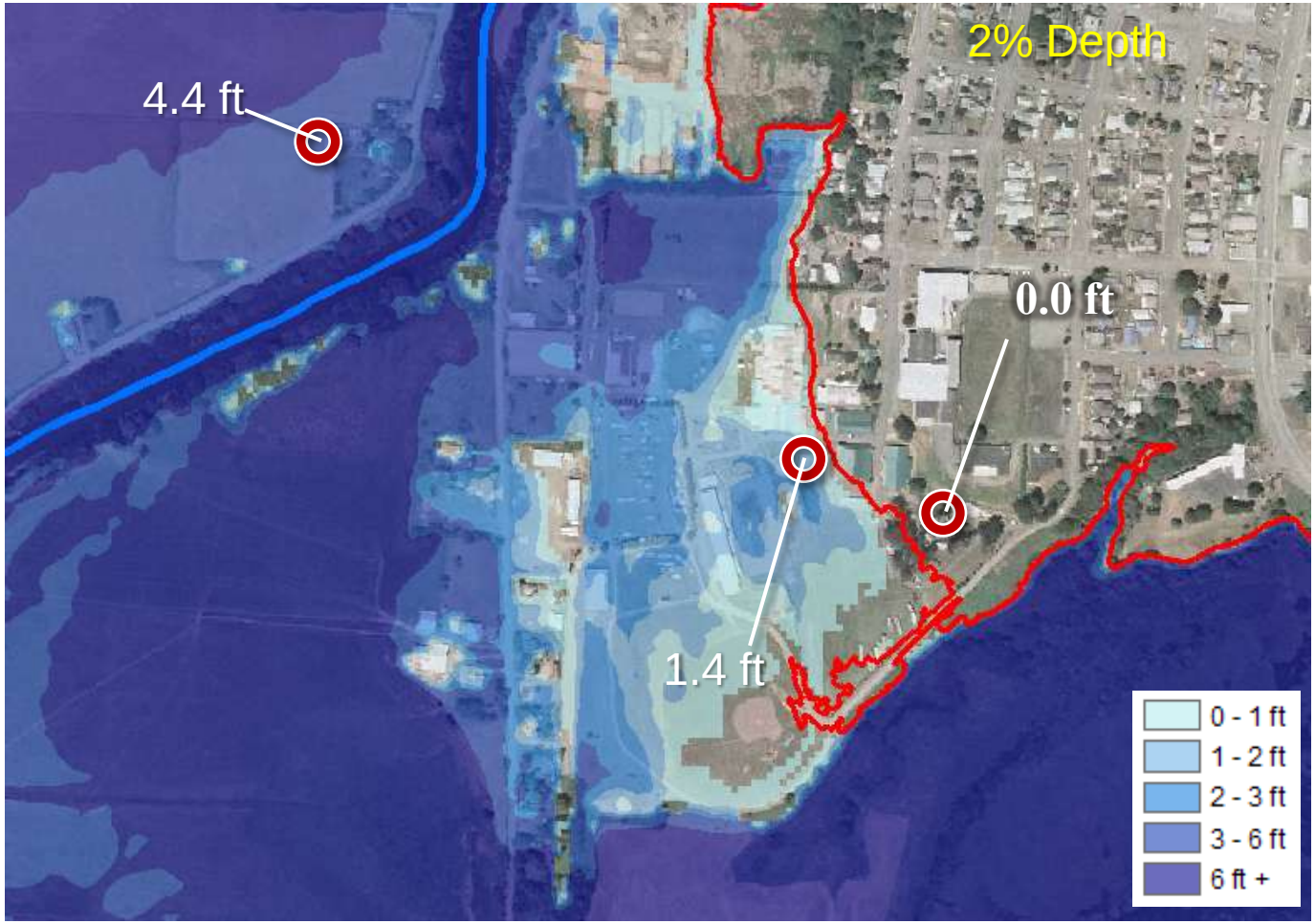

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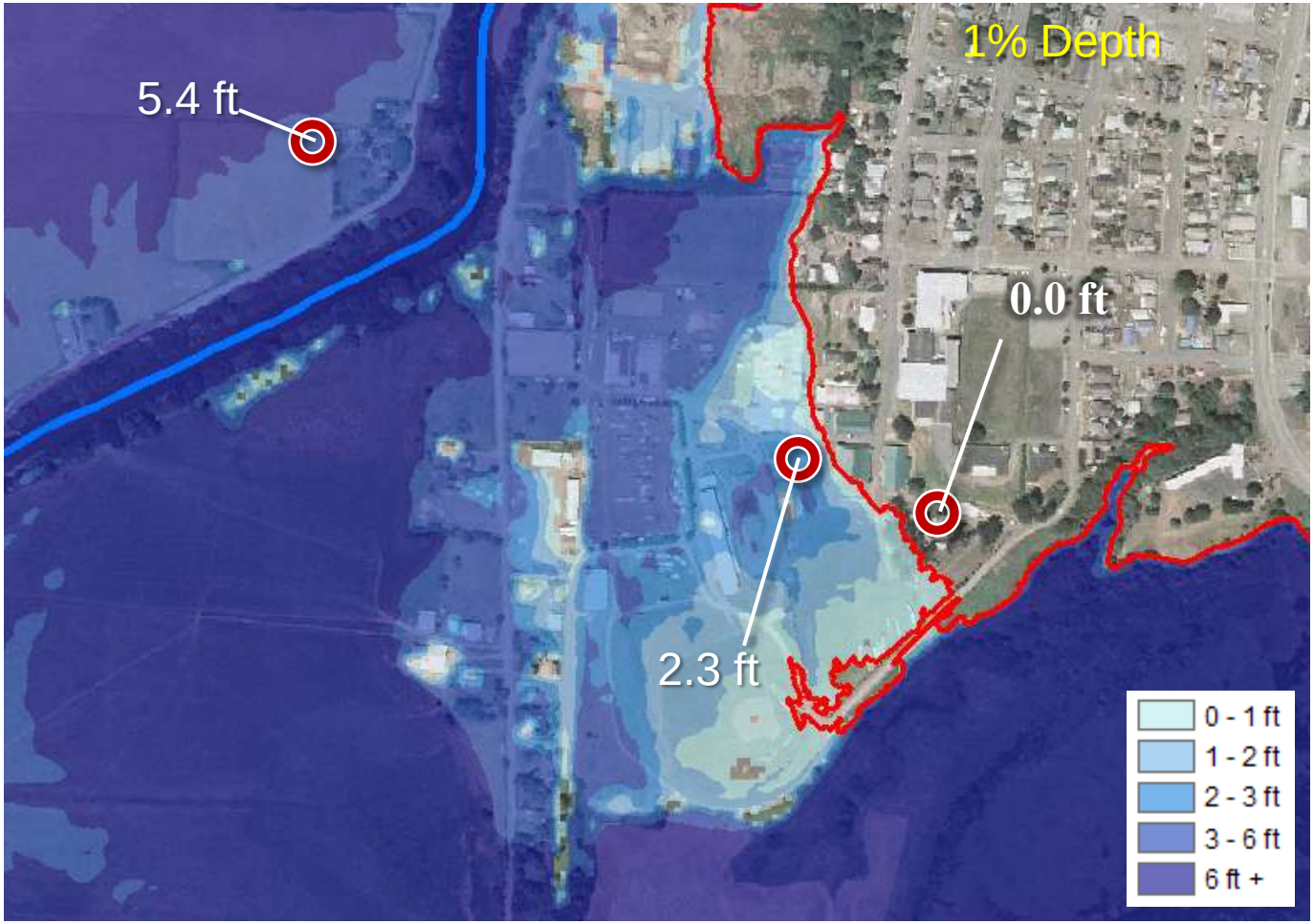

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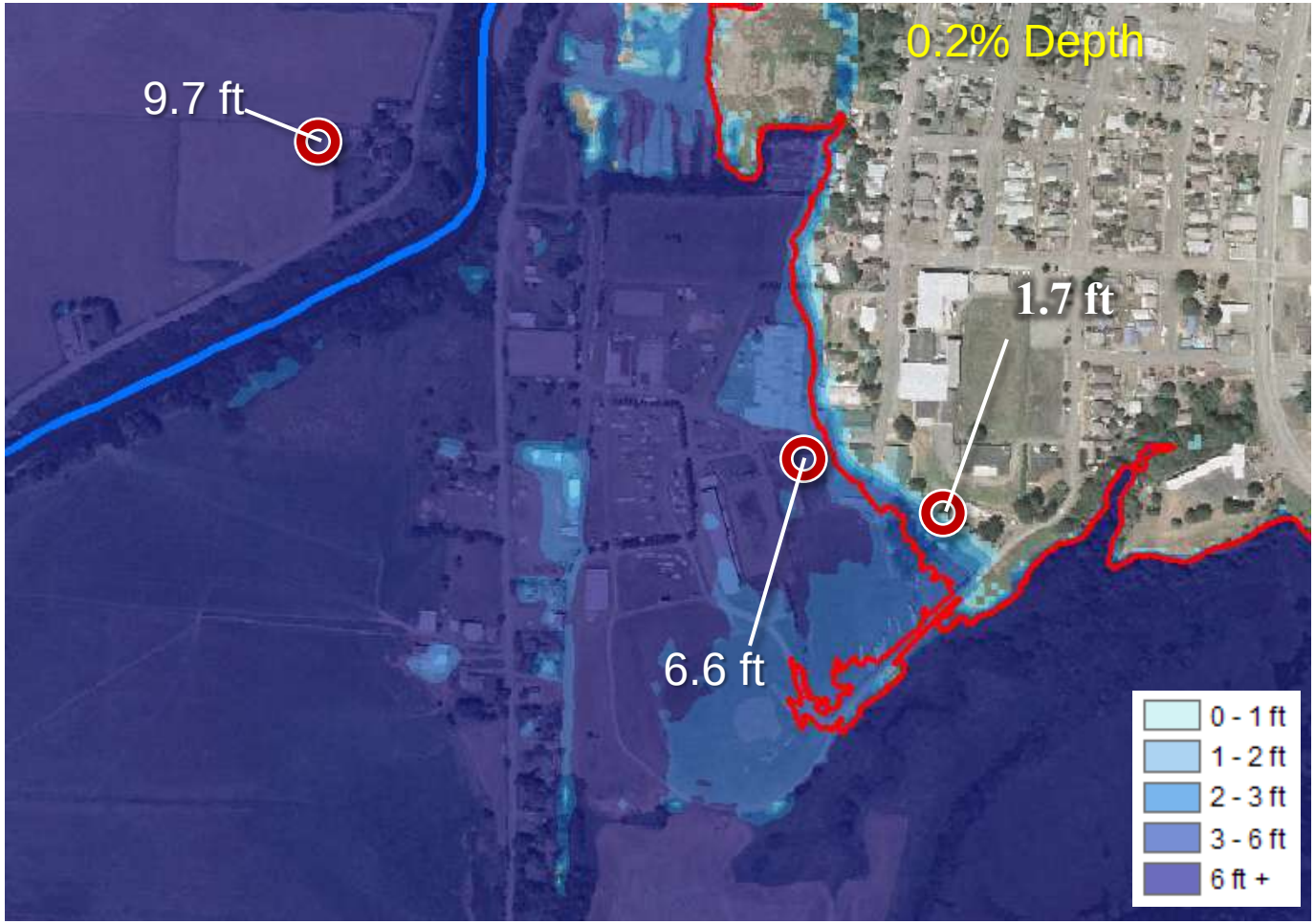
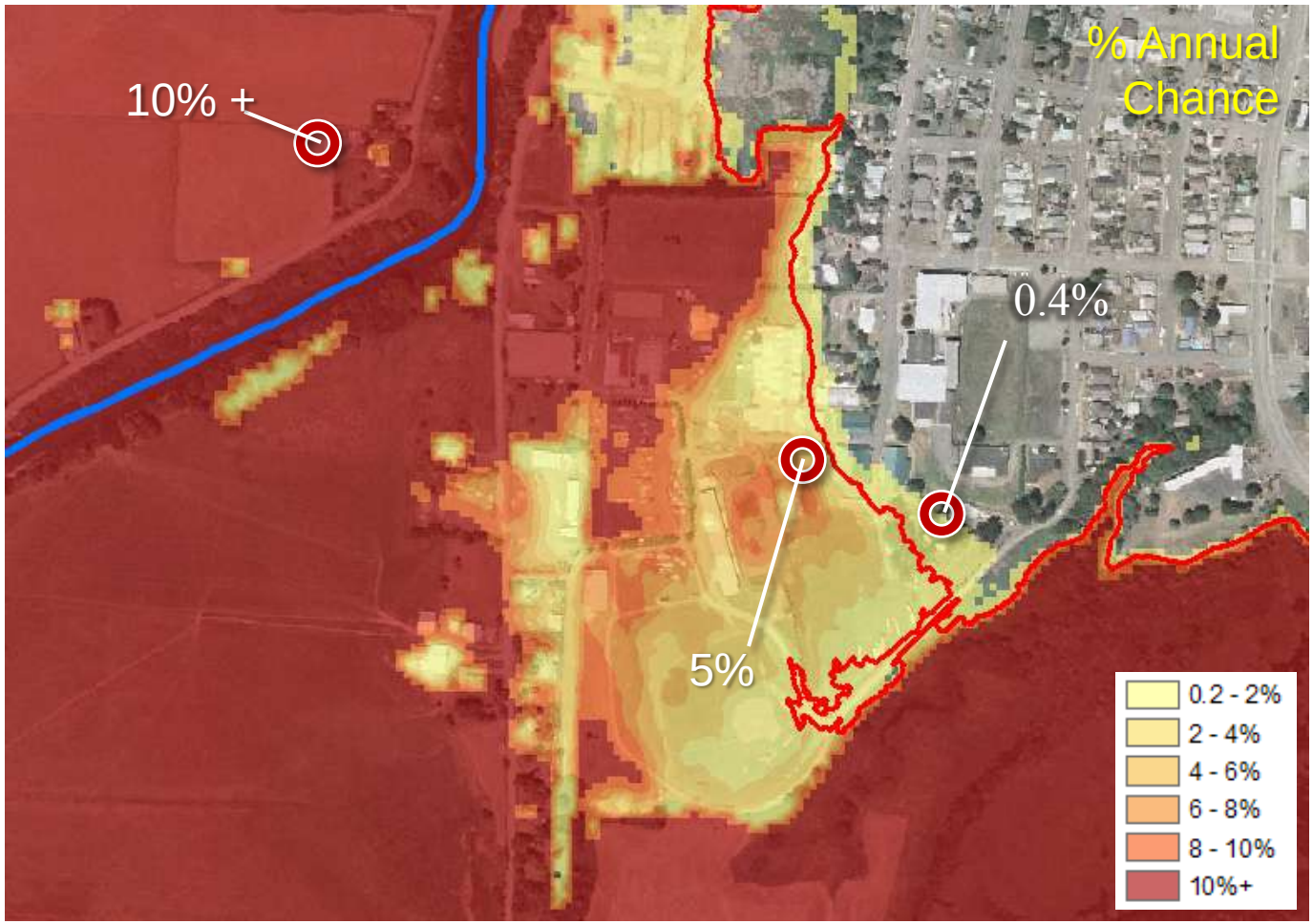
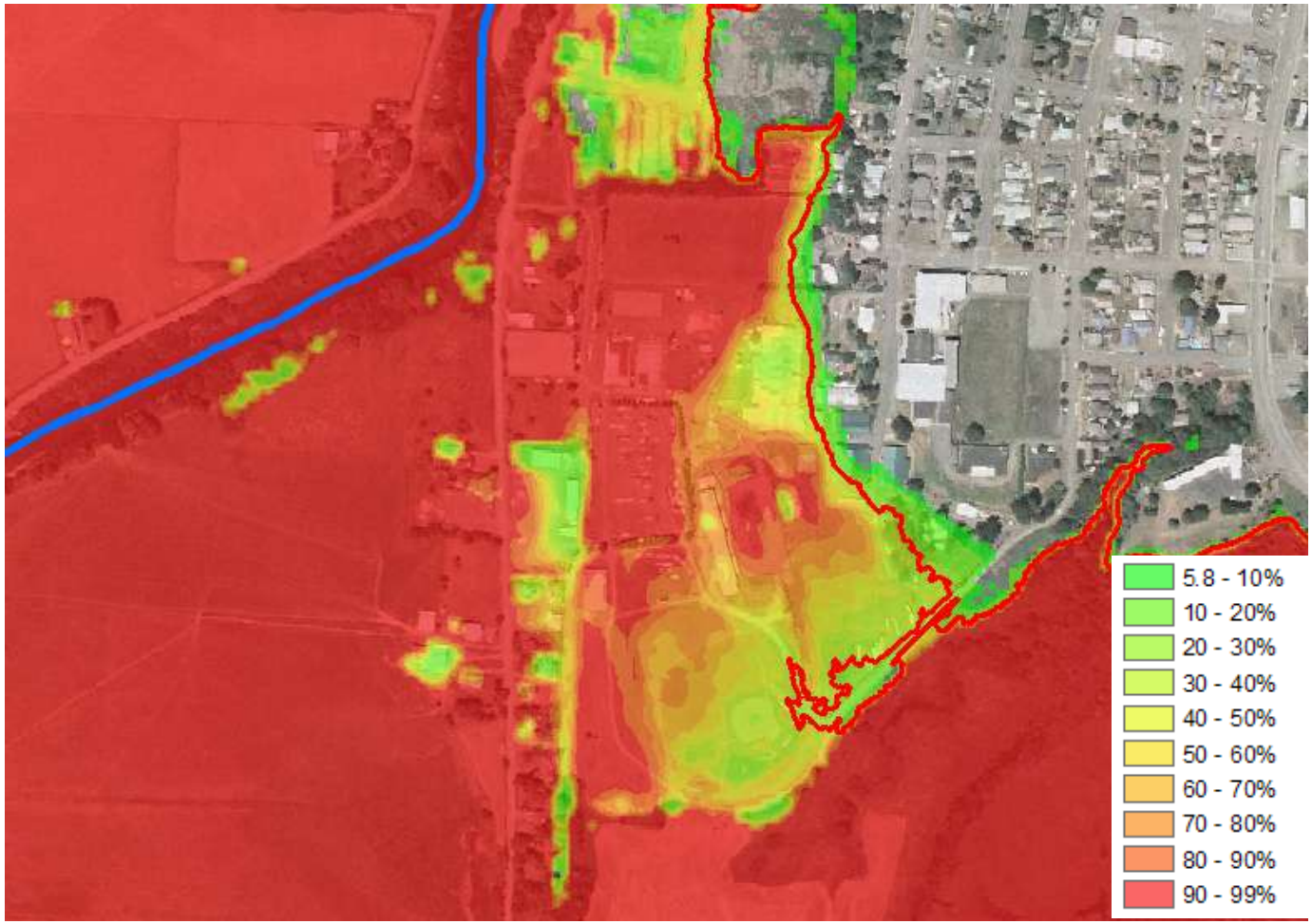


Percent Annual Chance of Flooding



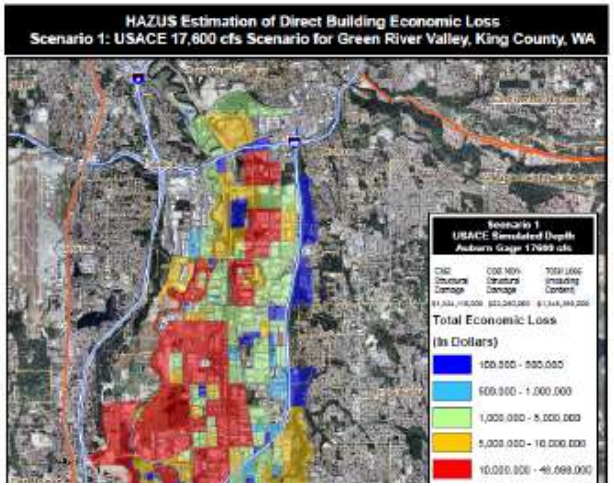
Percent Chance of Flooding over a 30-Year Period Grid

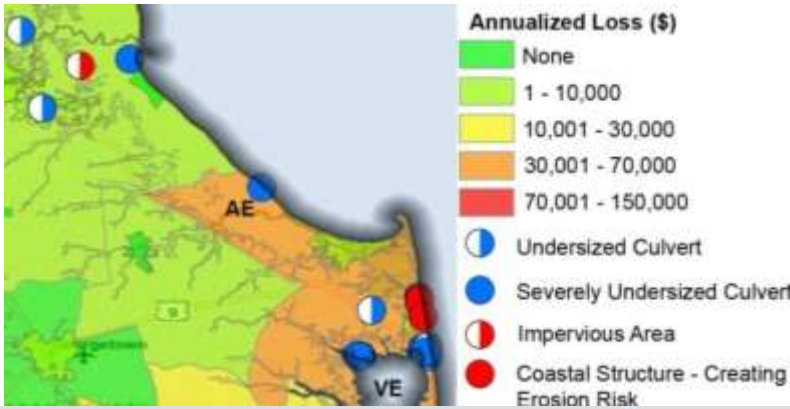


Flood Risk Assessment

HAZUS Risk Assessment & National Flood Risk Layer

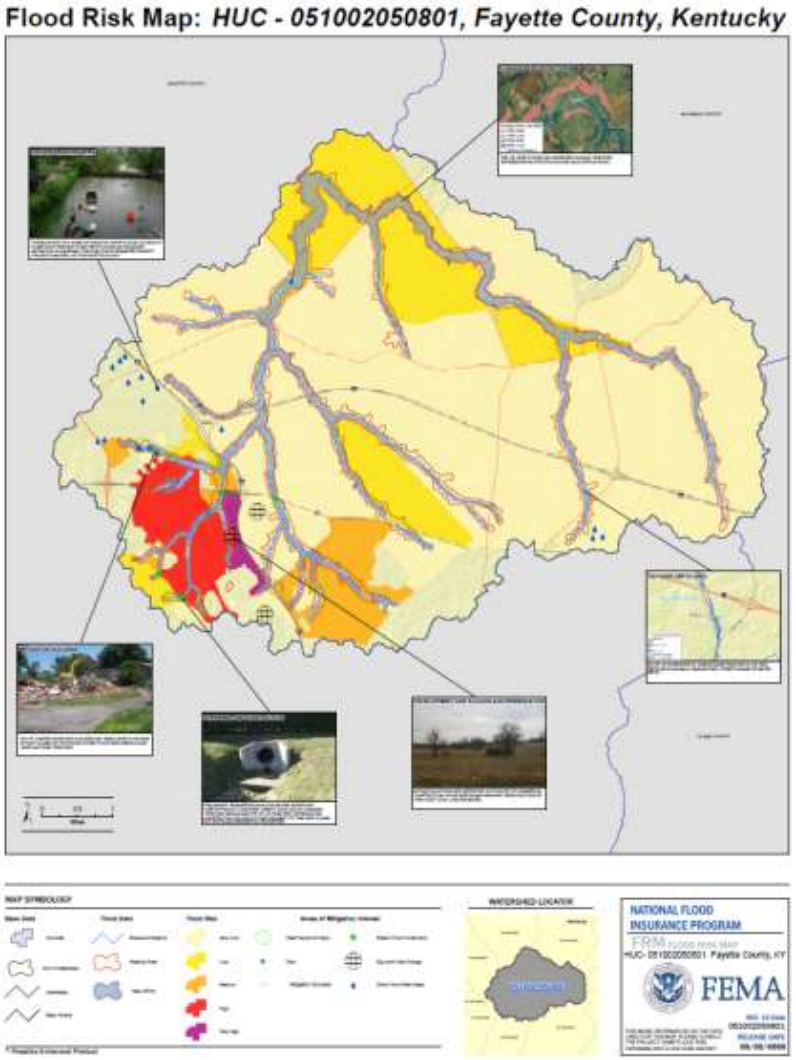
- Enables communities to understand risk by reference to existing structure loss (HAZUS Average Annualized Loss (AAL) Study and updates)
- A revised risk assessment to supplement the AAL is part of each watershed study





Areas of Mitigation Interest

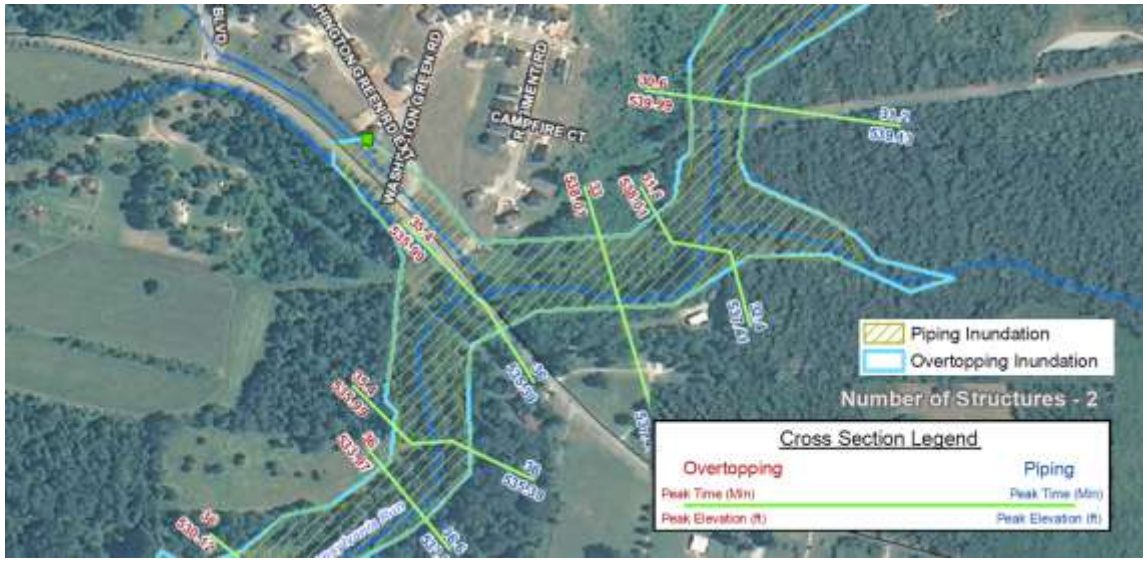
- **Helps communities better understand the impact of multiple physical factors on the floodplain elevation and extent**
- **Identifies conditions within a flood risk project area (watershed or otherwise) that may contribute to the severity of the flood hazard and associated losses**
- **Conditions include:**
  - areas with a history of flood claims
  - hydraulic or other structures that contribute to backwater (e.g., undersized culverts, bridges and dams)
  - and areas experiencing land use change or development
- **By identifying these conditions within the watershed, this product will also assist communities in determining potential mitigation opportunities.**



Dams

Ongoing program involves:

- **Data Collection**
- **Field Reconnaissance**
- **Simplified Breach Modeling**
- **Seismic Assessment Reviews**
- **Preliminary Risk Screening**
- **Simplified Emergency Action Plan Development**
- **Prototype Catastrophic Long Term Recovery Plans**
- **Expanded Dam Owner Outreach**



Risk MAP Applications - Dams

Dam Safety Hazard Mitigation Program Output	Risk MAP Applications
Inundation Mapping	• Enhanced Flood Risk Analysis • Areas of Mitigation Interest
Risk Screenings	• Enhanced Flood Risk Analysis
Simplified EAPs	• Enhanced Risk Communication • Inspire Mitigation Actions
CLTR Plans	• Community Resiliency • Economic Sustainability

Taking Action

- **Mitigation and risk reduction can only happen at the local level.**
- **Risk MAP can provide:**
  - Risk identification and awareness
  - Education on mitigation alternatives
  - Technical and outreach assistance
- **Risk MAP can also provide information about:**
  - FEMA Hazard Mitigation Assistance (HMA) grants
  - Other grants to support mitigation activities

Taking Action

- **Dependent upon community needs**
  - Structure relocation, elevation demolition
  - Replace undersized culverts and bridges
  - Detention/retention basins
  - Targeted outreach to specific areas
  - Training for local elected officials
  - Channel and road maintenance
  - Exposure to funding opportunities
  - The list goes on…

Questions?

Contact:

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