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Exploring the impacts of flood insurance reform on vulnerable communities

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ABSTRACT

This paper identifies geographic areas whose real estate markets were potentially impacted by US flood insurance reform, and it explores concurrent vulnerabilities—by income and race—in the most impacted areas. Because of the geographic and demographic significance of the Gulf Coast in terms of flood risk, flood insurance, and vulnerability, the Houston-Galveston region was selected for analysis. Flood insurance reform under the Biggert–Waters Flood Insurance Reform Act of 2012 occurred unabated over a 21-month period from July 2012 to March 2014. This period represents a unique real-world intervention that can be analyzed using a quasi-experimental design. The period was characterized by numerous anecdotal reports of spiking flood insurance rates and market uncertainty. Market data were gathered for two years before and two years after Biggert–Waters in Harris and Galveston Counties. Paired *z*-tests were performed to examine before and after market differences. Findings showed 17 zip codes that experienced significant impacts ($p < 0.01$ in 14 zip codes, $p < 0.05$ in 3 zip codes). Among the significantly impacted zip codes, low-income households were overrepresented by 11% in Harris County and by 32% in Galveston County; and minorities were overrepresented by 43% in Galveston. These results support the hypothesis that flood insurance reform can have disproportionate impacts. The paper provides a straightforward approach for analyzing the real estate market impacts of flood insurance reform at a community scale. It also provides a basis for recommending that regulatory decisions involving flood insurance must be informed by an analysis of disproportionate impacts.

1. Introduction

Since Hurricane Katrina, the United States has been engaged in debates over how to reform its flood policy. Recent reforms to flood mapping and flood insurance suggest a paradigm shift in the US position on flood risk, perhaps influenced by the emerging realities of climate change, increasingly destructive floods, and the heightened costs of disaster recovery. Not long ago the position was that subsidized flood insurance should provide "affordable protection" that reduced taxpayer costs and minimized the economic hardship of floods [1]. A stated purpose of the National Flood Insurance Program (NFIP) was to encourage sound land use by minimizing exposure of property to flood losses [2]. But today the National Flood Insurance Program is widely criticized for having spurred development in high-hazard areas [3], and the flood maps on which the program depends, until just recently, had been allowed to lapse for as long as two decades before being updated [4]. Today's position employs full-risk insurance rates and risk-based mapping based on state-of-the-art science.

Passing both Houses of Congress with no debate and with no analysis of its socio-economic impact, the Biggert–Waters Flood Insurance Reform Act of 2012 [5], or BW12[1], promised to eliminate all flood insurance subsidies and to impose full actuarial insurance rates. Soon after, flood insurance rates for properties in Hawaii, Georgia, Louisiana, and elsewhere went from as low as $600 per year to as high as $20,000–$50,000 per year. Properties that had never flooded or where not considered at risk were now being mapped into high-risk flood zones and hit with the highest possible rates, all within a relatively short period of time. After almost two years of BW12, nationwide protest led to the passage of the Grimm–Waters Homeowner Affordability Act of 2014 [6], or GW14, which slowed down the pace of BW12. The period during which BW12 was fully active—from July 2012 to March 2014—therefore offers a window for observing the socio-economic impacts of policy reform thought necessary to realize the new US

[1] Abbreviations used in this paper: the Biggert–Waters Flood Insurance Reform Act of 2012 is abbreviated "BW12," the Grimm–Waters Homeowner Insurance Affordability Act of 2014 is abbreviated "GW14," and the National Flood Insurance Program is abbreviated "NFIP."

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position on flood risk.

There is little or no published analysis of the impacts of BW12 on the most vulnerable communities and population groups. Moreover, there is not adequate research on the impacts of the shifting flood paradigm in general. If such a shift is necessary, and it most likely is, how will it affect people now living in harm's way, and what options will they have to adapt to the new paradigm? This paper addresses an understudied and important topic: identifying geographic areas where national flood insurance reform potentially affected real estate markets, and exploring the demographic vulnerabilities of the most impacted areas. The scale of analysis is the community (e.g., census block, census tract, zip code, flood zone, subdivision, neighborhood, or super-neighborhood boundaries) rather than the individual property owner. The research questions are: (1) *which real estate markets worsened during the BW12 period;* and (2) *were any population groups over-represented in the most impacted areas?* The paper uses the Houston-Galveston region as a case study; however, the approach developed in the paper can be replicated anywhere because it is based on easily accessible data.

1.1. Policy background

According to the National Oceanic and Atmospheric Administration (NOAA), states along the Gulf of Mexico have the highest sustained wetland loss rate in the country [7], and Southeast Louisiana in particular has the highest rate of relative sea level rise in the United States [8]. The Gulf Coast from Texas to Florida has the highest concentration of repetitive flood loss properties in the US, with hot spots in Houston-Galveston, New Orleans, Mobile, and Tampa [48]. The combination of land subsidence, rising sea level, wetlands erosion, and increasing storm activity is intensifying the flood hazard in this particular region. For about a decade FEMA has been responding to this changing flood risk profile by updating the nation's flood maps through its Map Modernization, Risk Map, and Digital Flood Insurance Rate Map programs. The updated maps reveal a more accurate understanding of today's flood risk and sometimes result in redrawn flood zone boundaries, changes in flood zone, and/or different base flood elevations in some communities. Flood map changes can trigger higher flood insurance costs for individual property owners and can affect the value of property and local real estate market conditions in general. The increasing risk of flooding is associated with the increased cost of flood disasters. Since the Sandy disaster, the National Flood Insurance Program (NFIP) has faced deepening debt of up to $24 billion as of July 2013 [9]. The NFIP program has also fallen short in other ways, as long recognized by Burby [10]. In Burby's analysis as quoted below, the NFIP suffers from:

- Incomplete flood hazard identification and use of flawed methods;
- Failure of mitigation to contain increasing exposure to property damage from floods and coastal storms;
- Failure of mitigation to markedly reduce exposure to loss of older buildings located in flood hazard areas; and,
- Low market penetration of flood insurance in spite of mandatory purchase requirements for new construction and the availability of subsidized insurance rates for older buildings located in flood-hazard areas.

In an attempt to make flood insurance more financially sound, the federal government passed the Biggert–Waters Flood Insurance Reform Act in 2012. This act called for the eradication of subsidized insurance rates, the elimination of grandfathering, and other rule changes that affect individual property owners and local housing markets (see Table 1).

The combination of new flood maps and new insurance rules represents a paradigm shift in how the US manages flood hazards, with the new paradigm embracing up-to-date maps that reveal flood risk more accurately, and actuarial insurance rates that represent the actual costs of risk. There is less compromise in the new paradigm and more reliance on risk as a driver of decisions. After the passage of BW12, stagnant or falling prices and market uncertainty signaled the impacts of the paradigm shift. In Louisiana, the St. Charles Parish Tax Assessor implemented an across-the-board reduction in value for all properties in the parish [12]. The Houston Chronicle [13] described the impacts to the Houston-Galveston region in the following quote:

> Veteran Clear Lake-area realtor Priscilla Ennis said, "It's still a busy market, but people are reluctant to purchase in areas where the flood insurance has just gone off the charts." She said that was true in two ZIP codes in particular-one of them in Nassau Bay. One of her clients, Jack Boze, of Kemah, has had his house on the market for months and says several potential buyers have been scared away by high flood insurance quotes.

Evidence of nationwide impact is the formation of the 35-state Coalition for Sustainable Flood Insurance founded by Greater New Orleans, Inc. in May 2013 [14]. This group lobbied their representatives for relief and was victorious when Congress and the President signed the Grimm–Waters Homeowner Flood Insurance

Table 1
Summary of BW12 Reforms.
Source: FEMA [11].

Key reforms specified in the Biggert–Waters Flood Insurance Reform Act of 2012	
• Subsidized rate phase-out for all businesses and non-primary residences (second homes, vacation homes) in flood zones. Insurance premiums must reflect full actuarial risk within 4 years.	• Subsidized rate phase-out for all remaining subsidized policies, including primary residences, with map updates beginning in 2014.
• Subsidized rate phase-out for all repetitive loss and severe repetitive loss properties (within or outside the flood zone). Insurance premiums must reflect full actuarial risk within 4 years.	• Grandfathered/discounted rates phase-out for all grandfathered properties, with map updates over 5 years.
• New purchases, new policies, property sales, policy lapses, and repetitive losses must reflect full actuarial risk immediately.	• FEMA must continuously update flood maps nationwide. Out-of-date maps no longer allowed.

Note: "Flood zone" refers to the Special Hazard Flood Area as defined by FEMA. "Subsidized rates" refer to the past practice of allowing older "pre-FIRM" homes (built before the first flood maps) to purchase lower-cost insurance that did not reflect actual risk. "Grandfathered rates" (also known as "discounted rates") refer to the past practice of allowing existing properties built in compliance with previous standards to maintain their previous rates even as map changes reflected increasing flood risks. "Repetitive loss" and "severe repetitive loss" refer to properties that have flooded multiple times, as defined by FEMA.