

The Emergent State of Flood Insurance Reform in Lewisburg, PA



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Abstract

The Biggert-Waters Flood Insurance Reform Act of 2012 and the Homeowner Flood Insurance Affordability Act of 2014 enacted significant changes to Federal flood insurance policies. These reforms drastically altered the financial outlook for many property owners who are now faced with unnerving spikes in flood insurance premiums. Given their potential effect on property values, the impacts of these changes on towns like Lewisburg where approximately 30% of Borough structures are within the FEMA-designated flood zone, have the potential to be extreme. The Lewisburg Neighborhoods Corporation (LNC) is in the process of analyzing these impacts to provide input to policymakers in hopes of making changes to the law when it comes up for reauthorization in 2017. Our goal was to aid the LNC in their preparation by using Geographic Information Systems (GIS) to conduct comprehensive spatial analyses of the Lewisburg floodplain. In conjunction with data supplied by Union County GIS, this research moves to model categories of flood depth and eventually mitigation costs to inform residents of floodplain structures of their options to relieve themselves of the impending financial burdens.

Questions of Interest

- What is Lewisburg's exposure to a 100 year flood?
- How many properties would a 100 year flood affect?
- To what degree or level of damage? - how deep would the flooding be for each structure?
- How accurate is FEMA's floodplain layer?

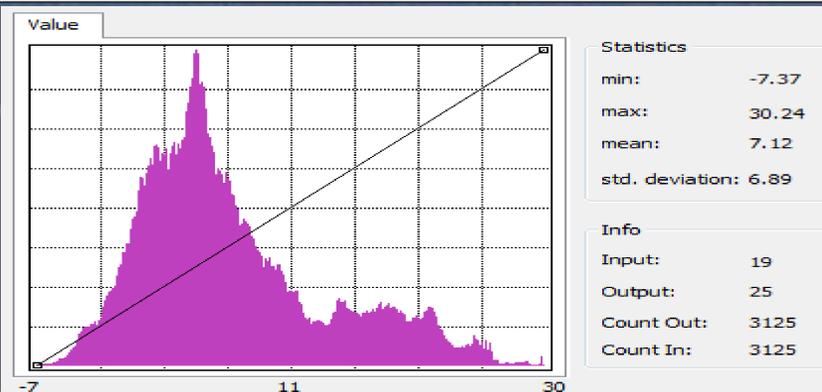
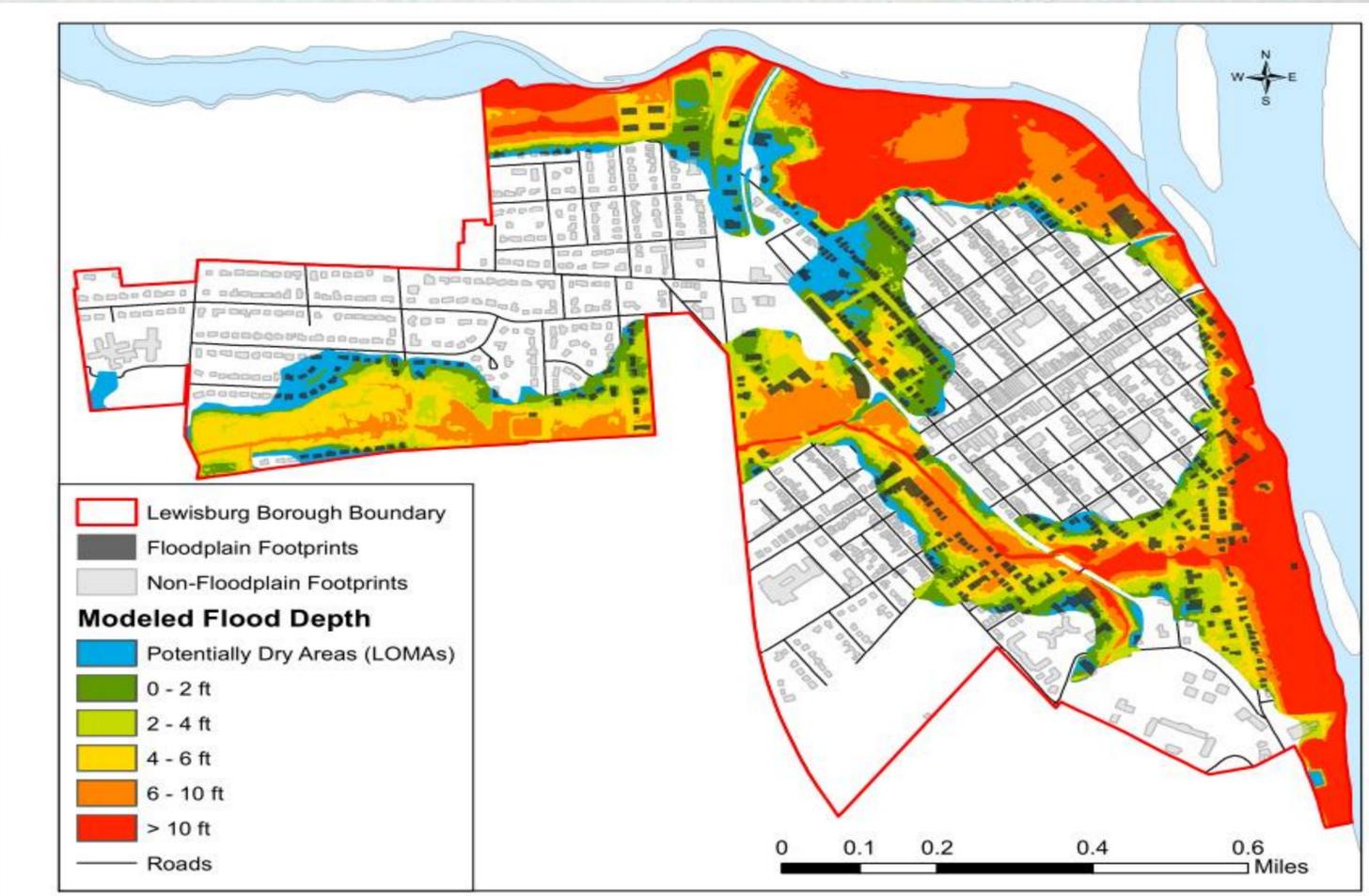
Methods

There were two essential sets of data used to model the depth of a 100 Year Floodplain in Lewisburg. The first was a series of Base Flood Elevation (BFE) cross sections provided by FEMA, designating the organization's current estimation of 100 year flood elevations. The second set was a digital elevation model provided by the Pennsylvania Spatial Data Clearinghouse, which provides the most accurate PA elevation data available to date. In 2007, the PAMAP Program used lidar to collect 3-D measurements of Union County's surface. Airborne lidar sensors fired laser beams to the ground at a rate of hundreds of thousands of pulses per second. Whenever a pulse hit an object (e.g., a building, a tree, or a rock), some of the light would be reflected back to the plane. In most areas, multiple returns were recorded for each pulse of light, and the intensity of the reflected energy was noted. By knowing the absolute position and orientation of the sensor (a feat that involves a global-positioning-system receiver and an inertial measurement unit), and considering such factors as the angle, speed, and travel time of the light pulse, elevations were calculated for each point of impact. By using GIS intersection methods, we were able to compare FEMA's perception of flood height to PASDAs elevation model, creating the interpolated depth surface you see in the map.

Depth Category	Number of Structures
Potentially Dry (<0 ft)	144
0 - 2 ft	146
2 - 4 ft	104
4 - 6 ft	81
6 - 10 ft	58
> 10 ft	3

Conclusions and Discussion

As evidenced by the resulting map, there are many homes and businesses at risk during a 100 year flood. With considerable impending damage for 536 borough structures, approximately half of which are prone to receiving more than 2 feet of flooding above Base Flood Elevation, there is certainly initiative to mitigate. However, we also see that 144 of the structures reported by FEMA to be in the floodplain were identified as having no flood depth at all by our GIS model. This would suggest that the structures in these areas have the highest chance of being able to be removed from the FEMA floodplain and therefore flood insurance obligations through pursuit of a Letter of Map Amendment (LOMA). Through obtainment of a LOMA, an individual who owns, rents or leases property may submit certain mapping and survey information to FEMA and request that FEMA issue a document that officially removes a property and/or structure from the Flood Insurance Rate Map. In most cases, the applicant will need to hire a Licensed Land Surveyor or Registered Professional Engineer to prepare an Elevation Certificate for the property. As for ongoing research, questions I hope to address by the end of the summer are: what portion of the 100 year flood would be above first floors? How much would it cost to mitigate these different flood depth categories? In answering these questions, we aim to come up with a cost function providing the LNC with more evidence for 2017 that shows that the expense of such widespread communal mitigation is economically unrealistic.



Acknowledgements

- Sam Pearson and the Lewisburg Neighborhoods Corporation
- Duane Griffin, Professor of Geography at Bucknell University
- Madeline Layos, Union County GIS
- Kathi Hannaford, SEDA-COG