Go, Collaborate, and Mitigate!
Coordinated Solutions for Floodplain Management and Risk Reduction

STARR II
JUNE 19, 2018
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Agenda

• Project Background
• Solution
• Results
• Project Outcomes

Walnut Creek, Clive, IA
STARR II/FEMA Involvement

- Flood Risk Products Completed 2015
- Polk County, IA – City of Clive Preliminary FIRM released June 2015
- Community Engagement 2015

North Raccoon River HUC 8 Watershed & Walnut Creek HUC 12 Watershed
Walnut Creek Watershed & City of Clive
Concern & Challenges

53,000-acre HUC 12 Watershed
Walnut Creek Watershed & City of Clive Concern & Challenges

400+ acres developed annually
Walnut Creek Watershed & City of Clive Concern & Challenges

2,200 parcels impacted by floodplain
628 parcels in Clive impacted by floodplain
Walnut Creek Watershed & City of Clive Concern & Challenges

- 1% Steams banks are stable
- 57% Steams have moderate to severe erosion
USACE Silver Jackets Involvement

FEMA

SILVER JACKETS

WALNUT CREEK WATERSHED

US Army Corps of Engineers

Clive

IOWA DEPARTMENT OF NATURAL RESOURCES
A United Solution

Entire Walnut Creek Watershed
• Large Scale, Structure-Specific Risk Assessment
• Evaluation of Current and Future Flood Risk
• Mitigation Options
• Insurance Premium Sensitivity
• Public engagement

STARR II/FEMA
Technical Assistance

USACE
Silver Jackets Project

Walnut Creek WMA
Local Interest

Walnut Creek Mitigation Benefits Estimator (MBE) Analysis
Mitigation Benefits Estimator (MBE)

- Automate the FEMA Benefit-Cost Analysis (BCA) Toolkit
- Analyze structure-specific risk (residential and non-residential)
- Estimate benefits/costs for various mitigation options
  - Elevation
  - Acquisition
  - Basement In-Fill
- Insurance premium sensitivity
MBE Results/BCA Toolkit Alignment

Quality Assurance

• Previous results
  • All results within 25% (or $250 of BCA Toolkit)
  • On average, results within 10% of the BCA Toolkit

• Walnut Creek MBE Assessment
  • Anticipated closer alignment
  • More sophisticated approach

Consideration of:

• Environmental benefits
• Productivity costs
• Mental health cost
• Discount rate
• Demolition threshold
Approach

• Collect data/confirm assumptions
• Develop flood hazard data
• Run MBE Analysis
• Present Results
  • Watershed Management Authority
  • Public
<table>
<thead>
<tr>
<th>Data Collection</th>
<th>STARR II</th>
<th>USACE</th>
<th>Local</th>
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Flood Data Development - Existing

STARR II Scoped for Existing Condition

• Existing conditions water surface elevation grids from Flood Risk Products
  • 10%
  • 4%
  • 2%
  • 1%
  • 0.2%

• Additional existing conditions water surface elevation grids.
  • 50%
  • 20%
  • 0.5%
  • 0.001%
Flood Data Development - Future

USACE Developing Future Conditions Hydrology & Hydraulic Modeling

Currently Developed

Planned 2050 Development

Watershed Land Use

- Commercial - Current Development
- Industrial - Current Development
- Residential - Current Development

Watershed Land Use

- Commercial - Develop by 2050
- Industrial - Develop by 2050
- Residential - Develop by 2050
- Current Development
MBE Analysis

- Results
  - Potential flood risk
  - Mitigation project identification
  - Flood height/water surface elevation
1. At Risk Structures (1.0-percent)

1. At Risk Structures (1%)
2. Dollar Loss (1%)
3. At Risk Structures (all)
4. Annualized Risk
5. Elevation Costs
6. Elevation Benefits
7. Elevation Candidates
8. Additional Results
2. Dollar Loss (1.0-percent)

1. At Risk Structures (1%)
2. Dollar Loss (1%)
3. At Risk Structures (all)
4. Annualized Risk
5. Elevation Costs
6. Elevation Benefits
7. Elevation Candidates
8. Additional Results
3. At Risk Structures (all frequencies)

1. At Risk Structures (1%)
2. Dollar Loss (1%)
3. At Risk Structures (all)
4. Annualized Risk
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6. Elevation Benefits
7. Elevation Candidates
8. Additional Results
4. Annualized Loss ($)

1. At Risk Structures (1%)
2. Dollar Loss (1%)
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8. Additional Results
5. Elevation Costs

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2. Dollar Loss (1%)
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5. Elevation Costs
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8. Additional Results
6. Elevation Benefits

1. At Risk Structures (1%)
2. Dollar Loss (1%)
3. At Risk Structures (all)
4. Annualized Risk ($)
5. Elevation Costs ($)
6. **Elevation Benefits ($)**
7. Elevation Candidates
8. Additional Results
7. Elevation Candidates

1. At Risk Structures (1%)
2. Dollar Loss (1%)
3. At Risk Structures (all)
4. Annualized Risk ($)
5. Elevation Costs ($)
6. Elevation Benefits ($)
7. Elevation Candidates
8. Additional Results
8. Additional Results

• Acquisition Projects
  • Benefits, costs, candidates

• Basement In-fill
  • Benefits, costs, candidates

• Future Conditions
  • Acquisition, Elevation, Basement In-fill

• Insurance Premium Sensitivity Analysis
Communicating Results

• Walnut Creek Watershed Management Authority
  • Results
  • Local Official Training

• Public Engagement Meetings
  • Homeowner-specific printouts
  • Multi-discipline support (e.g., mitigation, insurance, local floodplain managers)
Observations/Best Practices

• Align Timelines
  • Multiple contracts

• Define goals
  • Multiple drivers

• Reconcile flood data sources
  • FEMA FIS/DFIRM, USACE Hec-Ras

• Engage in regular communication
  • “internal” - partners
  • “external” with client/all partners
Walnut Creek MBE Outcomes

• **Automated, large-scale, structure-based risk assessment**
  - Understanding of flood risk (current and projected)
  - Consistent risk communication throughout watershed
  - Use in hazard mitigation plans

• **Mitigation project identification**
  - Costs and benefits
  - Project options
  - Cost considerations

• **Mechanism to prioritize projects**
  - Watershed/community-wide portfolio planning
  - Limits BCA application fatigue