United States Government Accountability Office

Report to Congressional Requesters

June 2014

NATIONAL FLOOD INSURANCE PROGRAM

Additional Guidance on Building Requirements to Mitigate Agricultural Structures' Damage in High-Risk Areas Is Needed

GAO-14-583

June 2014

NATIONAL FLOOD INSURANCE PROGRAM

Additional Guidance on Building Requirements to Mitigate Agricultural Structures' Damage in High-Risk Areas Is Needed

GAO Highlights

Highlights of GAO-14-583, a report to congressional requesters

Why GAO Did This Study

NFIP helps protect property in high-risk floodplains by, among other things, requiring communities that participate in the program to adopt floodplain management regulations, including building requirements for new or substantially improved structures such as elevating, dry flood-proofing, or wet flood-proofing structures.

GAO was asked to evaluate the possible effects of NFIP, including its building requirements, on farmers in riverine areas that have a high risk of flooding. This report examines, among other things, the effects of building requirements on farmers in high-risk areas and options that could help address any challenges farmers face. To do this work, GAO analyzed laws, regulations, and FEMA policy and claims data; interviewed 12 state and local floodplain managers, 24 farmers, and 6 lenders in 8 selected communities in California, Louisiana, North Carolina, and North Dakota (selection based on geographic diversity, presence of high-risk flood areas, and type of farming that required on-site structures); and interviewed flood management and planning experts and FEMA officials.

What GAO Recommends

The Administrator of FEMA should update existing guidance on mitigating the risk of flood damage to agricultural structures to include additional information that reflects recent farming developments and structural needs in vast and deep floodplains. FEMA agreed with the recommendation.

View GAO-14-583. For more information, contact Daniel Garcia-Diaz at (202) 512-8678 or garciadiazd@gao.gov

What GAO Found

The effects of the National Flood Insurance Program's (NFIP) building requirements for elevating or flood-proofing agricultural structures in high-risk areas varied across selected communities, according to interviews GAO conducted with floodplain managers and farmers. Specifically:

- Floodplain managers and 12 farmers in selected rural communities with whom GAO spoke in Louisiana, North Carolina, and North Dakota generally were not concerned about these requirements. Most of these farmers told GAO that they had land outside the high-risk areas where they could build or expand their structures, or they could elevate their structures relatively easily.
- Floodplain managers in selected California communities told GAO that farmers in their communities had been adversely affected by the building requirements. They said that most farm land was in high-risk areas and elevation of structures would be difficult and costly—due to the relatively deep flood depths, structures would be required to be elevated up to 15 feet to comply with the building requirements. They also indicated that some structures were difficult to make watertight below the projected flood level (dry flood-proofing).

According to a California floodplain manager and several farmers with whom GAO spoke, the farmers who were adversely affected by the building requirements have had to work around outdated Federal Emergency Management Agency (FEMA) guidance that does not fully address the challenges of vast and relatively deep floodplains or reflect industry changes. For example, the 1993 guidance from FEMA allowed an alternative flood-proofing technique (wet flood-proofing) that permits water to flow through certain agricultural structures in expansive high-risk areas. However, farmers in the California communities told GAO this was not a viable option because pests might enter openings and contaminate crops stored inside. FEMA typically updates guidance as needed but acknowledged the need for additional guidance that covers all of the different types of agricultural structures and reflects recent developments in the size and scale of farm operations, including supporting structures that were expensive to build and replace. Additional and more comprehensive guidance would allow FEMA to better respond to recent developments and structural needs in vast and deep floodplains.

Some local floodplain managers, farmers, and lenders from the selected communities identified options to help farmers manage the challenges of building or expanding agricultural structures in high-risk areas, but many of the options would entail certain risks and may run counter to the objectives of NFIP. For example, one commonly cited option calls for exempting agricultural structures from building requirements, with farmers assuming all of the flood risk and opting out of federal disaster relief. Both FEMA and the experts noted such an exemption could set a precedent, leading others to ask for similar exemptions. Further, FEMA officials stated that the agency had no legal authority to allow farmers or any other group to opt out of disaster relief.

Contents

Figures

Abbreviations

AFMA	Agricultural Floodplain Management Alliance
BFE	base flood elevation
DHS	Department of Homeland Security
FEMA	Federal Emergency Management Agency
LAMP	Levee Analysis and Mapping Procedures
NFIP	National Flood Insurance Program
PRP	Preferred Risk Policy
SFHA	special flood hazard area
USDA	Department of Agriculture

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

June 30, 2014

The Honorable Dianne Feinstein
Chairwoman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate

The Honorable John Garamendi
House of Representatives

The National Flood Insurance Program (NFIP) is the federal government's key effort to minimize the damage and financial effect of floods. NFIP has been the main source of insurance against flood damage for most residents and businesses, including farmers, since 1968. Community participation in NFIP is voluntary, but in order for residents and businesses to purchase flood insurance through the program, communities must join NFIP and adopt at least the minimum standards for floodplain management regulations, including building requirements. In communities participating in NFIP, owners of properties in special flood hazard areas (SFHA) obtain mortgages from federally regulated lending institutions or federal agency lenders or who receive direct financial assistance for acquisition or construction purposes are required to purchase flood insurance.[1] As of the end of fiscal year 2013, about 22 percent (1.21 million out of 5.54 million) of all NFIP policies were located in rural and agricultural riverine SFHAs.[2] According to the Federal Emergency Management Agency (FEMA), about 5 percent of NFIP policies cover nonresidential buildings, including agricultural buildings.

[1]Special flood hazard areas (SFHA), which are depicted on NFIP maps, represent the land subject to a 1 percent or greater chance of flooding in any given year. FEMA previously referred to this type of flood as the 100-year flood.

[2]For purpose of this report, we defined rural areas as areas that are not considered urbanized areas or urban clusters using U.S. Census Bureau data and agricultural areas as those counties with 50 percent or more of their land areas used in farming, based on the Department of Agriculture's (USDA) *Atlas of Rural and Small-Town America*. We defined riverine floodplains as any areas lying outside of the coastal areas that were at a high risk of flooding. The Federal Emergency Management Agency (FEMA) defines coastal areas as those areas that face potential storm surges and wave actions.

NFIP has been the subject of two new laws passed by Congress and signed by the President since 2012 and other congressional efforts to modernize the program and improve its finances after the program sustained heavy losses from major hurricanes, especially Hurricane Katrina in 2005. Starting in 2003, Congress appropriated $1.2 billion for the Map Modernization initiative, a comprehensive effort intended to upgrade the nation's inventory of flood maps to a digital format. On July 6, 2012, the President signed into law the Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters Act) and introduced many changes to, among other things, strengthen the future solvency of NFIP.[3] For example, it required FEMA to phase out almost all discounted insurance premiums (commonly referred to as subsidized premiums), end the practice of allowing premiums for properties that were remapped into a higher-risk flood zone to be calculated, in many cases, the same way as they were before they were remapped (grandfathering rates), and improve flood risk mapping, among other things. However, on March 21, 2014, the President signed into law the Homeowner Flood Insurance Affordability Act of 2014 (2014 Act), which repealed or altered portions of the Biggert-Waters Act.[4] Because of these changes, some concerns regarding the elimination of subsidized premiums and grandfathering may no longer be valid.

Some in the agricultural industry have questioned the effects of many of these changes on farmers and rural residents. For example, FEMA's mapping updates could place large portions of certain agricultural areas in SFHAs, so property owners in these areas could be required to purchase flood insurance if they do not have it and could see rates on existing policies rise. They could also be subject to floodplain management regulations that cover SFHAs, including building requirements that could raise the costs of new construction and involve mitigation efforts, such as elevating structures. We were asked to evaluate the possible effects of NFIP including floodplain regulations and insurance mandates on farmers and rural residents in high-risk rural and agricultural riverine floodplains.

[3]Pub. L. No. 112-141, Div. F, Tit. II, Subtit. A, 126 Stat. 405, 916 (2012). NFIP has been on our high-risk list since March 2006 after incurring billions of dollars in catastrophic losses from the 2005 hurricanes. NFIP currently owes about $24 billion to the U.S. Treasury.

[4]Pub. L. No. 113-89, 128 Stat. 1020 (2014).

This report discusses (1) the effects on farmers and rural residents of NFIP's building requirements for agricultural and residential structures, (2) the effects on rural residents and farmers of the mandatory purchase requirement and changes in premium rates, and (3) options that have been proposed to address any issues resulting from changes to NFIP requirements, and stakeholders' views on these proposals.[5]

For all objectives, we analyzed relevant laws, including changes made by the Biggert-Waters Act and the 2014 Act, as well as FEMA regulations and policies, and conducted a literature review. We also interviewed FEMA and Department of Agriculture (USDA) officials, representatives of national farming and floodplain management organizations, representatives of agricultural floodplain management organizations, lenders, and the insurance industry. We conducted case studies in eight selected NFIP communities in California, Louisiana, North Carolina, and North Dakota. We selected these geographically diverse locations because they were located at least partially in or near high-risk floodplains and included farms that produced crops or livestock requiring onsite agricultural structures.

To examine any effects that farmers and rural residents have faced as a result of NFIP's building requirements and the mandatory purchase requirement, we interviewed state and local floodplain managers, agricultural extension service officials, and agricultural lenders to obtain their views on how NFIP requirements had affected or could affect farmers and rural residents. Local floodplain managers and agricultural extension specialists helped us identify farmers and rural residents who had been remapped into SFHAs and could provide first-hand perspectives, and we conducted interviews with some of these individuals. To identify ways to address any challenges farmers and rural residents faced in complying with NFIP's building requirements and the mandatory purchase requirement, we gathered ideas from local floodplain managers, agricultural lenders, farmers, and rural residents that we met

[5]Federally backed or federally regulated lenders are required by the Flood Disaster Protection Act of 1973 to demonstrate adequate flood insurance coverage to their regulators for property serving as the principle collateral of a loan if the building is located in a SFHA in a participating community (known as the mandatory purchase requirement). Pub. L. No. 93-234, 87 Stat. 975 (1973) (codified as amended in scattered sections of 42 U.S.C.). Because the mandatory purchase requirement is required by statute, FEMA has no authority to waive it. Additionally, federal financial regulators, rather than FEMA, monitor compliance with the mandatory purchase requirement.

with during our case studies. We then asked experts from flood management, city and regional planning organizations, cognizant academics, and officials from FEMA to comment on the ideas we gathered.

We conducted this performance audit from August 2013 to June 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

National Flood Insurance Program

Floods are the most frequent natural disasters in the United States, causing billions of dollars of damage annually. In 1968, Congress created NFIP to address the increasing cost of federal disaster assistance by providing flood insurance to property owners in flood-prone areas, where such insurance was either not available or prohibitively expensive.[6] Since its inception, the NFIP has been a key component of the nation's efforts to minimize or mitigate the financial impact of flood damage on property owners and limit federal expenditures after floods occur. Community participation is central to NFIP's success. In order to participate in the program, communities must adopt and agree to enforce floodplain management regulations to reduce future flood damage. In exchange, NFIP makes federally backed flood insurance available to homeowners and other property owners (for example, farmers and other businesses) in these communities. As of May 2014, about 22,052 communities were participating in the program.

Insurance Coverage

Property owners can purchase flood insurance to cover both buildings and contents for residential and nonresidential properties. Insurable structures must have two or more outside rigid walls and a fully secured

[6]The National Flood Insurance Act of 1968 established NFIP. Pub. L. No. 90-448, Tit. XIII, 82 Stat. 476, 572 (1968).

roof that is affixed to a permanent site. NFIP's maximum coverage limit for residential policyholders is $250,000 for buildings and $100,000 for contents. For nonresidential policyholders, the maximum coverage is $500,000 for buildings and $500,000 for contents.[7] Agricultural structures are considered nonresidential structures, so items such as grain stored in a bin or a tractor stored in a shed are covered by contents coverage. Policyholders purchase separate policies for each structure they insure. Deductibles range from $1,000 to $5,000 on residential structures and $1,000 to $50,000 on nonresidential structures.[8]

When NFIP was created, property owners were not required to buy flood insurance, so participation was voluntary. Congress amended the original law in 1973 to require some property owners to purchase flood insurance in certain circumstances (mandatory purchase requirement). The mandatory purchase requirement applies to owners of properties located in SFHAs in participating communities with mortgages held by federally regulated lenders or federal agency lenders, or who receive direct financial assistance for acquisition or construction purposes.[9] Individuals in SFHAs who receive federal disaster assistance after September 23, 1994, for flood losses to real or personal property are also required to purchase and maintain flood insurance on the property as a condition for receiving future disaster assistance. The 2014 Act permits residential

[7]Multifamily buildings designed for use by five or more families are eligible for nonresidential policy limits.

[8]Section 12 of the 2014 Act provides FEMA the authority to increase the deductible for residential structures to $10,000. Pub. L. No. 113-89, § 12, 128 Stat. at 1025 (codified at 42 U.S.C. § 4013(d)).

[9]The mandatory purchase requirement applies to mortgages made, increased, extended, or renewed by lending institutions regulated by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, the Office of Comptroller of the Currency, the National Credit Union Administration, or the Farm Credit Administration. The requirement also applies to all mortgage loans purchased by Fannie Mae and Freddie Mac in the secondary market if the loan is secured by property in an SFHA for which flood insurance is available and to loans and grants guaranteed or provided by the Federal Housing Administration, USDA Rural Development, and the Department of Veterans Affairs. USDA Rural Development provides low-income housing assistance through several programs, including the section 515 (Rural Rental Housing) and section 502 (Single-Family Housing) loan programs and the section 504 (Rural Housing Repair and Rehabilitation) loan and grant program.

policyholders to forgo coverage for detached structures that do not serve as residences.[10]

NFIP Building Requirements for SFHAs

The 1973 Act also added certain requirements that, according to FEMA officials, were intended to encourage community participation in NFIP. Specifically, communities are required to adopt and agree to enforce adequate floodplain management regulations as a condition of participation in NFIP. In exchange, flood insurance and certain federal disaster assistance will be made available to property owners in the community. Community ordinances or regulations must be consistent with NFIP's minimum regulatory requirements, although communities may exceed the minimum criteria by adopting more comprehensive regulations. The following are some of the key NFIP building requirements and alternatives for new and substantially improved or substantially damaged structures located in riverine SFHAs.[11]

- Elevation. All new and substantially improved or substantially damaged structures must be elevated to or above the base flood elevation (BFE). The BFE is the projected level that flood water is expected to reach or exceed during a flood with an estimated 1 percent chance of occurring in any given year. The flood depth—height at which structures should be built—is calculated by the difference between the BFE and ground elevations that is established by topographic surveys.
- Dry flood-proofing. Nonresidential structures, including agricultural structures, may be flood-proofed instead of elevated. Nonresidential

[10]Pub. L. No. 113-89, § 13(a), 128 Stat. at 1026 (codified at .42 U.S.C. § 4012a(c)).

[11]FEMA defines a substantial improvement as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement, with exceptions for historic structures and projects to correct certain health, sanitary, or safety code violations. Substantial damage means damage of any origin sustained by a structure for which the cost of restoring the structure to its predamaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. 44 C.F.R. § 59.1. The National Flood Insurance Reform Act of 1994 amended the National Flood Insurance Act to allow for local communities to exempt agricultural structures substantially damaged by flooding from floodplain management regulations. Such structures would not be eligible for any federal disaster relief. Further, FEMA is required to either deny flood insurance for these structures or charge full-risk rates. Pub. L. No. 103-325, § 580, 108 Stat. 2160, 2285 (1994) (codified at 42 U.S.C. § 4022(a)(2)).

structures that are dry flood-proofed are designed to be watertight below the BFE.[12]

- Wet flood-proofing. FEMA also has guidance to allow communities to grant some categories of nonresidential structures, including certain agricultural structures, an exception from the requirement that certain structures be elevated or dry flood-proofed. This variance enables certain structures to be wet flood-proofed—applying permanent or contingent measures to a structure and/or its contents that prevent or provide resistance to damage from flooding by allowing flood waters to enter the structure. FEMA has instructed communities that variances may be issued for certain types of agricultural structures located in wide, expansive floodplains that are used solely for agricultural purposes, such as storage, harvesting, or drying. These types of structures include grain bins, corn cribs, general purpose barns open on at least one side, and buildings that store farm machinery and equipment.

Rate Setting for NFIP Premiums

FEMA bases premium rates for NFIP policies on a property's risk of flooding and several other factors. Specifically, FEMA uses location and property characteristics, such as flood zone designation, elevation of the property relative to the property's BFE, building type (e.g., residential or nonresidential), number of floors, presence of a basement, and the year of construction relative to the year of a community's original flood map.[13] Additionally, FEMA uses data on prior claims, coverage amount, and policy deductible amount.

NFIP has historically had two types of flood insurance premium rates: those that reflect the full risk of flooding to a property (full-risk rates) and those that do not. Properties that have not been charged property-specific full-risk rates have included those with grandfathered and subsidized

[12]To meet the requirement for dry flood-proofing, a nonresidential structure must, together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. 44 C.F.R. § 60.3(c)(3)(ii).

[13]Insurance premiums for structures that receive a variance may be higher than they are for structures that comply with the requirement to either elevate or dry flood-proof a structure, because premium rates reflect the degree of risk the covered property faces.

rates.[14] The largest number of subsidized policies has been for properties built before the initial flood insurance rate maps became available.[15] The authority for subsidized rates was included in the National Flood Insurance Act of 1968 as an incentive to encourage participation in the program.

In July 2012, Congress enacted the Biggert-Waters Act, which made significant changes to FEMA's ability to charge subsidized rates. These changes phased out existing subsidies for certain types of properties through 25 percent annual premium increases until the full-risk rate is reached, including business properties, residential properties that are not a primary residence, properties that have experienced or sustained substantial damage exceeding 50 percent of fair market value or substantial improvement exceeding 30 percent of fair market value, and severe repetitive loss properties.[16] For other properties, the Biggert-Waters Act raised the cap on annual premium rate increases from 10 percent to 20 percent, by risk class. The Biggert-Waters Act also prohibited subsidies from being extended for homes sold to new owners and removed them if properties were not covered or had a lapse in coverage after the date of enactment of the act as a result of the policyholders' deliberate choice. However, the 2014 Act reinstated premium subsidies for properties that were purchased after July 6, 2012, and properties not insured as of July 6, 2012. It also generally limited annual increases in property-specific premium rates to 18 percent for policies not covered by the 25-percent increases by the Biggert-Waters Act, although it changed the substantial improvement threshold to 50

[14]FEMA does not categorize policies with grandfathered rates—rates that were not changed after properties were remapped into higher risk flood zones—as "subsidized" because they are within classes of policies that are not subsidized for the class as a whole. However, FEMA officials acknowledged that property owners that obtain grandfathered rates are being cross-subsidized by other policyholders in the same flood zone that are paying higher rates.

[15]FEMA also subsidizes policies for other properties—for example, properties behind certain unfinished or de-accredited levees, certain properties built after the initial flood insurance rate maps became available, and emergency program properties are subsidized.

[16]For single-family properties, severe repetitive loss properties are those that have incurred four or more claims payments exceeding $5,000 each, with a cumulative amount of such payments over $20,000; or at least two claims with a cumulative total exceeding the value of the property. For multifamily properties, FEMA will define the term by regulation. 42 U.S.C. § 4014(h).

percent from the Biggert-Waters Act's 30 percent.[17] The 2014 Act does not remove the phase out for policies covering nonprimary residences, severe repetitive loss properties, and business properties, among others.

The Biggert-Waters Act also generally prohibited the grandfathering of rates after future remapping and required any rate increases stemming from future remapping to be phased in over time. However, the 2014 Act eliminated the Biggert-Waters Act's changes to grandfathering provisions, but included a provision which may prohibit grandfathering in limited situations.[18]

Flood Zone Mapping

FEMA creates maps that show the degree of flood hazard so that properties in participating communities can be assigned actuarial premium rates—that is, rates that reflect the full risk of flooding—for insurance purposes. Flood maps, also show SFHAs for which communities must adopt and enforce building requirements as part of their NFIP participation. Lending institutions use flood maps to identify properties that are required to have flood insurance and to help ensure that the owners buy and maintain it. FEMA engineers create flood maps using statistical information such as data for river flow, storm tides,

[17]Pub. L. No. 113-89, §§ 5, 15, 128 Stat. at 1022, 1026. In addition to these changes, the 2014 Act also required FEMA to refund to policyholders premiums paid after July 2012 that exceed the subsidized premiums permissible under the 2014 Act. *Id.* § 3, 128 Stat. at 1021. In addition, the act generally added a surcharge of $25 for residential properties and $250 for nonresidential properties and secondary residences to be deposited in the NFIP reserve fund. *Id.* § 8, 128 Stat. at 1023. According to FEMA, the fee will be included on all policies, including full-risk rated policies, until all pre-FIRM subsidies are eliminated.

[18]*Id.* §§ 4, 6, 128 Stat. at 1022, 1023. Specifically, the 2014 Act requires FEMA to transition policyholders newly mapped into the SFHA to a full-risk rate from a Preferred Risk Policy (PRP) rate at a maximum of 18 percent premium increase per year. FEMA offered a PRP Eligibility Extension program as a cost-saving option for property owners whose buildings had been mapped into SFHAs after October 1, 2008. The extension allowed policyholders to pay a lower premium rate until the policy is converted to the more expensive rate. Beginning January 1, 2011, FEMA allowed the lower premium rate to be charged for 2 years after a revised flood map became effective. On January 1, 2013, FEMA extended the period for which the lower premium rate could be charged, until it implemented changes in premium rates required by the Biggert-Waters Act. FEMA introduced a rate change that increased premiums for those under the PRP Eligibility Extension program by 20 percent, as allowed by the Biggert-Waters Act, on October 1, 2013. FEMA is now reviewing what will be done with these policies under the 2014 Act.

hydrologic/hydraulic analyses, and rainfall and topographic surveys.[19] The results of the topographic and flood hazard analyses are combined and integrated into digital maps that depict floodplain boundaries and the projected height of the base flood—the flood level that has a 1 percent chance of being equaled or exceeded in any given year.[20]

NFIP establishes flood zone designations through its mapping process (see table 1). Areas designated as A, AE, V, or VE zones have a high risk of flooding and are considered SFHAs. Areas designated as V or VE zones are located along the coast and have an additional hazard associated with storm waves. Areas with a moderate to low risk of flooding are designated as B, C, or X zones. Areas where flood risk is possible but undetermined are designated as D zones. For the purpose of our study, we are considering areas with flood zone designations beginning with an A to be high-risk riverine floodplains.

Table 1: National Flood Insurance Program Flood Zone Designations

Flood zone designation	Risk level
B, C, X	Moderate to low risk
A, AE	High-risk
V, VE	High-risk coastal
D	Undetermined risk

Source: FEMA. | GAO-14-583

FEMA is required by statute to assess the need to revise and update all floodplain areas and flood risk zones at least every 5 years. The agency has undertaken two initiatives to update and modernize its flood maps. Until 2003, flood maps were created and stored in paper format. From 2003 to 2008, FEMA spent $1.2 billion to upgrade the nation's flood maps to digital format as part of the Map Modernization initiative. Through this program, FEMA created digital flood maps for more than 92 percent of

[19]Hydrologic analyses look at the conditions affecting the amount of water that flows downstream during a flood. For example, soil and vegetation absorb rain and reduce runoff, while pavement and other impermeable manmade surfaces increase the flow of runoff and thus the risk of flooding. Topographic data assess the elevation of the terrain.

[20]This information is also described in a Flood Insurance Study. The maps and the Flood Insurance Study are adopted by participating communities and the flood heights shown on maps and in the study become the regulatory BFEs for floodplain management and insurance rating in that community.

the population.[21] In fiscal year 2009, FEMA began a 5-year initiative—Risk MAP—to improve the quality of data used in flood mapping. FEMA's goals for the initiative include addressing gaps in flood hazard data; increasing public awareness of risk; and supporting mitigation planning by state, local, and tribal entities.

Risk MAP's primary areas of focus are coastal flood hazard areas, areas affected by levees, and significant riverine flood hazards. Risk MAP received $325 million in appropriations in fiscal year 2009, but appropriations have declined since, falling to about $216 million in fiscal year 2014. According to FEMA officials, FEMA prioritizes its mapping projects based on needs and risk and balances them with available funding. Need is determined by assessing current flood data and changes since the last update. Risk is assessed largely by population and the number of structures and their exposure to flood hazards. While rural and agricultural areas may have needs identified, they are generally low risk and thus may not be a high priority for map updates.[22] According to FEMA officials, low-risk areas are more likely to receive approximated mapping studies than detailed mapping studies. Approximated mapping studies are not based on the same quality or quantity of data as are detailed studies. Maps made using approximated studies also do not show the BFE. This may require that communities or property owners in those areas obtain a BFE from local or state officials, developers, or other organizations. They may also develop their own BFE by hiring an engineer or surveyor or using guidance provided by FEMA, according to FEMA officials.

Levees—man-made structures, usually earthen embankments, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide protection from temporary flooding—are found in approximately 22 percent of U.S. counties (fig. 1). Levees are important factors in mapping flood risk. Levees that are accredited by FEMA can result in a community being mapped in a flood zone with a lower risk than it would be without the

[21]According to FEMA officials, some maps produced under the Map Modernization initiative were still in progress at the time of our review.

[22]However, according to FEMA officials, some rural or agricultural areas would have been a part of these mapping efforts because for Risk MAP, FEMA maps on a watershed basis, which is a large area of land that may include both populated and unpopulated areas.

accredited levee.[23] In order to have a levee accredited, the owners or community officials must demonstrate that the levee system provides adequate flood protection and has been adequately maintained by submitting an engineering certification indicating that the levee complies with established criteria. If a levee receives accreditation, property owners in the area it protects may not be subject to the mandatory purchase requirement if the area is not mapped as an SFHA. In some cases, areas behind accredited levees are still prone to flooding due to a lack of interior drainage or flooding from other sources and will therefore still be mapped as an SFHA, resulting in the property owners behind that levee still being required to purchase flood insurance.[24]

[23]FEMA does not certify levees. Rather, FEMA relies on communities and levee owners to provide certification proving that their levees meet FEMA's requirements. Once they do, FEMA can show the levee as accredited on the flood insurance rate map. For FEMA requirements for levee systems, *see* 44 C.F.R. § 65.10.

[24]In response to concerns from stakeholders and Congress, FEMA began Levee Analysis and Mapping Procedures (LAMP), a pilot program to test a new process to analyze and map areas protected by unaccredited levees in 2013. Through this process, FEMA will use improved technology to account more precisely for the level of protection provided by unaccredited levees when mapping flood risk.

Figure 1: Levee, Sutter County, California

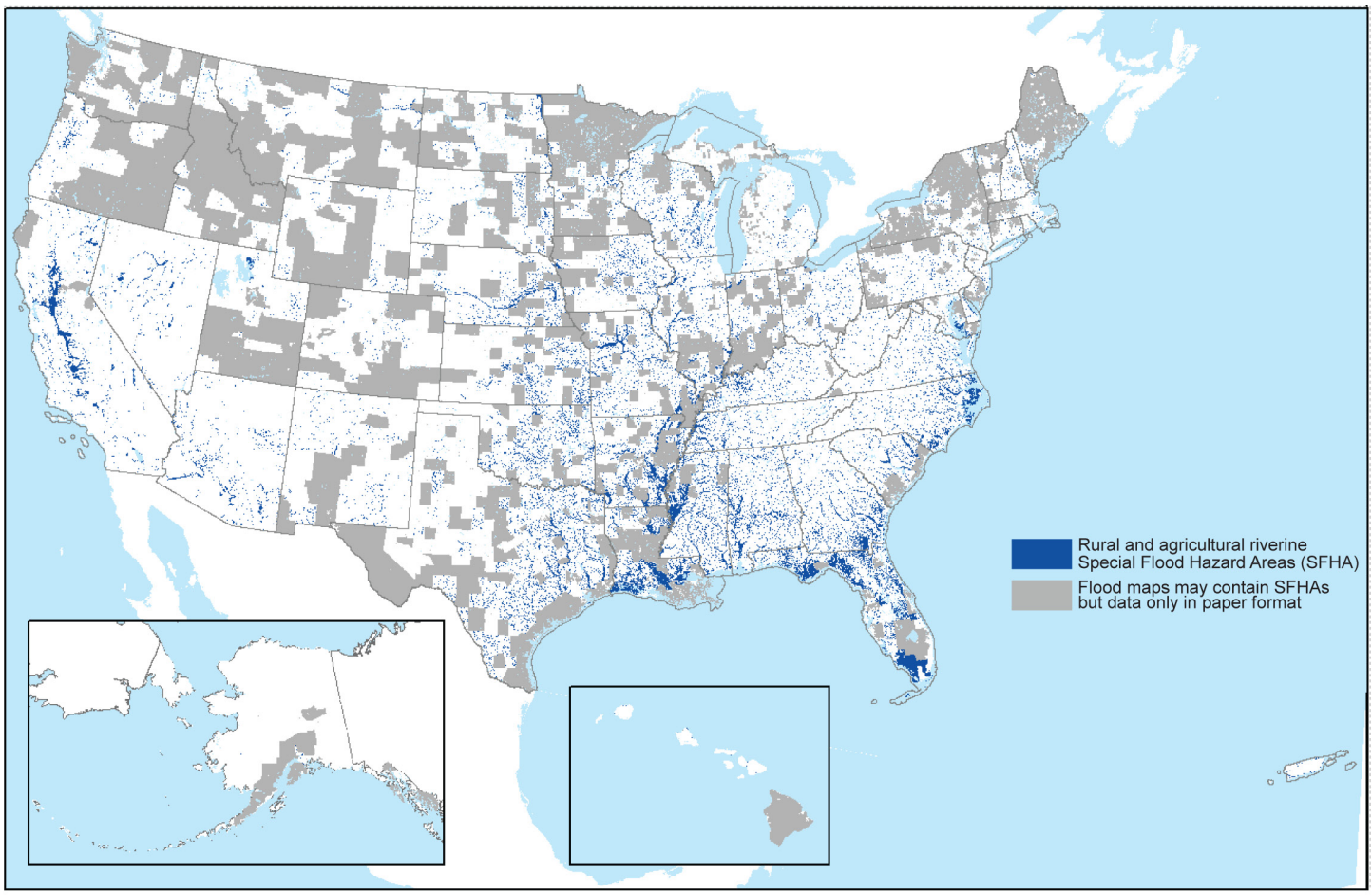
Source: GAO. | GAO-14-583

Rural and Agricultural Areas Located in Riverine SFHAs

Because FEMA does not identify whether floodplains are in urban or rural areas for the purposes of administering NFIP, we used available data to estimate the location of rural communities and agricultural areas in riverine SFHAs. We defined rural areas as areas that are not considered urbanized areas or urban clusters using U.S. Census Bureau data. We defined agricultural areas as those counties with 50 percent or more of their land areas used in agriculture, according to USDA's *Atlas of Rural and Small-Town America*. Figure 2 shows the location of riverine SFHAs according to FEMA's flood map data in the areas we defined as agricultural areas and rural communities.[25]

[25]Figure 2 does not include SFHAs in communities whose maps had not yet been converted to digital format as of February, 2014.

Figure 2: Rural and Agricultural Riverine Special Flood Hazard Areas (SFHA)



Source: FEMA flood map data and GAO analysis of Census and USDA data. | GAO-14-583

Note: The grey areas on the map include both SFHAs and moderate- to low-risk areas, but because the data are only in paper format, SFHAs could not be depicted. Therefore, the rural and agricultural riverine SFHAs on the map may be understated. The white areas on the map include urban areas, coastal areas, rural and agricultural areas of low- or moderate-risk, and unmapped areas. Also, because we considered counties as agricultural if 50 percent or more of their land area was used in farming, we may have captured some urban areas in the rural and agricultural SFHAs depicted on this map.

Our analysis of FEMA data showed that the population mapped in rural and agricultural SFHAs stayed about the same during FEMA's Map Modernization initiative, though certain areas saw increases or

decreases.[26] Specifically, the population in rural and agricultural SFHAs increased by 0.11 percent through Map Modernization, while the population in urban SFHAs decreased by 0.8 percent.

Effects of NFIP Building Requirements Varied for Farmers in Selected Communities, but Additional Guidance May Help Those Adversely Affected

Based on interviews with floodplain management officials, farmers, and others in selected communities, the effects of NFIP's building requirements for agricultural structures have generally varied. To comply with these requirements, new or substantially improved nonresidential structures in high-risk areas must be elevated or dry flood-proofed. FEMA guidance issued in 1993 noted that communities could allow wet flood-proofing that permits water to flow through a structure, for some nonresidential structures, including certain types of agricultural structures located in vast, expansive floodplains. However, the agency acknowledged that the methods included in the guidance do not cover all of the different types of agricultural structures located in vast flood plains with deep flood depths and may not reflect the changes in the size and scale of farm operations in recent years. Without additional guidance from FEMA, farmers may face challenges in effectively complying with its building requirements.

Effects of NFIP Building Requirements Varied, with Some Farmers Having Faced Difficulties Flood-Proofing Agricultural Structures

We found that the effects of NFIP building requirements varied in selected communities and the requirements negatively affected certain farmers who were located in vast floodplains with relatively deep flood depths. We selected eight geographically diverse locations in SFHA riverine floodplains in California, Louisiana, North Carolina, and North Dakota that supported crops or livestock requiring onsite agricultural structures.[27] Representatives from FEMA, USDA, and national floodplain management and farm organizations told us that they were unaware of any farmers in these states or others that faced negative effects on their operations from the NFIP building requirements (e.g., elevation, dry flood-proofing, or wet flood-proofing for certain nonresidential structures). State and local floodplain managers we spoke with from Louisiana, North Carolina, and

[26]We conducted this analysis using FEMA data for all maps that had been converted to a digital format by December, 2011.

[27]Sutter County, California, Yolo County, California, Rapides Parish, Louisiana, St. Landry Parish, Louisiana, Duplin County, North Carolina, Tyrrell County, North Carolina, Cass County, North Dakota, Walsh County, North Dakota.

North Dakota also said that they were not aware of any widespread concerns that farmers were having with NFIP's building requirements or of any negative effects the requirements might be having on agricultural expansion. Correspondingly, 12 farmers in the communities we selected concurred with these views and generally told us that they had not been adversely affected by NFIP building requirements.

However, state and local floodplain managers we spoke with from California said that some farmers in their state had been negatively affected by the requirements. The California state floodplain manager told us that the affected farmers typically lived and operated in agricultural areas behind levee systems that trapped water and had deep flood depths—up to 15 feet in some areas, compared with 1 to 6 feet in other states.[28] The deep flood depths make it difficult for the farmers to build new structures in accordance with NFIP requirements because of the cost and complexity of elevating and dry or wet proofing the new structures. This challenge is especially difficult in several counties along the lower Sacramento River, including Sutter and Yolo Counties where building requirements had affected farmers' ability to expand or rebuild agricultural structures, according to the California state floodplain manager. In addition, representatives of an agricultural floodplain management group whose members are primarily from California's Central Valley said that farmers they represented were concerned about the financial and technical feasibility of elevating or flood-proofing some agricultural structures to meet NFIP's building requirements. The 11 farmers we spoke to in these two communities shared these concerns and told us that they had experienced similar negative effects due to the NFIP building requirements.

Two key factors may partly explain the differing views of farmers in California as compared to those in the other selected rural and agricultural communities regarding the effects of NFIP building requirements. First, SFHAs in the two California communities have greatly increased in size in recent years compared to the other communities (see fig. 3). According to FEMA, the increase was mainly a result of areas behind unaccredited levees at risk of flooding being remapped into SFHAs. Second, the requirement to elevate or dry flood-

[28]According to FEMA, the flood depth—height at which structures should be built—is calculated by the difference between the BFE and ground elevations that is established by topographic surveys.

proof structures above the BFE is harder to meet in the California communities because the flood depth is up to 15 feet in certain areas, compared to the other selected communities in North Dakota and Louisiana whose flood depths range from 1 to 6 feet.

Figure 3: Characteristics of Selected Agricultural Riverine Communities, May, 2014

National Flood Insurance Program community	Percentage of land in Special Flood Hazard Area (SFHA) (most recent map update)	Change in percentage of land in SFHA after most recent map update	Main reason for SFHA change by type of update			
			Hydrology[a]	Hydraulics[b]	Levee analysis	Topography[c]
Sutter County, CA	 **34.7%** (12/2/08)	+79.7% 	■	■	■	
Yolo County, CA	 **40.1%** (5/16/12)	+66.2% 			■	
Rapides Parish, LA	 **30.7%** (6/2/99)	No change	No recent map update			
St. Landry Parish, LA	 **56.6%** (8/5/10)	+3.1% 				■
Duplin County, NC	 **14.2%** (2/16/07)	-10.5% 	■	■		■
Tyrrell County, NC	 **56.4%** (9/19/07)	-34.4% 				■
Cass County, ND	 **15.3%** (7/13/12)[d]	+4.7% 	■	■		■
Walsh County, ND	 **16.6%** (11/2/12)	+21.2% 	■	■		■

Source: GAO summary of FEMA data. | GAO-14-583

[a]According to FEMA, hydrology changes as houses are built, areas are paved, forests are logged, and other development occurs that allows more and faster runoff into streams and rivers.

[b]Hydraulics change as culverts are added and replaced, bridges are added, streams are channelized, and other development occurs that changes the way the water flows through the flooding source.

[c]Updated topography refers to changes in the elevation of the terrain.

Farmers in Louisiana, North Carolina, and North Dakota generally have been able to expand their operations in areas outside of SFHAs. For example, local floodplain managers in Duplin and Tyrrell Counties (North Carolina) told us that huge livestock processing plants were usually built outside of SFHAs after Hurricane Floyd in 1999 destroyed millions of livestock in the state.[29] Because of the severe damage from this hurricane, the state encouraged farmers to build their agricultural structures outside of SFHAs whenever possible. In addition, according to some farmers we spoke to in the selected Louisiana communities, at least a portion of their farmland was in non-SFHA areas, and they built or expanded their agricultural structures in those areas. As a result, they were not required to comply with the NFIP building requirements because those structures were not built in SFHAs. Further, four farmers in the Louisiana communities told us that they generally built their agricultural structures at the highest points on their farms, areas that were outside the SFHA.

In contrast, local floodplain managers from Sutter and Yolo Counties in California told us that these counties are surrounded by levees that were recently de-accredited, which resulted in a large increase of land in the counties to be remapped into SFHAs.[30] They anticipated that more parts of their counties would be remapped into SFHAs as more levees were de-accredited. Some farmers in these counties that we contacted said that because their land had recently been remapped into SFHAs, they did not have much land outside of SFHAs on which to build structures that were not required to meet NFIP's building requirements. As a result, building or expanding structures on the land that is now in SFHAs would be costly and technically difficult. For example, one walnut farmer said that he could not afford to put a processing facility in an area outside of the SFHA because it was more urban, resulting in a higher cost and heavy traffic (in peak season, he has 20 to 30 trucks loading daily). He added that, even if he could afford to put a processing facility outside the SFHA, he could not

[29]Hurricane Floyd was an event that had a 0.2 percent chance of occurring in any given year, destroyed almost 3 million livestock and 2.5 million acres of crops with over $500 million worth of damages. In addition, the total damage of agricultural structures and facilities from the hurricane was estimated to be about $256 million.

[30]Updated levee analysis can result in levee de-accreditation—that is, a determination that a levee no longer meets federal design, construction, maintenance, and operation standards to provide protection from a major flood. Subsequently, areas behind the levees can be remapped into SFHAs. See 44 C.F.R. §§ 65.10, 65.14.

process crops that far from the harvest area (which lay inside the SFHAs) because the walnuts could be damaged during transport.

We also found that the California farmers from our selected communities experienced greater challenges in relation to elevating structures than farmers in other areas. Local floodplain managers from the selected communities in Louisiana, North Carolina, and North Dakota told us farmers in their communities typically needed to raise building foundations by just a few feet (which they were generally able to do by adding fill dirt) to meet the BFE requirements for structures built inside SFHAs.[31] Farmers we spoke to also concurred with these views. For example, a farmer from Louisiana's St. Landry Parish who grows rice and soybeans and raises crawfish told us that although most of his structures were outside of the SFHA, he took precautionary steps to elevate them all—those outside it as well as those within it—by at least 2 feet based on his experience with regular flooding in the past and estimated future flooding trends. However, in both Sutter and Yolo Counties in California, the flood depths were relatively deeper (up to 15 feet in some areas). The Sutter County floodplain manager explained that elevating a structure 3 or more feet could require a base, or building pad, that occupied much more square footage than the structure. It could require additional land to build a slope that was not too steep to allow access to the structure. A slope that was too steep could present an obstacle for truck and equipment movement, making it impractical to conduct business. Further, 7 farmers there told us that it was technically difficult and cost prohibitive to elevate structures to the required height.

According to state and local floodplain managers and farmers we spoke with, farmers in Sutter and Yolo Counties who were subject to the NFIP building requirements were also facing challenges flood-proofing their new or substantially expanded agricultural structures to comply with NFIP building requirements. FEMA allows new, substantially improved, or substantially damaged nonresidential structures, including agricultural structures, to be dry flood-proofed (made watertight below the BFE). However, according to FEMA guidance, dry flood-proofing is often feasible only when the flood depth is less than around 3 feet, because

[31]As mentioned earlier, all new and substantially improved or substantially damaged structures must be elevated to or above the BFE to meet NFIP's elevation requirement. The BFE is the projected elevation which floodwater is anticipated to equal or exceed during a flood that is estimated to have a 1 percent chance of occurring in any given year.

deeper flood depths produce pressure on structures that may crack the walls or cause them to collapse. In addition, a local floodplain manager and a farmer told us that, regardless of the flood depth, it would be difficult to dry flood-proof structures used for rice and fruit drying because these buildings needed large openings for fan exhausts to dry the crops and prevent moisture from spoiling them (see fig. 4).

Figure 4: Rice Drying Structure, an Example of a Structure That Is Difficult to Dry Flood-proof because Openings Are Needed for Fan Exhaust (Sutter County, Calif.)

Source: GAO. | GAO-14-583

Guidance on Alternative Methods for Flood-Proofing Does Not Fully Address Risks in Vast, Deep Flood Depth Areas

FEMA has provided guidance on wet flood-proofing as an alternative to elevation and dry flood-proofing for certain nonresidential structures, including agricultural structures, but officials recognize that this guidance still may not be sufficient for assisting farmers in riverine floodplains with deep flood depths. Realizing the need to provide alternative methods to meet building requirements after a catastrophic flood in the Midwest in 1993, in the same year, FEMA issued guidance that allowed certain structures that cannot be elevated or dry flood-proofed to be wet flood-proofed, allowing water to flow through a building while minimizing

damage to the structure and its contents.[32] However, wet flood-proofing may not be viable for certain agricultural structures. For example, according to Sutter County's floodplain manager, USDA and the Food and Drug Administration have requirements for the water-tight storage of certain farm products, making wet flood-proofing not a viable option. The walnut farmer from Sutter County that we spoke to further explained that as a result of these requirements, he had to seal the structure to prevent cross-contamination of different crops, something that is important for allergy sufferers. Another farmer told us that if water could get into openings, so could pests that would damage crops. Further, crops such as rice would be ruined if moisture enters the structure.

Furthermore, FEMA's current guidance does not take into account important changes to the agricultural industry that have occurred in recent years. According to FEMA and USDA officials, the agricultural industry has become more consolidated, which has greatly increased the size and scale of farm operations. For example, supporting agricultural structures are now much more expensive to build and replace and may represent unique challenges not envisioned in the existing guidance. Such changes in the agricultural industry underscore the need for FEMA to periodically update and provide additional guidance that reflects current conditions.

The absence of current guidance on alternative methods has led some farmers to "work around" the building requirements. Six farmers we interviewed in Yolo and Sutter Counties in California told us that they worked around the building requirements while trying to expand their businesses. Two farmers in these communities told us that they had quickly built their facilities before flood map revisions placed their farms in SFHAs. A nursery farmer in Sutter County built a laboratory in an existing warehouse to avoid building a separate structure, although he lost the warehouse function. Three of the farmers said that instead of building new structures, they were careful to make incremental additions or

[32]See FEMA, *Wet Flood-proofing Requirements for Structures Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program*, Technical Bulletin 7—93, (Washington, D.C.: December 1993). The guidance specified that only certain agricultural structures can be wet flood-proofed using techniques that will result in minimal damage to the building and contents and create no additional threats to public safety. For example, confined animal feed lots are not allowed to be wet flood-proofed. Because wet flood-proofed structures are generally exposed to higher risks than those that meet the elevation or dry flood-proofing requirements, the insurance rates are generally significantly higher.

repairs that were below NFIP's substantial improvement threshold.[33] Two of the farmers also told us that, rather than building anything separately, they attached every expansion to an existing structure, thus sacrificing space for loading and unloading. Because it is costly, or, in certain circumstances, not technically feasible to comply with current NFIP building requirements, some farmers in our selected California communities were concerned about future expansion after recent map updates. Three farmers cited the importance of agriculture to the local economy and said that agriculture was the best use for floodplains.[34] However, these workarounds may not fully address the long-term expansion needs of these farmers, and more importantly, the workarounds may ultimately defeat the purpose of the NFIP building requirements because they may increase the risks of flood damage to the structures.

FEMA officials stated that it is their practice to update technical guidance as needed and recognized that the challenges some farmers faced in expanding or building agricultural structures in SFHAs might call for additional approaches for complying with NFIP building requirements. Officials explained that FEMA has not updated the guidance for wet flood-proofing in over 20 years because the agency thought the guidance covered the types of agricultural structures that could be feasibly wet flood-proofed. However, FEMA has identified the need for better ways to protect structures, especially in wide, expansive floodplains where flood depths may range from a few feet to 20 feet or more in depth. In particular, FEMA officials said they would like to further evaluate the vulnerability of structures and their contents to flood hazards and identify how mitigation measures, such as elevation, dry and wet flood-proofing,

[33]As mentioned earlier, FEMA defines a substantial improvement as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement, with exceptions for certain types of structures. Substantial damage is damage of any origin for which the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the building before the damage occurred.

[34]According to California's Department of Water Resources and the Central Valley Flood Protection Board, California is the top producer of agricultural products in the United States. The Central Valley of California (where Sutter and Yolo Counties are located), provides approximately 25 percent of U.S. food supply; it provides approximately 50 percent of U.S.-grown fruits, nuts, and vegetables.

and other measures could be used to minimize flood damage. FEMA also plans to solicit input from structure manufacturers and from farmers.

FEMA officials told us that they intend to begin updating all technical bulletins, including the 1993 bulletin, in the next 18 months; however, they are at a preliminary stage and have not yet identified resources for such a study or determined its scope and time frames for completion. In addition, FEMA officials told us that, although a recent statutory mandate in the 2014 Act for providing new guidelines on alternatives to elevation is specifically required for residential structures, they plan to issue broader guidance that could apply to nonresidential structures as well.[35]

Without updating and providing additional guidance, FEMA is missing an opportunity to help farmers who face challenges in effectively complying with its building requirements, especially if more agricultural production areas are remapped into SFHAs. Such guidance may not only be needed by farmers in the selected communities in California that we reviewed, but also in other similar agricultural areas across the country. Specifically, FEMA officials noted that there are other agricultural areas in vast riverine floodplains with deep flood depths across the country— some up to 37 feet—including Southwest Illinois, Northeast Arkansas, Southwest Mississippi, Southeast North Carolina, and Northwestern Missouri.

Building Requirements Have Had Other Negative Effects on Rural Communities

Some stakeholders from selected communities stated that NFIP's building requirements in SFHAs could contribute to the long-term economic decline of some small towns in rural areas. The local floodplain manager from Yolo County told us that in addition to difficulties in building and expanding agricultural structures, demand for farm worker housing is strong, and the requirement that new or substantially improved homes be elevated up to or above the BFE, which can be up to 15 feet, adds significantly to the already high price of housing. The floodplain manager stated that NFIP building restrictions that make it infeasible to build or expand agricultural structures, including farm worker housing, could

[35]Section 26 of the 2014 Act directs FEMA to establish guidelines for property owners that provide alternative methods of mitigation, other than building elevation, to reduce flood risk to residential buildings that cannot be elevated due to their structural characteristics. The guidelines are also to inform property owners how the implementation of such mitigation methods may affect their flood insurance premiums. Pub. L. No. 113-89, § 26, 128 Stat. at 1032 (codified at 42 U.S.C. § 4102(d)).

reduce both the tax base and the economic stability of the county by driving agricultural businesses elsewhere. However, according to FEMA, the current building requirements are effective in reducing flood-related damage and the loss of life because of specific requirements, such as elevation. Further, according to FEMA, properties that adhere to building requirements sustain less damage and as a result, may have lower insurance premiums, which in turn could make insurance rates more affordable and attract broader participation in the program.[36]

Farmers and rural residents we interviewed in Yolo County expressed similar concerns about the economic viability of their communities. For example, one farmer told us that a small nearby town that had been remapped into an SFHA would likely have trouble attracting viable businesses to keep the community thriving, because the building restrictions meant that businesses could only take over existing structures. Some residents of Yolo County also told us their fire station needed a new roof, which would have been considered a substantial improvement because its cost would have exceeded 50 percent of what the building was worth. However, according to the residents, the county had not allowed permits for any new buildings or substantial improvements to existing buildings since the 2012 map update because FEMA had not designated the BFE for the community. For these reasons, and because undertaking a substantial improvement would have meant elevating or dry flood-proofing the fire station, the town had to do minimal repairs, keeping the costs under the substantial improvements threshold.

Mandatory Purchase Requirements and Premium Changes Have Affected Rural Residents More Than Farmers

The mandatory purchase requirement and premium changes resulting from remapping and the elimination of subsidies and grandfathered rates appear to have affected rural home markets more than they have farming operations. For example, some homes affected by these changes might have lost value and become harder to sell and some development has been halted according to some state and local floodplain managers, rural residents, and developers we spoke with. Further, farmers often did not need to buy flood insurance on some structures because they were able to provide their own financing or take other measures, such as obtaining a loan only on land without structures.

[36]For more information, see FEMA, *Including Building Codes in the National Flood Insurance Program, Fiscal Year 2013 Report to Congress, Impact Study for Biggert-Waters Flood Insurance Reform Act of 2012 (*Washington, D.C.: October 2013).

Mandatory Purchase Requirement's Effect on the Residential Home Market

The mandatory purchase requirement and potential premium rate increases associated with recent map updates and, in some cases, legislative changes to NFIP, are likely to affect the residential real estate markets in rural areas more than the farming operations in those same areas, according to state floodplain managers and other stakeholders in our selected communities.[37] Representatives from national farm organizations were unaware of any effects of the mandatory purchase requirement on farmers; and local floodplain managers, agricultural lenders, and 12 farmers we spoke with in the selected communities generally agreed that mandatory purchase requirements had not affected agricultural land values.

However, all of the state floodplain managers with whom we spoke had heard concerns about the effects on the rural residential real estate market of increased rates resulting from the elimination of some subsidies and grandfathering provisions. In addition, some local floodplain managers, agricultural lenders, and five farmers we spoke with expect that being mapped into an SFHA would have a negative impact on the value of residential housing in certain communities either now or in the future. For instance, one agricultural lender in both selected communities in Louisiana said that being mapped into an SFHA would decrease the value of residential homes on the market in rural communities because of the increased cost of flood insurance premiums. Also, a resident with whom we spoke who lived in a rural part of Louisiana's Rapides Parish said that being mapped into an SFHA had reduced the value of his house and made it more difficult to sell, because prospective buyers would see it as prone to flooding. Similarly, in Walsh County, North Dakota, three residents told us that the requirement to buy flood insurance and the rate increases seen in their community after the SFHA was expanded in a 2012 map update had nearly halted the residential real estate market in their community. One resident said that he had tried to move but could not, because potential buyers walked away when they realized his home was in an SFHA.

[37]The premium rate increases we discuss in this section are primarily due to recent map updates that have placed portions of selected communities in SFHAs. In addition, stakeholders in some communities had concerns about rate increases they anticipated due to the Biggert-Waters Act. Some of these concerns, however, may no longer be relevant because the 2014 Act eliminated some of the sections of the Biggert-Waters Act that would have resulted in rate increases for some policyholders.

Some concerns were also raised about the overall affordability of NFIP insurance for homeowners mapped into SFHAs. Representatives of the Property Casualty Insurers Association of America told us that remapping would likely cause some affordability concerns as more areas were moved into high-risk zones. However, they noted that remapping would likely not impact residents of rural areas any differently than it would remapped residents in urban areas. Similarly, two residents of Walsh County, North Dakota, told us that the rate increases associated with their recent map change had made it hard for them to now afford to live in their homes. Concerns were also raised about the affordability of insurance premiums and the impact on the housing market once the phasing out of subsidized rates established in the Biggert-Waters Act and the elimination of grandfathering provisions began, but some of these concerns may no longer be relevant, because the 2014 Act amended sections of the Biggert-Waters Act that would have resulted in rate increases for some residential policyholders.

At the same time, local floodplain managers and residents of some selected communities said that NFIP insurance requirements associated with being in an SFHA could lead to positive outcomes for rural towns, including more mitigation actions and less development in the floodplain. For instance, the local floodplain manager of Duplin County, North Carolina, said that the few homeowners in the SFHA who had not elevated their homes would probably choose to do so, since mitigation actions could lower premium rates. Similarly, a resident of Walsh County, North Dakota who was concerned about rate increases after being mapped into an SFHA, said that he and some of his neighbors had already elevated their homes above the BFE or were considering elevating them. In addition, the local floodplain managers from Sutter County, California, and Duplin County, North Carolina, both stated that inhibiting development in SFHAs could help manage the adverse impacts of floods and help meet one of FEMA's goals of mitigation. We heard about areas in most of our selected communities where development had begun prior to a map update but was halted when the areas were remapped into SFHAs. For example, in Yolo County, California, and St. Landry Parish, Louisiana, we visited developments that had been partially built before being remapped into SFHAs. The developers in both areas said that the elevation requirements and probable decline in the value of the homes because of the flood insurance requirements would make further development economically infeasible. In both cases, the developers were not sure what would happen to the undeveloped land. We also heard from local floodplain managers in Duplin County, North

Carolina, and Yolo and Sutter Counties in California that being mapped into an SFHA had halted development in parts of their counties.

While the lack of development in SFHAs may be beneficial for floodplain management, the local floodplain managers and other stakeholders in Yolo and Sutter Counties in California noted the possible negative effects of being remapped into SFHAs—including changes in building requirements and insurance costs—on residents of small rural towns. As with building requirements, members of the selected communities said that insurance costs associated with being remapped into an SFHA could contribute to the long-term economic decline of some small towns. For instance, the local floodplain manager in Yolo County, California, told us that the town with the unfinished development that we discussed previously would probably enter a long, slow decline, in part because of recent changes in building requirements and insurance costs resulting from being remapped into an SFHA. He added that not only was it no longer economically feasible to develop certain areas within the town's borders, but also most of the town's inhabitants were farm workers who could not afford flood insurance for their houses. However, he said that NFIP requirements were only one factor that was impacting the economic future of this town. In addition, he noted that changes to building requirements and insurance costs resulting from being remapped into an SFHA would not impact all small towns in the same way and that other towns in the community would prosper despite being remapped into SFHAs. An agricultural lender we spoke with in Yolo County agreed that being remapped into SFHAs could have long-term economic impacts on rural towns that depended on the agricultural economy, because farm businesses that were already operating on thin profit margins could be hurt by the additional cost of flood insurance. This is because farmers must accept the market price for their crops, and therefore it may be difficult to pass the price of flood insurance on to their customers, according to one farmer and one lender we spoke with in California. In addition, the local floodplain manager in Sutter County said that some small businesses that supported agriculture, such as a local tractor dealership, had already seen premium rate increases due to the Biggert-Waters Act eliminating their subsidies. He believed that some of these small businesses would have to close because they would not be able to afford the full-risk rates for business structures.

Many Farmers May Not Be Required to Buy Flood Insurance

Like NFIP's building requirements, the mandatory purchase requirement and changes in flood insurance premiums have had limited effects on farmers we spoke to in the selected communities, except some in California. Many of those we spoke with—including FEMA and USDA officials, representatives of national farming organizations and a floodplain management organization, all state floodplain managers, and one insurance industry organization—were not aware of farm businesses that had been adversely impacted by flood insurance costs. However, representatives of an agricultural floodplain management group, whose members were primarily from California's Central Valley, said that its members were concerned that the cost of flood insurance on their structures in areas that had recently been remapped into SFHAs could make their businesses unsustainable. For example, according to a rice farmer in California, recent mapping updates placed his structures in an SFHA, raising his flood insurance premiums substantially. He said that his flood insurance premiums were now his third largest production expense. Three farmers in Yolo and Sutter Counties and the local floodplain manager in Sutter County were also concerned about rate increases they expected in the next year as NFIP moved toward full-risk rates.[38] However, six farmers we spoke with in the California communities told us that their flood insurance premiums were a very small portion of their total production cost. In addition, some of the farmers from these communities chose to purchase flood insurance even though they were not required to do so and considered it another cost of doing business.

According to state floodplain managers for most of the selected communities, many farmers were not required to insure their structures, for varying reasons. For instance,

[38]Many farmers in Sutter County were receiving PRP Eligibility Extension program rates, according to the floodplain manager for Sutter County. As we previously discussed, FEMA offered the PRP Eligibility Extension program as a cost-saving option for property owners whose buildings had been mapped into SFHAs after October 1, 2008. This extension allowed policyholders to pay a lower premium rate until the policy is converted to the more expensive rate. On October 1, 2013, FEMA introduced a rate change that increased premiums for those under the PRP Eligibility Extension program by 20 percent. FEMA had intended to raise the rates on these policies 20 percent per year until they reached the full-risk rate, as allowed under the Biggert-Waters Act. However, the 2014 Act reduced FEMA's maximum premium increase authority from 20 percent to 18 percent, which will apply to the policies currently insured in the PRP Eligibility Extension program. FEMA is now reviewing what will be done with these policies under the 2014 Act.

- In the two Louisiana communities we reviewed, all but one of the farmers with whom we spoke had farm structures only on parts of their land that lay outside SFHAs. None of these farmers voluntarily purchased flood insurance on these structures.
- In North Carolina, the floodplain manager said that many farms in the state were sponsored by large corporations that funded the construction of any necessary structures, and as a result farmers did not need loans that might include a mandatory purchase requirement.

In contrast, the floodplain manager from California said that institutions that provided loans to farmers for structures, such as rice or prune dryers, might require flood insurance as a condition of the loan, even if they were not required to do so.

Farmers may also take measures to avoid the requirement to buy flood insurance on their farm structures, although some of these measures may limit their ability to expand their business. The North Dakota floodplain manager and an agricultural lender from North Dakota stated that farmers often found ways to avoid the mandatory purchase requirement by, for instance, not pledging their structures as collateral for a loan. In addition, according to some agricultural lenders, local floodplain managers, and farmers in the selected communities, farmers might take other steps. For instance,

- Farmers may divide their land into separate parcels before they apply for a loan so that they can apply for a loan only on parcels that do not have any structures.[39] A farmer in Sutter County, California, who had used this method to avoid buying flood insurance noted that it limited his options for receiving financing for his business, because he could not seek as much financing as he could if he chose to use all of his land as collateral.
- Farmers may tear down old structures or remove walls from them so that NFIP no longer considers them "insurable."[40]
- Farmers may fund business changes with cash rather than with loans on land with structures. One farmer we spoke with in Yolo County

[39]However, farmers we spoke with in Yolo County, California, said that the county did not allow them to separate their land into different parcels in an effort to discourage development.

[40]Among other requirements, buildings with two or more outside rigid walls and a fully secured roof that are affixed to a permanent site are considered insurable structures, according to NFIP regulations. 44 C.F.R. § 59.1.

delayed planting a new crop because he lacked the cash to do so and did not want to take out a loan because he would have had to purchase flood insurance. He said that he expected it would take him 2 years to raise the needed money.

Also, almost all (five of six) of the agricultural lenders with whom we spoke had concerns about requiring farmers to purchase flood insurance on farm structures that had little or no value, such as dilapidated sheds or chicken coops.[41] These lenders told us that this issue was their most significant concern in implementing the mandatory purchase requirement for farm loans. These structures often provide little to no economic value to farmers, and lenders said that they would not require insurance on them in the absence of the mandatory purchase requirement because they did not need to use the structures as collateral. Two of the lenders told us that they had lost business because of this requirement. Further, one lender told us that it was difficult to determine the replacement value of a building that the appraiser valued at zero or in some cases did not even include in the appraisal.[42] One lender told us that in these situations their loan officers worked with the farmers to exclude the structures from the mortgage to avoid the mandatory purchase requirement.

[41]According to FEMA officials, the mandatory purchase requirement is regulated by banking regulators, not by FEMA. They stated that FEMA did not have the legal authority to require lenders to ensure that their customers complied with the mandatory purchase requirement.

[42]The Flood Disaster Protection Act of 1973, as amended, requires that lenders have their interests insured to the lowest of three values: (1) the maximum amount of insurance available through NFIP, (2) the full replacement value of the building, or (3) the outstanding principal balance of the loan. Pub. L. No. 93-234, § 102(a), 87 Stat. at 978 (codified as amended at 42 U.S.C. § 4012a(a). In the case of agricultural loans that cover several structures, the replacement value of a small farm structure, such as a barn or shed, may likely be the lesser amount of the three.

Options to Address Concerns about NFIP Requirements in Agricultural and Rural Areas Involve Trade-Offs and Risks

Local floodplain managers, farmers and lenders identified several options to help farmers located in SFHAs manage NFIP requirements for building new or substantially improved structures and lowering the cost of NFIP insurance. The most commonly cited option involved exempting agricultural structures from NFIP building requirements and the mandatory purchase requirement. Other options included charging insurance premiums based on an area's historical flood losses, accounting for some level of protection by certain unaccredited levees, providing need-based assistance to farmers and rural residents, and increasing funding for mitigation efforts. However, FEMA officials, experts from national floodplain management and city and regional planning organizations, and academics told us that many of these options carried risks and may run counter to the NFIP objectives.

Exempt Agricultural Structures. The most commonly cited option from farmers and local lenders, mainly from California and Louisiana, involved exempting new agricultural structures and those that needed substantial improvements from NFIP building requirements and the mandatory purchase requirement. Legislation has been proposed to amend NFIP to include relaxing NFIP requirements for some agricultural structures, including the Agricultural Structures Building Act of 2013, which aims to allow farmers to repair, expand, and construct agricultural structures without elevation in SFHAs.[43] In addition, one group has advocated the creation of a separate agricultural zone that would not require expensive elevation and dry flood-proofing but would require wet flood-proofing of certain structures. Some farmers from Sutter and Yolo Counties in California told us that they did not believe that the flood risk for their areas was high, since these counties have not experienced a major flood since the 1950s. The farmers have said that they would be willing to assume all risks and opt out of federal disaster relief if they could expand and construct buildings without being required to follow NFIP building requirements.

However, experts from national floodplain management organizations and academics told us that such exemptions were counter to the objectives of NFIP and carried significant risks. For example, one expert indicated that it might be difficult to differentiate agricultural structures from other nonresidential structures that may also store agricultural products (e.g., a

[43]H.R. 3315, 113th Cong. (2013).

corner store or a large industrial facility that may also store grain in an adjacent warehouse). He said that the tendency would be to classify any structures that could be remotely related to agriculture as agricultural structures. Further, experts we spoke to indicated that such an exemption could set a precedent, leading others to ask for similar exemptions.

FEMA officials shared these views, adding that FEMA had no legal authority to allow farmers or any other specific population group to opt out of disaster relief. According to FEMA officials, allowing farmers to assume all risks and not receive disaster relief would require further legislative changes to the Stafford Disaster Relief and Emergency Assistance Act.[44] Furthermore, one of the primary goals of FEMA's building requirements is to help reduce flood-related property damage. Complying with FEMA's building requirements would reduce flood-related losses and lower insurance premiums for compliant structures, according to FEMA officials. They added that this reduction in turn may help attract broader participation in the program. Exempting structures may defeat this goal and encourage farmers to build noncompliant structures in high-risk areas that may inadvertently cause damage to nearby communities, according to officials. For example, agricultural structures that do not adhere to building requirements—that is, that are not elevated or flood-proofed—could be washed downstream, creating blockages that could cause additional flooding in communities there. Both FEMA and the experts told us that while farmers might view their choices as affecting only themselves, flood mitigation needed to be considered holistically from the perspective of risks to the larger community. Further, experts indicated that exempting structures may reinforce farmers' potential misperceptions of their flood risks.

Charge Insurance Premiums Based on Historical Losses to Flooding. Some farmers, rural residents, state and local floodplain managers, and other organizations have suggested creating a variable premium rate structure based on historical flood risks in different areas. For example, some farmers from California told us that they should pay lower flood insurance premiums than others residing in areas that the farmers consider to be more flood-prone areas, such as coastal areas, as these farmers had not experienced flooding since the 1950s and did not

[44]Robert T. Stafford Disaster Relief and Emergency Assistance Act, Pub. L. No. 93-288, 88 Stat. 143 (1974) (codified as amended at 42 U.S.C. §§ 5121-5207).

perceive their flood risks as significant. However, according to FEMA the premium rates are determined by flood zone, among other factors, and policyholders in high-risk coastal areas (V zones) already pay higher rates than policy holders in other zones. Further, FEMA stated that flood maps already account for historical floods, in addition to other factors. According to the national floodplain management expert we spoke with, some states that had so far collected less in claims from NFIP than other states might welcome this option.[45] But they also noted that people tended to underestimate their long-term flood risks.[46]

Exempt Low-Value Agricultural Structures. As mentioned earlier, lenders from four of the selected communities suggested giving them the flexibility to decide whether a farmer needed flood insurance on low-value agricultural structures. Some lenders told us that they did not need to use the low-value structures as collateral. Experts indicated that this option could be further explored, provided that independent third parties appraised the structures and confirmed their values. FEMA officials also noted that federal financial regulators, not the agency, set the standards for insurance requirements for low-value structures and that FEMA did not have the authority to dictate to lenders what they could do. According to FEMA, in some instances lenders may require insurance even though it may not be required under the law. Therefore, farmers may face the prospect of paying for flood insurance coverage on properties that have low value.

Account for Some Protection Provided by Unaccredited Levees. According to a floodplain manager from Sutter County, California, and others, unaccredited levees still provide some protection and insurance

[45]We have previously reported that it takes only one catastrophic event to change a state from a net contributor to a net beneficiary of NFIP. We conducted state-by-state analyses of claims and premiums data and found that, for example, Louisiana was a net contributor until 2004, and it became a net beneficiary primarily because of Hurricanes Katrina, Wilma, and Rita. See GAO, *Flood Insurance: FEMA's Rate-Setting Process Warrants Attention*, GAO-09-12 (Washington, D.C.: Oct. 31, 2008).

[46]Prior studies using modeling have demonstrated that severe flooding in this area of California is indeed a real risk. In 2011, for emergency planning purposes, scientists from the U.S. Geological Survey designed a large, scientifically realistic winter storm scenario, "ARkStorm," by combining prehistoric geologic flood history in California with modern flood mapping and climate-change projections. The hypothetical storm could produce up to 10 feet of rain, causing extensive flooding. Specifically, the Central Valley would experience flooding 300 miles long and 20 or more miles wide and result in agricultural and other losses of nearly $400 billion.

premiums should reflect this fact. The experts we spoke with said that this option would help adjust insurance rates and provide more flexibility for policyholders in adhering to NFIP building requirements and mandatory purchase requirements. FEMA recognizes that unaccredited levee systems may still provide some measure of protection against flooding and has developed Levee Analysis and Mapping Procedures (LAMP) to account more precisely for the level of protection levees provide when mapping flood risk.[47] LAMP's goal is not to reduce insurance rates but to use the best scientific methodologies to more accurately determine flood risks and help ensure that premiums are based on the most accurate determination of flood risk. For example, LAMP may determine that an area around the levee should be in zone D (a non-SFHA area with undetermined risks). The levee may still technically not be accredited, but structures located in zone D have no mandatory purchase requirement or building requirements because it is not considered as SFHA. Policyholders in this zone would not be required by law to purchase insurance, but FEMA strongly advises that they do. However, some experts said that determining the safety of levees was difficult. FEMA officials noted that while LAMP allowed for a more detailed analysis of unaccredited levees, this analysis might not always result in lower BFEs, smaller SFHAs, or reduced NFIP premiums. FEMA and other experts emphasized that levees were never 100 percent safe and that communities needed to acknowledge the possibility that any levee—including those that are accredited to provide protection for a 1 percent annual event—could fail.

Provide Need-Based Assistance. Some farmers also cited need-based assistance as an option to help those who could not afford NFIP premiums to meet the insurance requirements. In general, stakeholders agreed that this option warranted further exploration, since flood insurance has been an affordability issue for many people. We have previously identified targeted assistance or subsidies based on financial need of policyholders as an option to consider to reduce the financial impact of subsidies on NFIP.[48] However, FEMA officials pointed out that

[47]Under FEMA's prior levee approach before LAMP, a levee system that did not meet the NFIP requirements was analyzed and mapped as if it had no effect on the landward side of the levee system during the base flood. If a levee did meet the requirements, it was accredited, and communities with accredited levees may be mapped in a lower risk flood zone.

[48]See *GAO, Flood Insurance: More Information Needed on Subsidized Properties*, GAO-13-607 (Washington D.C.: July 3, 2013).

the agency currently does not have the statutory authority or resources to provide need-based and targeted assistance to help property owners with NFIP insurance premiums. As required by the Biggert-Waters Act and the 2014 Act, the National Academy of Sciences is studying the issue of affordability but has not yet produced its report.[49] FEMA officials said that it would be premature to comment on how need-based assistance might operate.

Increase Funding for Mitigation. State floodplain managers from California and Louisiana and a local floodplain manager from North Carolina advocated providing additional resources for mitigation efforts. According to FEMA, mitigation efforts lead to lower premium costs and more effectiveness against flood damage. However, the experts explained that some local communities, especially rural ones, lacked the expertise and administrative capabilities to apply for and administer grants for mitigation activities.[50] Furthermore, not all communities are aware of these mitigation programs. FEMA officials added that they currently received applications requesting three to four times the available funding, as the program was oversubscribed. In addition, the applications are reviewed at the state level, and state officials generally give priority to areas with critical facilities such as power plants and hospitals and to

[49]The Biggert-Waters Act requires FEMA to enter into a contract with the National Academy of Sciences to inform its study of participation and affordability for certain policyholders. Pub. L. No. 112-141, § 100236, 126 Stat. 405, 957 (2012). The study is required to include methods to maintain participation, methods to educate consumers about flood risk, and alternatives to subsidies to address affordability, including means-tested vouchers. FEMA has projected an April 2015 completion date for this study. The 2014 Act provides additional time—until September 2015—to complete this study. Pub. L. No. 113-89, § 16, 128 Stat. 1020, 1026 (2014). It also provides more funding for the study and includes several new requirements, such as identifying options for maintaining affordability if annual premiums increase to an amount greater than 2 percent of the liability coverage on the policy. Further, the 2014 Act requires FEMA to submit to Congress a draft affordability framework, based in part on the affordability study, within 18 months of the study's completion. *Id.* § 9, 128 Stat. at 1024.

[50]FEMA supports a variety of flood mitigation activities that are designed to reduce the risk of flood damage and the financial exposure of NFIP. These activities, which are mostly implemented at the state and local levels, include hazard mitigation planning; the adoption and enforcement of floodplain management regulations and building codes; and the use of hazard control structures such as levees, dams, and floodwalls or natural protective features such as wetlands and dunes. Additionally, property-level mitigation options include elevating a building to or above the area's base flood elevation, relocating the building to an area of less flood risk, or purchasing and demolishing the building and turning the property into green space.

large communities with high population densities, according to FEMA officials.[51] The officials indicated that in general, agricultural areas and rural communities may be unlikely to meet these criteria and thus may have difficulty obtaining mitigation funding.

Conclusion

A number of rural and agricultural areas have recently been mapped into SFHAs. Farmers with new or substantially improved structures in these areas must now comply with NFIP building requirements, and farmers in some locales—specifically counties that we visited in California—face challenges meeting them. Based on information from FEMA, complying with NFIP's building requirements may be a broader problem applicable to agricultural communities that have vast floodplains with deep flood depths similar to those in California. The two options of complying with the program's building requirements—elevating and dry flood-proofing—are not always feasible for certain structures in these types of locations. For example, farmers in areas with deep flood depths cannot realistically elevate large structures to meet FEMA requirements and may not be able to dry flood-proof all structures. With regard to wet flood-proofing for some nonresidential structures, including certain agricultural structures, FEMA last updated its guidance for granting such variances in 1993. Although FEMA typically updates guidance as needed and acknowledges the challenges some farmers face, it has not updated its guidance with alternatives for complying with building requirements in over 20 years, or expanded it to reflect changes in the agricultural industry. Updated and detailed guidance that provides alternative mitigation methods for protecting agricultural structures from flooding and takes into account relevant changes to the agricultural industry would be an important step in assisting farmers in identifying feasible alternatives to complying with building requirements in expansive floodplains with deep flood depths.

Recommendation for Executive Action

As FEMA determines the scope of its efforts to revise its existing guidance, we recommend that the Secretary of the Department of Homeland Security (DHS) direct the Administrator of FEMA to update existing guidance to include additional information on and options for

[51]We have also previously reported on the advantages and disadvantages of need-based assistance and increased mitigation efforts when considering reforming NFIP. For more information, see GAO-13-607; and *Overview of GAO's Past Work on the National Flood Insurance Program,* GAO-14-297R (Washington D.C.: Apr. 9, 2014).

mitigating the risk of flood damage to agricultural structures to reflect recent farming developments and structural needs in vast and deep floodplains.

Agency Comments

We provided a draft of this report to the Department of Homeland Security (DHS) for its review and comment. DHS provided written comments that are presented in appendix IV. In its comments, DHS concurred with our recommendation to update existing guidance to include additional information on and options for mitigating the risk of flood damage to agricultural structures to reflect recent farming developments and structural needs in vast, deep floodplains. In particular, the letter noted that FEMA recognizes that agriculture is a good use of the floodplain. Further, changes in the agricultural industry and the diversity of agricultural structures are important to recognize in future guidance. FEMA stated that it is working to determine the best approach to update its guidance, but has not yet determined a completion date. FEMA also provided technical comments, which we incorporated, as appropriate.

As agreed with your offices, unless you publicly release the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to FEMA and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-8678 or garciadiazd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix V.

Daniel Garcia-Diaz
Director, Financial Markets and Community Investment

Appendix I: Objectives, Scope, and Methodology

This report discusses (1) the effects on farmers and rural residents of the National Flood Insurance Program's (NFIP) building requirements for agricultural and residential structures, (2) the effects of the mandatory purchase requirement and changes in premium rates, and (3) options that have been proposed to address any issues resulting from changes to NFIP requirements and stakeholders' views on these proposals. We focused our review on riverine rural and agricultural floodplains and excluded coastal areas.[1]

For all objectives, we analyzed relevant laws, as well as Federal Emergency Management Agency (FEMA) regulations and policies, including building requirements for properties located in special flood hazard areas (SFHA), flood mapping modernization efforts, and the analysis and mapping procedures for unaccredited levees.[2] We analyzed statutory requirements such as the mandatory purchase requirement for properties located in SFHAs. We reviewed the Biggert-Waters Flood Insurance Reform Act of 2012 (the Biggert-Waters Act), including provisions to phase out some premium subsidies.[3] We also reviewed provisions of the Homeowner Flood Insurance Affordability Act of 2014 (2014 Act) that repealed or altered portions of the Biggert-Waters Act.[4] We identified and reviewed research on the effects of NFIP requirements on farmers and rural residents.

To obtain views on the effects of NFIP's building and insurance requirements on farmers and rural residents, we met with a number of stakeholders. These included federal officials, representatives of national farming organizations (i.e., American Farm Bureau Federation, Association of State Departments of Agriculture, National Farmers Union, and American Farmland Trust), and national floodplain and city and

[1]We defined riverine floodplain as any area lying outside of the coastal areas that was at a high risk of flooding. FEMA defines coastal areas as those areas that face potential storm surges and wave actions.

[2]Levees are man-made structures, usually earthen embankments, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide protection from temporary flooding. 44 C.F.R. § 59.1. Levees that are accredited by FEMA can result in a community being mapped in a flood zone with a lower risk than it would be without the accredited levee.

[3]Pub. L. No. 112-141, Div. F, Tit. II, Subtit. A, 126 Stat. 405, 916 (2012).

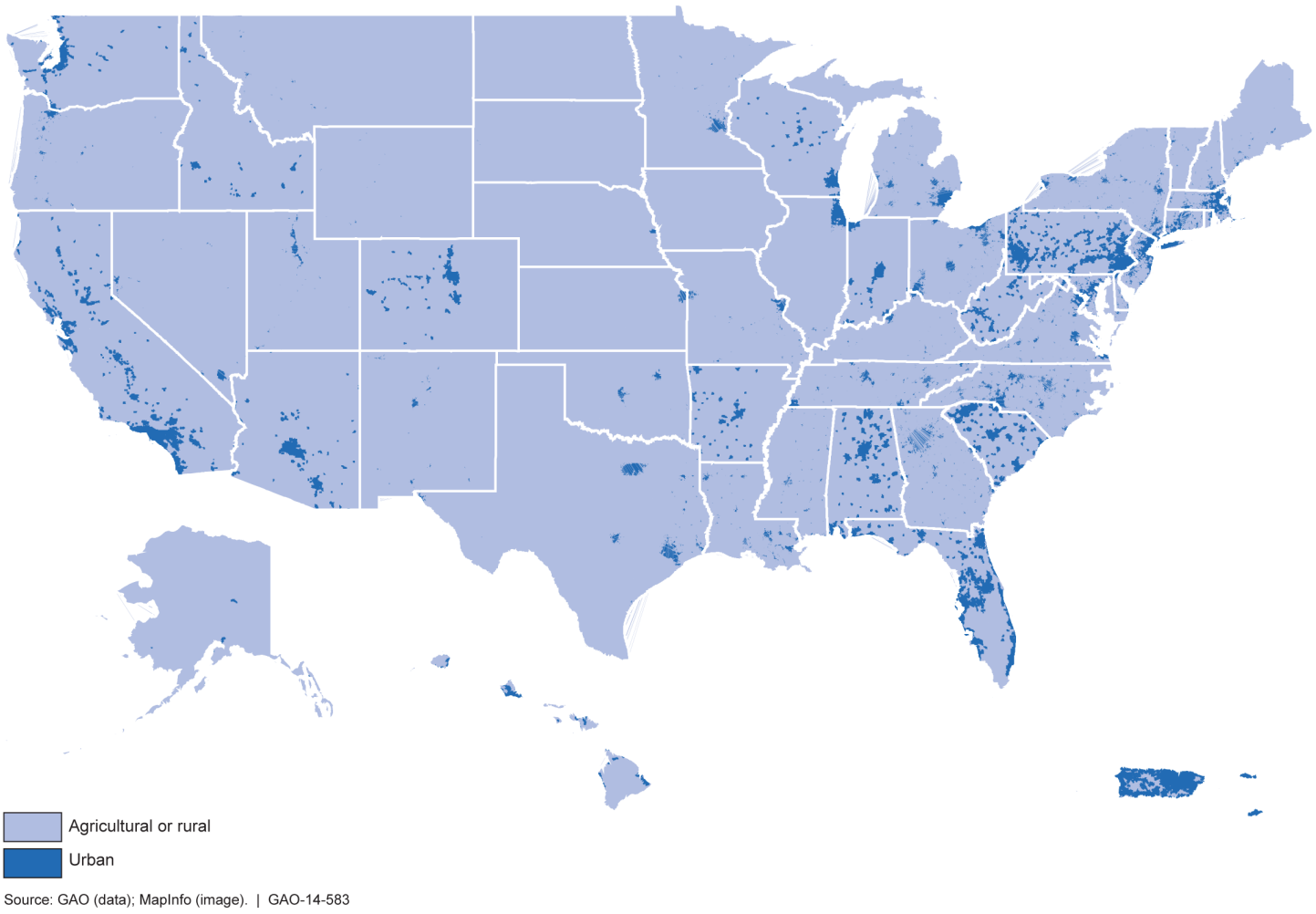
[4]Pub. L. No. 113-89, 128 Stat. 1020 (2014).

regional planning organizations (i.e., American Planning Association, Association of State Floodplain Managers, and National Association of Flood & Stormwater Management Agencies). We interviewed academics in the areas of floodplain management, officials from FEMA's Mapping, Insurance, Building Science and Flood Management Branches, and officials from Department of Agriculture's (USDA) Economic Research Service and Rural Development branches. In addition, we interviewed representatives of Agricultural Floodplain Management Alliance (AFMA) members primarily in California, and the insurance industry.

To identify the locations of rural and agricultural areas in SFHAs, we distinguished rural and agricultural land areas from urban land areas. FEMA does not make such a distinction for the purposes of administering NFIP. To make these distinctions, we first analyzed data from the U.S. Census Bureau (2010) and USDA's *Atlas of Rural and Small Town America* (2007) to determine the rural and agricultural areas within the United States. We defined rural areas as areas that were not considered urbanized areas or urban clusters using Census data and agricultural areas as counties where 50 percent or more of the land area was used for farming.[5] We considered all other areas as urban (see fig. 5). We reviewed information available online from the Census web site and the USDA web site on the data quality assurance processes for the data. We concluded that the Census and USDA data that we used were sufficiently reliable for purposes of using them as a base for this determination.

[5]To define rural areas, we used *Census Urban, Urbanized Area, Urban Cluster and Rural Population, 2010: United States* data.

Figure 5: Rural (2010), Agricultural (2007), and Urban Areas (2010)



Source: GAO (data); MapInfo (image). | GAO-14-583

We provided FEMA the data on rural and agricultural areas described above. FEMA mapping specialists used the data we provided them and combined it with FEMA's flood map data. For the rural and agricultural areas with maps that had been converted to a digital format as of February 2014, FEMA mapped the SFHAs. For the rural and agricultural areas that had flood maps that had not yet been converted to digital format as of February 2014, FEMA showed these areas on the map. FEMA excluded areas with coastal flood zones from the map.

To determine the number and percentage of policyholders located in rural and agricultural riverine SFHAs, we determined which ZIP codes were in the rural, agricultural, and urban areas. If 50 percent or more of land area of a ZIP code was within a rural or agricultural area, we considered it a rural or agricultural ZIP code. We analyzed FEMA's policy data as of September 30, 2013, (most recently available fiscal year-end data), to determine how many policies were zoned in an SFHA in the ZIP codes we deemed rural or agricultural using the method described above. We excluded policies with a coastal flood zone designation because the scope of this study was on riverine flooding.[6] To determine the percentage of the population mapped into or out of SFHAs because of FEMA's Map Modernization initiative, we analyzed available FEMA data on the number of people that received a map change at the Census Block Group level under this initiative. We determined which Census Block Groups were in rural and agricultural ZIP codes and compared the number of people that received a change in SFHA designation in those Census Block Groups to population data from the 2010 Census, which was also provided by FEMA. We reviewed documentation on how the data were collected and interviewed a FEMA official on the usability of the data. We determined these data were sufficiently reliable for our purposes.

To assess any effects of NFIP's building requirements and the mandatory purchase requirement on farmers and rural residents, we conducted case studies in eight selected NFIP communities. We selected these communities using the following criteria:

- crop and livestock production requiring nonresidential farm structures or nearby on-farm processing (e.g., rice, corn, soybeans, cotton, sugar beets, hogs, chickens, and cattle (dairy));
- some agricultural land located in SFHAs that was prone to flooding; and
- geographic variations (e.g., East coast, West Cost, the South and the Midwest) of the riverine agricultural areas located in SFHAs across the country.

We selected California, Louisiana, North Carolina, and North Dakota as key states. We then interviewed four state floodplain managers from each

[6]We focused on riverine SFHAs because the area was where we were likely to find agricultural structures that might be subject to NFIP building requirements.

state to obtain their views on any effects NFIP building requirements and the mandatory purchase requirement have had or could have on farmers and rural residents. In addition, we solicited their input, as well as additional input from three state agricultural extension specialists in California, Louisiana, and North Carolina, in identifying two additional communities in their states that met our criteria. The eight selected communities were: Sutter County, California; Yolo County, California; Rapides County, Louisiana; St. Landry Country, Louisiana; Duplin County, North Carolina; Tyrrell County, North Carolina; Cass Country, North Dakota; and Walsh Country, North Dakota.

We interviewed eight local floodplain managers and five agricultural extension service officials in the suggested communities to obtain their views on the effects of NFIP on farmers and rural residents. We also requested the help of the floodplain managers and extension personnel in identifying local farmers and rural residents with properties located in SFHAs. The local officials helped us identify a total of 24 farmers and 10 rural residents from the selected communities. Although we provided the officials with guidance for the characteristics of persons identified, we did not independently verify that all of our criteria were met and acknowledge that some selection bias may be present since we relied on local officials for selecting the farmers to participate in our study. We contacted the people identified for each community. We conducted structured interviews with all farmers and rural residents who had been remapped into SFHAs according to local officials and could provide first-hand perspectives on any challenges they faced in complying with NFIP's building requirements and the mandatory purchase requirement. We also discussed identified options to address these challenges.

We spoke with some farmers and rural residents who had been remapped into SFHAs after their community's initial flood map had been established and some farmers and rural residents who were not currently mapped into an SFHA. We also spoke with six agricultural lenders about the effect insurance requirements had on farmers and rural residents and with two developers about the effects of the requirements on rural communities. We then summarized all interviews and analyzed them by category of questions: NFIP building requirements, the mandatory purchase requirement, effects on the community, and options to address these challenges.

Table 2 shows, for each of the eight selected communities, the number of farmers and rural residents with whom we spoke and the major crops produced by those farmers. We could not obtain the same number of

interviews in each community, because the local floodplain managers and agricultural extension specialists who provided referrals to people provided different numbers and types of contacts in each of the selected communities. In addition, the relationships between the local floodplain manager and the contacts sometimes differed, and in some cases a relationship may have affected our ability or inability to obtain an interview with that person. For example, some successful contacts served on community water management task forces with the local floodplain manager.

Table 2: Selected Communities and the Number of Farmers, Rural Residents, Agricultural Lenders and Developers Interviewed

Selected NFIP community	Number of farmers and production	Number of rural residents	Number of agricultural lenders/developers
Sutter County, CA	8; Produced walnuts, rice, root stock, prunes, plums, crop protectant, and fertilizer	None	1 lender
Yolo County, CA	4; Produced wine, wine grapes, alfalfa, wheat, tomatoes, walnuts, corn, and seed crops	4	1 lender /1 developer
Rapides Parish, LA	3; Produced rice, crawfish, grain sorghum, wheat, corn, soybeans, and cotton	2	1 lender
St. Landry Parish, LA	2; Produced rice, crawfish, soybeans, and wheat	None	1 lender /1 developer
Duplin County, NC	4; Produced hogs, chicken, corn, soybean, cotton, and wheat	None	
Tyrrell County, NC	None	None	1 lender
Cass County, ND[a]	2; Produced corn, soybeans, and wheat	None	1 lender
Walsh County, ND	1; Produced spring wheat, corn, pinto beans, soybeans, sugar and beets	4	

Source: GAO. | GAO-14-583

[a]Because the NFIP community consisting of the unincorporated parts of Cass County had not yet adopted a preliminary flood map that placed portions of the community in an SFHA, we spoke with two farmers from other NFIP communities in Cass County.

We visited California and Louisiana and interviewed the local farmers and residents. For the other two states (North Carolina and North Dakota), we interviewed the farmers and rural residents by telephone.

The purpose of our extensive work in these selected communities was to illustrate and more fully understand farmers' and residents' experiences in dealing with NFIP's requirements. Our individual interviews were not designed to demonstrate the extent of an issue such as a survey might do and we determined that personal contact would prove more reliable in completing interviews with this rural population. In addition, through individual interviews we were able to obtain a more complete

understanding of each person's perspective, the reasons for their opinions or attitudes on specific topics and their insights into concerns related to NFIP requirements, all of which would supplement the information provided by state and local NFIP officials. The combination of design, targeted research questions, multiple sources of information, the use of selected representative communities to address the research questions and systematic analyses all serve to support greater generalizability of our findings. Nevertheless, due to the differing nature of communities and their responses to the NFIP requirements, a possibility exists that had we selected different communities we might have found some different results. We believe that the patterns and consistency of our findings within and across our selected cases support the widespread applicability of our findings.

To identify options to address any challenges farmers and rural residents faced in complying with NFIP's building requirements and the mandatory purchase requirement, we gathered suggestions from local NFIP administrators, local lenders, farmers, and rural residents that we met with during our case studies. We then asked experts from flood management and city and regional planning organizations, cognizant academics, and officials from FEMA to comment on the ideas that we gathered and summarized their views.

To determine historical NFIP premium and claims amounts, we analyzed annual NFIP premium data for years 1994-1998 and 2000-2013, and the NFIP claims database as of September 30, 2013 (most recently available fiscal year-end data).[7] We adjusted these premium and claim amounts for inflation to report them in constant 2014 dollars. We conducted electronic testing including checks for outliers and missing data. We also interviewed FEMA officials on the usability and reliability of the data and reviewed our past assessments of these data. We determined these data were sufficiently reliable for our purposes. We determined the premiums and claims attributable to rural and agricultural areas and to urban areas using the ZIP codes for rural, agricultural, and urban areas we found using the method described above. We used 2007 agricultural data and 2010 rural and urban data as the base years for determining whether a ZIP code area was rural, agricultural, or urban. As a result, we may

[7]We are not able to report premium and claims data for the year 1999 due to technical issues.

under-represent the premiums and claims attributable to the rural and agricultural areas for earlier years because urban areas have tended to grow larger over time. Data were not available for 1999 and the years prior to 1994 that would allow us to determine the premium amounts comparable to the premium amounts we reported for 1994 through 2013. FEMA told us that the available premium data for 1999 and years prior to 1994 was for all policies that had been in place during the year, as opposed to the policies in force at a specific point in time of each year. Using these data would have resulted in overstated premiums. Also, FEMA told us that in some of the earlier years ZIP codes were not reported consistently from the insurance companies. In some years, ZIP codes were not available at all (1978–1981, 1983, and 1992).

Appendix II: Analysis of National Flood Insurance Program (NFIP) Premiums and Claims, Rural and Agricultural and Urban

We analyzed FEMA data on National Flood Insurance Program (NFIP) premiums and claims from 1994 through 2013 (except 1999) to determine the claims paid to and the premiums taken-in by FEMA from rural and agricultural riverine areas and urban riverine areas.[1] We also analyzed the total premiums and claims for rural and agricultural areas and urban areas on a state-by-state basis for this time period.

Overall, our analysis of premiums and claims indicates that in both rural and agricultural and urban areas nationwide, policyholders have historically received more in claims than they have paid in premiums. However, flooding is a highly variable event, with losses differing widely from year to year. Therefore, analysis of historical data can lead to unreliable conclusions about the actual flood risk faced by a given state or area. Also, catastrophic events greatly impact the long-term aggregate experience of a state. While the difference between premiums and claims in rural and agricultural and urban areas is not a meaningful measure of whether policyholders are paying premiums commensurate with their risk because NFIP premiums are intended to cover losses as well as operating expenses, among other reasons, it provides additional descriptive information.

Table 3 shows NFIP premiums and claims of policyholders in rural and agricultural areas from 1994 through 2013 (except 1999). This information provides some indication of the trends over this period for rural areas.

Table 3: Total Annual Premiums and Claims for Rural and Agricultural Riverine Areas (in constant 2014 dollars), 1994-2013 (excluding 1999)

Dollars in thousands

Calendar year	Rural and agricultural riverine areas Total premiums	Rural and agricultural riverine areas Total claims	Ratio of claims to premiums
2013	$1,385,209	$156,929[a]	0.11
2012	1,317,016	1,578,485	1.2
2011	1,314,237	1,236,725	0.94
2010	1,271,112	397,394	0.31
2009	1,195,438	280,280	0.23

[1]Because FEMA was not able to provide us similar data for 1999, we are excluding premiums and claims for that year in this analysis.

Dollars in thousands			
Calendar year	**Rural and agricultural riverine areas Total premiums**	**Rural and agricultural riverine areas Total claims**	**Ratio of claims to premiums**
2008	1,135,962	2,233,049	1.97
2007	1,049,637	337,142	0.32
2006	975,137	440,104	0.45
2005	853,057	6,607,700	7.75
2004	810,990	1,325,846	1.63
2003	779,378	436,523	0.56
2002	754,314	332,853	0.44
2001	740,352	284,983	0.38
2000	745,011	79,415	0.11
1998	732,542	676,241	0.92
1997	623,629	527,643	0.85
1996	521,269	677,365	1.3
1995	466,580	685,838	1.47
1994	410,932	311,947	0.76
Total	**$17,081,802**	**$18,606,462**	**1.09**

Source: GAO analysis of FEMA data. | GAO-14-583

Notes: Because 1999 policy data were not available from FEMA in a comparable format to the data for the other years, we are excluding premiums and claims for that year in this analysis.

[a]Not all 2013 claims were processed at the time we collected the data from FEMA.

Similarly, table 4 provides 1994-2013 (except 1999) premium and claims data for urban areas.

Table 4: Total Annual Premiums and Claims for Urban Riverine Areas (in constant 2014 dollars), 1994-2013 (excluding 1999)

Dollars in thousands			
Calendar year	**Urban riverine areas Total premiums**	**Urban riverine areas Total claims**	**Ratio of claims to premiums**
2013	$2,224,326	$145,947[a]	0.07
2012	2,104,928	7,290,166	3.46
2011	2,082,646	1,283,414	0.62
2010	2,070,372	425,804	0.21
2009	1,950,615	560,298	0.29
2008	1,906,114	1,555,033	0.82
2007	1,781,760	341,244	0.19

Dollars in thousands

Calendar year	Urban riverine areas Total premiums	Urban riverine areas Total claims	Ratio of claims to premiums
2006	1,669,818	287,366	0.17
2005	1,481,128	14,241,951	9.62
2004	1,404,981	1,373,001	0.98
2003	1,349,121	529,058	0.39
2002	1,317,264	213,858	0.16
2001	1,317,598	1,354,849	1.03
2000	1,322,863	251,053	0.19
1998	1,311,434	523,512	0.4
1997	1,149,065	181,899	0.16
1996	1,031,843	458,854	0.44
1995	943,272	1,151,750	1.22
1994	834,893	282,422	0.34
Total	**$29,254,041**	**$32,451,479**	**1.11**

Source: GAO analysis of FEMA data. | GAO-14-583

Notes: Because 1999 policy data were not available from FEMA in a comparable format to the data for the other years, we are excluding premiums and claims for that year in this analysis.

[a]Not all 2013 claims were processed at the time we collected the data from FEMA.

Table 5 includes available premium and claims data by year in the rural and agricultural riverine areas of each state. Because comparable 1999 premium data were not available, the ratio of claims to premiums for some states may be distorted.[2] In 1999, some states on the east coast experienced large losses from Hurricane Floyd likely resulting in high claim amounts. According to FEMA, for example, NFIP policyholders in the state of North Carolina received over $141 million in claims between September 1999 and June 2000. If the premiums and claims for 1999 were included, the ratio of claims to premiums for states affected by Hurricane Floyd could have been larger.

[2]For more information on our methodology, please see appendix I.

Table 5: Total Premiums and Claims by State for Rural and Agricultural Riverine Areas (in constant 2014 dollars), 1994-2013 (excluding 1999)

Dollars in thousands

State	Rural and agricultural riverine areas Total premiums (1994-2013, excluding 1999)	Rural and agricultural riverine areas Total claims (1994-2013[a], excluding 1999)	Ratio of claims to premiums
Alaska	$30,029	$7,631	0.25
Alabama	251,748	734,877	2.92
Arkansas	139,659	81,002	0.58
Arizona	164,342	11,881	0.07
California	1,963,946	365,585	0.19
Colorado	147,906	9,238	0.06
Connecticut	67,858	31,725	0.47
District of Columbia	—	—	—
Delaware	77,150	23,170	0.3
Florida	2,493,450	1,069,660	0.43
Georgia	578,678	124,876	0.22
Hawaii	175,993	32,036	0.18
Iowa	159,721	247,331	1.55
Idaho	58,038	6,551	0.11
Illinois	246,779	188,710	0.76
Indiana	178,784	155,699	0.87
Kansas	116,338	59,034	0.51
Kentucky	186,644	219,247	1.17
Louisiana	1,783,964	5,726,140	3.21
Massachusetts	183,708	32,541	0.18
Maryland	187,768	123,534	0.66
Maine	90,019	19,968	0.22
Michigan	173,412	19,369	0.11
Minnesota	89,750	138,087	1.54
Missouri	193,740	230,248	1.19
Mississippi	340,630	2,018,966	5.93
Montana	43,040	8,501	0.2
North Carolina	664,838	590,866	0.89
North Dakota	83,022	290,116	3.49
Nebraska	134,223	21,497	0.16

Dollars in thousands

State	Rural and agricultural riverine areas Total premiums (1994-2013, excluding 1999)	Rural and agricultural riverine areas Total claims (1994-2013[a], excluding 1999)	Ratio of claims to premiums
New Hampshire	51,587	34,455	0.67
New Jersey	610,780	953,199	1.56
New Mexico	134,857	10,676	0.08
Nevada	69,273	6,913	0.1
New York	349,225	578,694	1.66
Ohio	287,702	199,627	0.69
Oklahoma	110,558	86,674	0.78
Oregon	238,806	74,083	0.31
Pennsylvania	487,727	766,733	1.57
Rhode Island	48,843	38,141	0.78
South Carolina	519,285	22,586	0.04
South Dakota	45,702	36,191	0.79
Tennessee	142,386	169,688	1.19
Texas	1,847,503	2,206,746	1.19
Utah	22,125	1,111	0.05
Virginia	259,763	217,605	0.84
Vermont	50,605	63,870	1.26
Washington	324,084	207,313	0.64
Wisconsin	134,064	53,891	0.4
West Virginia	223,627	263,985	1.18
Wyoming	28,304	795	0.03

Source: GAO analysis of FEMA data. | GAO-14-583

Notes: Because 1999 policy data were not available from FEMA in a comparable format to the data for the other years, we are excluding premiums and claims for that year in this analysis. Due to this exclusion, the ratio of claims to premiums for some states may appear higher or lower than actual.

In addition to claims, NFIP premiums are also intended to cover expenses necessary to operate NFIP. In addition, an analysis of two decades of historical data could lead to unreliable conclusions about the actual flood risk faced by a given state.

[a]Not all 2013 claims were processed at the time we collected the data from FEMA.

Table 6 provides the same premium and claims information for urban areas by state.

Table 6: Total Premiums and Claims by State for Urban Riverine Areas (in constant 2014 dollars), 1994-2013 (excluding 1999)

Dollars in thousands

State	Urban riverine areas total premiums (1994-2013)	Urban riverine areas total claims (1994-2013[a], excluding 1999)	Ratio of claims to premiums
Alaska	$2,845	$160	0.06
Alabama	135,235	304,820	2.25
Arkansas	24,096	12,691	0.53
Arizona	144,645	8,302	0.06
California	1,431,599	134,051	0.09
Colorado	74,138	2,686	0.04
Connecticut	458,810	388,679	0.85
District of Columbia	8,306	3,646	0.44
Delaware	111,544	45,906	0.41
Florida	12,294,959	2,725,923	0.22
Georgia	240,531	201,623	0.84
Hawaii	168,259	6,964	0.04
Iowa	—	—	—
Idaho	6,395	45	0.01
Illinois	343,305	179,854	0.52
Indiana	175,009	72,884	0.42
Kansas	15,345	12,444	0.81
Kentucky	62,167	52,431	0.84
Louisiana	2,635,418	13,054,624	4.95
Massachusetts	518,870	142,915	0.28
Maryland	298,581	170,499	0.57
Maine	10,185	2,965	0.29
Michigan	152,086	17,301	0.11
Minnesota	23,514	7,087	0.3
Missouri	126,747	115,962	0.91
Mississippi	189,613	1,324,054	6.98
Montana	1,796	482	0.27
North Carolina	358,085	252,604	0.71
North Dakota	—	—	—
Nebraska	12,320	1,165	0.09

Dollars in thousands

State	Urban riverine areas total premiums (1994-2013)	Urban riverine areas total claims (1994-2013[a], excluding 1999)	Ratio of claims to premiums
New Hampshire	39,300	13,998	0.36
New Jersey	2,130,262	4,170,723	1.96
New Mexico	12,543	632	0.05
Nevada	75,616	37,935	0.5
New York	1,464,840	4,242,605	2.9
Ohio	177,068	86,847	0.49
Oklahoma	56,409	14,093	0.25
Oregon	77,057	29,295	0.38
Pennsylvania	409,106	387,389	0.95
Rhode Island	152,039	69,654	0.46
South Carolina	875,658	33,971	0.04
South Dakota	—	—	—
Tennessee	96,349	171,886	1.78
Texas	2,472,116	3,341,013	1.35
Utah	12,299	257	0.02
Virginia	667,032	414,122	0.62
Vermont	239	52	0.22
Washington	84,516	33,865	0.4
Wisconsin	33,879	28,069	0.83
West Virginia	14,583	8,393	0.58
Wyoming	—	—	—

Source: GAO analysis of FEMA data. | GAO-14-583

Notes: Because 1999 policy data were not available from FEMA in a comparable format to the data for the other years, we are excluding premiums and claims for that year in this analysis. Due to this exclusion, the ratio of claims to premiums for some states may appear higher or lower than actual.

In addition to claims, NFIP premiums are also intended to cover expenses necessary to operate NFIP. In addition, an analysis of two decades of historical data could lead to unreliable conclusions about the actual flood risk faced by a given state.

[a]Not all 2013 claims were processed at the time we collected the data from FEMA.

Additional study would be required to determine whether policyholders in some states with lower losses are paying a higher premium than is appropriate for their risk and others paying too little. For example, our analysis did not control for differences in the type of policy purchased, such as the mix of certain property types across states and insurance coverage amounts, which could affect both premiums and claims. In addition, we did not control for differences in the mix of subsidized and

full-risk policies or the impact of subsidized premiums on our results. As we have reported previously, some states have a relatively large number or proportion of subsidized properties that generally would lead to higher expected claims relative to premiums.[3] The limitations in setting full-risk rates that we discussed in the prior report could result in systematic mispricing relative to risk that becomes apparent only over long periods. Further, the analysis conducted for this report included both subsidized and full-risk properties, and so the results should be considered in this context.

[3]See GAO-09-12.

Appendix III: Additional Information on Selected Agricultural and Rural Communities

The following are some basic characteristics of the selected communities: Sutter County, California; Yolo County, California; Rapides Parish, Louisiana; St. Landry Parish, Louisiana; Duplin County, North Carolina; Tyrrell County, North Carolina; Cass Country, North Dakota; and Walsh Country, North Dakota.[1] Tables 7 to 14 show, for each individual community, the total number of National Flood Insurance Program (NFIP) policies, the number of policies in a special flood hazard area (SFHA), the number of miles of levees in the county, and the top agricultural commodities in the county.[2] Figures 6 to 11 show FEMA's flood maps for the counties, when available.[3]

Sutter County, California

Table 7: Key Characteristics of Sutter County, California

Number of NFIP policies, as of Sept. 30, 2013 (Sutter County National Flood Insurance Program (NFIP) Community)	4,812
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Sutter County NFIP Community)	1,040
Levee miles, accredited, as of May 2014[a]	47
Levee miles, not accredited, as of May 2014[a]	180

[1]We chose the NFIP communities that consisted of the unincorporated portions of each of these counties because those are the most rural portions of the counties. The NFIP community ID numbers are: Sutter County- 060394#; Yolo County-060423#; Rapides Parish-220145#; St. Landry Parish- 220165#; Duplin County- 370083#; Tyrrell County-370232#; Cass County, North Dakota-385362; and Walsh County-380135#. As we described previously, for Cass County we expanded the area from which we chose farmers and rural residents to speak with because the NFIP community that consists of the unincorporated parts of Cass County had not yet adopted its new map with an expanded SFHA.

[2]The top agricultural commodities were determined using data from the USDA's National Agricultural Statistics Service's 2012 Census of Agriculture.

[3]The flood maps for Rapides Parish, Louisiana and Cass County, North Dakota are not available because FEMA has not yet digitized these maps.

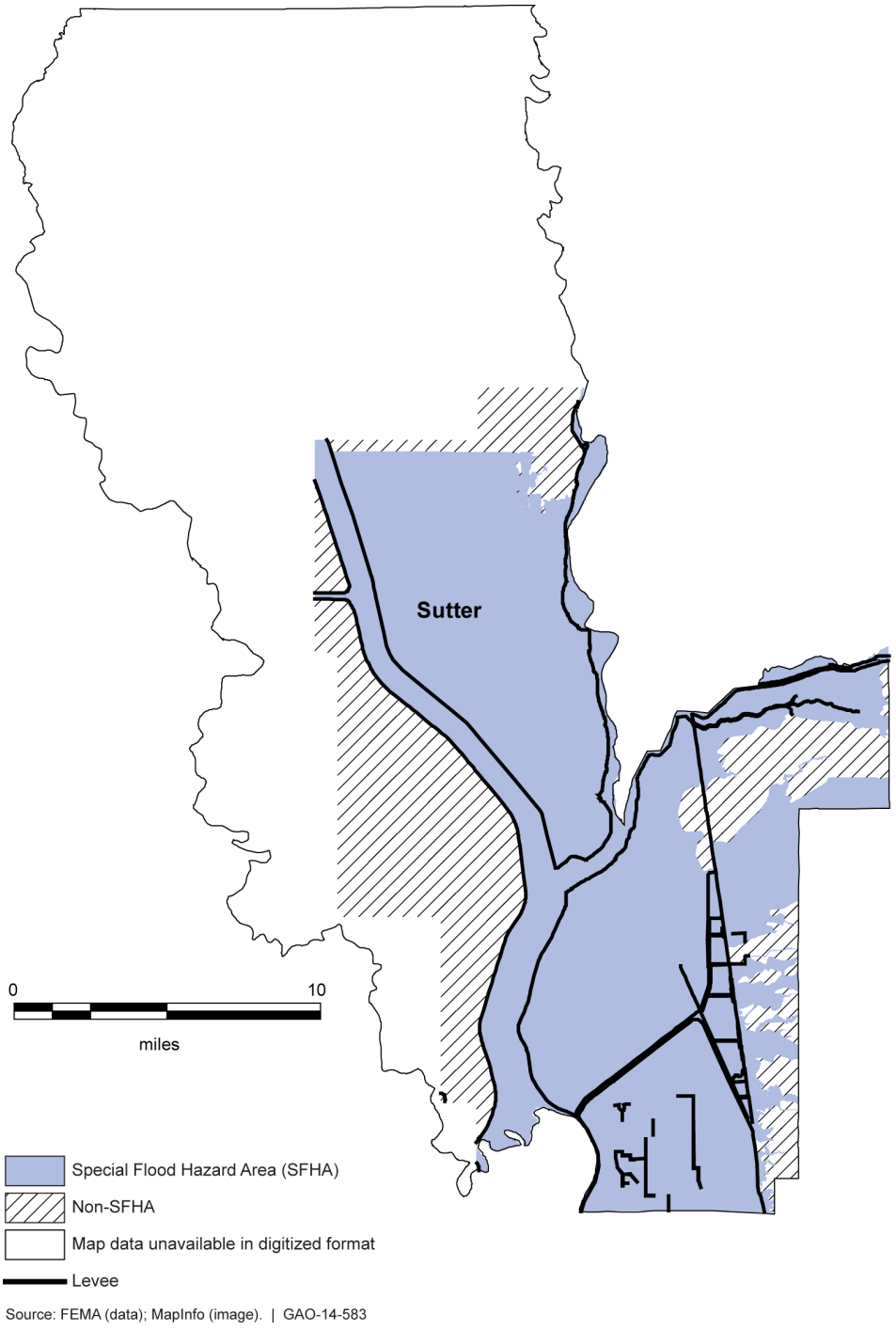
Top 5 agricultural commodities by value of production (2012)[b]	Fruits and tree nuts
	Rice
	Vegetables, melons, potatoes, and sweet potatoes
	Other grains, oilseeds, dry beans, and dry peas
	Corn

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Figure 6: FEMA Flood Map, Sutter County, California



Source: FEMA (data); MapInfo (image). | GAO-14-583

Yolo County, California

Table 8: Key Characteristics of Yolo County, California

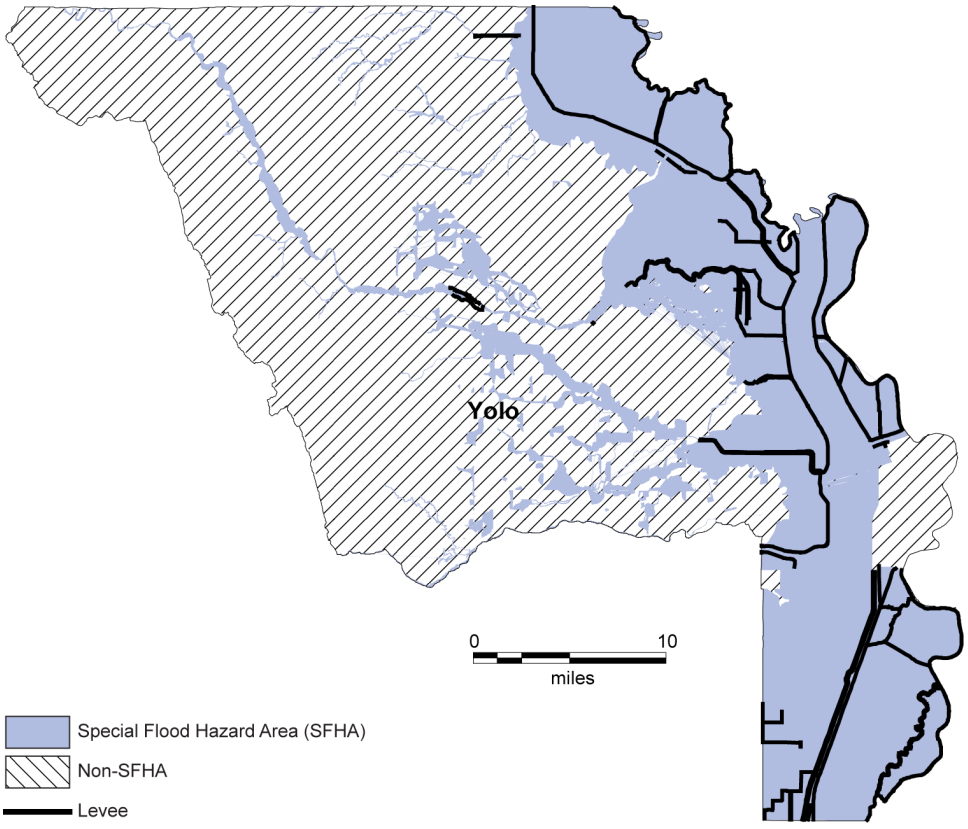
Number of NFIP policies, as of Sept. 30, 2013 (Yolo County National Flood Insurance Program (NFIP) Community)	1,337
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Yolo County NFIP Community)	977
Levee miles, accredited, as of May 2014[a]	105
Levee miles, not accredited, as of May 2014[a]	282
Top 5 agricultural commodities by value of production (2012)[b]	Fruits and tree nuts Vegetables, melons, potatoes, and sweet potatoes Rice Corn Wheat

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Figure 7: FEMA Flood Map, Yolo County, California



Source: FEMA (data); MapInfo (image). | GAO-14-583

Rapides Parish, Louisiana

Table 9: Key Characteristics of Rapides Parish, Louisiana

Number of NFIP policies, as of Sept. 30, 2013 (Rapides Parish National Flood Insurance Program (NFIP) Community)	1,472
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Rapides Parish NFIP Community)	808
Levee miles, accredited, as of May 2014[a]	0
Levee miles, not accredited, as of May 2014[a]	68

Top 5 agricultural commodities by value of production (2012)[b]	Nursery, greenhouse, floriculture, and sod Soybeans Other crops and hay Cattle and calves Corn

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

St. Landry Parish, Louisiana

Table 10: Key Characteristics of St. Landry Parish, Louisiana

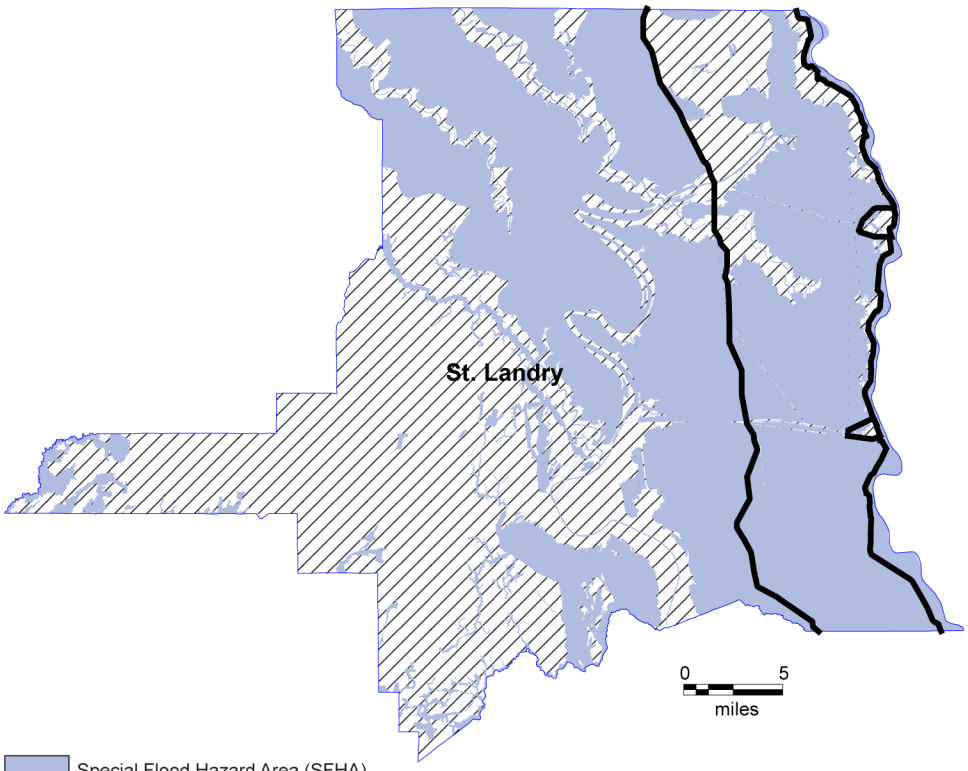
Number of NFIP policies, as of Sept. 30, 2013 (St. Landry Parish National Flood Insurance Program (NFIP) Community)	1,855
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (St. Landry Parish NFIP Community)	1,248
Levee miles, accredited, as of May 2014[a]	80
Levee miles, not accredited, as of May 2014[a]	0
Top 5 agricultural commodities by value of production (2012)[b]	Soybeans Rice Sorghum Corn Other crops and hay

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Figure 8: FEMA Flood Map, St. Landry Parish, Louisiana



Source: FEMA (data); MapInfo (image). | GAO-14-583

Duplin County, North Carolina

Table 11: Key Characteristics of Duplin County, North Carolina

Number of NFIP policies, as of Sept. 30, 2013 (Duplin County National Flood Insurance Program (NFIP) Community)	346
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Duplin County NFIP Community)	54
Levee miles, accredited, as of May 2014[a]	0
Levee miles, not accredited, as of May 2014[a]	0

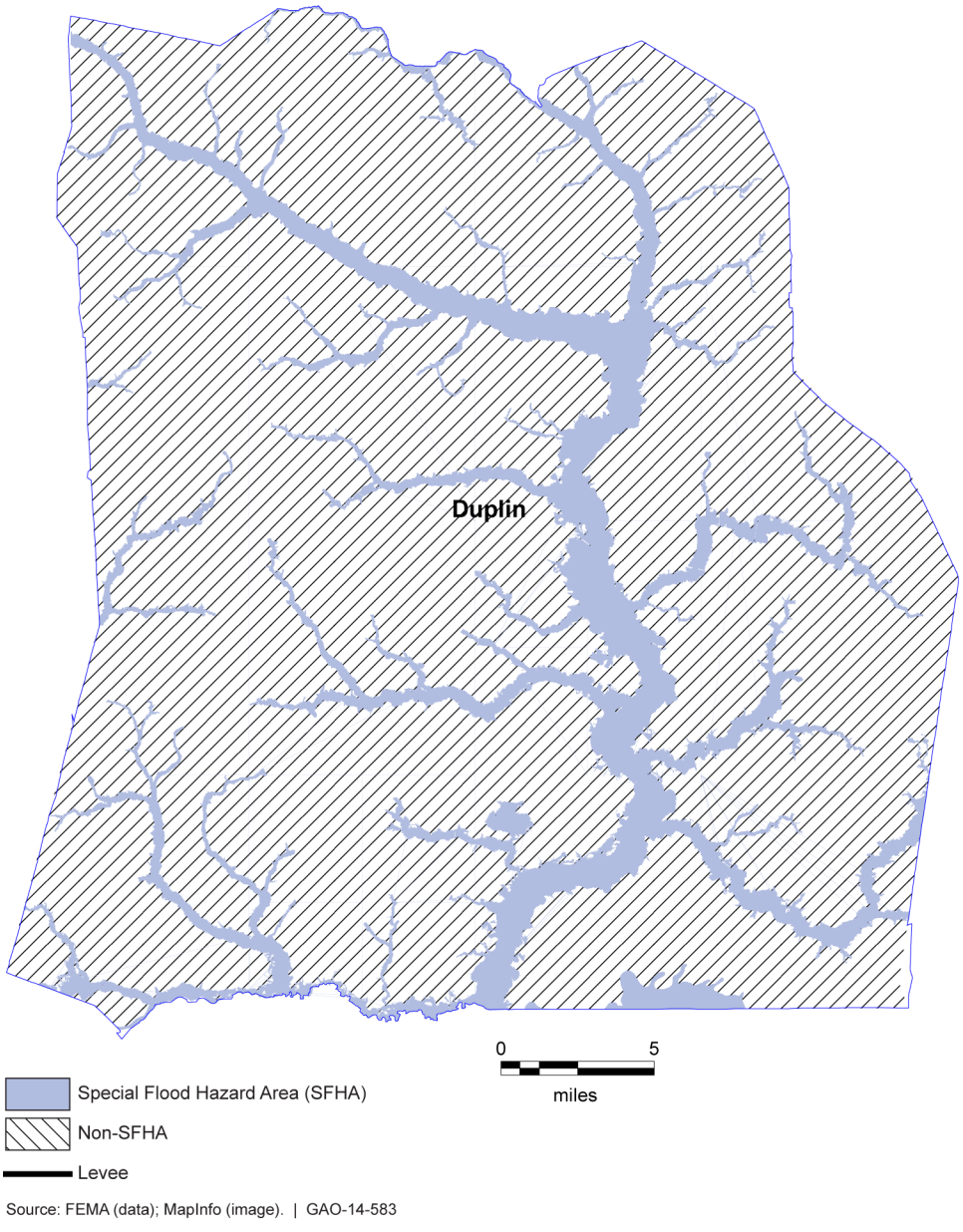
Top 5 agricultural commodities by value of production (2012)[b]	Hogs and pigs Poultry and eggs Corn Soybeans Vegetables, melons, potatoes, and sweet potatoes

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Figure 9: FEMA Flood Map, Duplin County, North Carolina



Source: FEMA (data); MapInfo (image). | GAO-14-583

Tyrrell County, North Carolina

Table 12: Key Characteristics of Tyrrell County, North Carolina

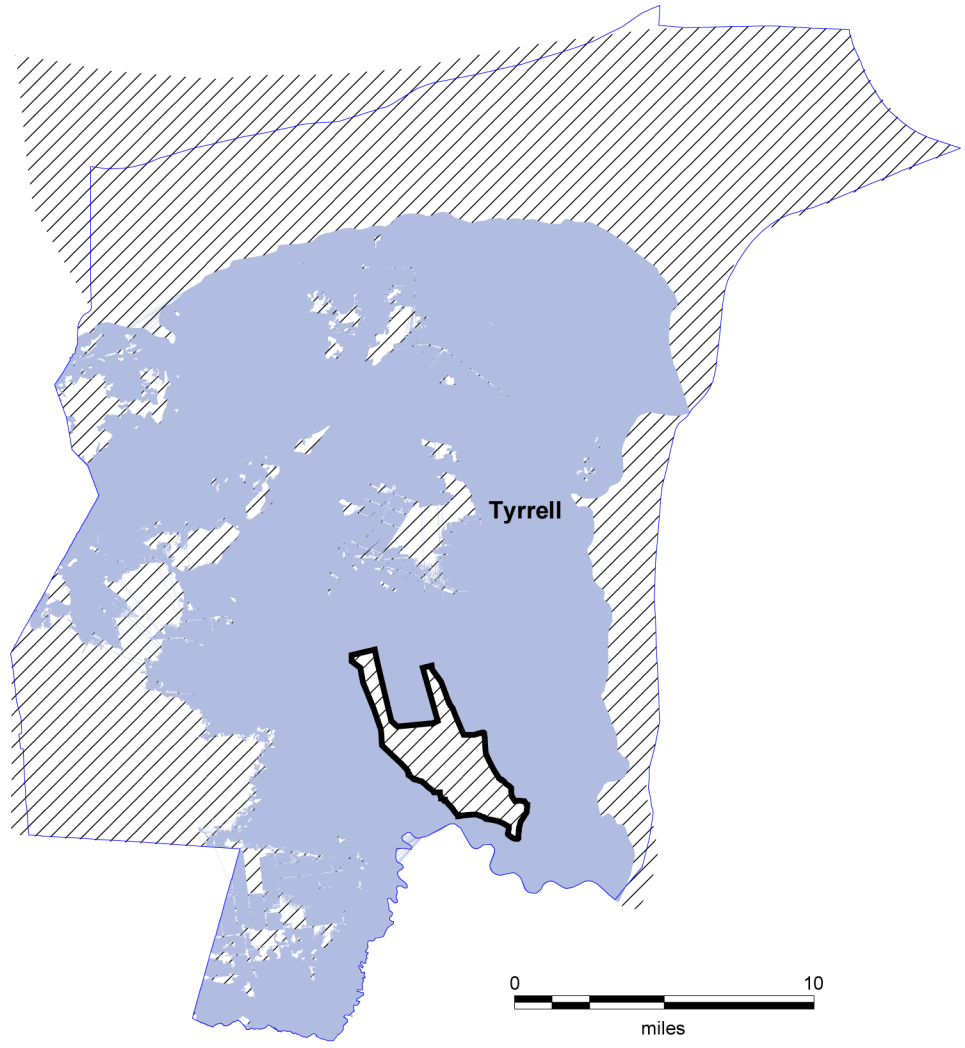
Number of NFIP policies, as of Sept. 30, 2013 (Tyrrell County National Flood Insurance Program (NFIP) Community)	436
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Tyrrell County NFIP Community)	402
Levee miles, accredited, as of May 2014[a]	24
Levee miles, not accredited, as of May 2014[a]	0
Top 5 agricultural commodities by value of production (2012)	Not able to determine[b]

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. Because the majority of crop/livestock categories for Tyrrell County were not disclosed, GAO could not determine the top 5 agricultural commodities in the county.

Figure 10: FEMA Flood Map, Tyrrell County, North Carolina



Source: FEMA (data); MapInfo (image). | GAO-14-583

Cass County, North Dakota

Table 13: Key Characteristics of Cass County, North Dakota

Number of NFIP policies, as of Sept. 30, 2013 (Cass County National Flood Insurance Program (NFIP) Community)	8
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Cass County NFIP Community)	0[a]
Levee miles, accredited, as of May 2014[b]	46
Levee miles, not accredited, as of May 2014[b]	7
Top 5 agricultural commodities by value of production (2012)[c]	Corn Soybeans Wheat Other crops and hay Cattle and calves

Source: FEMA and USDA data. | GAO-14-583

[a]The Cass County NFIP community 385362 had no policyholders in an SFHA as of September 30, 2013 because the community had not yet adopted its updated preliminary flood map. Prior to this map update, the entire community was in zone X, without a defined SFHA.

[b]These miles represent only the levees that FEMA has inventoried.

[c]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Walsh County, North Dakota

Table 14: Key Characteristics of Walsh County, North Dakota

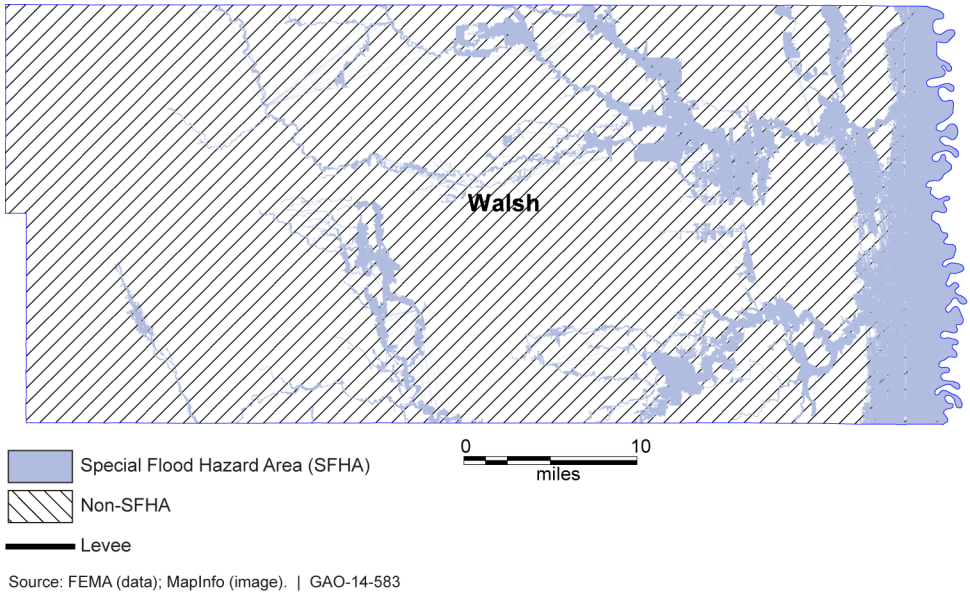
Number of NFIP policies, as of Sept. 30, 2013 (Walsh County National Flood Insurance Program (NFIP) Community)	54
Number of NFIP policies in Special Flood Hazard Areas (SFHA), as of Sept. 30, 2013 (Walsh County NFIP Community)	45
Levee miles, accredited, as of May 2014[a]	0
Levee miles, not accredited, as of May 2014[a]	4
Top 5 agricultural commodities by value of production (2012)[b]	Wheat Vegetables, melons, potatoes, and sweet potatoes Other crops and hay Other grains, oilseeds, dry beans, and dry peas Corn

Source: FEMA and USDA data. | GAO-14-583

[a]These miles represent only the levees that FEMA has inventoried.

[b]Some crop/livestock categories did not contain sales production data and were not disclosed due to USDA disclosure rules. For example, USDA did not disclose production data for crop/livestock categories in which the data represented less than three operations in a county. GAO could not incorporate such categories in our analysis. While it is possible, it is unlikely that we have left out any major crop/livestock categories.

Figure 11: FEMA Flood Map, Walsh County, North Dakota



Source: FEMA (data); MapInfo (image). | GAO-14-583

Appendix IV: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

June 20, 2014

Daniel Garcia-Diaz
Director, Financial Markets and Community Investment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Garcia-Diaz:

Re: Draft Report GAO-14-583, "NATIONAL FLOOD INSURANCE PROGRAM: Additional Guidance on Building Requirements to Mitigate Agriculture Structures' Damage in High-Risk Areas Is Needed"

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO's) work in planning and conducting its review and issuing this report.

The Federal Emergency Management Agency (FEMA) is committed to providing the best possible service to its State, local, and tribal partners. The partners' adoption and enforcement of sound floodplain management ordinances is vital to the success of the National Flood Insurance Program. Currently more than 20,500 communities voluntarily adopt and enforce floodplain management ordinances that provide flood-loss-reduction building standards for new and existing development. FEMA supports these efforts by regularly reviewing its own policies and ensuring that communities have the best available information to make informed decisions with regard to floodplain management.

The draft report contained one recommendation, with which the Department concurs. Specifically, GAO recommended that the Administrator of FEMA:

Recommendation: Update existing guidance to include additional information on and options for mitigating the risk of flood damage to agricultural structures to reflect recent farming developments and structural needs in vast and high-depth floodplains.

Response: Concur. FEMA's Federal Insurance & Mitigation Administration recognizes that agriculture land is a good use of the floodplain, and that changes in the agriculture industry and the diversity of structures that support agriculture are important to recognize in future guidance. FEMA is working to determine the best approach for updating its Technical Bulletin 7, "Wet Floodproofing Requirements." Estimated Completion Date: To Be Determined.

Again, thank you for the opportunity to review and comment on this draft report. Technical comments were previously provided under separate cover. Please feel free to contact me if you have any questions. We look forward to working with you in the future.

Sincerely,

Jim H. Crumpacker, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

2

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Daniel Garcia-Diaz, (202) 512-8678 or garciadiazd@gao.gov

Staff Acknowledgments

In addition to the contact named above, Triana McNeil and Jill Naamane (Assistant Directors); Simin Ho (Analyst in Charge); Emily Chalmers; William Chatlos; Barbara El Osta; Melissa Kornblau; John Mingus; Marc Molino; and Ruben Montes De Oca made key contributions to this report.