Lewisburg Borough
Flood Impact Summary

8 June 2016
Samantha Pearson, Elm Street Manager
Background

West Branch near the confluence
Union County – population <50K
County impact -- ~3% of total parcels
Lewisburg Borough – population ~6K
Year settled – 1763-9
Average Household Income -- ~$56K
Total addressable structures – 1650
Structures in floodway – 57 (3%)
Structures in 100 year FP – 600 (36%)
Total historic structures – 1115 (67%)
Repetitive Loss Properties – 6
Total flood insurance claims – 333
Total value of claims paid -- $3,420,546.27
Average value of claim -- $10,272
Assessed value in floodplain -- $185M (55%)
Character of the Town
History of Flooding
History of Flooding
Borough Resources

• Borough Flood Impact Task Force established 2015
• Borough part of Community Rating System (CRS) program
• Borough engineer has a Certified Floodplain Manager on staff
• No designated, proactive CFM for Borough
• Lewisburg Neighborhoods Corporation provides support
• County has GIS capabilities
• Bucknell University participates in planning and analysis
• Funding available for summer student interns with advisors
Borough Flood Impact Task Force

• Coordination
• Information
• Legislation
• Public Outreach
• Borough Support
Borough Flood Impact Task Force

• Coordination
  • Funnel input to federal level
  • Communicate with state
  • Work with County
  • Connect with state agencies
  • Network with other River Towns
  • Look for national allies
Borough Flood Impact Task Force

• Information
  • Finance/banking options
  • Input from insurers
  • Historic economic impacts
  Detailed economic implications (tax base)
  • Realty implications
  • Construction/Mitigation Techniques and Costs
  • International models for resilient cities
  • Low income impacts
Borough Flood Impact Task Force

• Legislation
  • Suggestions for 2017 reauthorization of legislation
  • Consider PennVest-modeled loan program to facilitate mitigation projects
  • Separate impact levels for low income and/or historic areas
  • Research local tax multiplier possibilities
Borough Flood Impact Task Force

• Public Outreach
  • Keep residents informed about submissions, information, events
    • Home-owners
    • Multifamily/rental properties
    • Business owners
    • Renters
    • Second homes
  • Raise awareness of floodplain location and insurance rate impacts
  • Pool properties for group rates (on Certificates of Elevation)
  • How to mitigate (being done by Lycoming County, stay tuned)
  • Template for other locales
  • Target top 5 topics under awareness
Borough Flood Impact Task Force

- Borough Support
  - Community Rating System (CRS) assistance
  - Elevation application review
  - Make case for pilot study
  - Certified Floodplain Manager
  - Compile elevation certificate info (for Emergency Management and GIS use)
Borough Flood Map
LEWISBURG BOROUGH

Number of Addressable Structures Per Flood Constraint

Total Number of addressable Structures in Lewisburg: 1649
Structures within Floodway: 67
Structures within 100 Year: 600
Structures within 500 Year: 1290
Structures Outside Flood Area: 389

One inch equals 700 feet
or 1:8400

Flood Designation

- Floodway
- 100 year floodplains
- 500 year floodplains

For Planning Purposes Only
Not For Engineering Use

Prepared by:
Ohiopyle GIS Department
October 2015

Source:
USGS 3D GIS Data
Flood data derived from FEMA

Borough Boundary

Road Centerline
Stream Centerline
Water Body
Floodplain Affected Properties
Historic District
Simplified Flood Map

FEMA DFIRM FLOOD ZONES: Lewisburg Borough

Legend
- Managed Boundary
- Streams
- Parcels
- DFIRM Flood Zones
- 1% ANNUAL CHANCE (100 Year)
- 0.2% CHANCE (500 Year)
- Floodway Boundary

One inch represents 800 feet

FOR PLANNING PURPOSES ONLY NOT FOR ENGINEERING USE

Prepared By: Union County GIS Department
January 2004 Revised April 2014
Source: Union County GIS Data
Prepared: State Plane Coordinates, NAD 83

Acreage
- Lewisburg: 610.7 Acres
- Floodway: 71.9 Acres
- 100 Year: 277.3 Acres
- 500 Year: 463.0 Acres

30% 34% 12% 24%

500 Year 100 Year
Reconstructing the Floodplain

The Emergent State of Flood Insurance Reform in Lewisburg, PA
Greg Millor '18
Advisors: Duane Griffin and Sam Pearson
Support: Bucknell Institute for Public Policy
Department of Geography, Bucknell University, Lewisburg, Pa.

Abstract

The Biggert-Waters Flood Insurance Reform Act of 2012 and the Homeowner Flood Insurance Affordability Act of 2014 mandated significant changes to the National Flood Insurance Program (NFIP). This research examines the effects of these changes on flood insurance premiums and the feasibility of reconstructing the floodplain in Lewisburg, PA. The study utilizes Geographic Information Systems (GIS) to analyze flood risk and insurance costs for different flood mitigation strategies.

Questions of Interest

What is Lewisburg’s exposure to a 100-year flood?
How many properties would be affected by a 100-year flood?
What degree of damage would be incurred by each structure?
How accurate is FEMA’s floodplain map?

Methods

The study focused on a subset of 100-year flood risk areas in Lewisburg. A floodplanning model was created using Geographic Information Systems (GIS) to analyze flood risk and insurance costs for different flood mitigation strategies.

Conclusions and Discussion

As evidenced by the resulting map, there are many homes and businesses within only 100 feet of the 100-year flood plain, particularly those with basements or first floors. The study also highlighted the need for improved flood mitigation strategies, such as elevation and floodplain management. The results suggest that floodplain management and insurance premium adjustments are necessary to ensure the long-term sustainability of the floodplain in Lewisburg.

Acknowledgments

Sam Pearson and the Lewisburg Neighborhood Corporation
Chase Griffin, Professor of Geography at Bucknell University
Madeline Logan, Lewis County GIS
Kathie Harran, SESNA-CG

This research was funded in part by the Bucknell Institute for Public Policy.
Reconstructing the Floodplain

The Emergent State of Flood Insurance Reform in Lewisburg, PA

Greg Miller '18
Advisors: Duane Griffin and Sam Pearson
Support: Bucknell Institute for Public Policy
Geography Department, Bucknell University, Lewisburg, PA

Introduction

The Gigantic Waters Flood Insurance Reform Act of 2012 and the Homeowner Flood Insurance Affordability Act of 2014 were established in an attempt to eliminate substantial increases in flood insurance rates for policies that were below the current floodplain requirement. These acts were a significant step forward in flood risk management, but their impact remains uncertain.

The study of floodplain management and flood insurance reform in Lewisburg, PA, is designed to assess the implications of these acts and to explore the potential for improved floodplain management. The study will evaluate the impact of flood insurance reform on the viability of continued development in flood-prone areas and will provide insights into the effectiveness of floodplain management policies.

Analysis

Data: We calculated the projected depth of a 100 year flood by extrapolating ground observations (GPM) from a flood elevation (FSE) survey conducted by the U.S. Geological Survey (USGS). The estimated flood elevation (FED) was used as the threshold for determining floodplain boundaries.

Questions 1 & 2: To identify areas at risk of flooding, we used the Flood Insurance Rate Maps (FIRMs) provided by the Federal Emergency Management Agency (FEMA). The FIRMs are based on a combination of historical flood data and current land use patterns.

Results: The study found that the FIRMs accurately predicted the areas at risk of flooding. The analysis also showed that the FIRMs are an effective tool for identifying flood-prone areas and for planning floodplain management strategies.

Discussion and Conclusions

As evidenced by the figures showing the extent of flooded areas in Lewisburg, PA, the FIRMs provide valuable insights into the potential impacts of flooding. The study concludes that the FIRMs are an effective tool for identifying flood-prone areas and for planning floodplain management strategies. However, additional research is needed to evaluate the effectiveness of flood insurance reform in reducing the financial burden of flooding.

Table 1

<table>
<thead>
<tr>
<th>Mitigation Class</th>
<th>Cones</th>
<th>Basements</th>
<th>Ponds</th>
<th>Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOMA (B)</td>
<td>154</td>
<td>937</td>
<td>572</td>
<td></td>
</tr>
<tr>
<td>LOMA (E)</td>
<td>30</td>
<td>294</td>
<td>918</td>
<td></td>
</tr>
<tr>
<td>50% Flood</td>
<td>101</td>
<td>150</td>
<td>1,155</td>
<td></td>
</tr>
<tr>
<td>Moderate Flood</td>
<td>104</td>
<td>45</td>
<td>3,200</td>
<td></td>
</tr>
<tr>
<td>Substantial Flood</td>
<td>111</td>
<td>50</td>
<td>5,500</td>
<td></td>
</tr>
</tbody>
</table>

$1,147,000
Reconstructing the Floodplain
Reconstructing the Floodplain
Reconstructing the Floodplain
Reconstructing the Floodplain
## Range of Exposure/Mitigation Options

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential LOMAs</td>
<td>BFE not touching structure</td>
<td>144</td>
<td>$500</td>
<td>$72,000</td>
</tr>
<tr>
<td>Landscaping</td>
<td>FFE &gt; 2’ above BFE</td>
<td>36</td>
<td>$5,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Basement Filling</td>
<td>FFE &lt; 2’ above BFE</td>
<td>101</td>
<td>$15,000</td>
<td>$1,515,000</td>
</tr>
<tr>
<td>Moderate Elevation</td>
<td>FFE &lt; 3’ below BFE</td>
<td>154</td>
<td>$100,000</td>
<td>$15,400,000</td>
</tr>
<tr>
<td>Substantial Elevation</td>
<td>FFE &gt; 3’ below BFE</td>
<td>111</td>
<td>$150,000</td>
<td>$16,650,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>546</td>
<td></td>
<td>$33,817,000</td>
</tr>
</tbody>
</table>

Results from 2015 Summer Internship project by student Greg Miller funded by Bucknell Institute for Public Policy. Preliminary to actual economic analysis.
Observed Results to Date

11 feet BFE, 2.75 feet on first floor
Pre-Biggert Waters: $1,500
Post-Biggert Waters: $10,519

13.5 feet BFE, 6.5 feet on first floor
Pre-Biggert Waters: $2,800
Post-Biggert Waters: $8,900
Observed Results to Date

Mitigation by Elevation: 1 since 1977 (completed in 2016, multiyear process)
Mitigation by Elevation: must increase by three orders of magnitude (1600x)
NFIP policies in Borough: continue to drop as PSAB promotes private insurance and cash sales increase and debt is reallocated outside the floodplain
Conclusion

• While it is clear that the insolvency of the National Flood Insurance Program is a serious problem, destroying entire municipalities in an attempt to fix it is counterproductive.
• The new laws are in and of themselves a federal emergency and may well leave communities as devastated as the floods they attempt to protect against.
• There must be a way to more equitably share in the cost at a level commensurate with actual risk.
• Reauthorization is scheduled for 2017.
Recommendations

• Mandatory coverage for all properties in or near floodplain
• Recognition of the infeasibility of eliminating flood relief for uninsured properties in the event of a disaster
• Severing of rushing versus rising waters beyond velocity zones or floodways
• Accommodation for historic structures
• Elimination of coverage cap for high value properties
• Accommodation of local property values/economic context