RiskMAPing the Rock River Watershed

Amanda Flegel, PE, CFM

University of Illinois at Urbana-Champaign
Presentation Overview

Project introduction

What “RiskMAP” means in the Rock River watershed

Details on the Rock River RiskMAP products being developed
Rock River Watershed Study

Multi-year, Multi-organization Effort

Hydraulics

Hydrology,
Regulatory and non-regulatory FEMA products
Lower Rock River Project Reaches

- Winnebago County – urban reach
- Ogle and Lee – steady state modeling
- Whiteside, Henry and Rock Island – unsteady state modeling
- 2011 FEMA included RiskMAP products to the project

- 165 Rock River miles
- 6 counties
FEMA’s Risk MAP
(Mapping, Assessment, and Planning)

Objective: deliver **quality data** that increases **public awareness** and leads to **action that reduces risk** to life and property.
Aspects of a “RiskMAP” project

• **Method of prioritizing projects**- *watershed based*, FEMA has identified key elements for RiskMAP projects,

• **Process**- more communication with communities throughout project

• **Products**- additional non-regulatory products that will be tools to encourage action to reduce risk on a local level
PRIORITIZING ROCK RIVER AS A RISKMAP PROJECT
Rock River Adapted to Risk MAP

Watershed Based

Risk to be addressed—164 stream miles through Rockford and Moline Rock Island areas.

Need for more accurate data—County to county discrepancies, old studies with outdated methodology

High resolution Topography and contribution—Lidar data available from Illinois Height Modernization project
ROCK RIVER RISKMAP
PROJECT APPROACH
Rock River RiskMAP Approach

- Multiple opportunities for discussions during data development
- Multiple opportunities for discussions concerning mitigation planning

Data Development and Sharing → Proposed NFIP Map Changes and Impacts → Risk Awareness and Mitigation Outreach → Preliminary NFIP Map Release & Mitigation Planning → Due Process and Path Forward

- Discovery/Scoping Meeting
- Flood Risk Review Meeting
- Resilience Meeting
- Open House meeting

Status:
- Ogle, Lee, Whiteside, Henry and Rock Island County Status
- Winnebago County Status
6 Rock River meetings to date

• Discovery Meeting in Winnabago County
  – April 2011
  – Collected information on recent bridge construction and mitigation projects

• Flood Risk Review meeting in Ogle, Lee, Whiteside, Henry and Rock Island.
  – April and December 2011
  – Review DRAFT results, Changes Since Last FIRM, workmaps, profiles

How did we do? We’ll go take another look at that issue.
Future RiskMAP meetings

• An additional stakeholder meeting with topics to be determined based on project needs

• CCO Meeting/ Public Open House
  — Similar to MapMod open house meetings
ROCK RIVER RISKMAP
NEW NON-REGULATORY PRODUCTS
RiskMAP Datasets/Products

Traditional Regulatory Products

DFIRM Database

Traditional products are regulatory and subject to statutory due-process requirements

Non-Regulatory Products

Flood Risk Database

Risk MAP products are non-regulatory and are not subject to statutory due-process requirements
FEMA’s operating Guidance No. 6-11

“The power and value of RiskMAP is in the ability to visualize and analyze a wide variety of flood risk information”

- User Guidance for Flood Risk Datasets and Products
Effective FIRM vs Proposed

No more Spot the Difference puzzles!
DRAFT Rock River Changes Since Last FIRM
DRAFT Rock River Changes Since Last FIRM

Map Legend:
- Cross Section (River Mile)*
- Water Line (NFHL 9/29/2011)
- Limit of Study
- Political Boundaries (NFHL 9/29/2011)
- Levee Centerline
- Backwater Line
- DFIRM Panels (NFHL 9/29/2011)
- Index Map Panel (No relation to DFIRM)

Changes Since Last FIRM:
- Removed Floodway
- Added Floodway
- 1% Changed to Floodway
- Removed 1% Annual Chance
- Added 1% Annual Chance
- Floodway Changed to 1%
- Removed 0.2% Annual Chance
- Added 0.2% Annual Chance
- Remains 0.2 % Annual Chance
- Remains Floodway
- Remains 1% Annual Chance

TIP:
- GREEN - removed area
- RED - added area
- YELLOW - zone change
- BLUE - no change
DRAFT Rock River Changes Since Last FIRM

– During the project:
  • More efficiently review the maps and communicate your concerns before they go “preliminary”
  • Summary included in Flood Risk Report

– Potential community uses: (*requires additional GIS analysis)
  • Revise old evacuation plans.
  • *Use with community parcel data to estimate the total number of structures added to floodplain/removed from floodplain
  • *Combine with GIS parcel data to identify all newly added structures- mail them invites to the open house where they can gather more information.
DRAFT Rock River Depth Grids

– During the project:
  • Review and communicate study results
  • identify areas flood risk
  • Use for Flood Risk Assessment

– Potential uses:
  • Publicize to residence for CRS credit
  • or use map depth and depth/damage curves to estimate dollar damages to specific properties (even without parcel data or HAZUS)
  • Emergency planning uses: road closures, prioritizing structures of concern
### Example

<table>
<thead>
<tr>
<th></th>
<th>Estimated Value</th>
<th>% of Total</th>
<th>Dollar Losses</th>
<th>Loss Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential Building/Contents</strong></td>
<td>$10,000,000</td>
<td>75%</td>
<td>$7,500,000</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Commercial Building/Contents</strong></td>
<td>$15,000,000</td>
<td>15%</td>
<td>$5,000,000</td>
<td>29%</td>
</tr>
<tr>
<td><strong>Other Building/Contents</strong></td>
<td>$15,000,000</td>
<td>10%</td>
<td>$5,000,000</td>
<td>28%</td>
</tr>
<tr>
<td><strong>Total Building/Contents</strong></td>
<td>$150,000,000</td>
<td>100%</td>
<td>$30,000,000</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Business Disruption</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>2,000,000</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$122,695,000</td>
<td>N/A</td>
<td>$50,000,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Estimated Potential Losses for Flood Event Scenarios**

- **Total Inventory**: $150,000,000 (1% (100-yr))
- **Residential Building/Contents**: $10,000,000 (75%)
- **Commercial Building/Contents**: $15,000,000 (15%)
- **Other Building/Contents**: $15,000,000 (10%)
- **Total Building/Contents**: $150,000,000 (100%)
- **Business Disruption**: N/A

**TOTAL**: $122,695,000

**22% Loss Ratio**
## Coming Soon: Flood Risk Assessment

<table>
<thead>
<tr>
<th>Total Inventory</th>
<th>Estimated Potential Losses for Flood Event Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1% (100-yr)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Estimated Value</th>
<th>% of Total</th>
<th>Dollar Losses</th>
<th>Loss Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Building/Contents</td>
<td>$100,000,000</td>
<td>75%</td>
<td>$20,000,000</td>
<td>20%</td>
</tr>
<tr>
<td>Commercial Building/Contents</td>
<td>$20,000,000</td>
<td>15%</td>
<td>$6,000,000</td>
<td>30%</td>
</tr>
<tr>
<td>Other Building/Contents</td>
<td>$20,000,000</td>
<td>10%</td>
<td>$6,000,000</td>
<td>30%</td>
</tr>
<tr>
<td>Total Building/Contents</td>
<td>$140,000,000</td>
<td>100%</td>
<td>$28,000,000</td>
<td>20%</td>
</tr>
<tr>
<td>Business Disruption</td>
<td>N/A</td>
<td>N/A</td>
<td>2,000,000</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$190,000,000</td>
<td>N/A</td>
<td>$62,000,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Coming Soon: Flood Risk Assessment

– During the project:
  • Use for mitigation discussions at the resilience meeting with the community.
  • Summary of results are included in the Flood Risk Report.

– Potential community uses: (*requires additional GIS analysis)
  • Quantify potential future losses and use to prioritize mitigation priorities.
  • Supports mitigation plan updates or creation of county mitigation plans.
  • *Use community parcel data rather than, census block data, and further refined the risk assessment.
RiskMAP Datasets

Term Datasets includes the GIS/digital information-CSLM, Depth Grids, and HAZUS data

Better GIS layers can earn you CRS credits

These additional tools for visualization and analysis can be used by the community to engage a wide user base.

– Realtors
– Home owners
– Planners
– Local permit and construction inspection officials
– Elected officials
Coming Soon: Flood Risk Database

Includes all the digital GIS input and output when creating the Rock River RiskMAP products.
Coming Soon: Flood Risk Report

- Like the FIS to a DFIRM
- Non-Regulatory
- Non-technical terms
- Pictures & Notes in right margin
Coming Soon: Flood Risk Map

- Base Data
- HAZUS DATA
- Area of Mitigation Interest

NON-REGULATED DAM STRUCTURE

The Big Lake Dam, an unregulated structure located along Tributary A, causes upstream backwater during flood events more frequent than the 1% annual chance of occurrence. During large flood events, portions of River Road are un-passable and several homes receive flooded yards and basements.

Example
Summary

Rock River watershed is now a RiskMAP project

RiskMAP impacts the selection, process and products of a floodplain study

Goal is to provide tools that communities will use to reduce risk
©2011 University of Illinois Board of Trustees. All rights reserved. For permission information, contact the Illinois State Water Survey.