

The Emerging Private Residential Flood Insurance Market in the United States

Carolyn Kousky, Howard Kunreuther, Brett Lingle, and Leonard Shabman



Contents

Executive Summary	1
1. Introduction	3
2. Approach of This Report.....	4
3. Residential Flood Insurance Today	5
3.1. Overview of Private Flood Insurance	5
3.2. Background on the NFIP	6
3.3. The Flood Insurance Gap.....	9
3.4. Market Structure.....	11
3.4.1. Admitted versus Excess and Surplus.....	11
3.4.2. Policy Distribution	13
3.4.3. Reinsurance	13
3.4.4. Overview of the Residential Flood Market	14
3.5 Analysis of Private Insurers.....	16
3.5.1. Types of Firms	16
3.5.2. Policy Terms	19
3.5.3. Pricing and Underwriting Strategies	20
3.6. State Analysis	23
3.6.1. Texas.....	25
3.6.2 Florida	25
3.7. Market Evolution.....	27
4. Market Drivers	28
4.1. Interaction with the NFIP	28
4.1.1 WYO Program	28
4.1.2 The Mandatory Purchase Requirement and Lender Acceptance.....	28
4.1.3. Rate Competition	30
4.1.4. Data and FIRMs	30
4.1.5. Use of Forms.....	31
4.1.6 Continuous Coverage and Mid-Term Refunds	32
4.2. Managing Catastrophic Risk	32
4.2.1 Data and Modeling	33
4.2.2. Reinsurance for Managing Catastrophic Risk.....	34
4.2.3. Managing Concentration	35
4.3. State Regulation and Legislation.....	35
4.4. Agents.....	38
4.5. Demand	39
4.6. Exposure Management.....	40
5. Implications for the Future of Flood Insurance.....	41
Author Bios	44
References	46
Appendix 1: Interviewees.....	50



Executive Summary

The federal National Flood Insurance Program (NFIP) underwrites the overwhelming majority of residential flood insurance policies in the United States. As of April 2018, more than 5 million NFIP policies were in force nationwide (4.8 million residential), representing slightly more than \$1.28 trillion in coverage (\$1.17 trillion residential). For decades, the NFIP has been homeowners' only option for flood insurance, but over the past several years, a small private market for residential flood insurance has emerged. Policymakers are increasingly interested in learning whether the expansion of this market could help meet the policy goals of increasing the number of homeowners with flood insurance or offering more affordable coverage.

Stakeholders—in congressional testimony, op-eds, reports, and other forums—have offered diverging opinions as to the appetite of the private sector in writing more flood insurance, on the existing barriers to private coverage, and on the implications for the NFIP. The present state of the market is unclear, particularly since there is no nationwide database on the companies writing residential flood insurance, coverages offered, policy terms, pricing, and any differences between private and NFIP flood insurance. This makes it difficult to evaluate the market's future evolution and relationship to the NFIP.

This report aims to fill these knowledge gaps and has two primary objectives:

1. to document the current state of the private, residential flood insurance market across the United States; and
2. to identify the main factors influencing the number and form of flood insurance policies offered by the private market.

To meet these objectives, we conducted in-depth, semi-structured interviews with 63 insurers, reinsurers, state brokers, and other market participants. We also gathered and analyzed current private market data from a range of sources including public documents, congressional testimony, news articles, state regulators, and private firms.

ACKNOWLEDGEMENTS

This report is based on work supported by the Science and Technology Directorate of the US Department of Homeland Security for the Flood Apex Program under Contract HSHQDC-17-C-B0032. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the US Department of Homeland Security. The authors would like to thank the following individuals for their helpful comments: Clark Poland, Paul Huang, David Alexander, Liz Asche, Flood Apex program experts, Katherine Greig, all the stakeholders whom we interviewed (see Appendix 1), and those that reviewed a draft of the report. The authors would also like to thank the Federal Emergency Management Agency for assistance with supporting data, and in particular, Scott McAfee and Andrew Martin. Finally, we would like to thank Xiao Wu for assistance with map production.

Key Findings

- The private residential flood insurance market in the United States is currently small relative to the NFIP. We estimate that private flood insurance accounts for roughly 3.5 to 4.5 percent of all primary residential flood policies currently purchased.
- With the exception of Puerto Rico, more policies are written by surplus lines carriers than by admitted carriers subject to state rate and form regulations. This is unsurprising, since surplus lines firms tend to cover new or catastrophic risks for which consumers may have trouble finding coverage in the admitted market.
- Roughly 20 percent of private residential flood policies (and 40 percent of admitted carrier policies) are in Puerto Rico; another roughly 20 percent are in Florida. No data are available to evaluate the size of the total private market in other states or at a substate level nationwide.
- Private market growth to date has largely been driven by the interest of global reinsurers in covering more US flood risk. In the admitted market, reinsurers are assuming most of the risk for primary insurers, often in excess of 90%. In the surplus lines market, Lloyd's of London has played a major role, backing the majority of residential flood policies.
- Among the small number of policies written by the private sector, we identified three broad policy types. The most prevalent is what we refer to as an "NFIP+" policy within the FEMA-mapped 100-year floodplain, where flood insurance is required for federally backed mortgages. NFIP+ policies have higher limits and/or broader coverages than NFIP policies. Most are stand-alone policies, although some are sold as endorsements to homeowners policies. A second type is a lower coverage limit policy issued as an endorsement in lower risk areas. The third type, used by only a couple of firms, mimics the NFIP policy.
- There does not exist data to ascertain how many homeowners previously uninsured against flood are purchasing private policies versus how many are switching from NFIP policies to private coverage. Insurers in the market believe their portfolios include both newly insureds and policyholders switching from the NFIP.
- Since the NFIP will provide a policy to anyone in a participating community, private firms can operate only where they can price lower than the NFIP or provide broader or different coverages for which there is consumer demand. In a sense, then, the NFIP is a default benchmark for comparison with private flood insurance policies.
- Companies have identified certain types of properties or risks where they believe they can profitably operate and compete with the NFIP. Those target areas of opportunity, however, vary across firms. For example, some are restricting themselves to areas FEMA designates as lower flood risk and others are focusing on areas FEMA designates as at higher flood risk.
- The largest US homeowners insurance companies have generally been hesitant to enter the flood market, although a few have begun to enter through subsidiaries. Their caution, we learned, stems from concern about being unable to adjust rating or policy coverages as they gain experience in writing flood because of state regulatory practices; concentration of risk in their portfolio; correlation of flood with existing wind exposure; satisfaction with the current arrangement; and concern about reputational risk should they need to raise premiums or scale back coverage as they explore the potential flood market.
- More private capital is now willing to back private flood coverage in the United States. Interviewees agreed that as insurers' familiarity with flood catastrophe models grows, as underwriting experience develops, and as state regulatory structures evolve, the number of private flood policies in force could continue to grow, including among admitted carriers. As of this writing, there were multiple new rate filings in many states, suggesting a continued expansion of the market.
- Whereas the NFIP is required to take all risks, private insurers are selective in their underwriting. All interviewees agreed that the private sector will never be able to write policies for certain properties or locations (e.g., repetitive loss properties or high-tide flooding areas) at a price homeowners would be willing to pay. Substantial public investment in risk reduction, combined with aggressive land-use

management, they said, was essential for limiting future exposure and encouraging the private sector to move into those areas.

- The private market participants we interviewed differed as to how much flood risk in the US, and storm surge risk in particular, they thought could be underwritten by the private sector. All agreed there would likely remain a large and important role for the NFIP to play, particularly in the near-term.
- Acceptance of private flood insurance by banks and financial institutions does not appear to be a major constraint on the market at present. With very few exceptions, private insurers have told us banks ultimately accept their products, though they may have some initial questions or concerns.
- There is a need for expanded insurance agent education about flood risk and flood insurance products, both for the NFIP and private policies. Interviewees disagreed about whether the higher-than-market commissions paid by the NFIP were creating a disincentive for the private market.
- Most interviewees saw limited demand for flood coverage today, whether offered by the NFIP or by a private provider, and said that consumers were price sensitive.

1. Introduction

Flood insurance is a necessary component of household and community resilience. Flood insurance provides reliable financial assistance to cover the costs of repair and rebuilding without the need to draw down savings, divert consumption, or take on debt. Insurance provides greater and timelier assistance than federal disaster aid, which may take months or years to reach victims, and the aid may be poorly matched to needs (e.g., Talbot and Barder 2016; Fernandez et al. 2017). Federal assistance is not available after every flood and more limited than many realize.¹ Insured property owners are

more likely to rebuild; a study from the Department of Housing and Urban Development found that insured households were 37 percent more likely to have rebuilt their homes after Hurricanes Katrina and Rita (Turnham et al. 2011). While flood insurance is thus valuable to everyone, it may be particularly critical for low- and middle-income families that lack enough savings to finance their recovery or have a lower capacity to take on debt. Unfortunately, these are also often the households that can least afford flood coverage.

Despite the known benefits of insurance, there is a large and persistent flood insurance gap in the United States. FEMA estimates that the residential flood insurance market penetration rate in the 100-year floodplain (also known as the special flood hazard area, or SFHA) is approximately 30%. Outside the 100-year floodplain, take-up rates are very low. New York City (2013), for example, estimates that fewer than 20 percent of those inundated by Hurricane Sandy had flood insurance, in part because Sandy's storm surge pushed beyond SFHAs. More recently, less than a fifth of those most affected by Hurricane Harvey had flood insurance (Long 2017).

Some observers have cited the flood insurance gap as an opportunity for private market growth, with the US flood market estimated at \$30 billion to \$50 billion in revenue (Hayes and Kulik 2017; Michel-Kerjan and Taglioni 2017). For the past 50 years, the flood insurance that has been written in the United States has been almost exclusively through the National Flood Insurance Program (NFIP). Flood policies have been written by the private sector for commercial properties and also for residential "excess" policies, which provide private coverage above the \$250,000 NFIP residential building coverage cap, but until recently, very few primary flood policies for residences were offered. In the past few years, however, a small private market for residential flood has emerged.

Opinions vary on how this market will grow and evolve, including whether that growth will help close the

¹ FEMA's Individuals and Households Program (IHP) provides funds to help with essential home repairs, temporary housing costs, and other necessary expenses. It is only to make homes safe and habitable after a flood, not bring them back to pre-disaster conditions. IHP grants are capped at \$34,000 for FY 2018, and the average award provides only about \$5,000 – \$6,000. Recovery funds are also available through the Disaster Loan Program of the Small Business Administration (SBA), which provides individuals up to \$200,000 for repairs. For most disaster victims, SBA loans are the main source of government assistance rather than IHP grants. Funding from either program is available to individuals only if the US president or SBA has issued a disaster declaration.

coverage gap or just transfer policies from the NFIP to the private sector. Given the cross-subsidies, uniform surcharges, and coarse rating currently used by the NFIP, some believe that private companies will take the lower risk and overpriced policies from the NFIP, leaving it with only high-risk properties and underpriced policies (e.g., Berginnis 2016; Birnbaum 2016). Absent any reform efforts, they say, this would undercut the financial stability of the program. Others believe that pulling exposure from the NFIP is on net positive; that is, the overall exposure reduction is more important than the fact that remaining policies may have higher loss ratios (e.g., Poulton 2017; RAA 2017). These observers argue that overall a greater role for the private sector will lower taxpayer exposure to NFIP shortfalls.

Similarly, supporters of private market growth have suggested that it will expand consumer choice and provide more complete coverages, lower prices, and products better matched to household needs. On the other hand, some consumer advocates worry that private market offerings will not increase resiliency if companies offer less comprehensive coverage than the NFIP or cancel coverage after a consumer experiences a loss or risk levels change. A shift in flood to the private market, they believe, could undercut other NFIP activities, such as public flood mapping and funding of flood mitigation, because these activities are funded by fees on NFIP premiums.

This report does not directly address questions about the pros and cons of growth in private coverage. Yet these and other questions cannot be answered without first understanding the current status of private coverage, as well as the opportunities and challenges for growth. This is our focus. The report has two principal objectives:

1. to document the current state of the private residential flood insurance market across the country; and
2. to identify the main factors influencing the number and form of residential flood insurance policies offered by the private market.

We limit our attention to the primary, residential market for flood insurance and do not examine the lender-placed flood insurance market (insurance purchased

by lenders on behalf of consumers to comply with regulations that certain borrowers are required to have flood coverage as a condition for a federally insured mortgage). Although we do not examine commercial flood policies in detail, it is worth noting that whereas residential policies constitute the majority of the NFIP portfolio, commercial flood policies account for the majority of private flood insurance coverage.

The report is organized as follows. Section 2 discusses our methods and the approach taken for this report. Section 3 provides a snapshot of the current private residential flood insurance market. Section 4 then turns to address drivers of the private market. Section 5 concludes with preliminary observations on the future of the flood insurance market and the interactions of the private and public sectors.

2. Approach of This Report

No data are systematically collected on the private residential flood market nationwide. A couple states collect some data on premiums and policy counts (see Section 3.6) and there is some data collected on all flood insurance including commercial, but no detailed, nationwide, residential-only data. For this reason, our findings are based on in-depth, semi-structured interviews with market participants. Via internet searches, review of news articles, and examination of congressional testimony and other documents, as well as conversations with market observers, we created a list of all known companies offering or backing residential flood in the United States. We sent out an interview request to every such firm. We also sent interview requests to a sample of other stakeholders, such as insurance regulators in states with many flood policies, some agents writing flood insurance, and associations and non-governmental organizations.

Of our 70 interview requests, 20 stakeholders did not respond or follow up with us and one declined to be interviewed, such that we interviewed representatives from 49 institutions (70%) and a total of 63 individuals. All these individuals are listed in Appendix 1. We supplemented our interviews by collecting and analyzing

all government and industry reports, academic papers, congressional testimony, and other documents we could find related to the private residential flood insurance market.

All our interviews were semi-structured and lasted between 30 minutes and 1 hour. Most took place on the phone; a few were in person. Following the recommendation of Weiss (1994), before each interview we produced interview guides, which listed our questions and topics for inquiry. We told participants that their specific statements would be kept confidential unless they gave us permission to quote or paraphrase them in the report. All interviewees agreed to have their names listed in the appendix.

The research team then analyzed the interviews and the documents from the comprehensive literature review to develop themes and analytical categories. The basis of this report, therefore, is a high volume of unstructured, text-based information (Ritchie and Spencer 1994). We synthesized this into two categories: current structure of the market (Section 3) and determinants or drivers of the market (Section 4). We highlight throughout the themes that we heard from multiple interviewees. Attribution to particular firms and interviewees is kept confidential except when a point is in a publicly available document or we had permission to name a person or company.

3. Residential Flood Insurance Today

This section discusses the current state of the residential flood market in the United States. First, in Section 3.1, we provide a brief overview of private flood insurance broadly and then, in Section 3.2, offer background on the NFIP. In Section 3.3 we document the flood insurance gap for residential properties. We turn in Section 3.4 to the basic structure of the private residential flood market, including a description of the major market players. Section 3.5 discusses the types of private firms in the market today, the policy terms they are offering, and their pricing and underwriting strategies. Section 3.6 offers a more detailed look at private,

residential flood in Texas and Florida, the two states collecting data on these policies. Section 3.7 discusses perspectives on the evolution of the private residential flood insurance market.

3.1. Overview of Private Flood Insurance

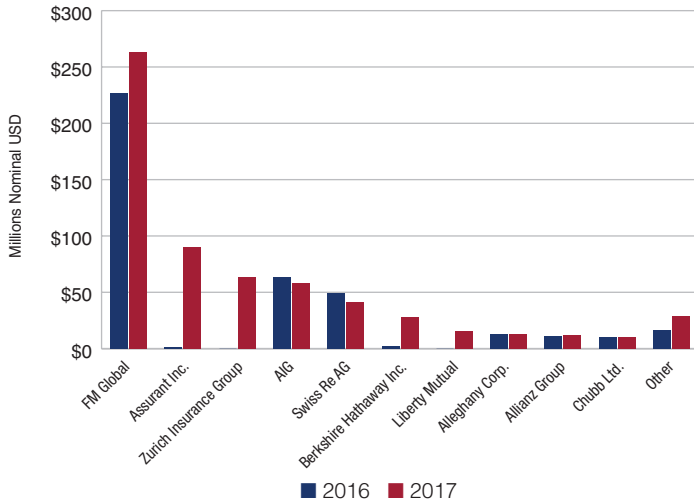
Private insurance is regulated by the states. They license insurance companies and agents, regulate products, oversee rate setting and forms for the admitted market, set solvency requirements, monitor market conduct, and carry out other activities. Their primary objective is consumer protection. State regulators often work together through the National Association of Insurance Commissioners, a standard-setting and regulatory support organization created and governed by insurance regulators in all 50 states, the District of Columbia, and US territories.

Comprehensive data on the private residential flood market in the US do not exist, but S&P Global Market Intelligence provide data on the broader market, covering both residential and commercial flood.² These data show 20 groups and unaffiliated organizations³ offering private flood insurance in the U.S. in 2016 and 30 in 2017 (it is possible the 2016 data is an underestimate if not all firms fully reported in the first year of data collection). Total premium written in 2017 was approximately \$623.5 million. Figure 1 shows the top 10 private flood insurance writers—commercial and residential—by premiums written for 2016 and 2017. Of these, Assurant, AIG, Liberty Mutual (through subsidiaries), and Chubb are also operating in the residential market, and Swiss Re and Berkshire Hathaway are reinsuring residential flood. Commercial flood is estimated to be roughly 64% of all private flood (Carrier Management 2018).

² This data includes the flood portion of premiums from all-risk commercial policies.

³ These groups and organizations may have one or multiple subsidiaries and/ or affiliates that offer private flood insurance.

Figure 1. Top 10 writers of private flood insurance by direct premiums written, 2016 and 2017



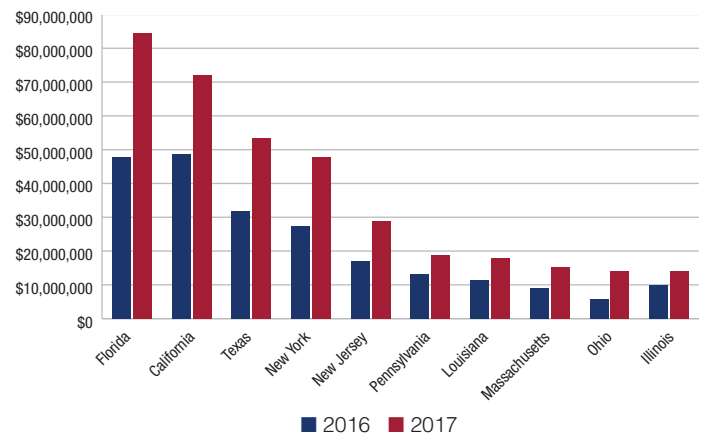
Source: S&P Global Market Intelligence. The table includes both residential and commercial flood insurance, stand-alone, and excess policies. It excludes sewer and water backup and agriculture coverage for crops.

According to these data, FM Global is by far the largest flood writer in the United States; it insures only commercial clients and generally writes all-risk policies (the data shows the portion of premium for the flood peril). For companies that write both commercial and residential flood, the S&P data do not differentiate across these two lines and are thus of limited use for an examination of the residential flood market. A recent report, however, provides a breakdown of residential flood premium based on data reported to the National Association of Insurance Commissioners (Carrier Management 2018). That report indicates that the largest residential writer is Assurant, with over \$89.8 million in premium, representing just over 40% of private residential flood premium. The top four writers then include AIG (just over 26%), Swiss Re (just under 19%), and Chubb (just under 4.5%).

State-level data show broad growth in commercial and residential flood insurance. The top 10 states for private flood insurance all saw growth between 2016 and 2017 (Figure 2). Florida leads, followed by California, Texas, and New York. Still, the amount written by the private sector is small compared with NFIP premiums. Combining commercial and residential, private sector

premiums were approximately 16 percent of total flood insurance premiums nationwide, with the NFIP responsible for the other 84 percent.

Figure 2. Private market growth, by state (top 10 states by 2017 premiums written), commercial and residential



Source: S&P Global Market Intelligence.

3.2. Background on the NFIP

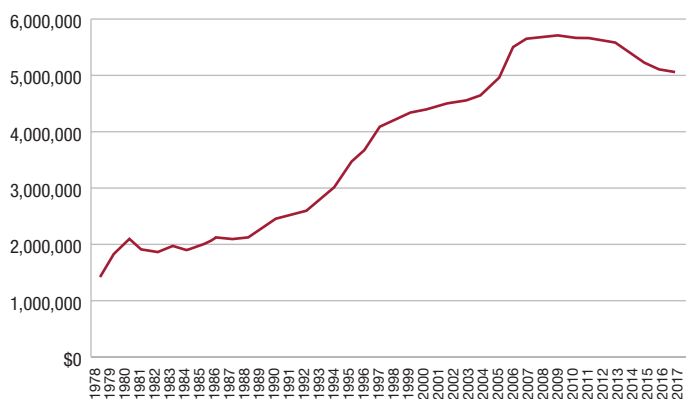
Congress established the National Flood Insurance Program in 1968, partially in response to the lack of a robust private market for residential flood insurance. The NFIP operated as a private-public risk sharing partnership until 1978, and in 1979 took its current form (Shabman 2018). Currently housed in FEMA, the NFIP has been the primary provider of residential flood insurance in the United States for the past 50 years. Communities that voluntarily join the program make their residents eligible to purchase flood insurance. Upon joining, communities must adopt minimum floodplain management regulations within the mapped special flood hazard area (SFHA), which is the area of the floodplain that has a 1 percent annual chance of flooding. Residential property owners can buy up to \$250,000 of building coverage and up to \$100,000 of coverage for contents. Commercial clients can insure for up to \$500,000 each for their building and contents. Currently, more than 22,000 communities throughout the country participate in the program, and these communities include the vast majority of nation's

population that is at risk of flooding. (For more details on the program, see Kousky 2018.)

While NFIP policies can be written by insurance agents directly with the NFIP, the program relies on private companies to help with the sale and administration of policies and settling claims. These firms, referred to as “Write Your Own” (WYO) companies, market policies and process claims (many use a vendor) in exchange for a fee from FEMA. WYO companies may currently receive up to 31.9 percent of written premiums to cover operating and administrative expenses and compensate agents.⁴ We were told by an interviewee that WYO companies may retain 15% - 24% of written premium for agent compensation. FEMA reimburses loss adjustment expenses according to a fee schedule coordinated with the company. These approximately 70 WYOs bear none of the risk and are not involved in rate setting. The top three WYO companies nationwide are Wright, Assurant, and Allstate (FEMA 2015); together they accounted for 42% of all NFIP policies as of May 31, 2017.

In the program’s first few years, very few households purchased flood insurance. In response, Congress passed the Flood Disaster Protection Act in 1973, which required property owners located in a 100-year floodplain with a loan from a federally backed or regulated lender to purchase flood insurance. Referred to as the mandatory purchase requirement, this led to a substantial increase in the take-up or purchase of flood insurance. As of April 2018, more than 5 million total policies were in force nationwide, representing more than \$1.28 trillion in coverage (4.8 million policies were residential representing \$1.17 trillion in coverage). The number of policies in force grew fairly steadily until 2009 but has been declining since then (Figure 3). Premium and fee increases required by 2012 and 2014 reform legislation (see below) may have caused some policyholders to drop coverage, although growth stalled before these changes.

Figure 3. Total NFIP policies in force nationwide, 1978–2017



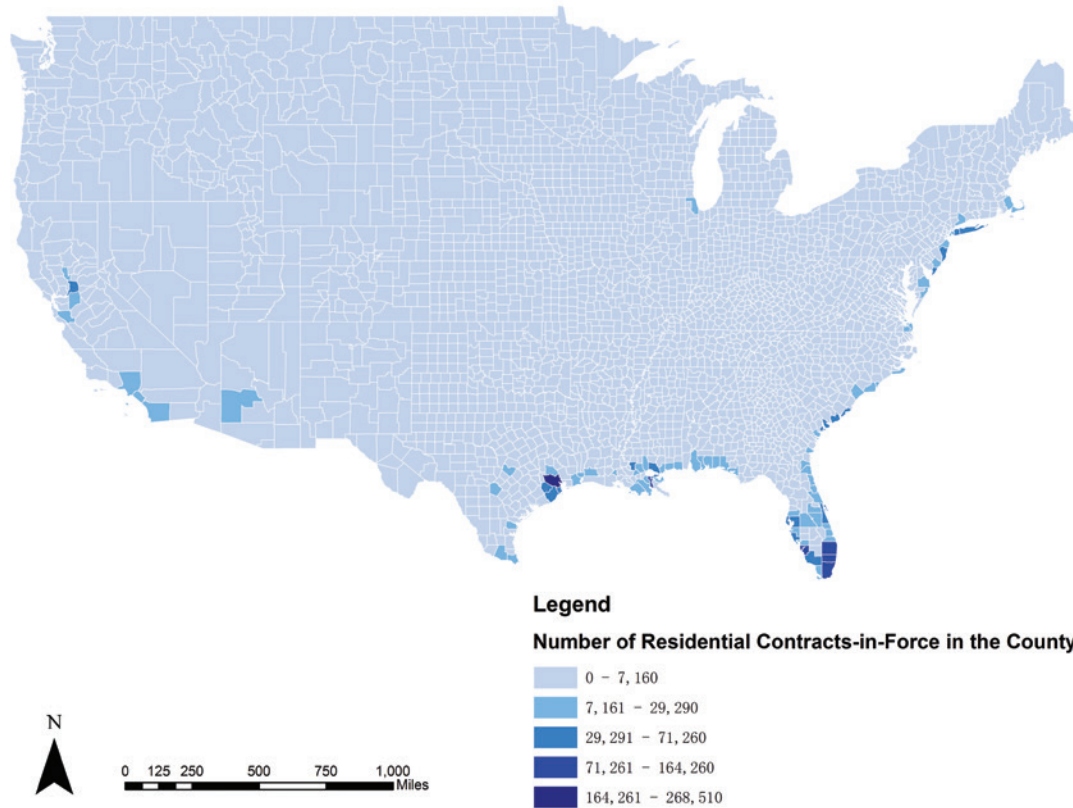
As noted, FEMA maps flood hazards for communities on Flood Insurance Rate Maps (FIRMs), which delineate different flood zones. The SFHA comprises two zones: the A zone and the V zone. A zones are inland floodplains and coastal floodplains subject to waves of less than 3 feet. V zones are narrow strips on the coast subject to breaking waves of at least 3 feet. SFHAs generally also show the base flood elevation (BFE) or the estimated height of waters in a 100-year flood. FIRMs also map the 500-year floodplain and beyond it, referred to as the X Zone.

NFIP contracts in force are heavily concentrated geographically in coastal counties (Figure 4). (FEMA differentiates between contracts in force and policies in force for multi-unit structures. An insured structure counts as one contract in force, but if that structure has multiple units that are covered under one contract, each unit is counted as a policy. So, for example, a 50-unit condominium building is one contract but 50 policies.) As of February 2018, just three states—Florida, Texas, and Louisiana—accounted for slightly less than 60% of all contracts nationwide. Despite an apparent concentration of NFIP policies in hurricane-prone coastal communities, many of these contracts are in the A zone, outside the area mapped as at risk of high storm surge. The V zone accounts for only about 1 percent of policies nationwide.

As of April 2018, the median premium (including fees) across all residential policies was \$516 and the mean

⁴ As of October 2018, the maximum reimbursement will be lowered to 30 percent of written premiums, as per a notice in the Federal Register by FEMA on March 16, 2018 (83 FR 11772).

Figure 4. Residential contracts in force nationwide, February 2018



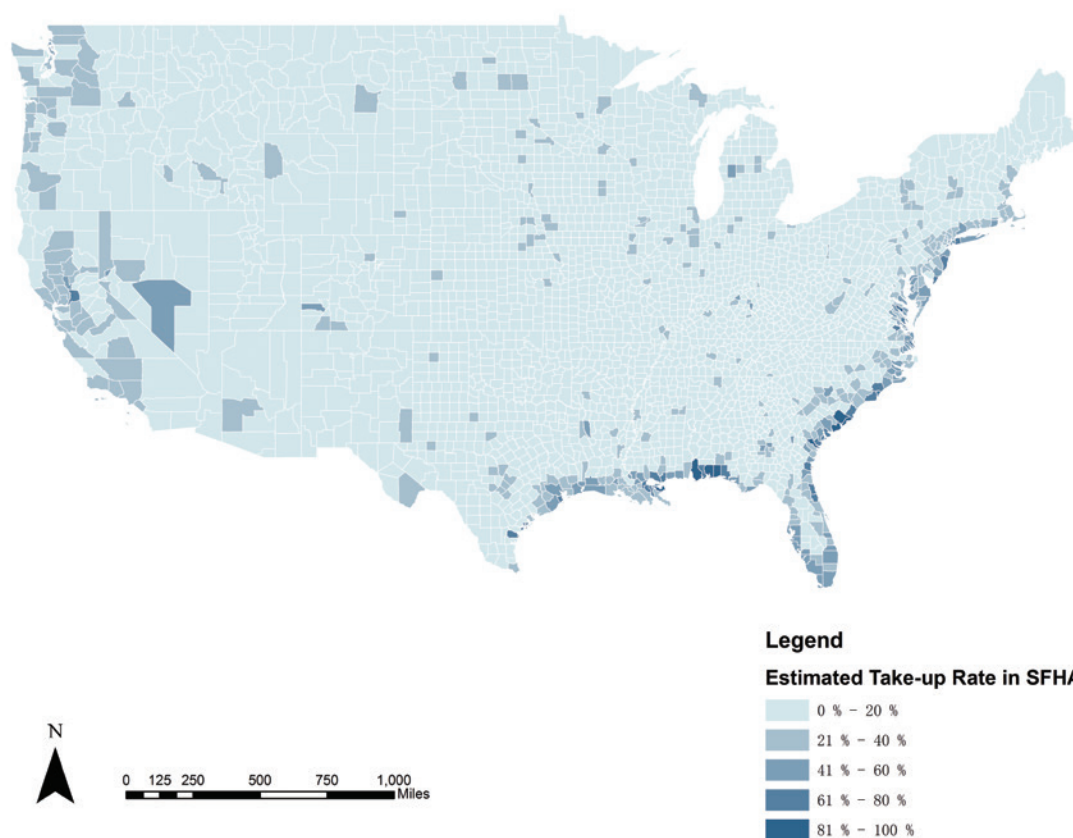
Source: Map produced with data from FEMA. The data are divided using Jenks breaks, which maximize the difference between classes. The breaks are not equal intervals, nor are they quantiles. Jenks breaks highlight the geographic concentration of NFIP policies.

was \$951. The 99th percentile premium was \$6,053.⁵ NFIP premiums vary across zones (in A zones, for example, for all residential policies, the median premium was \$824) and also by structural characteristics of specific properties. NFIP rating is fairly coarse, as the same rating tables are used in large zones across the country, although differentiated by aspects of the property—notably elevation relative to BFE. Multiple cross-subsidies are built into NFIP ratings. (For more details on these, see Kousky et al. 2017). These cross-subsidies, combined with a coarse rating system and congressionally mandated uniform surcharges, create a substantial disconnect between the premium paid and the modeled risk for some properties.

Three classes of policyholders receive discounted premiums in the NFIP. The first are older homes built

before a community’s first flood hazard map (known as a Flood Insurance Rate Map, or FIRM) was issued. These “pre-FIRM” properties have historically received lower rates to encourage program participation. FEMA has estimated about 20% of properties receive pre-FIRM discounts. Due to legislation passed in 2012 and 2014, however, these discounts are now slowly being phased out. FEMA provides a second category of lower rates for grandfathered properties. These are structures that, for example, were built in compliance with the FIRM in effect at the time of construction, but later mapped into a higher risk zone or to a lower elevation relative to the 100-year flood. Owners of these properties are allowed to continue to be rated based on the lower risk they had before the new FIRM took effect. A third category of discounts is available if a policyholder’s community participates in the NFIP’s Community Rating System and

⁵ Thanks to Mitchell Waldner at FEMA for providing the premium statistics.

Figure 5. Estimated take-up rate of residential NFIP contracts in SFHAs, by county, February 2018

Source: Produced by the authors with data from FEMA. Take-up rates are based on residential policy contracts and counts of structures.

adopts certain risk management practices. The amount of the discount varies with the actions taken by the community and can be as high as 45 percent for homes in the SFHA.

Historically, the NFIP has not been able to cover claims from catastrophic flood events because of price discounts, inadequate pricing to cover the possibility of high loss years, and congressional decisions not to cover the high claims from concentrated exposure. Congressional commitments had been part of the early NFIP but have not continued to the present (Shabman 2018). When premium funds are insufficient to cover losses, FEMA borrows from the US Treasury. Since 1978, the program has paid out more than \$65 billion in claims⁶ – most of which is attributable to just a few catastrophic loss years. As of January 2018, the

program was \$20.525 billion in debt to the Treasury.⁷ The NFIP amassed much of the debt following the catastrophic loss year of 2005 and has been carrying a debt it cannot repay for more than 15 years. In recent years, the program has purchased a small amount of reinsurance on the private market. Reform legislation in 2014 also established a reserve fund, created from an additional 15% assessment on premiums. After the 2017 hurricane season, Congress forgave \$16 billion of NFIP debt in lieu of further increasing its borrowing authority.

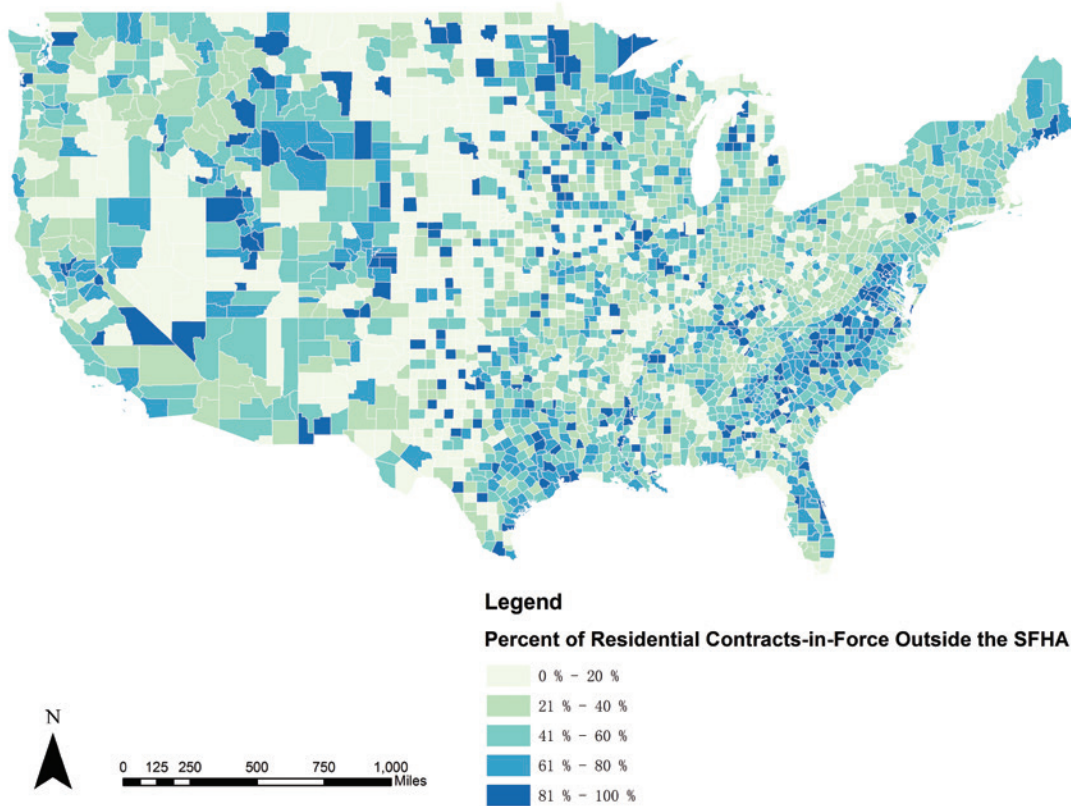
3.3. The Flood Insurance Gap

The NFIP was initially created because flood insurance was not available from the private sector. Simply making it available, however, did little to increase

⁶ Statistics from FEMA website: <https://www.fema.gov/loss-dollars-paid-calendar-year>.

⁷ As of January 2018, the NFIP's total claims-paying ability stood at \$14.66 billion, including \$9.9 billion in borrowing authority.

Figure 6. Percentage of residential contracts outside SFHAs, February 2018



Source: produced by the authors with data provided by FEMA.

purchase among those at risk. In 1973, Congress therefore created the mandatory purchase requirement. Although policies have increased over time, a large and persistent flood insurance gap remains: many households at risk of flooding do not have flood insurance. Figure 5 shows the estimated take-up for NFIP residential contracts in SFHAs by county, based on February 2018 NFIP data. In some areas, such as along the Gulf and east coasts, take-up rates are fairly high. In many 100-year floodplains, however, far fewer households are insured. Nationwide, the take-up rate in the SFHA is a little over 30%.

Outside SFHAs, flood insurance take-up rates are much lower. Over the past decade, following flood events outside SFHAs, several reports and news articles have observed that very few of the flooded homes had flood insurance (e.g., Dixon et al. 2013; CoreLogic 2017). Nevertheless, as of February 2018,

some 2 million residences outside mandatory purchase areas had voluntarily purchased coverage. This means approximately half of residential NFIP flood contracts in the country are outside SFHAs and not subject to the mandatory purchase requirement. In some parts of the country, the percent of contracts outside SFHAs is even higher. There is residual risk beyond the SFHA, as well as areas with outdated FIRMs, and many homeowners appear to be aware of this and choose to voluntarily insure. Figure 6 shows the percentage of residential contracts in force by county that are outside SFHAs. There is a surprising amount of variation around the country, with numerous counties where the majority of contracts are non-SFHA. That said, many of the counties with a high number of non-SFHA contracts have a low absolute number—for example, of the roughly 280 counties with 100 percent of policies located outside the SFHA, only 13 have more than 100 contracts-in-force in total. However, there are some notable exceptions, such

as Fort Bend County, TX with nearly 50,000 contracts-in-force and 95% of them outside the SFHA.

The argument for closing the flood insurance gap is that insured property owners are better able to recover, and recover more quickly, than those without insurance. Absent insurance, people must depend primarily on personal savings or loans, but these financial resources are likely limited for low- and moderate-income households. If a flood qualifies as a presidentially declared disaster, some federal programs offer loans or grants for rebuilding, but receiving aid to rebuild is far more uncertain and the amounts are far less generous than many people believe. Following Hurricane Harvey, for example, the average flood insurance payout was approximately \$120,000, whereas uninsured victims eligible for FEMA assistance received just \$4,300 on average (FEMA 2017). For this reason, the NFIP has developed a “moonshot” goal of doubling the number of structures with flood insurance in the United States by 2022 relying on both the NFIP and the private sector.

A challenge for policymakers is that those who most need flood insurance for their recovery—lower-income households—are least able to afford the coverage. These at-risk residents should be a target for policymakers when considering the flood insurance gap. Indeed, multiple reports have examined how to design means-tested assistance programs to help lower-income families with the costs of both flood insurance and flood mitigation (Kousky and Kunreuther 2014; National Research Council 2015; National Research Council 2016; Dixon et al. 2017). A recent FEMA report examines the issue of affordability in the program and provides data suggesting that low- and middle-income households may indeed be forgoing insurance (FEMA 2018). Based on Census and NFIP data, FEMA estimates that around 1/3 of the households in the SFHA have flood insurance. Those with a policy have a median household income of \$77,000 per year. Those without a policy have a median household income of \$40,000, or slightly more than half the income of those with a

policy. FEMA estimates that 26% of current policyholders meet HUD low income definitions but 51% of potential policyholders meet HUD low income definitions.

3.4. Market Structure

For the past 50 years, residential flood insurance in the United States has been almost exclusively provided by the NFIP, with a small private market for two types of residential policies. The first is lender-placed policies. These are flood policies that a lender purchases on behalf of a borrower when the borrower fails to comply with the mandatory purchase requirement.⁸ The second is “excess” policies, which are flood policies that provide coverage beyond the NFIP coverage caps.

The past few years have seen the incremental development of a broader residential flood market, with policies generally taking one of two forms: standalone flood policies and flood endorsements to homeowners policies. In addition, there are a few difference in conditions policies on the market to fill coverage gaps in the NFIP policy. Representatives of the private sector firms moving into flood-prone areas note they are motivated by what they see as a market opportunity. This seems to be particularly true for reinsurance companies, which believe they can profitably handle more US flood risk in their portfolios. The US flood market has been characterized as “the largest potential growth opportunity in the property and casualty market” (Deloitte Center for Financial Services 2014). Yet to date it remains quite small. We now turn to a discussion of the players in the market and their roles.

3.4.1. Admitted versus Excess and Surplus

Flood insurance can be written by either admitted or non-admitted companies. Admitted carriers are licensed by the states in which they operate and file their rates and forms with the state regulator. In the case of insolvency, their claims are backed by state guaranty

⁸ Standard homeowners policies can be force-placed, as can flood insurance policies. RAND undertook a study on the lender-placed market a little over a decade ago. At that time, the authors estimated there were roughly 130,000 to 190,000 residential primary lender-placed flood policies (Dixon et al. 2007).

funds up to a limit set by state law. Non-admitted carriers, also called surplus lines carriers or excess and surplus (E&S) companies, though approved by the state, have no requirements on their rates and forms and are not backed by state guaranty funds, but they may have higher minimum solvency requirements than admitted carriers. Rate and form freedom allows them to specialize in potentially volatile markets—nonstandard, unique, complex, or catastrophic risks. Surplus lines firms are usually the first to enter markets for high, new, or unknown risks; once the market matures, admitted insurers may begin to claim greater market share (Donelon and Travis 2017). As the former insurance commissioner for Pennsylvania said in testimony, “after a new coverage has proven itself profitable in the surplus lines market and sufficient data has been gathered to provide a sound basis for rate development, the coverage tends to become a standard product in the admitted market” (Miller 2016).

Although E&S companies do have rate and form freedom, it is a misconception that they are not regulated at all. US based surplus lines companies must be licensed in at least one state, which imposes solvency and market conduct requirements. States may also impose other regulations on surplus lines companies. In Pennsylvania, for example, surplus lines insurers can be deemed ineligible to do business in the state if they have unsound financials, violate state laws, or do not promptly pay claims (Miller 2017). States also license and oversee surplus lines brokers, discussed below. In all states, surplus lines policies are subject to a surplus lines tax, which is similar in principal to insurance premium taxes imposed on admitted insurers. The surplus lines tax is typically between 3 and 6 percent of the premium, depending on the state. Surplus lines insurers based outside of the United States are overseen by a committee of state regulators through the National Association of Insurance Commissioners.

These companies may offer coverage in the United States once they meet capital and surplus requirements, agree to maintain U.S. trust accounts, and meet “certain character, trustworthiness and integrity requirements” (Kelley 2016).

Surplus lines companies are not backed by state guaranty funds but they do face capital requirements and in recent years have had a strong track record of solvency and stability. According to global credit rating agency A.M. Best (2017), 97 percent of surplus lines insurers had “excellent,” “superior,” or “exceptional” ratings, compared to 78.6 percent of companies in the overall property and casualty market. A.M. Best also reported that from 2004 to 2015, the surplus lines industry recorded zero financially impaired companies,⁹ whereas the admitted market reported 217. That said, a comparison of financial impairment frequency (FIF)¹⁰ suggests that the solvency differences between surplus lines and admitted insurers are less stark. From 1977 to 2015, the admitted market’s FIF was 0.86 percent, and the FIF for the surplus lines market was somewhat lower, at 0.74 percent (A.M. Best 2016). We also heard that agents play a role in promoting solvency in the E&S market because they often place customers with financially strong surplus lines companies; agents may have less motivation to do this when it comes to placing admitted policies, since they know the consumer would be backed by a state guaranty fund.

In most states, insurance laws and regulations require agents to make a diligent effort to place risks in the admitted market before turning to a surplus lines carrier. This generally means that a risk must be denied by three or more admitted insurers before it can be placed in the surplus lines market. However, state regulators may waive these “diligent search” requirements for certain types of insurance products and coverages that are difficult to place with admitted carriers.¹¹ For flood insurance, 19 states have waived the requirement to varying degrees,

9 A.M. Best classifies an insurer as financially impaired when a state insurance department takes its first official regulatory action against that insurer. Such actions may include “involuntary liquidation because of insolvency as well as other regulatory processes and procedures such as supervision, rehabilitation, receivership, conservatorship, a cease-and-desist order, suspension, license revocation, administrative order, and any other action that restricts a company’s freedom to conduct its insurance business as normal” (A.M. Best 2015).

10 The FIF is calculated by dividing the number of insurers that become impaired in a given year by the total number of firms in the market that year.

11 These could also be waived if the insured qualifies as an Exempt Commercial Purchaser or Industrial Insured, meaning they are of a relevant size and employ a qualified risk manager to purchase insurance. This, obviously, would not apply to residential policies.

13 have no restrictions on accessing surplus lines for flood, five allow direct access for excess flood coverage, four allow direct access when an insured’s community does not participate in the NFIP, and one (Nevada) allows direct access for the lender-placed market (Table 1).

Table 1: States’ diligent search requirements for private flood insurance

Required	AL, AR, CO, DE, DC, GA, HI, IL, IN, IA, KS, KY, ME, MA, MN, MS, MO, MT, NE, NH, NC, ND, OH, OR, PR, SC, SD, TN, TX, UT, VT, WA, WY
Fully waived	AK, AZ, CT, FL, ID, LA, NJ, OK, PA, RI, VA, WV, WI
Direct access for excess only	CA
Direct access for excess and non-NFIP communities	MD, MI, NM, NY
Direct access for lender-placed	NV

3.4.2. Policy Distribution

Admitted and E&S insurers take different approaches to distributing their policies. Admitted insurers write policies directly to a customer, through a captive agent who writes only their policies, through independent retail agents who connect consumers to insurers and provide quotes from multiple companies, or may access business through brokers and managing general agencies. E&S insurers tend to work with wholesalers or brokers—intermediaries between a retail agent and an E&S insurer who work on behalf of the insurance agency to access the E&S market. The broker must have a surplus lines license and a standard license for selling property and casualty insurance (unless the state has reciprocity standards where no underlying property and casualty license is required).

In addition, many E&S companies work with wholesalers known as managing general agencies (MGAs) or

managing general underwriters (MGUs). An MGA/MGU works on behalf of the insurer and organizes and manages its book of business. The MGA/MGU will employ the underwriters, develop premium-setting practices, issue policies on the insurer’s behalf, and manage claims payments. They get a fee or share of premiums for these services. An MGU, as opposed to an MGA, also undertakes the underwriting. MGAs vary significantly in their size and scope. Some offer a wide range of E&S products; others focus on only a specific category of coverage or just one product. Some operate nationally; others work only in a given region or locality (Hull 2002).

3.4.3. Reinsurance

Reinsurance protects insurers against catastrophic losses and helps diversify risks globally. Reinsurance has been and will continue to be critical to the growth and development of the US private flood insurance market by helping insurers spread risk in the same way that insurance plays this role for homeowners.

For US flood, reinsurers are playing a large role in the market, although relationships with primary insurers vary. We identified two dominant types of reinsurance relationships for residential flood. In the first, the reinsurer simply provides the financial protection, but takes on a substantially greater share of the risk than is standard for property insurance. This may be done as a separate agreement and not rolled into other existing reinsurance treaties, such as a catastrophe excess of loss contract. We heard the reinsurance sector often takes in excess of 90% of the flood risk in a quota share model—meaning, the reinsurer would take 90% of flood premiums and pay 90% of flood claims. Several interviewees told us they expected that as a primary company became more comfortable writing flood, it would keep more of the risk and move to a more traditional excess-of-loss reinsurance contract.

In the second dominant model, the reinsurance company offers a white label or turn-key flood product. These products are fully designed by the reinsurer. In this way, the reinsurer takes on many functions traditionally done by the primary insurance company, such as setting

underwriting guidelines, rating, and developing forms. Many large reinsurers have their own flood models and use this expertise to design the policy. They then also back their product—again, perhaps in excess of 90 percent, even 100 percent initially. For example, Hiscox Re offers a turn-key flood insurance product called FloodXtra that personal lines insurers can add to homeowners policies. Hiscox provides interested insurers with forms, rules, rates, an underwriting portal, a pricing system, and reinsurance (Insurance Journal 2017). Flood, it should be noted, is not the only peril for which reinsurers offer white label products.

Multiple reinsurance companies are in the US flood market, including many backing the NFIP. Lloyd's of London in particular has been playing a large role in the development of the US flood insurance market. Dating back to the 1700s, Lloyd's is a specialist insurance market where insurers can find coverage for rare or challenging risks. A company needing a particular insurance coverage takes information to a broker, who then discusses it with underwriters for different syndicates. There are close to 100 syndicates. These are one or more members (usually (re)insurance companies or other companies) that provide capital for the risks they accept. Syndicates are managed by a managing agent. Lloyd's has a chain of capital to back all underwritten risks. Lloyd's syndicates stand behind many types of flood risk in the United States: the NFIP, commercial, lender-placed, and residential. Given their position in the US flood market, Lloyd's syndicates continue to develop a more enhanced understanding of US flood exposures to support more accurate pricing of such exposures.

In the private flood market, many MGAs are Coverholders for Lloyd's syndicates. Coverholders are companies or partnerships authorized by a syndicate to enter into insurance contracts on behalf of the syndicate.¹² The Coverholder's authority and responsibilities are defined in a "Binding Authority" agreement and may include the ability to set rates, underwrite, issue policies, collect premiums, and/or

handle claims. Syndicates use Coverholders to gain access to local markets without having to build the local infrastructure needed to market and sell insurance policies. Coverholders benefit from access to Lloyd's underwriters and brokers as well as the organization's financial security and ratings.

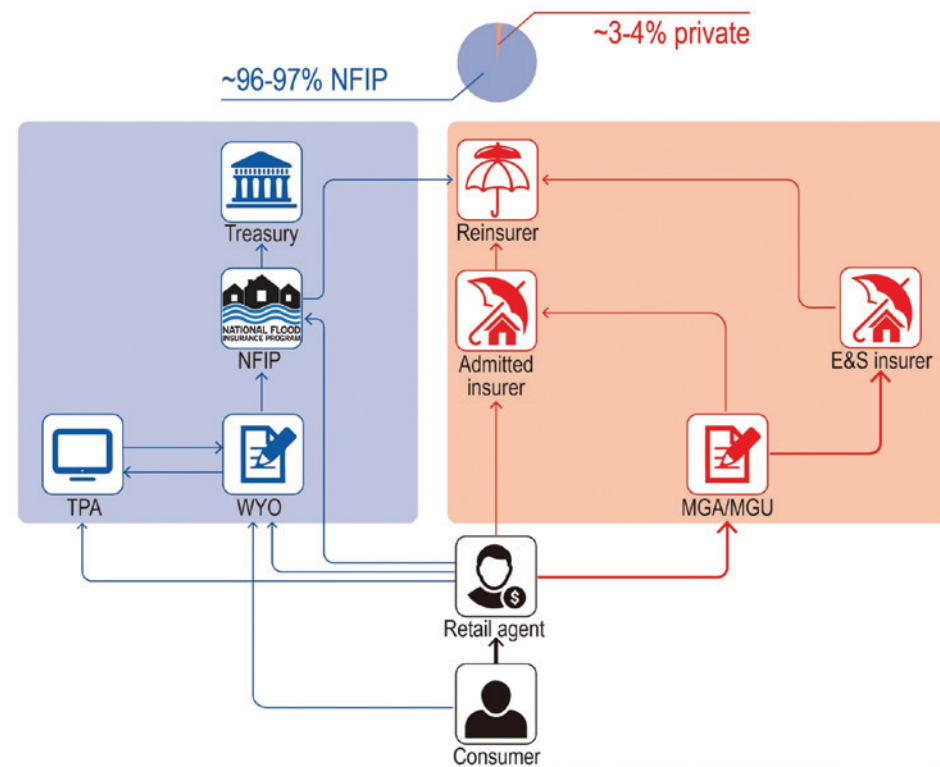
Among the MGAs we identified, all but two (The Flood Insurance Agency, which is backed by Lexington/AIG and Prospect General, which is backed by Palomar Specialty Insurance Co.) offer private flood coverage backed by Lloyd's. Most offer coverage through Lloyd's only, but some offer products backed by Lloyd's and other carriers. We estimate that Lloyd's directly holds the risk for approximately 50 to 60% of surplus lines flood policies and about 20 to 30% of all private flood policies. However, Lloyd's likely holds even more private flood risk by providing reinsurance to admitted companies as well.

While reinsurance is thus key to the development of the U.S. residential flood market, a couple of interviewees expressed caution on the sustainability of this relationship. Since reinsurance rates are not regulated the way primary insurance premiums are by state regulators, reinsurers can increase rates quickly in response to a bad loss year or revisions in catastrophe models, for example. This could then strain insurers and be passed on to their policyholders. An interviewee told us that a market so inherently reliant on reinsurance could be prone to instability.

3.4.4. Overview of the Residential Flood Market

Figure 7 depicts the structure of the residential flood insurance market in the United States. A consumer can purchase flood insurance either through the NFIP (blue) or through the private market (red). The figure shows the links from the consumer to the ultimate risk holder. In this section, we walk through a consumer's options for obtaining residential flood coverage. We estimate that more than 95 percent of the residential flood policies sold

¹² For more information, see <https://www.lloyds.com/market-resources/delegated-authorities/compliance-and-operations/about-coverholders>.

Figure 7: Structure of the residential flood market

are currently purchased through the NFIP.¹³ Specifically, we estimate that the private residential flood market accounts for 3.5 to 4.5 percent of the total residential flood market in terms of number of policies sold (see Section 3.5.1), but it is growing.

A property owner who wants to purchase a flood insurance policy typically contacts a retail insurance agent. To write an NFIP policy, the agent must have completed the NFIP training required by the state and be appointed by the insurer or MGA providing coverage. The agent searches for the best policy options available based on the property's flood risk, typically by entering information about the property into an online portal,

which then determines what types of coverage the consumer is eligible for and at what price. An agent will not usually have access to all available product offerings. If the agent is qualified to write both NFIP and private coverage, they may quote both types of policies or the one they feel is best for their client. Depending on the price and coverages, the consumer may choose to go with the NFIP or a private carrier. (For more discussion of the role of the agent in the private flood insurance market, see Section 4.4.)

If a customer chooses an NFIP policy, the agent will place the risk with a WYO company operating on behalf of the NFIP. Some policies, such as severe repetitive

¹³ This is in line with the few other estimates we have seen. For example, WSIA (2018) extrapolated data from nine states to estimate that primary residential flood insurance with surplus lines carriers was just over 2%. Since the admitted market is of a similar size, this comports with our estimate.

loss¹⁴ properties, may be placed directly with the NFIP through the Special Direct Facility. WYO companies typically rely on third-party administrators (TPAs), such as Marsh's Torrent Technologies and Aon's National Flood Services, to carry out NFIP-related tasks. WYO companies may rely on TPAs to quote NFIP premiums, communicate with policyholders, collect premiums, handle claims, provide IT services, and manage finances, including passing on premium dollars to the NFIP. Often, agents will work through TPAs to place policies, as well. For some WYO companies, a customer could bypass the agent and go directly to the company, such as through a website.

Alternatively, the property owner could choose a private policy through either the admitted or the surplus lines market. An admitted insurer would then be backed by reinsurance. Admitted companies may also be providing the homeowners policy and then the flood may be an endorsement to that policy or they may write excess or standalone flood policies. A surplus lines policy is often done via an MGA. Some MGAs may write directly to consumers, bypassing agents. MGAs may also rely on TPAs for certain services, such as claims handling, while doing policy administration themselves. Behind the MGA is usually an E&S (re)insurer. MGAs provide access to customers for insurers and may provide underwriting expertise, but they do not bear any of the risk. MGA products tend to be standalone flood products.

3.5 Analysis of Private Insurers

In this section we report findings based on all private carriers we found active in the residential flood market today. There may be a few insurers, reinsurers, and MGAs offering residential flood policies or bearing this risk that we were unable to identify, particularly since the market is evolving so quickly. New offerings continue to be made available and private insurers continue to expand into new

states.¹⁵ We believe, however, that the firms for which we do not have information are likely to have only a small number of policies thus far. In this section, we first discuss the types of firms writing residential flood policies and their policy terms. We then turn to discussing their pricing and underwriting strategies.

3.5.1. Types of Firms

Table 2 lists all those we identified as currently involved in writing residential flood insurance in the United States at the time of our analysis. The majority of these companies offer primary coverage, with many also offering excess policies; a few offer excess flood only. All MGAs we identified were underwritten by a surplus lines carrier. Some offer a range of flood products underwritten by different carriers. For example, Orchid Underwriters offers primary and excess flood products backed by multiple carriers. In Table 2, a double asterisk (***) indicates the company is also a WYO company for the NFIP. A caret (^) indicates the company is an admitted carrier that offers flood on the surplus lines market.

We estimate that 175,000 to 220,000 private residential flood policies are currently in force in the United States. This is roughly 3.5 to 4.5 percent of the total residential flood market (NFIP plus private flood policies). Seven major surplus lines programs¹⁶ account for almost the entire E&S market, which is roughly 70,000 to 110,000 policies nationwide. We identified 26 insurers offering flood on an admitted basis, with more than 100,000 policies in total across the firms. Almost all of these companies also offer homeowners coverage. At least three insurers offer homeowners insurance and other products on the admitted market but offer primary flood coverage on a surplus lines basis (in which case they may not bear any financial risk if fully backed by another entity). Some of these companies are also currently

¹⁴ Severe repetitive loss properties are those with four or more flood insurance claims payments that each exceeded \$5,000, with at least two of those payments occurring in a 10-year period, and with the total claims paid exceeding \$20,000; or two or more flood insurance claims payments that together exceeded the value of the property.

¹⁵ The market is continuing to evolve and we were not able to identify a fully exhaustive list of companies. In review, two additional firms were brought to our attention: Security First Insurance Company and Johnson and Johnson. Additionally, as we were writing this report, Neptune, a Lloyd's backed MGA, was expanding into new states (Simpson 2018).

¹⁶ These include: The Flood Insurance Agency, Assurant, Poulton Associates/NCIP, Superior Flood, Dual, NFS Edge, and Tower Hill/ RenaissanceRe.

Table 2. Residential flood insurance firms active in the United States

MGA/MGU	SURPLUS LINES CARRIERS/ GROUPS	ADMITTED CARRIERS/GROUPS	REINSURER
Clearwater Underwriters	Assurant**	AIG Group	Berkshire Hathaway
Dual	Chubb	American Bankers Insurance Co. of Florida (Assurant subsidiary)**	Hanover Re
Flood Simple	Hiscox (Lloyd's syndicate)	American Integrity Insurance Co. of Florida	Hiscox Re
Gridiron Insurance Underwriters	Lexington	American National Property and Casualty Co.	Markel Corp.
Homeowners Catastrophe Insurance Co.	Liberty	ASI Group**	Munich Re
Insurmark Catastrophe	Lloyd's	Centauri Insurance Co.**	RenaissanceRe
National Risk Solutions	Validus Group/ Western World	Cincinnati Insurance Co.	Swiss Re
Neptune Flood		Coastal American Insurance Co.	Tokio Marine
New England Flood Insurance		Edison Insurance Co.	
NFS Edge		Federal Insurance Co. (Chubb Subsidiary)	
Prospect General Insurance Agency		Florida Peninsula Insurance Co.	
Orchid Underwriters		Golden Bear Insurance Co.	
Poulton Associates/Natural Catastrophe Insurance Program		Homeowners Choice Insurance Property & Casualty Co.	
Superior Flood Inc.		Ironshore** (Parent company, Liberty Mutual, is a WYO company)	
SWBC		Kingstone	
The Flood Insurance Agency		MAPFRE**	
Trusted Flood		Palomar Specialty Insurance Co.	
TWFG Insurance		Safe Harbor Insurance Co.	
WNC Insurance Services		Safeco** (Parent Company, Liberty Mutual is a WYO company)	
Winchester General Agency		Southern Oak Insurance Co.	
Wright**		The Philadelphia Contributionship**^	
		Tower Hill**^	
		TypTap	
		U.S. Coastal Insurance Co.	
		United Surety & Indemnity Co.**	
		Universal Insurance Co. of North America**	
		Weston Insurance Co.	

Note: This table may not be fully exhaustive. It is all private firms we identified that had written residential flood policies as of July 2018. Insurance groups consist of subsidiary insurance companies, some of which may offer private flood insurance. Individual insurers are single companies that offer private flood coverage.

**Indicates the company is also a WYO company for the NFIP.

^Indicates the company is an admitted carrier that offers flood on the surplus lines market. For these offerings, these companies are essentially functioning as MGA/MGUs.

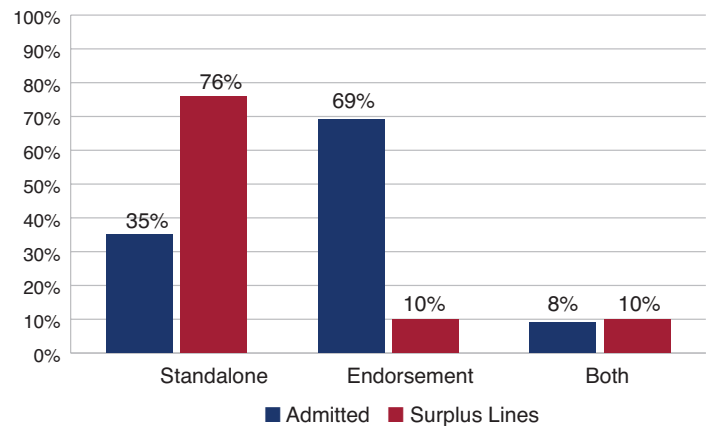
developing or have recently developed their own flood endorsements to be offered in the admitted market.

Roughly 40,000 of the admitted primary flood policies are in Puerto Rico. Two WYO companies found they could consistently underprice the NFIP on the island, largely because of construction practices not accounted for in NFIP rates (for example, concrete buildings that sustained less damage from flooding). Whereas the NFIP dominates the residential flood market on the mainland, in Puerto Rico, 90 percent of residential flood policies are private. That said, less than 5 percent of households in Puerto Rico have flood insurance, so the insurance coverage gap is large. (For more discussion on flood insurance on Puerto Rico, see Kousky and Lingle 2018.)

Currently, WYO companies may not directly compete with the NFIP by offering standalone, private flood. However, effective October 1, 2018, these restrictions are being eliminated (discussed further in section 4.1.1). Today, 11 WYO companies offer primary flood insurance as an endorsement or as a standalone product. Due to the regulations that will be rescinded, their standalone products are either coupled with other coverages (such as vandalism, as is the case in Puerto Rico (Kousky and Lingle 2018)), offered through a subsidiary or affiliated company, or offered through a surplus lines carrier.

Surplus lines companies tend to write standalone policies rather than endorsements to homeowners insurance; admitted companies generally lean in the other direction. To offer an endorsement, companies must first offer standard homeowners insurance policies. Because homeowners insurance is widely available in the admitted market, fewer surplus lines insurers offer homeowners coverage and associated flood endorsements. Figure 8 shows the types of flood policies offered by admitted and surplus lines companies that are active in the residential flood market (this does not include excess coverage). Close to 70% of admitted companies offer a flood endorsement, whereas only 10% of surplus lines companies do. And whereas 35 percent of admitted companies offer a stand-alone flood product, more than three-quarters of surplus lines companies offer stand-alone flood.

Figure 8. Distribution of policy types for admitted companies and surplus lines programs



Note: There are two surplus lines programs for which we could not identify the type of policy offered. Among the programs we identified, all offered stand-alone coverage and at least one offered both stand-alone and endorsement policies.

In general, the large US homeowners companies have not yet entered the flood market. We were told there were several reasons for their hesitancy. If they start offering flood widely, they could sustain large losses from the correlated exposure on the sheer volume of policies they write: any mistake could be very costly. We were also told that these firms wish to maintain a similar customer experience across all regions where they write policies, and thus they are unlikely to experiment with a different product in just one small area. They are also concerned about whether state regulators will allow them to adjust rates and policies in response to new information. Finally, they may be worried about price volatility in the reinsurance market. For these reasons, the companies tend to be cautious; they are not the innovators and first movers of this market.

That said, the policies of large property and casualty companies may likely be what ultimately determine how extensive the supply side of the private market becomes, as well as the role of the private sector in closing the flood insurance gap. If these firms begin adding flood as an endorsement to their homeowners policies, the number of households with flood coverage could grow dramatically. An overwhelming majority of stakeholders we spoke with indicated that if flood could be included as the default in homeowners policies, myriad benefits would accrue to both the companies and the insured. Once one of these large companies begins to include

flood in its homeowners coverage, we were told, likely competitors will follow. (The advantages and challenges of an all-peril homeowners policy that would include flood are discussed in Kunreuther 2018a.)

3.5.2. Policy Terms

After 50 years of NFIP-dominated residential flood coverage, it is perhaps not surprising that the program's policy is a benchmark for private residential flood coverage. It is worth stressing that more than 95% of the total residential market is still served by the NFIP. Among the few private policies, however, we identified three strategies or policy types. The first and most prevalent is what we refer to as an "NFIP+" policy, usually offered within the SFHA. This is a policy that has broader coverage than the NFIP. This is most often a stand-alone policy but there are also a few NFIP+ endorsements on the market. The second is a lower coverage endorsement to homeowners policies. Many of these are targeted explicitly outside the FEMA-mapped 100-year floodplain. The third approach, which we do not discuss further, and is used by only a couple firms, is to mimic the NFIP policy very closely.

NFIP+ policies focus on SFHAs and offer the NFIP basic policy with additional coverages and higher limits. These policies are likely to meet the current requirement that private insurance coverage be at least as broad as an NFIP policy to satisfy the mandatory purchase requirement (see Section 4.1.2). For example, almost all insurers and MGAs offer building coverage that meets or exceeds the NFIP limit of \$250,000. For admitted carriers offering nonexcess flood in SFHAs, 16 of 26 (just over 60 percent) offer coverage that exceeds the NFIP limit. Four of 26 (roughly 15 percent) offer matching coverage limits; for an additional four firms, we are uncertain about the specifics. For MGAs/MGUs offering nonexcess flood policies in SFHAs, at least 10 of 20 offer coverage (both building and contents) that exceeds the NFIP limits, four of 20 match the NFIP limits, and the specifics of six are unknown. Among the stand-alone products whose coverage caps exceed the NFIP limits, coverage limits range from \$500,000 for buildings and \$250,000 for contents to a maximum

combined coverage cap of \$15 million for both building and contents. Among these firms, the average coverage limits are approximately \$2.7 million for the building and \$2.2 million for contents.

One regulator told us that forms and coverages for these policies tend to mimic the NFIP policy, making it easy for lenders to demonstrate that it complies with the mandatory purchase requirement. That said, we also heard several ways in which companies were specifically rejecting NFIP terms and approaches. For example, many interviewees noted that—unlike the NFIP—their companies tried to match policy terms to homeowners policies to avoid confusion on the part of the consumer. Relatedly, almost all private policies cover structures and contents on a replacement cost value rather than actual cash value basis, or at least provide the option to do so, as well as offer coverage for additional living expenses.

The second strategy is to target properties outside the high-risk areas and offer flood coverage as an endorsement to homeowners policies. These policies tend to have lower coverage limits, such as \$50,000, designed for properties that are highly unlikely to face catastrophic flooding. Many endorsements are turn-key products from a reinsurer. Munich Re, for example, has a flood endorsement for properties outside (and not within 25 meters) of FEMA A and V zones, which it is offering in all states except Alaska, Hawaii, Louisiana, and Florida (see Munich Re 2016). Hiscox Re has a similar turnkey flood endorsement for lower-risk zones that is available in the contiguous United States except for the coastal states from Texas to North Carolina. AIG is another large firm offering a flood endorsement in low-risk areas; it is available in 48 states (North Carolina and Alaska are the exceptions) and the District of Columbia.

Some small, regional firms are taking a similar approach. This is the strategy of Coastal American Insurance Company, for example, which writes policies in Mississippi and Alabama (Dolese 2017). Prior to the development of its flood endorsement, Coastal American Insurance Company had required those buying its homeowners policies to also maintain flood insurance through the Coordination of Benefits endorsement (matching flood coverage to homeowners' coverage) (Dolese 2017). As another example, The Philadelphia

Contributionship has started offering an endorsement to inland homeowners policies with a maximum limit of \$50,000 and a deductible of \$500, which covers basements, loss of use, and debris removal, and has a broad definition of “flood.”¹⁷

As demonstrated by The Philadelphia Contributionship policy, regardless of the coverage level, many private policies—standalone or endorsement—often include additional coverages, some of which are typically included in a standard homeowners policy. For instance, most offer coverage for additional living expenses, or loss of use, which covers an insured’s extra costs while the home is uninhabitable. This may cover expenses such as rent, hotel stays, restaurant meals, and storage fees. Assurant also offers coverage for food spoilage. And multiple firms provide coverage similar to the NFIP’s Increased Cost of Compliance (ICC) coverage to bring damaged homes into compliance with current building regulations, but often for higher limits. The NFIP offers up to \$30,000, but the ICC payment plus the claim cannot exceed the residential building cap of \$250,000. American National offers similar coverage but up to \$40,000, AIG and Ironshore offer similar coverage up to \$75,000, and Dual offers up to \$500,000 for a combination of ICC-like coverage, additional living expenses, and loss avoidance measures.

The NFIP allows policies to take effect immediately if tied to a loan, but otherwise there is typically a 30 day waiting period. This prevents consumers from purchasing a policy when floodwaters are imminent, collecting a claim, and then canceling their policy right after, undermining the financing structure of insurance. Many private firms have waiting periods shorter than 30 days, and many also waive the waiting period if the policy is bought at the time of home loan origination but otherwise may have a waiting period of up to a few weeks. Some firms may issue a weather moratorium, which restricts the writing of new flood policies immediately prior to or during flood events. Alternatively, some companies exclude coverage for floods in progress, even if it is possible to purchase a policy immediately. For example, there is no waiting period for

AIG’s flood endorsement, but ongoing flood events are not covered.

Many company representatives say that compared with the NFIP, they have made the process of placing a policy much simpler for the agent and less time consuming and confusing for the customer. Although most require consumers to fill out an application and contact an agent to determine eligibility before binding a flood policy, many private companies are trying to improve the experience of getting a policy for both customers and agents. One firm’s application has only half the questions that the NFIP asks. A few companies provide immediate online quotes and are automating many functions. Most private policies do not require an elevation certificate (although most insurers will use it if provided, and some require it if the property is in the SFHA). That said, we heard that in at least some cases, quoting and binding a policy through certain WYOs is quicker and easier. Ease for agents likely varies by firm.

Some firms are beginning to innovate with products that differ from the two dominant types, the NFIP+ for SFHAs and the flood endorsement outside SFHAs. As an example, USIC-Puerto Rico has recently begun including \$3,000 of contents coverage for flood with a zero deductible in some homeowners policies. To obtain more coverage, a consumer can purchase an NFIP or private policy with a \$3,000 deductible, which would be less expensive than lower deductibles. As another example, Assurant offers FlexCash with its policies: \$10,000 is paid to the insured in the event of a flood, with no restrictions on how the funds are used. And NFS Edge offers a product that wraps around NFIP coverage, including basements (for post-FIRM properties), additional living expenses, loss avoidance, septic system plumbing, golf carts, and trailers, with higher ICC payments and optional excess coverage.

3.5.3. Pricing and Underwriting Strategies

Not surprisingly, the pricing and underwriting strategies of the private sector are often quite different from the NFIP’s. The NFIP has social goals and objectives,

¹⁷ For more information on this product, see <https://1752.com/wp-content/uploads/2018/02/Inland-Flood-4.pdf>.

reflected in mandates from Congress, that private companies do not share. For instance, the NFIP has provided lower rates to those who see their risk change and for policyholders in communities that participate in the Community Rating System, neither of which a private firm would do. They also have mandated surcharges on policies from Congress that do not apply to the private sector. Nevertheless, because the NFIP is required to take all comers, private companies must compete with it for policyholders, writing where they can offer a policy for a lower premium than that charged by the NFIP or provide broader coverage that consumers value.

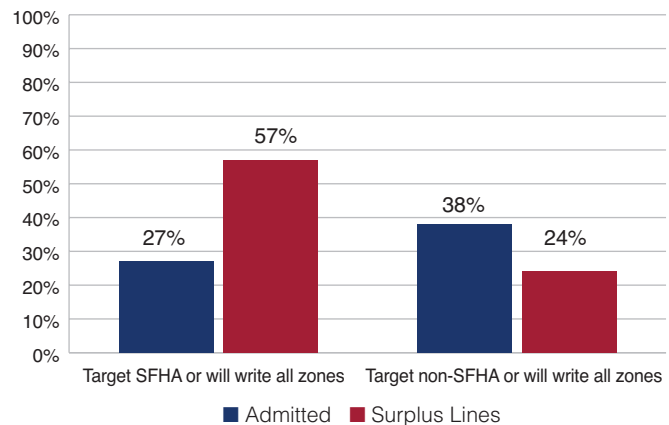
All company representatives with whom we spoke believed that the coarse rating and cross-subsidies inherent in NFIP pricing resulted in only certain areas where the private sector could offer lower prices. They did not agree about the types of properties where they could be more competitive, however, reflecting private insurers' varying risk appetites, modeling, policy types, and approaches. This variation is a strength of the private sector: many firms create many options for the consumer by covering many property types and risks.

FEMA flood zones have become the language of flood risk in the United States and so we heard market participants at times speaking in these terms as shorthand, and some used them for a first cut at underwriting and occasionally for rating. Although a few firms are essentially mimicking NFIP rating, many more companies have developed their own rate-setting approach that bears little resemblance to that of FEMA. These companies are using third-party data providers and online databases to obtain information about structures and local conditions (see Section 4.2.1.) For example, the vice president of Golden Bear noted in an interview, that whereas NFIP policies for two homes in the same FEMA X zone would have the same terms and the same price, the company differentiated pricing based on localized topology in the X zone (Donlon 2017). Whatever its approach to rating, each firm has identified those places where it can effectively compete with the NFIP; these target areas vary across firms.

A handful of firms are interested in taking on risks only

outside SFHAs. For example, Golden Bear is targeting low to moderate risk in California where it believes it can price below NFIP rates (Donlon 2017). Another company's representative told us that the coastal A zone and much of the V zone were not adequately priced by the NFIP, so the firm cannot be competitive in those areas. We heard from another interviewee that the NFIP policies did not sell well outside SFHAs because the price was too high and the policies were not targeted to homeowners' needs, creating a niche for the private sector. We found that admitted companies were more likely than E&S companies to be targeting outside SFHAs (Figure 9).

Figure 9. Programs targeting SFHA or non-SFHA risks



Note: Totals do not add to 100 percent because we lack information for several firms.

More firms, however, believe they can compete with the NFIP in SFHAs. For instance, one firm's representative told us that outside SFHAs, the cost of NFIP policies was too low, so it has decided not to compete in X zones and to focus exclusively on SFHAs. Someone from another firm thought that NFIP's preferred risk policies in most X zones were underpriced. SFHAs include both coastal and riverine areas and the focus varies by company. One interviewee thought the NFIP was overcharging in coastal areas where homes are elevated and underpricing in X zone areas subject to rainfall flooding, so this company has targeted coastal areas. Another company, however, had determined that almost all NFIP coastal rates were too low and it could never price compete in

those areas.¹⁸ Again, E&S companies are more likely to target SFHAs (Figure 9). This strategy is echoed by the Wholesale and Specialty Insurance Association (WSIA 2018), which found that Lloyd’s brokers estimated that close to 100 percent of the primary residential flood they had written satisfied the mandatory purchase requirement.

Some companies are targeting pre-FIRM properties, often thought to be risky, because they believe the NFIP has been overcharging on these structures. For example, Evan Hecht, CEO of The Flood Insurance Agency, said that his firm focused on pre-FIRM properties given discounts: “Nearly all of the 18,500 risks [his company] has taken from FEMA are subsidized policies, the policies FEMA believes are 45–50 percent underpriced. We believe that FEMA’s actuarially rated risks are the policies that are not rate sufficient” (Hecht 2017). The representative of another company, however, told us the firm would never write policies for pre-FIRM properties.

We also heard that many companies were targeting high-end homes, a sector often not well served by the NFIP with its coverage limits. This was not universally true, however. Coastal American, for example, targets homes that are a few blocks back from the beach, well built, and not extremely high value. The cofounder of Coastal American was quoted in a newspaper article

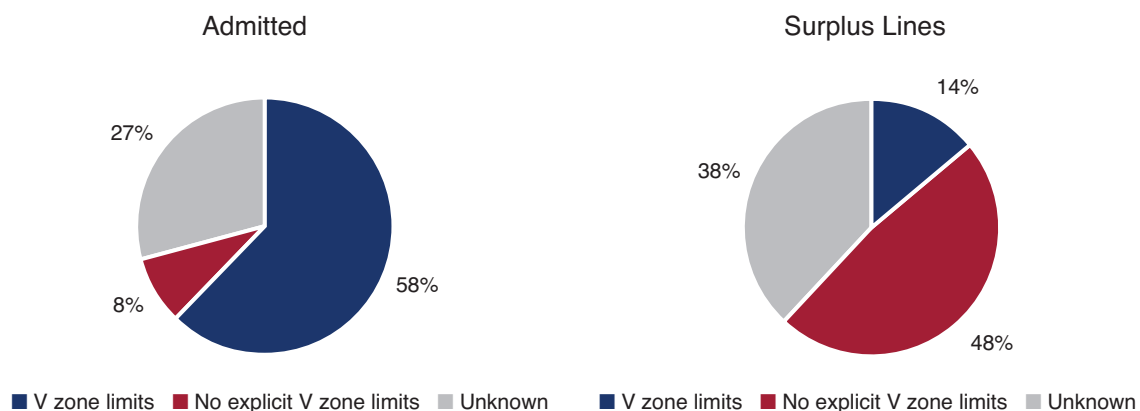
as saying, “Middle America cannot afford to live on the water’s edge” (Festa 2016). At least one interviewee mentioned that NFIP rates do not take into account the value of a home (at least outside the V zone), which can create challenges for the private sector. This person noted that for a given flood zone and elevation, a \$1 million home and a \$250,000 home pay the same for \$250,000 of coverage even though the high-value home is much more likely to incur a loss of a given value. He called this a fundamental error in NFIP pricing. It also creates a regressive benefit to higher-value property owners that would not occur in the private market.

Still other firms are targeting second-home properties, since the 2014 legislation requires them to pay a higher NFIP fee. Many companies do not cover risks in communities that do not participate in the NFIP or are otherwise ineligible for NFIP coverage (such as those located in areas protected by the Coastal Barrier Resources Act). However, at least one company has found a niche in insuring these properties.

A major difference between the NFIP and the private sector is underwriting. The NFIP does not underwrite while the private sector is very choosy. The CEO of HCI group wrote that “private insurers can underwrite to better loss ratios and innovate to better expense ratios”

18 As another example, Evan Hecht, CEO of The Flood Insurance Agency, said in testimony for Congress, “It is also noteworthy that FEMA’s most hazardous rated policies, V (velocity) zones, have enjoyed the most favorable loss experience of any sub-group, while FEMA’s preferred risk policies (PRP) have performed rather poorly” (Hecht 2017).

Figure 10. Limitations on writing V zone risks, by type of insurance company



(Patel 2017). All the company representatives we spoke with engage in some form of aggressive underwriting. Multiple interviewees told us there were certain risks they would not accept into their portfolios. These universally include repetitive loss properties: many companies will not write policies for any property with a prior flood loss. Some stakeholders expressed concern that private insurance companies may decline to provide coverage after policyholders suffer flood damage, putting those properties back in the NFIP and making private flood unsustainable. The market is still too young for us to ascertain how much of a problem this could be.

Certain geographic regions were also deemed “uninsurable” by some firms. The specific regions varied by firm, but the following locations were mentioned by at least one company representative: Fire Island, New York; Monroe County, Florida; Miami, Florida; Norfolk, Virginia; Padre Island, Texas; Sacramento, California; and southern Louisiana. One MGA representative noted that offering no coverage in certain risky areas was better than trying to weed out a location’s riskiest properties because it was less onerous for agents. Interviewees said that if an insurer’s underwriting criteria were too selective, an agent might stop using it, even if that insurer provided a great price.

Some firms would not write coverage for structures whose first floor was below BFE. Superior Flood will not write properties in the 20-year floodplain unless the structure is sufficiently elevated. Despite statements that the private sector could compete in SFHAs, many companies’ representatives told us that they placed some restrictions on writing in coastal areas: some companies would not write in V zones or on barrier islands, and others excluded beachfront homes or those within a certain distance of tidal water or the ocean. The limitations on V zone risks were predominantly from admitted carriers (Figure 10). Just under 60 percent of admitted carriers had some underwriting restrictions for V zones as opposed to less than 15 percent for E&S firms.

Most companies have strategies to manage concentration of exposure. Many are diversifying geographically. Multiple interviewees told us, for example, that they limit the number of policies written in

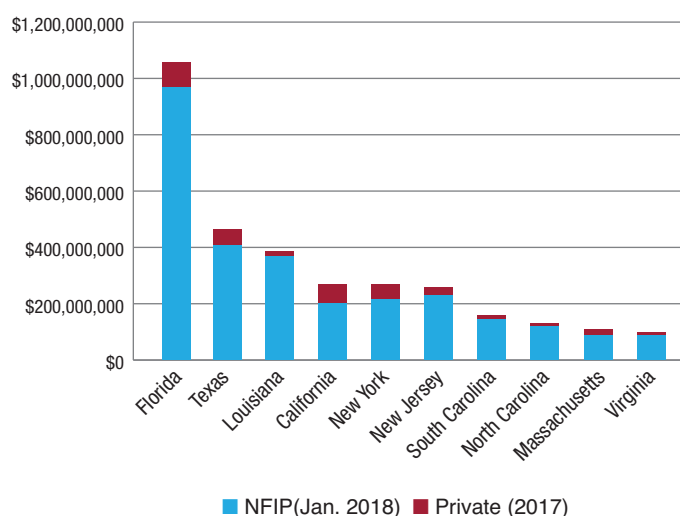
a given zip code, county, or neighborhood. Once that limit is reached, the company may decide not to write anything else in that area at any price (see Section 4.2.3).

3.6. State Analysis

A comprehensive state-by-state analysis is not possible because of data limitations. Only Florida and Texas are systematically collecting data on residential private flood insurance. Companies were extremely reluctant to share data broken out by state. In this section, we provide an overview of what we know from broader data and then turn to look at Texas and then Florida.

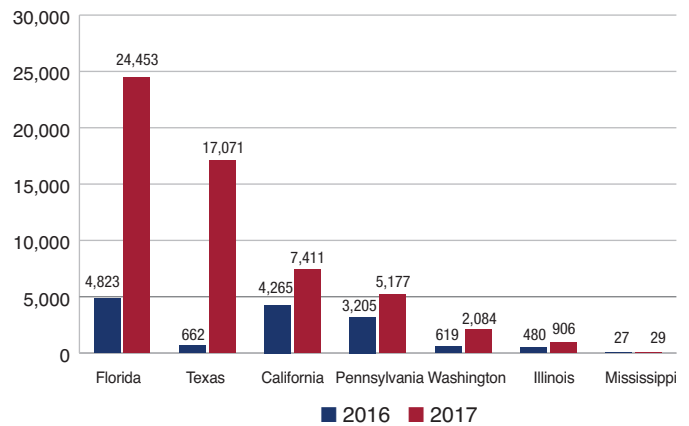
The S&P Global Market Intelligence data, discussed in Section 3.1, covers total flood premiums written by state, for both commercial and residential flood insurance. This is shown in Figure 11, in combination with the NFIP written premium for that state. In 2017, Florida and California had the highest amount of private flood premiums written, with \$84 million and \$72 million, respectively. However, these totals are still small compared with the NFIP. As of January 2018, NFIP premiums written in Florida stood at \$962 million, making private flood almost 9 percent of the state’s flood market, and \$190 million in California, where private flood accounts for about 28 percent of the total.

Figure 11. Total commercial and residential premiums written, NFIP versus private market



Another source of data that allows for cross-state comparisons comes from the Wholesale & Specialty Insurance Association (WSIA), which collected data on surplus lines flood policies (commercial and residential) in nine states: California, Florida, Illinois, Mississippi, New York, Pennsylvania, Texas, Utah, and Washington. Of the flood premiums written in these states in 2017, WSIA (2018) estimates that 21.5% of it was for residential flood. At just under \$50 million, this is roughly 1 percent of NFIP premiums. Of the nine states for which WSIA has data, just under 40 percent of the residential E&S flood premiums are in Florida, 25 percent are in Texas, and almost 12 percent in California (WSIA 2018). Figure 12 shows the number of surplus lines flood policies in seven states for 2016 and 2017. All states saw growth in private flood. Florida again has the highest policy count, with Texas and California coming in second and third.

Figure 12. Surplus lines primary residential flood policies for select states



Source: Data reported by Wholesale & Specialty Insurance Association. Note that these totals may not reflect end of year policy counts. For example, The Surplus Lines Stamping Office of Texas provided updated data showing that Texas had about 13,000 primary residential flood policies at the end of 2016.

The WSIA data include counts of surplus lines policies for excess flood above the NFIP coverage cap. Looking at Florida, Mississippi, Texas, and California, WSIA found that in 2015, there were 6,620 such policies, jumping to 13,643 in 2016, and then falling back to 10,911 in 2017. The largest number every year are in Florida by an order of magnitude with 80% or more of the excess flood policies written in the state.

Table 3. Residential and commercial premiums for Texas flood Insurers, 2016–2017

COMPANY	DIRECT PREMIUMS, 2016	DIRECT PREMIUMS, 2017	GROWTH
Factory Mutual Insurance Co.	\$17,689,903	\$20,390,720	15%
American Security Insurance Co.	\$0	\$5,991,217	—
Affiliated FM Insurance Co.	\$2,810,453	\$3,362,493	20%
Zurich America Insurance Co.	\$0	\$2,979,234	—
Westport Insurance Co.	\$2,406,469	\$2,630,333	9%
Liberty Mutual Fire Insurance Co.	\$0	\$1,635,547	—
AIG Property Casualty Co.	\$1,452,158	\$1,389,962	-4%
American Guarantee & Liability Insurance	\$0	\$1,286,147	—
Allianz Global Risks US Insurance Co.	\$1,084,363	\$1,153,752	6%
Employers Insurance of Wausau	\$0	\$714,585	—
Other firms	\$1,136,768	\$1,291,424	14%
Total	\$26,580,114	\$42,825,414	61%

Source: S&P Global Market Intelligence data as provided by the Texas Department of Insurance.

Even though the residential flood market, like the NFIP market, is geographically concentrated, some form of residential flood policy is available in almost all states. Private insurers typically do not write policies in Alaska, Hawaii, Louisiana, and Kentucky.¹⁹ In all the states with high counts of NFIP policies—with the notable exception of Louisiana—residential flood is available from multiple carriers in both the admitted and non-admitted markets. In Louisiana, there is only one admitted company writing flood, but several MGAs offer surplus lines coverage.

3.6.1. Texas

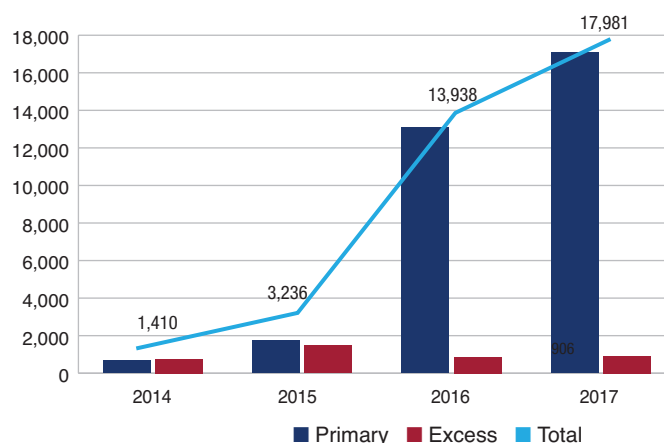
Texas has the second-highest number of NFIP policies in force in the country (behind Florida), approximately 676,000 total policies (645,000 residential) as of the end of February 2018. Perhaps surprisingly, only roughly 30 percent of the covered properties are located in SFHAs (fewer than 10 percent are in coastal A and V zones). This makes it a state with very high numbers of X zone policies. Texas has collected data on both admitted residential flood and surplus lines flood policies.²⁰ Texas has diligent search requirements under which consumers must first seek insurance in the admitted market. If they cannot get admitted coverage, only then can they turn to the surplus lines market.

Direct written premiums for insurers writing flood in Texas are shown in Table 3. Overall, the state saw 60-plus percent growth in flood premiums between 2016 and 2017. This generally reflects the recent growth in private flood nationwide. Total flood premiums account for a bit over 4 percent of total flood premiums in the state.

The Surplus Lines Stamping Office of Texas collects data on surplus lines flood policies. As shown in Figure 13, the state saw an over 838% increase in the number of surplus lines flood policies between 2014 and 2017 and over a 260% increase in flood premium over the same time period. This was an increase of 17,788 surplus lines policies and \$23,921,000 in premium. For comparison,

as of February 2018, there were 676,000 NFIP policies in Texas amounting to about \$400 million in premium. So the surplus lines policies, while growing, are still less than 3% of the number of NFIP policies in Texas. The Texas Surplus Lines Stamping Office has found these policies tend to be concentrated closer to the coast.

Figure 13: Texas surplus lines residential flood policy growth, 2014 - 2017



Source: Data provided by the Surplus Lines Stamping Office of Texas

3.6.2 Florida

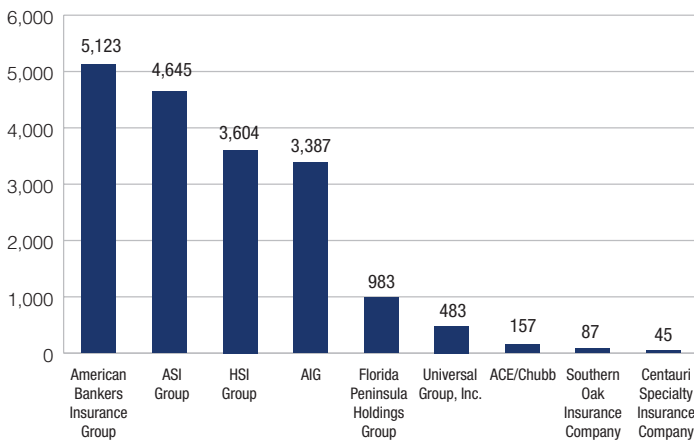
Florida is the largest flood insurance market in the country and home to roughly 35% of NFIP policies nationwide. There are also more private flood carriers active in Florida than in any other state. As of May 2017, at least 14 admitted companies offered primary residential flood insurance in the state, as did nearly every MGA we identified (except those few with a regional focus that excludes Florida). This grew such that as of July 2018, there were 29 companies writing admitted flood in Florida. The state has been active in trying to attract private flood policies through favorable regulations and approaches.

¹⁹ We were told by an interviewee that the reasons for limited private market in these states vary. This person noted that in Alaska there is not much demand, in Hawaii there is concern over tsunami risk, and in Kentucky there are complex rules for E&S companies.

²⁰ Admitted data are collected by the Texas Department of Insurance. Surplus lines data are collected by the Surplus Lines Stamping Office of Texas (SLTX), a nonprofit, unincorporated organization created by the state legislature to “ensure the integrity of the excess and surplus lines market.” SLTX provides data, analysis, and educational resources on the state’s surplus lines market. We thank both offices for sharing these data for this report.

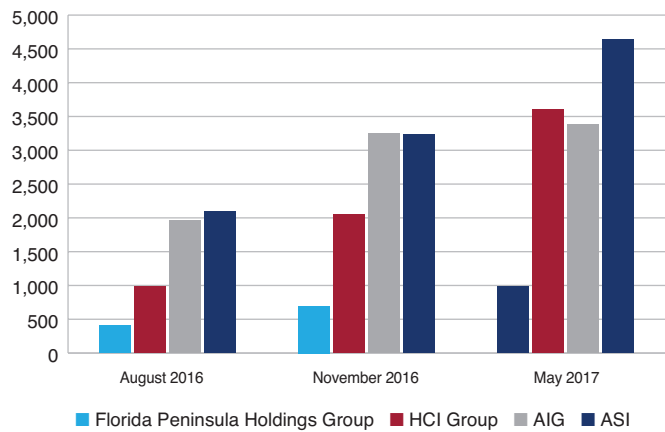
The Florida Office of Insurance Regulation shared with us companies' unaudited, voluntarily reported flood insurance data from May 2017. The data show that the state's admitted insurers had 18,514 primary and 5,811 excess private flood insurance policies in force as of that date. These policies were written by nine insurance groups and individual insurers throughout Florida. At least three others (Cincinnati Insurance Group, Tower Hill Insurance Group, and American Integrity Insurance Company of Florida) were awaiting approval of rates and forms at the time the data were collected.²¹ Figure 14 provides a breakdown of the number of private primary policies in force by company for May 2017.

Figure 14. Policies in force with Florida's admitted primary residential flood insurance writers, May 2017



While these numbers are modest in comparison with the state's 1.7 million NFIP policies, the market has grown quite rapidly. This is shown for select companies for which data was available for several years in Figure 15. Each company saw yearly growth in policy counts. Such growth continued into 2018.

Figure 15. Florida's admitted primary policy counts for select companies



Source: Company data voluntarily reported to the Florida Office of Insurance Regulation; the data have not been audited.

Both stand-alone flood policies and endorsements are offered in Florida (as, of course, are excess policies). Florida has collected data on whether admitted carriers were offering endorsements or stand-alone policies. For admitted carriers, the majority offered endorsements, with two also offering stand-alone policies and only one only offering a stand-alone product. Table 4 lists the policy types for companies offering flood insurance as of May 2017. This table echoes the broader finding nationwide that admitted carriers are more likely to offer endorsements (Figure 8).

²¹ Insurance groups such as AIG Group, ASI Group, and HCI Group consist of subsidiary insurance companies, some of which may offer private flood insurance. For example, in HCI Group, Homeowners Choice Property & Casualty Insurance Company, and TypTap Insurance Company offer private flood. Individual insurers are single companies that offer private flood coverage; they are not part of a larger group of companies. For example, Southern Oak Insurance Company is an individual insurer.

Table 4. Policy types offered by Florida admitted writers

GROUP OR INSURER	ENDORSEMENT	STAND-ALONE
ACE/Chubb		✓
AIG	✓	
American Bankers Insurance Group	Mobile homes only	
American Integrity Insurance Company of Florida	✓	
ASI Group	✓	
Centauri Specialty Insurance Company	✓	
Florida Peninsula Holdings Group	✓	✓
HCI Group	✓	✓
Southern Oak Insurance Company	✓	
Universal Group, Inc.	✓	

There is also a robust E&S flood market in Florida. Data from WSIA (2017) show that the number of primary residential E&S flood policies in Florida grew by 500 percent in a single year, from roughly 4,900 in 2016 to more than 24,400 in 2017. The E&S policies, however, are still less than 2 percent of all residential flood in Florida; the NFIP remains the overwhelmingly dominant provider. Of 16 E&S products, we found that Lloyd's backs 13 (more than 80 percent). One was backed by Hiscox, one by Lexington, and one was jointly backed by Lloyd's and Liberty.

3.7. Market Evolution

Although the nascent residential private flood market in the United States has seen year-over-year growth, it remains small compared with the NFIP. We saw indications of continued expansion, with numerous companies beginning to enter new states or introduce new products. Almost all individuals with whom we spoke believed the market will continue to grow but is unlikely to dominate market share over the NFIP in the near-term. The Associate General Counsel from Lloyd's America was quoted in a news article as summing up private market growth this way: "We think it will continue to grow strongly over the next few years but we do not

see that it will explode and be able to take over the NFIP or replace it anytime in the near future" (Madonna 2017).

For certain residential properties and regions, the private market is not going to find it profitable to offer flood coverage at an affordable or attractive price. The NFIP will certainly retain its role for these properties. In 2016 testimony, the Independent Insurance Agents and Brokers of America noted that although it supports private market growth, "the private insurance industry lacks the capability to underwrite flood insurance on a pervasive basis to meet customer needs" (Heidrick 2016).

Right now, there are more E&S residential flood policies than admitted ones and we heard some comments that E&S firms would maintain the largest share of policies in the near-term given the nature of the flood peril. Others we interviewed, however, suggested that as comfort with the modeling, rating, and underwriting increased, the admitted market would grow more substantially. If surplus lines firms devised a functional business model that could be scaled up, some interviewees said, more admitted firms were likely to enter the market; on the other hand, if losses to these surplus lines firms consistently exceeded model estimates, larger admitted carriers would hold back (Lamparelli and Maddox 2017).

Today the large US property and casualty companies have very little presence in the residential flood market, although some have begun to test the market through subsidiaries. All interviewees agreed that large homeowners insurers would enter the residential flood market slowly and carefully. These firms are concerned about reputation, risk concentration, and regulatory constraints and are taking a wait-and-see approach. Furthermore, we heard repeatedly that demand for residential flood insurance is low. If homeowners companies felt pressure from consumers to include flood coverage in their policies, they might respond, but right now, the US private residential flood market appears to be largely driven by interest from international reinsurance companies. That said, some interviewees expressed optimism that demand would grow for a low-coverage endorsement to homeowners policies for properties outside SFHAs.

Even with today's small, emerging market, the variety of firms in the residential flood space may create a range of products for consumers. Firms are offering different types of coverages, targeting different properties, and using different pricing and underwriting approaches. John Dickson, president of NFS Edge, summed it up this way in a news article: "it is about creating as many options as possible for the customer" (Madonna 2017). Several interviewees told us that the NFIP couldn't be everything to everyone, and that product diversity could be the strength of the private market.

4. Market Drivers

This section of the report examines drivers of the private market. We begin by discussing various aspects of the NFIP and their influence on the private residential market. We then look at state regulation, concerns about the catastrophic nature of the flood peril, the role of agents, demand for flood insurance, and exposure management or risk reduction.

4.1. Interaction with the NFIP

4.1.1 WYO Program

Currently, WYO companies are not permitted to offer standalone private flood insurance policies.²² Outside the NFIP, WYO companies can offer only: (1) excess flood coverage above NFIP limits; (2) multi-peril policies that include flood as a named peril; and (3) any flood policy (including a standalone policy) if it is offered by a subsidiary of the WYO company. In March 2018, however, FEMA announced regulatory changes that would eliminate these restrictions and allow WYO companies to offer any private flood policy in competition with the NFIP, as long as the firm's private flood business remains entirely separate from its NFIP business.²³ The changes will become effective October 1, 2018.

WYO companies could therefore be well positioned to

help grow the private flood market if allowed to offer their own stand-alone flood products: they have existing customer bases and substantial experience in marketing flood insurance, issuing policies, and handling claims (or can effectively outsource these functions to a TPA). For instance, a representative of one of the largest WYO companies noted that the regulation excluding WYO companies from competing could be preventing firms with experience in writing flood from developing fully private primary products (Templeton-Jones 2016). It would also be easy for WYO firms to transition their NFIP policyholders to private policies when their NFIP policies come up for renewal.

Some interviewees noted that the only reason their firms participate in the WYO program is to maintain customers in their other lines of business. Insurers do not want their policyholders to turn to another company to purchase flood coverage lest that company take the opportunity to sell other lines of insurance, such as homeowners or auto. The new regulations will allow these companies to test the waters with private flood policies.

WYO firms might also seem to have an advantage in having access to NFIP claims history for their NFIP policies to assist in rating and underwriting. However, according to FEMA's fiscal year 2019 arrangement with WYOs (Assistance to Private Sector Property Insurers, Notice of FY 2019 Arrangement, Article II.I.2), WYOs are not allowed to access NFIP data to support their private product offerings. That said, we found some confusion on this point among interviewees, with some suggesting that not all WYO companies may strictly adhere to this requirement. Given the variation, it seems FEMA should either consistently enforce this policy or eliminate it.

4.1.2 The Mandatory Purchase Requirement and Lender Acceptance

Because of the low take-up rates in the NFIP's first several years, Congress passed the Flood Disaster Protection Act of 1973 requiring federally regulated

²² See FEMA's WYO Company Financial Assistance/Subsidy Arrangement for FY 2018 <https://www.fema.gov/media-library/assets/documents/17972>.

²³ See <https://www.federalregister.gov/documents/2018/03/16/2018-05418/national-flood-insurance-program-nfip-assistance-to-private-sector-property-insurers-notice-of-fy>.

mortgage lenders to ensure that borrowers in SFHAs purchase flood insurance and maintain it over the life of the loan. Under this mandatory purchase requirement, borrowers must have flood insurance in an amount equal to the balance of the loan, the maximum coverage available under the NFIP, or the replacement cost of the structure, whichever is less. Interestingly, we heard that some firms enforce their own mandatory purchase requirement on homes they insure in high flood risk areas to prevent any wind-water controversies after a hurricane.

FEMA-issued guidance going back to 1974 has allowed private flood policies to satisfy the mandatory purchase requirement, as long as the coverage is at least as broad as NFIP coverage. In 1994, Congress required that lenders provide written notice to consumers indicating whether a property was in an SFHA and advising them that flood insurance is available from the NFIP and also from private firms. In 2007, FEMA provided

six criteria for lenders to use in determining whether private flood insurers and their products satisfied the mandatory purchase requirement (see Table 5).²⁴ The federal regulators with supervision over lending institutions²⁵ used these criteria to develop guidance on the acceptability of private flood insurance; the criteria are still used by lenders today (GAO 2016). In 2012, the Biggert-Waters Flood Insurance Reform Act required federal regulators to tell lenders to accept private policies that meet a definition laid out in the law which essentially mirrors the FEMA criteria. FEMA rescinded its guidelines in 2013, citing a lack of authority and stating that implementation of the mandatory purchase requirement is the responsibility of federal regulators (GAO 2016). Regulators issued rulemaking proposals on private flood insurance in 2013 and again in 2016,²⁶ but a final rulemaking has yet to be made.

Some stakeholders we spoke with expressed concern that the Biggert-Waters Flood Insurance Reform Act

Table 5: FEMA criteria for evaluating private flood insurance policies, 2007 (rescinded February 2013)

CRITERION	SUMMARY
Licensure	The insurer must be licensed, admitted, or otherwise approved to do business in the jurisdiction where the building is located, by the insurance regulator of that jurisdiction, except for surplus lines recognition (see next row).
Surplus lines recognition	In the case of nonresidential commercial property insurance issued under a policy of difference in conditions, multiple peril, all risk, or other blanket coverage, the insurer should be recognized, or not disapproved, as a surplus lines insurer by the insurance regulator of the jurisdiction where the building is located.
Requirement of 45-day cancellation/nonrenewal notice	The policy should include a requirement for the insurer to give 45 days' written notice of cancellation or nonrenewal of flood insurance coverage to the insured, with respect to the flood insurance coverage. The policy should also state that, to be effective, such notice must be mailed to both the insured and the lender or federal agency lender, and must include information about the availability of NFIP insurance. The policy should be as restrictive in its cancellation provisions as the NFIP standard policy.
Breadth of policy coverage	The policy must guarantee that the flood insurance coverage, considering deductibles, exclusions, and conditions offered by the insurer, is at least as broad as the coverage under the NFIP standard policy.
Strength of mortgage interest clause	Lenders must ensure that the private policy contains a mortgage interest clause similar to that contained in the general conditions section of the NFIP standard policy
Legal recourse	The policy must contain a provision that the insured must file suit within 1 year after the date of written denial of all or part of the claim.

Sources: FEMA 2007; GAO 2016.

24 See pages 57–58 of FEMA's Mandatory Purchase of Flood Insurance Guidelines, available at <http://www.ca1.uscourts.gov/sites/ca1/files/citations/FEMA%20Mandatory%20Purchase%20Agreement%202007.pdf>.

25 These institutions are the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, the Office of the Comptroller of the Currency, the National Credit Union Administration, and the Farm Credit Administration.

26 See <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20161031a.htm>.

has made it more difficult for lenders to accept private policies. Whereas the FEMA guidelines allowed lenders the discretion to accept private insurance, the 2012 law codified those criteria, including the provision that the policy “must guarantee that the flood insurance coverage, considering deductibles, exclusions, and conditions offered by the insurer, is at least as broad as the coverage under the NFIP standard policy.” Some insurers worried that this has created confusion among lenders, who feel ill-equipped to make such a determination. Some stakeholders also argued that it is inappropriate for lending institutions to decide which policies satisfy the mandatory purchase requirement and which do not. Many interviewees reasoned that since most banks do not have insurance expertise or experience, responsibility for deciding which policies are acceptable should be in the hands of state insurance regulators, as is the case for homeowners and auto insurance.

That said, none of the insurance company representatives we spoke with indicated substantial trouble with having their policies accepted by lenders. A few indicated they had had to explain products to lenders, but after doing so, the lender was comfortable with a private policy. Some noted that once lenders got to know them, they had little difficulty. In fact, we were told that in the case of at least one major MGA, banks have promoted the private flood product because of its broader coverage and often lower price. A report by the Government Accountability Office (GAO 2016) similarly found that lenders were willing to accept private flood policies and had procedures to ensure compliance with the mandatory purchase requirement.

The one exception is loans insured by the Federal Housing Administration (FHA). Current FHA regulations (24 C.F.R 203.16a) specify that mortgagors and mortgagees subject to the mandatory purchase requirement must obtain “NFIP flood insurance coverage.” This language contrasts with lender requirements outlined in the Biggert-Waters Flood Insurance Reform Act of 2012, which require lenders

to accept private insurance in satisfaction of the mandatory purchase requirement if the policy meets particular criteria.²⁷ Because of this FHA regulation, lenders are refusing to accept private flood insurance on FHA-insured loans, even if such policies provide more comprehensive coverage and/or are available at lower premiums. A group of insurers, lenders, and other stakeholders have voiced opposition to this policy and requested that FHA-insured loans accept private flood, particularly when it can financially help the homeowner.²⁸ Echoing this, at least one company representative told us it was problematic that FHA would not accept private flood.

4.1.3. Rate Competition

Since the NFIP will write a flood policy for any property in a participating community, NFIP pricing has become a de facto baseline against which the private sector must compare itself. Multiple interviewees told us that most consumers care only about finding the cheapest flood coverage, so if a firm cannot undercut the NFIP, it will not be able to write policies in that location. Current rating practices by the NFIP create numerous properties for which the rate charged by the program does not reflect the risk, creating market distortions. Given this situation, companies have found niches where they find they can underprice the NFIP. FEMA is actively reforming its rating approaches and moving toward more risk-based prices at a property level. This will impact the dynamic between private firms and the NFIP. Several interviewees suggested that if NFIP pricing more closely matched risk at a structure level, there may be greater ability for the private sector to compete with the NFIP in more areas. Firms will continue to differ in their rating as their models, risk appetites, and risk of the overall book of business, leading to continued variation.

4.1.4. Data and FIRMs

We heard that most companies are not relying on FIRMs for rating and underwriting but are using private sector

27 See 42 U.S.C. § 4012a(b)(1) and (2).

28 See https://www.iamagazine.com/docs/default-source/Legislative-Activity/fha-flood-letter.pdf?sfvrsn=b70ad3a5_0.

models (see Section 4.2.1). Nevertheless, many market participants stated in interviews that FEMA flood maps should be updated to provide better information to households and communities. We were told the SFHA designation is misleading consumers about whether they actually need flood insurance and this is hindering demand and thus impacting the market. There was concern that once a homeowner was told they were outside the SFHA, they interpreted this as being safe or that homeowners focused exclusively on compliance with the mandatory purchase requirement, as opposed to managing flood risk. One interviewee said its firm had acquired much better, finer-scale data on flood risk at a fraction of the cost FEMA spends and expressed incredulity that FEMA could not provide better maps nationwide.

Many interviewees stated that NFIP data, if released to the private sector, could be used to validate flood models and assist in rating and thus would encourage faster development of the market; many stakeholders have publicly agreed (e.g., Templeton-Jones 2016). That said, model development is proceeding absent such information. More than one company representative said, however, that their firm would be more comfortable writing flood if they could work with the historical loss data themselves instead of having to purchase and trust third-party models. It is unclear how much the unavailability of claims data truly impedes market development.

The Association of State Floodplain Managers has indicated that the NFIP shares data on policies and claims to help communities with their floodplain management and has said that private companies should similarly be required to provide such information. The association has suggested a repository for all flood insurance data—public and private.²⁹ FEMA does not currently allow release of property-level data, however. Perhaps private firms and FEMA could agree to release information on policies and claims at a higher level of geographic resolution, such as zip codes or census tracts.

4.1.5. Use of Forms

A few companies began writing private flood using NFIP policy forms, with only minor adjustments, and some continue to do so. One reason may be that this makes it easier to show that their policies meet the equivalent NFIP coverage requirement. Other private insurers are rejecting NFIP forms in favor of documents they find easier for them, their agents, and their customers. We were told that customers and firms prefer flood coverage that mirrors homeowners coverage.

In January 2018, the Insurance Services Office (ISO, a subsidiary of Verisk, a data analytics firm) introduced a new residential flood insurance support program through which primary insurers in the contiguous United States could obtain assistance in offering stand-alone flood coverage on broader terms than the NFIP, and in a format similar to a standard homeowners policy—something with which consumers are typically familiar. ISO is also working to clarify language for flood insurance policies. For instance, we were told that under the NFIP, a sunken living room in a split ranch home is considered a basement and thus subject to coverage exclusions. Since no homeowner would consider this space a basement, ISO uses the language of above and below grade instead. ISO develops forms, rating rules, and loss-costs and then licenses those products to participating companies, making it easier for them to enter the private flood market. The program allows for various deductible choices and optional coverages, such as additional living expenses, detached structures and pools, property losses in below-ground areas, and replacement cost on personal property. Using catastrophe models from AIR Worldwide (also a Verisk company) as well as ISO and NFIP data, the firm developed a rating manual based on 57 flood territories, allowing insurers to price risks at a more granular level than the NFIP (Insurance Journal 2018). It is too early to ascertain the effect of this development on the market.

²⁹ See <https://www.floods.org/ace-images/ASFPMPriorities4NFIP2018ReauthApril2018update.pdf>.

4.1.6 Continuous Coverage and Mid-Term Refunds

The majority of interviewees from private firms identified two NFIP practices as barriers to expansion of the private market: (1) the NFIP deems that property owners who buy private policies do not meet its continuous coverage requirements; and (2) the NFIP does not allow partial refunds if a property owner switches to a private provider mid-term. We discuss each in turn.

Under current continuous coverage requirements, a policyholder receiving a grandfathered rate (a lower-risk rate even though a new map indicates the structure is at higher-risk) can keep that low premium only by maintaining an NFIP policy. If such property owners switch to a private company for their flood insurance and decide to return to the NFIP later, they will no longer receive the discounted grandfathered rate. Many interviewees believe this ties policyholders to the NFIP and may thus depress demand for private policies; some have made this observation publicly (e.g., Dolese 2017).

One company that offers a flood endorsement to its homeowners policy, for example, and focuses on risks in coastal counties argued that grandfathering interferes with its ability to write in SFHAs. Nearly 70 percent of its flood policies are for properties outside SFHAs that have never had flood insurance before. This came as a surprise to the company, which thought most of its business would come from SFHAs, where property owners are required to buy flood coverage. Another firm's representative told us it will not write flood endorsements for consumers with grandfathered NFIP policies because if they move and the new owners want a homeowners policy from a different company, they may need to return to the NFIP for flood insurance, at which point the lower premium would be unavailable; this could be capitalized into home values.

The second barrier concerns refunds. FEMA does not currently give policyholders prorated refunds if they switch from the NFIP to a private carrier midway through a policy. FEMA only refunds premiums for valid

cancellation reasons, which had not previously included consumers' desire to switch to private coverage.³⁰ We heard from many interviewees that this refusal to issue refunds has possibly been depressing demand for private policies since switching to the private sector then required forfeiting months of premium. FEMA has now already taken action to remove this barrier. As stated in Bulletin w-18008, beginning October 1, 2018, policyholders will be given mid-year refunds if they move to a private carrier. Several interviewees thought this was a positive step and mirrored standard practice in the industry to allow such refunds.

4.2. Managing Catastrophic Risk

As a catastrophic peril, flood presents some challenges for the private insurance market. Losses are correlated spatially, the market is subject to a high degree of adverse selection, and residential flood risk is correlated with hurricane wind in coastal areas. This leads to challenges of risk concentration that make flood insurance more costly and difficult for the private sector to cover at a price that insureds can or will pay (e.g., see Kousky and Cooke 2012). This section discusses three aspects of insuring flood related to its catastrophe potential: (1) data and modeling; (2) international reinsurance; and (3) underwriting approaches for limiting concentration of risk.

The potential for flood to generate extraordinary losses was evidenced by the 2017 hurricane season in the United States and the record-breaking rainfall event in Texas. We asked interviewees whether the 2017 flooding led to any changes in the emerging residential flood market, but they said it had little effect. Most insurers and reinsurers reported that their experience with Hurricanes Harvey, Irma, and Maria had not changed their risk appetite or willingness to insure private flood. This, however, was largely due to only a very small number of policies in flooded areas.

³⁰ See "Cancellation/Nullification – Section 14" of the *National Flood Insurance Program (NFIP) Flood Insurance Manual, Effective April 1, 2018*, available at <https://www.fema.gov/media-library/assets/documents/162601>.

4.2.1 Data and Modeling

Proprietary catastrophe models for many perils have been developed by multiple firms to help insurance companies price and manage their exposure (Grossi and Kunreuther 2005). The development of natural hazard catastrophe models took off in earnest following Hurricane Andrew in 1992 and the Northridge earthquake in 1994, and their use in the property and casualty insurance industry today is widespread. Although storm surge flood estimates have been available from all the major modeling firms for many years, inland flood modeling has not been, likely because the NFIP has suppressed a private market for flood and because of the technical difficulties of modeling inland flood.

The private market requires modeling of all forms of flood at a fairly detailed resolution to comfortably underwrite and price flood policies. This capacity is rapidly becoming more available and more sophisticated. Inland flood models are now available from AIR Worldwide, Core Logic, Impact Forecasting (Aon), KatRisk, and RMS. These are full simulation hazard models that vary somewhat in their technical details.³¹ Some reinsurers also have their own models. Further, several firms—including Coastal Risk Consulting, CoreLogic, Intermap, and SpatialKey—are providing flood scores or metrics to assist in writing flood (Lamparelli and Maddox 2017). According to many stakeholders, the development and availability of these tools has played a significant role in the growth of the private residential flood insurance market, enabling insurers to quantify and price flood risk more accurately.

Insurers may license a model directly or work with brokers, consultants, or reinsurers that have access to one or more models. These entities use models, insurers' data, and their expertise to help insurers understand market opportunities, develop products and rating guidelines, price reinsurance, and assess risk concentration. Most of our interviewees said their firm used more than one flood model and compared

and interpreted results across them. Some companies have developed their own methods of modeling and rate setting. Palomar Specialty Insurance Co., for example, has taken a unique approach to modeling flood risk for its policies. The company divides each state into as many as 38 million flood grids—a feat that would have been infeasible just a few years ago and a testament to the new modeling capabilities. Palomar has worked with AIR to simulate flood losses across tens of millions of defined zones to generate expected losses on a probabilistic basis. It uses a 30-meter resolution in populous and higher-risk areas. Firms that have been in the market longer also have the advantage of drawing on their own experiences and claims histories, which can be used to validate model outputs.

Not all insurers, however, are using flood models. Some remain cautious because U.S. flood models are still relatively new and fairly untested. Also, we found that some very small and new insurance companies do not yet have the volume of sales and thus enough revenue to pay for licensing models. As a result, these private insurers may rely on FEMA flood hazard maps or other methods to make underwriting and pricing decisions. One MGA representative explained that although the company uses flood models on a limited basis, it believes that no US flood model can provide accurate average annual loss estimates. This sentiment was echoed by another interviewee, also from an MGA, who said that no major model currently available could support development of actuarially sound rates. On the other hand, another insurer noted that despite flood models' nascent stage and less than 100 percent accuracy, they were the best tools now available. Firms that do not currently use flood models or other advanced flood risk metrics generally want to adopt more sophisticated rating methods in the future, particularly given the widespread lack of confidence in FIRMs. For example, AIR has found that more than 40 percent of properties on the Atlantic and Gulf coasts subject to storm surge risk are not even mapped into SHFAs (FEMA 2015).

³¹ US inland flood models vary in such technical specifications as resolution level, vulnerability curve characteristics, event frequency distribution, stochastic catalogues, and depiction of flood defenses. These differences, combined with differences in baseline assumptions, contribute to variation in model outputs.

Despite advances in flood modeling, flood is still an extremely complex peril, and modeling it accurately presents challenges. The United States is an enormous territory whose weather and precipitation patterns vary widely, there are multiple riverine basins that must be modeled, and little information on historical losses at a structure level is available. Flood risk modeling can be especially sensitive to the characteristics and location of individual structures. Whereas wind or earthquake hazards are likely to cause similar damage to adjacent structures, flood damage depends on the building's base flood elevation, the elevation relative to surrounding properties and terrain, community and neighborhood drainage infrastructure and flow patterns, permeability of surrounding land, and other factors. One catastrophe modeler explained that a wind model that misplaces the projected wind field by 100 to 300 yards can still yield accurate results, but a flood model that is off by just 10 feet can produce large errors in estimated damage.

Beyond working with models they trust, insurers thus need good exposure data on their books of business. If a parcel is mislocated by just a few feet, that could be the difference between being mapped as literally in the river or on high ground (Lamparelli and Maddox 2017). One catastrophe modeler stressed that given the site-specific nature of flood risk, insurers need granular, high-resolution exposure data on individual properties and their physical surroundings. He believes that as data become more available, insurers will grow more comfortable with flood underwriting and risk selection.

Another challenge for flood modelers is accurately depicting the risk of off-floodplain (pluvial or stormwater) flooding. Accuracy here requires data on urban land use and drainage infrastructure, which may be labor intensive to collect and pose technical challenges. However, as Hurricane Harvey demonstrated, stormwater flooding can cause immense damage in areas far from rivers and coasts. The AIR Inland Flood Model estimates that roughly 60 percent of the annual average loss from inland floods in the United States comes from riverine flooding and 40 percent from stormwater flooding. This may also explain the finding

that despite their low take-up rates for flood insurance, properties outside SFHAs account for 30 percent of NFIP claims and have an average annual claim rate that is not statistically different from properties inside SFHAs (Kousky and Michel-Kerjan 2015). Of course, that finding is also driven by adverse selection outside the SFHA.

Catastrophe modelers have taken varying approaches to incorporating climate sensitivity into their models. For example, the KatRisk model incorporates climate sensitivity for storm surge, allowing the user to set parameters for sea-level rise. AIR does not incorporate climate change projections into its models, but each update includes the most current sea-level estimates. According to one industry executive, despite his company's interest in exploring climate-related challenges, insurers are not demanding tools and features to help them understand risks associated with or exacerbated by climate change. This attitude is attributable in part to the year-by-year nature of insurance: policies are typically written for a term of one year and premiums are calculated to reflect a property's expected losses over that period. Despite an apparent lack of interest from insurers, modelers have worked with government organizations to understand the potential consequences of climate change for future flood risk.

4.2.2. Reinsurance for Managing Catastrophic Risk

Several insurers we spoke with noted that reinsurers' interest and willingness to back US flood was an important driver of their decision to enter the market. Reinsurance capital to support US flood is currently abundant, and several reinsurers are investing in product development to encourage primary insurers to enter the market. One reinsurer believes interest is high because, unlike the flood market in other countries, the US market is undeveloped and has significant potential for growth. Bermuda-based reinsurer RenaissanceRe noted in a 2017 letter that the company currently "insures substantial commercial and some residential

flood risk and is willing and able to cover substantially more residential flood risk within the U.S.”³² It observed a broad willingness and ability to write US residential flood across the reinsurance industry, which is investing heavily in the research and development of those products.

Reinsurers are doing most of the heavy lifting for primary companies by creating underwriting guidelines, setting rates, developing forms, and bearing most of the risk on private flood products (see Section 3.4.3). Aon Benfield noted that most reinsurers are willing to support quota shares with high cession percentages—90 percent or greater—with “uncapped capacity not out of the question.”³³ Indeed, one company representative indicated that most of the primary insurers it worked with wanted to cede most if not all flood risk to the reinsurer, at least in the beginning. The willingness to provide substantial reinsurance capital combined with reinsurers’ investments in product development, mapping, and risk analysis have led to growing interest from primary insurers. One reinsurer who works with primary companies to develop products and set rates noted that primary insurers’ interest has increased substantially in the past two years, especially in developing flood endorsements to homeowners policies; although all types of insurers are beginning to explore flood, it saw the most interest from regional and single-state underwriters.

Reinsurers’ enthusiasm is evident not only in the private market but also in the public sector where 28 reinsurers currently participate in the NFIP’s reinsurance program, up from 25 in 2017.³⁴ After a pilot program, the NFIP first purchased reinsurance in 2017, paying a \$150 million premium to cover 26 percent of losses between \$4 billion and \$8 billion for any single event, up to a total possible payout of \$1.042 billion. That policy paid out in full following Hurricane Harvey, but that did not scare reinsurers away. Indeed, more companies participated

in the 2018 contract, which provides even greater coverage: 18.6 percent of losses between \$4 billion and \$6 billion and 54.3 percent of losses between \$6 billion and \$8 billion for any event, up to a total of \$1.46 billion (NFIP 2018). The 2018 premium is \$235 million.

4.2.3. Managing Concentration

As mentioned, floods can produce catastrophic losses for an insurer if they provide coverage to many properties in an at-risk area. To limit their concentration and reduce the possibility of bankrupting losses from flood, firms have sought to limit exposure through underwriting (see Section 3.5.3). Some companies with only a few flood policies are not yet worried about concentration of risk because their portfolios are small, according to interviewees. Most, however, have adopted controls on their portfolios. For instance, some companies are limiting the number of policies they write in a neighborhood or other defined area, such as a zip code. A company whose portfolio of flood risks is too concentrated may stop writing policies in that zip code but possibly “reopen” the area when it feels more diversified. This raises the question, however, of how much of a catastrophic risk could be covered by the private market if companies limit the number of policies they are willing to write in the riskiest locations. While multiple interviewees saw room for private sector expansion, we also heard that the nature of floods as a catastrophic peril might put a limit on the private sector’s interest and ability to cover flood.

4.3. State Regulation and Legislation

We heard that the structure of insurance regulation in the United States—each state has its own regulator,

³² See https://www.federalreserve.gov/SECRS/2017/February/20170201/R-1549/R-1549_010617_131670_332070960802_1.pdf.

³³ Taken from a presentation by Megan Hart and Neal Reeves from Aon Benfield at the Ignition Forum: Catalyst for Action conference, May 3-4 2017.

³⁴ The 28 private reinsurance markets under FEMA’s 2018 Reinsurance Agreement are Allied World Insurance Company, Amlin (Lloyd’s Synd. No. 2001 AML), Apollo (Lloyd’s Synd. No. 1969 APL), Ariel (Lloyd’s Synd. No. 1910 ARE), Ascot (Lloyd’s Synd. No. 1414 ASC), AXIS Reinsurance Co US, Brit (Lloyd’s Synd. No. 2987 BRT), Canopus (Lloyd’s Synd. No. 4444 CNP), Chaucer (Lloyd’s Synd. No. 1084 CSL), Faraday (Lloyd’s Synd. No. 0435 FDY), General Reinsurance Corporation, Hannover Ruck SE, Hiscox (Lloyd’s Synd. No. 0033 HIS), Liberty Mutual Insurance Company, Lloyd’s Syndicate 4472 Liberty Specialty Markets, Managing Agency Partners (Lloyd’s Synd. No. 2791 MAP), Markel Global Reins Co, Munich Reinsurance America, Inc., QBE Reinsurance Corporation, RenaissanceRe (Lloyd’s Synd. No. 1458 RNR), Renaissance Reinsurance U.S. Inc., SCOR Reinsurance Company, Swiss Re Underwriters Agency, Inc. o/b/o Swiss Reinsurance America Corporation, The Cincinnati Insurance Co, Transatlantic Reinsurance Company, Validus Reinsurance (Switzerland) Ltd., and XL Catlin (Lloyd’s Synd. No. 2003 XLC), and XL Reinsurance America, Inc.

approaches, and requirements—in itself was a hurdle, most particularly for admitted companies.³⁵ A couple of interviewees told us that even when regulators were easy to work with, it was nonetheless time consuming and costly to undergo different review processes in every state for the same product. That said, many firms reported positive interactions with insurance regulators on flood products. The vice president of Golden Bear, for example, was interviewed in 2017 about the company's new flood product and noted that approval in California went smoothly (Donlon 2017).

Admitted companies are concerned that state-by-state insurance regulation may make it difficult to adjust prices and underwriting in response to new information. This is problematic for a new line, such as flood, where there is low confidence in the models, little claims experience, and uncertainty about rating. We also heard, however, that price stability was important to consumers. A balance then must be struck by the regulator, but firms may not enter the market if they believe they will not be able to adjust their premiums and coverages to reflect new information. Following a disaster that causes a change in risk perceptions, for example, insurers will need to adjust their strategies and also react to other market shifts (Kousky 2017b). This appears to be holding back primarily the larger homeowners firms, which are concerned about being “stuck” in unfavorable conditions. On the other hand, we were told that surplus lines companies could adjust and respond quickly, which explains why on the mainland US (Puerto Rico is an exception), there is more private flood in the E&S market. Nevertheless, consumer advocates are concerned that policyholders may not anticipate price volatility for E&S policies and that to protect them, such flexibility should not be offered to admitted carriers. This issue appears to be a source of insurer-regulator tension.

Several states are encouraging development of the private residential flood market. For example, some states have removed diligent search requirements (see Table 1, Section 3.4.1) to make it easier for consumers to access surplus lines companies for flood. In the

admitted market, some states have relaxed rate requirements. For instance, Florida and New Jersey are allowing companies to submit rates on an informational basis only; rates do not have to be approved by the commissioner. Indeed, Florida has been a leader in attempting to grow the private flood market. S.B. 542, passed in 2014, removed diligent search requirements and enabled companies selling private flood policies to set their own rates without approval from state regulators. This bill was a response to the rate hikes of the Biggert-Waters Flood Insurance Reform Act of 2012 and began a process in Florida of welcoming private sector flood policies. In 2017, this provision was extended to 2025. The bill also helps consumers understand the consequences of switching to private flood by requiring agents to notify policyholders that they could lose rate subsidies if they later return to the NFIP, and it allows the insurance commissioner to provide certification that private policies meet or exceed NFIP coverage, making it easier for lenders to accept private policies.

Tower Hill, a prominent homeowners insurer and WYO company in Florida, first entered the private flood insurance market by offering a surplus lines product for which it could set and change rates without state approval. After gaining some experience with private flood and experimenting with rate setting, the company entered the admitted market in May 2018 by adding an optional flood endorsement to its homeowners policies. According to Tower Hill's president, the freedom to set and change rates was influential in the company's decision to enter the admitted market.

Another concern that came up in several interviews was how states treat catastrophe models. Many stakeholders point to the development and increasing availability of flood catastrophe models as a driver of the private flood market because they enable insurers to better calculate and price flood risk (e.g., AAA 2017) (see Section 4.2.1.). However, when admitted companies use models to price and underwrite insurance, those models are subject to the scrutiny of state regulators,

³⁵ Private flood is regulated by the states, unlike the NFIP. One observer cautioned that lawsuits may increase post-flood for private policies since in federal lawsuits over the NFIP, plaintiff's lawyers cannot recover statutory attorney's fees and public adjusters and attorneys cannot be named on settlement checks (Wolf 2018).

who have authority to review and approve insurance rates. Multiple interviewees told us that state regulators are often uncomfortable with “black-box” catastrophe models, posing a challenge for rating catastrophic perils. However, regulators we spoke with generally accepted flood models and had procedures to review them and collect relevant information from insurers. In fact, one regulator said his office would be skeptical if a company were writing flood without using a catastrophe model.

Some insurers said that the regulatory review process for catastrophe models could be difficult but acknowledged that it varied by state. Some states have substantial flexibility in rate review and do not need to understand a model in detail. Others must adhere to stricter standards and may be required to collect full information about a model’s assumptions, inputs, and outputs. We also heard from some stakeholders that certain states may not allow catastrophe models to be used in ratemaking or may allow them only for certain perils.

In California, for example, catastrophe models are only allowed to be used for the earthquake line of business and for fire following earthquake exposure in other lines (CCR, §2644.4(e)). However, one insurance representative we spoke with recalled no challenges to referencing a flood model in the company’s California rate filings. This person said that although referencing a model may lead to more back-and-forth with a regulator, for catastrophe perils with poor loss experience (such as flood), most insurance regulators understand the necessity of using models; insurance regulators may not explicitly approve models, but this is not the same as considering them not allowable at all. This representative further observed that regulators viewed the use of a catastrophe model in filing for a new product differently from using a model in an effort to justify changes to an existing product.

As another example, the Texas Department of Insurance provides guidelines on what information insurers must submit if they use catastrophe models to develop rates. In 2010, the Department issued a bulletin³⁶ stating

that companies using them must provide the following supporting data and documentation:

- a comparison of historical losses to modeled losses and an explanation of differences;
- information on the model, such as the number, intensity, and type of simulated events;
- a description of the insurer-supplied inputs;
- the insurer’s adjustments to the model; and
- a description of how modeled results are integrated with historical experience.

In Florida, catastrophe models have long played a central role in ratemaking because of the state’s high exposure to hurricane and storm surge risk. In 1995, the state established the Florida Commission on Hurricane Loss Projection Methodology, an independent panel of experts that develops standards and evaluates hurricane models. In 2014, the state legislature directed the commission to review and develop standards for flood models as well. Standards are expected to be issued in 2020 or 2021, at which point the state is expected to resume reviewing flood insurance rates and the modeling methods used to develop them.

The use of catastrophe models is especially important in flood insurance because in most cases insurers cannot rely on historical claims data to set rates; the NFIP does not release detailed claims information and few private insurers have sufficient data of their own. The following factors related to catastrophe models specifically will likely influence insurers’ willingness to develop and file private flood insurance products in a particular state:

- regulators’ general acceptance of catastrophe models in developing premium rates for flood insurance;
- the amount and detail of data and documentation that insurers must provide to demonstrate that their rate-setting methods are not excessive, inadequate, or unfairly discriminatory; and
- regulators’ willingness to engage with insurers and provide guidance on the information needed to approve rates developed with catastrophe models.

³⁶ See Commissioner’s Bulletin #B-0030-10, available at <https://www.tdi.texas.gov/bulletins/2010/cc29.html>.

States that generally approve of models, provide guidance to insurers, and work with them in the rate review process will likely see more companies entering the private flood insurance market.

4.4. Agents

Agents interface with property owners and may be the only people residential consumers speak with about their insurance. As such, they have a critical role in the residential flood market. One challenge expressed by multiple interviewees was agents' lack of understanding about the flood peril and more generally about flood insurance, particularly such nuances of the NFIP as when post-FIRM rating would be preferable for a property, what mitigation might lower premiums, and what the coverage limitations are. This is problematic since consumers themselves lack information on their risk and are often confused about product options. Many agents, however, may write very few flood policies a year and only do so when required by the mandatory purchase requirement. Even those that write more policies may be ill-equipped to advise on properties, such as Severe Repetitive Loss structures.

Indeed, many insurers and other stakeholders pointed to agents' insufficient understanding of flood risk and the flood insurance market as a barrier to greater take-up of flood insurance—for both the NFIP and the private market. Some noted that unlike auto insurance, where operations are increasingly moving online, the flood market gives insurance agents a large role because many residents still rely on them to secure homeowners coverage. Interviewees observed, however, that younger people expected to be able to make most transactions, including insurance, by phone or online and that many private companies were constructing website platforms to facilitate purchases of flood insurance as well. For instance, Neptune Flood has just launched a portal where consumers can obtain quotes and buy flood coverage entirely online.

Regardless, those we interviewed generally agreed that better education for agents would be beneficial. In most

states, flood education is a one-time requirement: agents complete a three-hour course and are then certified to sell NFIP policies, even if the program undergoes major changes. One local government official noted that his state's lack of continuing education requirements for flood insurance harmed homeowners because agents who did not fully understand the NFIP's complicated pricing and requirements sometimes recommended inappropriate or suboptimal policies. For instance, agents may not explain the details of grandfathered premiums, leaving consumers unaware that if they move to the private sector, they could lose that favorable rate. Or agents may not inform pre-FIRM property owners that an elevation certificate could give them a lower post-FIRM rate.

In four states—Louisiana, Maryland, Delaware, and North Carolina—agents must complete flood education courses on a continuing basis. Louisiana requires three hours of training every two years, Maryland and Delaware require two hours every two years, and North Carolina requires three hours every four years. In Louisiana and North Carolina, these additional licensing requirements apply not just to agents selling flood but to all property, casualty, and personal lines agents.³⁷ Other states' adoption of such approaches would likely improve agents' competence with flood insurance and help their clients secure more effective flood coverage, whether through the NFIP or the private sector.

In response to the lack of formal training requirements in most states, some private companies are investing in their own agent education programs about their flood products. One MGA representative said that for agents, the process of writing flood insurance with the NFIP was so complex and aggravating that insurance agencies limited the number of people they had working on flood. As a result, whereas almost every agent in a medium to large insurance agency sells home, auto, and umbrella policies, typically only one sells flood. The MGA is hoping to change this for private residential flood.

We also heard from multiple stakeholders that the NFIP's agent commission exceeded the standard commission in the private market for homeowners,

³⁷ In North Carolina, flood education requirements also apply to insurance adjusters.

automobile, and other common lines, creating a financial disincentive for the agent to place a flood policy with a private company. Evan Hecht noted in testimony to Congress that many WYO agents today received 20 to 22 percent of the premium for placing policies with the NFIP, higher than in the private market (his firm pays 10%); reducing the commission, or even using the same commission as when agents place policies directly with the NFIP (generally 15%) would save the NFIP millions each year (Hecht 2017). If private insurers try to compete with the NFIP on price, an agent will earn even lower commissions on the less expensive private policies and thus have even less incentive to sell their products.

Although sentiment that agents' commissions for the NFIP should be reduced was widespread, a few individuals disagreed. One interviewee said that agents were the ones directly interacting with potential customers, and if the policy objective was to expand flood insurance take-up, cutting their commissions would be counterproductive. Another said that the gap between private insurers' and NFIP commissions might not necessarily be a disincentive to place private flood, since even though the agent took a smaller commission, the flood policy could be an entry into other lines of business with the customer. We also heard that the large commissions are paid by WYO companies in order to protect their homeowners business. And finally, another interviewee argued that the NFIP product is more complicated and time-consuming than other insurance products and this requires a higher commission.

4.5. Demand

Many interviewees considered sluggish demand for flood insurance an ongoing challenge for the private sector. The reasons for low demand are well studied: lack of information on flood risk, lack of information on potential damages, lack of attention, and systematic behavioral biases, such as optimism, myopia, inertia, and relying on small samples (e.g, Kahneman et al. 1982; Slovic et al. 1982; Rabin 2002; Siegrist and Gutscher 2008; Meyer and Kunreuther 2017; Kunreuther 2018b). Some

of these reasons were cited by interviewees and have been discussed publicly (Insurance Business 2017). In addition, consumers may not fully understand the nature of insurance and price of coverage may limit demand.

Summarizing the literature on insurance demand is beyond the scope of this report. We simply note that there have been several studies on this topic. Those focused specifically on flood generally find that demand for insurance is greater in areas at greater risk, with a larger share of highly educated residents, with a larger proportion of higher valued homes, and among those with a greater perception of the risk (Kousky 2011b; Landry and Jahan-Parvar 2011; Petrolia, Landry et al. 2013; Atreya, Ferreira et al. 2015; Brody, Highfield et al. 2016). Demand also increases after floods but then falls again (Gallagher 2014; Kousky 2017a). In addition, there is a very large literature on demand for insurance more broadly, much of which might relate to flood.

In addition to the well-researched aspects of demand, other factors were noted by our interviewees. For instance, one person said that when his company entered the flood market, sources in the NFIP value chain complained that the purchase process was time consuming and tedious. If you want more people to buy flood insurance, this interviewee said, you have to make it easier for them to do so. We also heard that consumers often did not understand what was included in their NFIP policies, so if a company offered broader coverage, consumers might simply reject it based on the higher premium without understanding the additional value. Our interviews revealed that a principal reason for the limited interest in flood insurance was that people in flood-prone areas would not or could not pay a lot for flood.

That said, some companies are enrolling new people and beginning to "grow the pie" of the number of residences with flood coverage. For instance, one person told us that roughly half of the company's book of business was nonmandatory purchase. We also heard that demand was very regional: in higher-risk areas, interest and demand are higher, too.

Our interviewees had different perspectives on whether and how to address low demand. The Louisiana

insurance commissioner has suggested a federal mandate that all property insurance include flood and earthquake, to spread the risk across the country (Donelon and Travis 2017). A benefit of mandated coverage is that it ensures a broad spread of risk and limits adverse selection (Oliver Wyman 2015). Others suggested improved education and outreach, particularly among agents (see Section 4.4). And some thought eventually market forces would prevail, saying that a growing market would put pressure on companies in the homeowners market to offer flood.

4.6. Exposure Management

There are many properties and locations that the private sector has deemed too risky to insure (see Section 3.5.3). What is needed for these places, we were told, is not risk transfer but risk reduction. There was agreement among our interviewees that risk reduction investments had to be a partnership between the public and private sectors, as well as with property owners.

Interviewees discussed the importance of elevation in some areas, as well as lower-cost mitigation options, such as moving utilities out of flood-prone basements. They also observed that some places were so flood-prone that no structures should be allowed at all. One private insurer we interviewed considered it a fundamental challenge that people were living in areas where they could not afford the risk costs; we have been hiding those costs from people, he said, and are reluctant to make them pay. Another interviewee said that the NFIP has perpetuated repetitive loss structures: a private company would never continue to insure such buildings, and eventually that signal would lead to their mitigation or buyout. Now these properties need to be addressed through government risk-reduction efforts.

Multiple sources stressed that governments, particularly local governments, were not doing enough to regulate land use and set appropriate building codes in risky parts of the floodplain. One report summed it up this way: “Flood-related losses are often directly attributable to under-investment in public infrastructure, poor

asset management, obsolete building codes and ineffective land-use planning. Unless governments fulfil their obligations to improve risk planning and mitigation, the widespread availability of residential flood insurance may remain commercially unviable” (IBC 2015). Without more aggressive land-use management by local governments, one interviewee said, private flood insurance could not be written for large areas; the deficiencies in local land-use management were coupled to problematic state regulation. As an illustration of this point, we heard that in Louisiana, regulators made it difficult for insurers to drop policies, and yet the state was allowing continued development in very high-risk areas. If the state wants more private insurance, this person argued, it will have to do a better job curbing risky development.

A few interviewees worried that the emergence of the private flood market could potentially undermine funding for mitigation programs currently paid for by the NFIP. The Association of State Floodplain Managers and others have lobbied for an “equivalency fee” on private flood policies, comparable to the federal fee on NFIP policies, to fund FEMA mapping and floodplain management programs.³⁸ This user fee would ensure that all flood policyholders support programs for flood risk awareness and reduction. Some in the private sector have publicly supported such a fee to support mapping (Hecht 2017). Since the flood models used by many private insurers do not produce public hazard maps, continued FEMA mapping for individuals and communities was recognized as critical.

The Association of State Floodplain Managers has also expressed concern that some federal mitigation dollars, such as FEMA’s Flood Mitigation Assistance grant program, are available only to property owners with NFIP policies. Property owners may not realize that by choosing a private policy, they are also opting out of being eligible for certain FEMA mitigation grants. These mitigation grants are intended to help reduce the NFIP’s exposure but are only a small portion of total federal mitigation dollars. The vast majority of mitigation funds are distributed through two post-

38 See <http://www.floods.org/ace-images/H2874HouseFinal.pdf>.

disaster programs—FEMA’s Hazard Mitigation Grant Program and HUD’s Community Development Block Grant–Disaster Assistance program—neither of which requires homeowners to have an NFIP policy (Kousky and Shabman 2017). A final concern was that if most homeowners purchased private flood insurance—something our interviewees found extremely unlikely in the near term—communities would have less incentive to participate in the NFIP’s Community Rating System, which encourages communities to adopt more flood mitigation measures. That said, others suggested greater private market share would send stronger price signals for risk-responsible development.

Most private firms are not offering explicit mitigation discounts, although elevation discounts may be “baked in” to rating. This is consistent with the NFIP, which also does not offer many mitigation discounts besides a lower rate for elevated structures. One exception is Superior Flood, which offers a 10 percent premium reduction for qualifying policyholders who install SmartVent flood vents.³⁹ Another approach is for insurance to help encourage greater risk reduction after a flood. The Flood Insurance Agency and Lexington Insurance recently introduced “FloodReady,” an insurance product that allows policyholders to repair flood-damaged homes with materials that are more resistant to floodwaters. Many private products also offer additional funding to rebuild in compliance with current floodplain management regulations.

5. Implications for the Future of Flood Insurance

In this section we briefly review those findings most relevant to the future of residential flood insurance in the United States.

Flood is insurable—mostly.

One interviewee told us that because the insurance industry had said so often that flood was uninsurable, many firms had come to believe this and simply not

tried to develop flood products. As new catastrophe models have come online, as reinsurance industry interest and willingness to provide risk capital has grown, and as some firms have begun to experiment with writing policies, the situation is changing. Multiple people we interviewed believed that a sizable share of flood risk in the United States should be insurable by the private market. We were told that many companies were investing in the technology and infrastructure to support flood products. We were also told by multiple states that several companies had rate filings pending or had informed the regulator they intended to bring a new product to market soon. That said, the market is still extremely small—by our estimate less than 5% of all residential flood policies are currently with private firms. Even substantial growth in the private residential flood market will still leave the NFIP as the dominant provider. And we also heard a couple interviewees caution that there are limitations to the private sector covering a large share of so catastrophic a peril. They contended that a market heavily reliant on reinsurance may be unsustainable and that growth could stall as soon as there are substantial losses from an event.

We also learned that private firms are finding different niches in the emerging residential market. Some are targeting low-risk areas, for example, and others, high-risk areas. Some offer policies with high limits and broad coverages, and others, limited products for homeowners in areas unlikely to see catastrophic flooding. If such product diversity continues, the private sector could be in a position to better match insurance to consumers’ needs and preferences.

The riskiest areas may not be privately insurable and need aggressive flood risk reduction.

The nature of the flood peril itself means that the private market will not be able to write all risks, according to our sources. One interviewee, for example, cautioned that the private sector will never be able to write a large share of flood in the US due to the challenge of concentrated exposure and correlated losses, necessitating premiums that would far exceed what any insured would be willing

39 For more information, see <https://smartvent.com/news/pr/superior-flood-insurance-launches-strategic-partnership-with-smart-vent>.

or able to pay. This is particularly true for high-risk areas, where the NFIP will retain a role (e.g, Templeton-Jones 2016). There was a universal feeling that these areas needed more aggressive public commitments to risk reduction; such investments would increase the insurability of flood in the private sector and make flood insurance less costly. Such risk reduction investments as a complement to insurance will be ever more important due to changing storm patterns and sea-level rise in coastal communities.

Are more people insured against flood?

We opened this report with a discussion of the resilience benefits of widespread take-up of flood insurance, particularly among low- and middle-income households. Recognizing this, FEMA has adopted a “moon shot” goal of doubling the number of structures with flood coverage over the next four years. A critical question is whether the emerging private market is simply substituting for NFIP policies or actually closing the insurance gap. Unfortunately, a definitive answer awaits more data, but the perceptions of market participants suggest the answer is probably both: many companies know they are replacing NFIP mandatory-purchase policies, and some companies also know that at least a portion of their flood book of business is policies for previously uninsured homeowners. The latter case is particularly true for flood endorsements outside the SFHAs.

Many interviewees agreed that to increase flood insurance take-up, coverage needed to be included in homeowners policies, primarily because demand for standalone flood will always be limited. We heard many reasons why this would benefit the consumer: it would be less confusing, it would ensure coverage, and according to a few interviewees, a flood endorsement could be easier to administer and therefore cheaper. One interviewee also noted that with both wrap-around and excess coverage being offered on the private market, consumers may have to purchase multiple policies to get the flood coverage they desire; pulling this into one policy would be simpler. We were told that this approach would benefit firms, too. It would eliminate legal disputes over the cause of damage after hurricanes and tropical storms, for example. One interviewee considered

large homeowners companies better positioned to do customer education and to help overcome the lack of awareness and understanding about flood risk since they already worked with property owners. And another interviewee believed that a flood endorsement would be easier for agents to sell. We were also told it is preferable for all parties to have just one adjuster after storm events. Finally, we heard from one interviewee that it would be easier to adjust flood premiums in light of new information if included in homeowners. They gave the example of having to increase a flood-only premium by 50% after learning new flood-related information. If flood was included in the homeowners policy, that same increase to the flood premium may only be say, 10% to 20% of the total premium—a much more palatable change for consumers and regulators.

Going forward, is competition the best model for the NFIP and the private sector?

Although the private residential market is currently very small, it is growing. Several interviewees predicted that the NFIP would be left not with the riskiest properties but with the badly priced properties. The NFIP currently has extensive cross-subsidization in rates and there are many locations where the NFIP premiums do not accurately reflect the risk. The private sector can expand flood offerings only where they can price lower than the NFIP. The anomalies of NFIP rating have created particular areas and properties that are targets of opportunity for insurers to compete and other regions and properties for which they cannot price compete. It should be noted, however, that the NFIP is currently undertaking a substantial overhaul to both rating and mapping through an effort called Risk Rating 2.0, shifting to more property-level, risk-based pricing. While this may not be fully in effect for several years, it could shift the dynamic between the NFIP and the private sector.

The impacts of more substantial private sector growth, if that emerges, have been debated. Some worry about loss of the highest priced policies undermining the financial stability of the NFIP. Others argue any shedding of policies to the private sector should be on net positive for the NFIP. They argue that the increase in premiums and the depopulation of Florida’s state-run insurer of last resort, Citizens Property Insurance Corporation, provides

an example of how to move policies to the private sector and reduce overall exposure of the program (e.g., Camara 2017; Hurtibise 2017). If the private sector could grow the number of insureds nationwide, that could be on net positive for community resilience.

Some interviewees volunteered that a new model, in which the NFIP and the private sector were complements, might be useful. They suggested that the NFIP become an insurer of last resort, similar to wind pools in hurricane-prone states. Multiple models exist, and more research is clearly needed on the design of such a program (e.g., Kousky 2011a; Medders and Nicholson 2018). Wind pools generally do not price below the private sector, although this is not always the case. One interviewee noted that the NFIP has been mispricing many risks and if these are modified or if there is a greater move to private flood insurance, property values in some places will need to adjust in response.

Resilience requires public sector roles.

We heard some concern that any shifts in the insurance-related role of the NFIP could harm two other important functions of the program—flood hazard mapping and flood mitigation funding through the Flood Mitigation Assistance program (see Section 4.6). It is worth reflecting on whether these two functions need to be, or are benefitting from, being tied directly to an insurance program in the first place. As many have observed, FIRMs are not ideal risk communication tools, and a public commitment to better risk communication, including the dynamic nature of risk, could be carried out independent of both the NFIP and private providers. The overwhelming majority of federal flood mitigation dollars do not come from the NFIP-funded mitigation programs (see Section 4.6), so it is not a foregone conclusion that growth in the private sector would undercut mitigation. That said, currently participation in the NFIP requires communities to adopt floodplain management regulations and some stakeholders have voiced concern that communities may forgo such regulation if insurance were provided through the private sector. On the other

hand, others have suggested that greater private sector pricing might compel greater risk reduction by communities and homeowners.

The broader point, however, is that flood insurance is only one component of flood resilience. Truly flood-resilient communities will require commitments by both the private and the public sectors to a range of mutually reinforcing activities. Some interviewees noted that the sophisticated models used by private firms for assessing flood risk were not available to communities and households; information provision must therefore be maintained by the public sector. In its December 2015 annual report, the Technical Mapping Advisory Committee (TMAC) recommended that “FEMA should transition from identifying the 1-percent-annual-chance floodplain and associated base flood elevation as the basis for insurance rating purposes to a structure-specific flood frequency determination.” FEMA is now moving in this direction—a first step in overcoming homeowners’ misperception that they have a flood risk only if they are in an SFHA and required to purchase insurance. In this sense, flood risk communication extends beyond mapping to include disclosure of relevant and understandable risk information.

Several private companies would be willing to insure high-risk properties, but their representatives said the rate would need to match the risk. In working class and low-income areas at risk of flooding that are central to people’s livelihoods and culture, the NFIP is needed to provide affordable insurance. The Louisiana insurance commissioner wrote, “No depopulation of the NFIP is acceptable unless it includes a market to provide coverage for areas tied to the coastal economy of Louisiana” (Donelon and Travis 2017). For low-income families at risk of flooding, the cost of flood insurance can be a financial burden (e.g., Dixon et al. 2017; FEMA 2018). Means-tested assistance for disaster insurance would address this concern and has support from members of both political parties, although Congress has yet to make such a change to the program.

Author Bios



Carolyn Kousky is Director for Policy Research and Engagement at the Wharton Risk Management and Decision Processes Center at the University of Pennsylvania. Her research has examined disaster insurance markets, the National Flood Insurance Program, federal disaster aid and response, and policy responses to potential changes in extreme events with climate change. She has published numerous articles, reports, and book chapters on the economics and policy of natural disasters and disaster insurance markets, and is routinely cited in media outlets. She was a member of the National Research Council Committee on Analysis of Costs and Benefits of Reforms to the National Flood Insurance Program. She is the recipient of the 2013 Tartufari International Prize from the Accademia Nazionale dei Lincei and the X International Julio Castelo Matrán Insurance Award from the Fundación MAPFRE on behalf of the Policy Incubator, which she directs. Dr. Kousky is a University Fellow at Resources for the Future. She has a BS in Earth Systems from Stanford University and a PhD in Public Policy from Harvard University.



Howard Kunreuther is James G. Dinan Professor of Decision Sciences and Public Policy and Co-Director of the Center for Risk Management and Decision Processes at the Wharton School, University of Pennsylvania. He is a fellow of the American Association for the Advancement of Science (AAAS), a distinguished fellow of the Society for Risk Analysis, and recipient of the 2015 Shin Research Excellence Award from the Geneva Association and International Insurance Society (IIS). Howard currently serves on the Technical Mapping Advisory Council (TMAC) under the direction of the Federal Emergency Management Agency (FEMA). He previously served on the National Academy of Science's committees on Analysis of Costs and Benefits of Reforms to the National Flood Insurance Program, and the Roundtable on Risk, Resilience, and Extreme Events. He was a Coordinating Lead Author for the Intergovernmental Panel on Climate Change (IPCC)'s 5th Assessment Report, Working Group III, Chapter 2, "Integrated Risk and Uncertainty Assessment of Climate Change Response Policies."

Howard's recent books include *Mastering Catastrophic Risk: How Companies are Coping with Disruption* with M. Useem (Oxford University Press) and *The Ostrich Paradox: Why We Underprepare for Disasters* with R. Meyer (Wharton Digital Press).



Brett Lingle is Senior Research Coordinator at the Wharton Risk Management and Decision Processes Center. His work focuses on disaster risk financing and the role of public policy in hazard mitigation and disaster recovery. Before joining the Risk Center, he worked with Resources for the Future's Rethinking Risk Initiative to analyze various aspects of the National Flood Insurance Program, FEMA's disaster assistance and mitigation efforts, and federal policy's influence on household and community resilience. Lingle has a B.A. in Politics from Pomona College and an M.A. in Environmental Policy from American University.



Leonard Shabman is a Senior Fellow at Resources for the Future. He has written about, and advised on, national flood risk management policy and programs of the Corps of Engineers and FEMA, to include the NFIP, for many years. He recently chaired the National Academy of Sciences Committee on affordability of flood insurance and current work includes documenting the experience of the National Flood Insurance program between 1969 and 1978, when it operated as a private –public risk sharing partnership. During his career he also has served on the faculty at Virginia Tech, as staff economist at the United States Water Resources Council, as Scientific Advisor to the Assistant Secretary of Army, Civil Works, and as the Arthur Maass-Gilbert White Scholar at the Corps of Engineers Institute for Water Resources. In 2004 he was honored to be named an Associate of the National Academies of Science (NAS) and in 2018 he received the lifetime achievement award from the Universities Council on Water Resources.

References

- AAA. 2017. The National Flood Insurance Program: Challenges and solutions. Washington, DC: American Academy of Actuaries, Flood Insurance Work Group.
- A.M. Best. 2016. U.S. surplus lines: Surplus lines growth continues. Oldwick, NJ: A.M. Best Company.
- A.M. Best. 2017. U.S. Surplus Lines: Surplus lines growth continues. Oldwick, NJ: A.M. Best Company.
- Atreya, A., S. Ferreira and E. Michel-Kerjan. 2015. What drives households to buy flood insurance? New evidence from Georgia. *Ecological Economics* 117: 153-161.
- Berginnis, C. 2016. Private flood insurance bill—The beginning of the end for the NFIP and comprehensive flood risk management in the US? Association of State Floodplain Managers.
- Birnbaum, B. 2016. How to create a more robust and private flood insurance market place. Testimony before the Subcommittee on Housing and Insurance, Committee on Financial Services, U.S. House of Representatives. Washington, DC: Center for Economic Justice.
- Brody, S. D., W. E. Highfield, M. Wilson, M.K Lindell, and R. Blessing. 2016. Understanding the motivations of coastal residents to voluntarily purchase federal flood insurance. *Journal of Risk Research* 20(6): 760-775.
- Camara, C. 2017. Florida's private flood insurance market is a template for the country. *The Hill* May 16.
- Carrier Management. 2018. Top private flood insurers: 2017 market study. *Insurance Journal Research & Trends*.
- CoreLogic. 2017. Natural hazard risk summary & analysis. Irvine, CA.
- Deloitte Center for Financial Services. 2014. The potential for flood insurance privatization in the U.S. Could carriers keep their heads above water?
- Dixon, L., N. Clancy, B. Bender, and P. Ehrler. 2007. The lender-placed flood insurance market for residential properties. Santa Monica, CA: RAND Corporation.
- Dixon, L., N. Clancy, B. Bender, A. Kofner, D. Manheim, and L. Zakaras. 2013. Flood Insurance in New York City following Hurricane Sandy. Santa Monica, CA: RAND Corporation.
- Dixon, L., N. Clancy, B. M. Miller, S. Hoegberg, M. Lewis, B. Bender, et al. 2017. The cost and affordability of flood insurance in New York City: Economic impacts of rising premiums and policy options for one- to four-family homes. Santa Monica, CA: RAND Corporation.
- Dolese, N. 2017. Observations and opportunities for flood insurance enhancements. *Flood Risk and Insurance* April: 84–88.
- Donelon, J. J., and T. Travis. 2017. Flood Risk and Insurance in Louisiana. *Flood Risk and Insurance* April 100–101.
- Donlon, R. 2017. Offering private flood insurance in California: Golden Bear's experience. *Property Casualty* 360.
- Federal Emergency Management Agency (FEMA). 2007. FEMA's mandatory purchase of flood insurance guidelines. Washington, DC: Department of Homeland Security.
- — —. 2015. National Flood Insurance Program: Report to Congress on reinsuring NFIP insurance risk and options for privatizing the NFIP. Washington, DC.
- — —. 2017. Texas Hurricane Harvey (DR-4332). Available at <https://www.fema.gov/disaster/4332>.

- — —. 2018. An affordability framework for the National Flood Insurance Program. Washington, DC: Department of Homeland Security.
- Fernandez, M., L. Alvarez, and R. Nixon. 2017. Still waiting for FEMA in Texas and Florida after hurricanes. *New York Times* October 22.
- Festa, E. 2016. Coastal American Insurance enters flood market in Mississippi, Alabama. *S&P Global Market Intelligence* September 8.
- Gallhager, J. 2014. Learning about an infrequent event: Evidence from flood insurance take-up in the United States. *American Economic Journal: Applied Economics* 6(3): 206-233.
- Government Accountability Office (GAO). 2016. Potential barriers cited to increased use of private insurance. Washington, DC.
- Grossi, P., and H. Kunreuther, eds. 2005. *Catastrophe modeling: A new approach to managing risk*. Hübner International Series on Risk, Insurance and Economic Security. New York: Springer
- Hayes, J., and J. Kulik. 2017. Flood insurance: The 2018 market opportunity—GC@PCI commentary. Available at <http://www.gccapitalideas.com/2017/10/16/flood-insurance-the-2018-market-opportunity-gcpci-commentary/>.
- Hecht, E. 2017. Flood insurance reform: A community perspective. Testimony before House Financial Services Subcommittee on Housing and Insurance. Washington DC.
- Heidrick, C. 2016. Statement on behalf of the Independent Insurance Agents & Brokers of America before Financial Services Committee, Housing and Insurance Subcommittee, U.S. House of Representatives. Washington, DC.
- Hull, R. 2002. Using the excess and surplus lines market. *Insurance Journal* July 22.
- Hurtibise, R. 2017. Lawmaker wants to model flood insurance reform after Citizens takeout policy. *Sun Sentinel* July 3.
- Insurance Bureau of Canada (IBC). 2015. The financial management of flood risk. An international review: Lessons learned from flood management programs in G8 countries. .
- Insurance Business. 2017. What will it take to expand private flood insurance? September 7.
- Insurance Journal. 2017. Hiscox Re offers private label flood insurance endorsement for U.S. insurers. October 16.
- — —. 2018. Verisk's ISO personal lines program targets \$40 billion private flood insurance market. January 11.
- Kahneman, D., P. Slovic, and A. Tversky, eds. 1982. *Judgment under uncertainty: Heuristics and biases*. Cambridge: Cambridge University Press.
- Kelley, B. 2016. How to create a more robust and private flood insurance market. Testimony before Subcommittee on Housing and Insurance, Committee on Financial Services, U.S. House of Representatives. Washington, DC.
- Kousky, C. 2011a. Managing natural catastrophe risk: state insurance programs in the United States. *Review of Environmental Economics and Policy* 5(1): 153–71.
- Kousky, C. 2011b. Understanding the demand for flood insurance. *Natural Hazards Review* 12(2): 96-110.
- Kousky, C. 2017a. Disasters as learning experiences or disasters as policy opportunities? Examining flood insurance purchases after hurricanes. *Risk Analysis* 37(3): 517-530.
- — —. 2017b. Revised risk assessments and the insurance industry. In *Policy shock: Regulatory responses to oil spills, nuclear accidents, and financial crashes*, edited by E. Balleisen, L. Benneer, K. Krawiec, and J. Wiener. Cambridge: Cambridge University Press, 58–81.

- — —. 2018. Financing flood losses: A discussion of the National Flood Insurance Program. *Risk Management and Insurance Review* 21(1): 11–32.
- Kousky, C. and R. Cooke. 2012. Explaining the failure to insure catastrophic risks. *The Geneva Papers* 37: 206-227.
- Kousky, C., and H. Kunreuther. 2014. Addressing affordability in the National Flood Insurance Program. *Journal of Extreme Events* 1(1). DOI: 10.1142/S2345737614500018.
- Kousky, C., and B. Lingle. 2018. Flood insurance in Puerto Rico. Issue brief. Philadelphia: Wharton Risk Management and Decision Processes Center. March.
- Kousky, C., B. Lingle, and L. Shabman. 2017. The pricing of flood insurance. *Journal of Extreme Events* 4(1). DOI: 10.1142/S2345737617500014.
- Kousky, C., and E. Michel-Kerjan. 2015. Examining flood insurance claims in the United States. *Journal of Risk and Insurance* 84(3): 819-850.
- Kunreuther, H. 2018a. All hazards homeowners insurance: Challenges and opportunities. *Risk Management and Insurance Review* 21(1): 141-155.
- Kunreuther, H. 2018b. Improving the National Flood Insurance Program *Business and Public Policy*. Online at: <http://dx.doi.org/10.1017/bpp.2018.26>.
- Lamparelli, N., and I. Maddox. 2017. Policy alternatives and potential future flood insurance regimes. *Flood Risk and Insurance* April: 52–66.
- Landry, C. E. and M. R. Jahan-Parvar. 2011. Flood insurance coverage in the coastal zone. *Journal of Risk and Insurance* 78(2): 361-388.
- Long, H. 2017. Where Harvey is hitting hardest, 80 percent lack flood insurance. *Washington Post* August 29.
- Madonna, A. 2017. U.S. insurers ask state regulators to push case for private flood coverage. Reuters.
- Medders, L., and J. E. Nicholson. 2018. Evaluating the public financing for Florida’s wind risk. *Risk Management and Insurance Review* 21(1): 117–39.
- Meyer, R., and H. Kunreuther. 2017. *The ostrich paradox*. Philadelphia: Wharton Digital Press.
- Michel-Kerjan, E., and G. Taglioni. 2017. Insuring hurricanes: Perspectives, gaps, and opportunities after 2017. *Insurance Practice* December.
- Miller, T. D. 2016. How to create a more robust and private flood insurance market. Testimony before Subcommittee on Housing and Insurance, Committee on Financial Services, U.S. House of Representatives. Washington, DC.
- — —. 2017. Flood risk and insurance in Pennsylvania. *Flood Risk and Insurance* April: 105–108.
- Munich Re. 2016. Inland flood coverage endorsement: Flood risk turn-key solution. Princeton, NJ: Munich Reinsurance America.
- National Research Council (NRC). 2015. Affordability of National Flood Insurance premiums: Report 1. Washington, DC: National Academies Press.
- — —. 2016. Affordability of National Flood Insurance premiums: Report 2. Washington, DC: National Academies Press.
- National Flood Insurance Program (NFIP). 2018. National Flood Insurance Program (NFIP) Reinsurance Program. Available at <https://www.fema.gov/nfip-reinsurance-program>.

- New York City. 2013. PlaNYC: A stronger, more resilient New York. New York City: Mayor's Office of Long Term Planning and Sustainability.
- Oliver Wyman. 2015. Flood insurance risk study: Options for privatizing the NFIP. Produced by Marsh & McLennan Companies for Federal Emergency Management Agency, Department of Homeland Security.
- Patel, P. 2017. Admitted private market flood: Lessons from competing with the NFIP. *Flood Risk and Insurance* April: 89–91.
- Petrolia, D. R., C. E. Landry, and K. H. Coble. 2013. Risk preferences, risk perceptions, and flood insurance. *Land Economics* 89(2): 227–245.
- Poulton, C. 2017. Why “cherry-picking” is the solution to our nation’s flood insurance disaster. Washington, DC: *The Hill*, month/date?.
- Reinsurance Association of America (RAA). 2017. Private flood improves NFIP’s stability. Washington, DC.
- Rabin, M. 2002. Inferences by believers in the law of small numbers. *Quarterly Journal of Economics* 117(3): 775–816.
- Ritchie, J., and L. Spencer. 1994. Qualitative data analysis for applied policy research. In *Analyzing Qualitative Data*, edited by A. Bryman and R. G. Burgess. London and New York: Routledge, 173–94.
- Shabman, L. 2018. Fixing Flood Insurance. *Milken Institute Review* volume(number): pages?.
- Siegrist, M., and H. Gutscher. 2008. Natural hazards and motivation for mitigation behavior: People cannot predict the affect evoked by a severe flood. *Risk Analysis* 28(3): 771–78.
- Simpson, A. G. 2018. Startup Neptune offering digital private flood product to agents, carriers in nationwide expansion. *Insurance Journal* volume(number): pages?
- Slovic, P., B. Fischhoff, and S. Lichtenstein. 1982. Facts versus fears: Understanding perceived risk. In *Judgment under uncertainty: Heuristics and biases*, edited by D. Kahneman, P. Slovic, and A. Tversky. Cambridge: Cambridge University Press, 463–89.
- Talbot, T., and O. Barder. 2016. Payouts for perils: Why disaster aid is broken, and how catastrophe insurance can help fix it. Washington, DC: Center for Global Development.
- Templeton-Jones, P. 2016. Opportunities and challenges facing the National Flood Insurance Program. Testimony before House Financial Services Subcommittee on Housing and Insurance. Washington, DC.
- Turnham, J., K. Burnett, C. Martin, T. McCall, R. Juras, and J. Spader. 2011. Housing recovery on the Gulf Coast, Phase II: Results of property owner survey in Louisiana, Mississippi, and Texas. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- Weiss, R. S. 1994. *Learning from strangers*. New York: Free Press.
- Wolf, J. 2018. Is Florida’s flood insurance industry really prepared? *Insurance Journal* June 26.
- Wholesale and Specialty Insurance Association (WSIA). 2017. Surplus lines flood insurance market data and statistics. Kansas City, Missouri. Available at <https://www.wsia.org/docs/PDF/Legislative/Surplus%20Lines%20Market%20Data%20and%20Statistics%201-24-17%20w%20attachement.pdf>.
- — —. 2018. Surplus lines flood insurance market data and statistics. Kansas City, Missouri. Available at: <https://www.wsia.org/docs/PDF/Legislative/SurplusLinesMarketDataandStatistics2-9-18.pdf>

Appendix 1: Interviewees

FIRST	LAST	TITLE	ORGANIZATION
Ken	Allen	Deputy Commissioner, Rate Regulation Branch	California Department of Insurance
David	Altmaier	Commissioner of Insurance Regulation	Florida Office of Insurance Regulation
Jessica	Altman	Acting Insurance Commissioner	Pennsylvania Insurance Department
Angela	A'Zary	Vice President	RenaissanceRe
Mark	Bonthrone	Senior Communications Manager	Swiss Re
Tim	Brockett	Senior Vice President Strategic Products Reinsurance Division	Munich Re
Michael	Brown	Vice President and Property Department Manager	Golden Bear Insurance
Dennis	Burke	Vice President, State Relations	Reinsurance Association of America
Tim	Byrne	Consultant	J. Byrne Agency, Inc.
Jon	Christianson	Chief Operating Officer	Palomar Specialty Insurance Co.
Virginia	Christy	Director of Property and Casualty Financial Oversight	Florida Office of Insurance Regulation
Bill	Churney	President	AIR Worldwide
Jake	Clark	Managing Director	Guy Carpenter
Michael	Cohen	Vice President, Government Affairs	RenaissanceRe
Dan	Dick	Managing Director	Aon
John	Dickson	CEO/President	NFS Edge
Ned	Dolese	Co-Founder, President	Coastal American Insurance Co.
Chris	Donahue	Global Head Underwriter, Personal Property	AIG
Jim	Donelon	Commissioner	Louisiana Department of Insurance
Norma	Essary	Chief Executive Officer	Surplus Lines Stamping Office of Texas
Raymond	Farmer	Director	South Carolina Department of Insurance
William	Fleischhacker	Executive Managing Director and Leader, US Flood Specialty Practice Group	Aon
Joe	Gunset	General Counsel	Lloyd's US
Peter	Hartt	Director, Insurance Division	New Jersey Department of Banking and Insurance
Jonathan	Hayes	Managing Director	Guy Carpenter
Chris	Heidrick	Agency Principal	Trusted Flood; Heidrick & Company Insurance and Risk Management Services, LLC
Matt	Herr	Chief Executive Officer	Superior Flood
Kam	Jha	Vice President, Growth and Marketing	Assurant Flood Solutions
Matt	Junge	Senior Treaty Underwriter	Swiss Re
Sean	Kevelighan	Chief Executive Officer	Insurance Information Institute
John	Kulik	Senior Vice President, Analytics	Guy Carpenter
Dag	Lohmann	Chief Executive Officer and Cofounder	KatRisk
Ian	Macartney	Chief Executive Officer of Torrent	Torrent/Marsh
Don	Matz	President	Tower Hill
Sanjay	Mehrotra	Vice President, Strategic Products	Munich Re
Kevin	Milkey	Executive Vice President	American Strategic Insurance
Frederick	Millan	President	United Surety and Indemnity Company (USIC)
Tara	Mitchell	Vice President of ITS, Chief Information Officer	Surplus Lines Stamping Office of Texas
Susanne	Murphy	Deputy Commissioner of Property and Casualty	Florida Office of Insurance Regulation

FIRST	LAST	TITLE	ORGANIZATION
Rade	Musulin	Chair of Flood Working Group and Vice President - Casualty; Chief Executive Officer	American Academy of Actuaries; FBAlliance Insurance
Eric	Nelson	SVP, Catastrophe Risk Management	Travelers Insurance
Frank	Nutter	President	Reinsurance Association of America
Chris	Oehrle	VP Marketing & Agency Relations	The Philadelphia Contributionship
John	O'Marra	Senior Vice President - Property	RT Specialty
Paresh	Patel	Chairman and Chief Executive Officer	HCI Group
Craig	Poulton	Chief Executive Officer	Poulton Associates/ Natural Catastrophe Insurance Program
Jay	Rosario	Senior Vice President, Strategic Products Development Manager	Munich Re
Steve	Samuelson	NFIP Specialist, CFM	Kansas Department of Agriculture, Division of Water Resources/Floodplain Management
Tom	Santos	Vice President for Federal Affairs	American Insurance Association (AIA)
Lisa	Sharrard	Agent/Owner	US Flood Solutions
Sara	Singhas	Associate Regulatory Counsel	Mortgage Bankers Association
Chris	Sykes	Managing Director	Guy Carpenter
Patrick	Small	Managing Director	DUAL Commercial
Nick	Sumbles	Flood Underwriting Specialist	Gridiron Insurance
Patty	Templeton-Jones	President and Chief Program Advocate	Wright Flood
Peter	Thomas	Managing Director	Guy Carpenter
Craig	Tillman	President	WeatherPredict Consulting an affiliate of RenaissanceRe
Marc	Treacy	Managing Director of Flood	ISO
Jim	Watje	Vice President, National Sales and Marketing	Universal North America
Nancy	Watkins	Principal, Consulting Actuary	Milliman
Steve	Weinstein	Chief Compliance Officer, Group General Counsel, and Corporate Secretary	RenaissanceRe
James	Whittle	Assistant General Counsel & Chief Claims Counsel	American Insurance Association (AIA)
Mark	Worman	Associate Commissioner, Regulatory Policy Division	Texas Department of Insurance