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FEMA Public Assistance Grants: Implications of a Disaster Deductible

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Key Points

- The number of declarations authorizing Public Assistance (PA) grants to states has been increasing over the last several decades, but annual PA spending has not.
- PA spending after major disaster declarations totaled \$82 billion from August 1998 to October 2015. Three events account for over half: Hurricane Katrina (over 25 percent of the total), Hurricane Sandy (18.5 percent), and the 9/11 attacks (9.4 percent).
- Over that period, the average spending on PA per declaration was \$87.5 million. Excluding Katrina and Sandy, the average drops to \$50 million. The median over the period was just under \$9.75 million; it is similar excluding Katrina and Sandy.
- A disaster deductible would reduce PA spending by a small percentage while eliminating a much larger share of declarations. A deductible would thus save on administrative costs, by reducing the number of declarations.
- At present, there is insufficient information about the deductible to evaluate whether it would incentivize mitigation by state and local governments. The incentive effect of the deductible will depend critically on how it is designed.

1. Introduction

The Office of Management and Budget estimates that the federal government, across all agencies, spent \$104.3 billion on disaster relief between 2006 and 2015 (OMB 2015). The large supplemental appropriation following Hurricane Katrina in 2005 was even greater (\$120 billion). The appropriation for Hurricane Sandy (\$50 billion), although less than Katrina, still exceeded the annual spending of many federal agencies and programs (Kousky and Shabman 2013). These large emergency spending bills have led to widespread discussions about how the

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nation funds disaster costs at the federal and state levels. Congress has held hearings,¹ reports have been issued by the Government Accountability Office (GAO) and the Congressional Research Service (GAO 2012; Lindsay 2014; Lindsay and Murray 2014; GAO 2015), and there has been discussion of these issues in the popular press (e.g., Gillis and Barringer 2012) and in academic publications (for example, Wildasin 2008; Cummins, Suher et al. 2010).

When a disaster occurs that is judged to exceed a state's ability to respond, the president can issue a disaster declaration. Among other things, this allows the Federal Emergency Management Agency (FEMA) to transfer funds from the Disaster Relief Fund (DRF) to state and local governments or households in designated counties for spending on certain response and recovery activities. One program the president can authorize in a declaration is Public Assistance (PA), which provides funds to local governments for response and recovery. In cases where the DRF has inadequate funds, Congress can add to the DRF by passing a supplemental legislation.

Recently, FEMA put forward a proposal to establish a disaster deductible for PA spending, which would require a state to spend up to its deductible before FEMA would provide PA funds. Under such a policy, a disaster declaration would only be issued for events with greater damage than the amount of the deductible, and the federal government would only provide PA in excess of the deductible. FEMA suggested that the deductible could be lowered, however, for states that adopt certain predetermined hazard mitigation practices. This proposal was put forward as a reform to disaster spending; the proposal, FEMA argues, could reduce the costs of disasters, make better use of taxpayer dollars, and incentivize greater investments in risk reduction by states and local governments.

In this policy brief, we examine PA spending between 1998 and 2015 to provide context for FEMA's proposal and to broaden the discussion about disaster funding in the United States. We find that while the number of disaster declarations authorizing PA spending has been increasing, annual PA spending has not increased over this time period. A few events received very large appropriations, however, and these account for the majority of PA spending, which totaled \$82 billion between August 1998 and October 2015. Hurricane Katrina accounts for over 25 percent of PA spending over this period and Hurricane Sandy is 18.5 percent. Our analysis finds that a disaster deductible would reduce PA spending by a small percentage while eliminating a much larger share of declarations. A deductible would thus save on administrative costs, as the number of declarations would be sharply reduced. While the PA data do not permit an analysis of the incentives for mitigation, we do conclude that the ability of a

¹ For example, the Subcommittee on Economic Development, Public Buildings, and Emergency Management of the Transportation and Infrastructure Committee held a hearing in January 2015 addressing these topics, titled: "Rebuilding After the Storm: Lessening Impacts and Speeding Recovery." As another example, back in October of 2011 the Senate Appropriations Subcommittee on Homeland Security addressed these issues in a hearing titled "The Federal Role in Disaster Recovery and Response."

deductible to increase mitigation by state and local governments would depend critically on how the deductible policy is designed.

2. Background

In this section, we briefly review the disaster declaration process and then turn to giving an overview of the PA program. Section 2 concludes with a summary of FEMA's deductible proposal.

2.1. Disaster Declarations

Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988), the president has the authority to issue emergency and major disaster declarations when hazardous events are “of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments and that Federal assistance is necessary.”² A presidential declaration activates federal programs to assist in response and recovery efforts and allows FEMA to deliver federal aid to the affected communities.

A governor must first request a declaration by the president. Prior to sending the request, the governor must put the state's emergency plan into action and ensure that state and local responses have been activated. Working with the state, FEMA then conducts a Preliminary Damage Assessment to evaluate the magnitude and severity of the disaster and estimate the assistance needed. FEMA then provides a recommendation to the president, who decides whether to issue an emergency declaration, a major disaster declaration, or no declaration at all. The deductible proposal, discussed in more detail in section 2.3, focuses on major disaster declarations, not emergencies, and we limit attention to these events in this Issue Brief.

Once a declaration is issued, FEMA can disburse money from the DRF.³ Each year, Congress appropriates funds into this account. In years with a very severe event or many disasters, supplemental appropriations are needed. When the president issues a declaration, he includes a designation of which counties are included and what types of assistance are offered. He can authorize one or both of two types of programs from FEMA: the PA program and the Individuals and Households Program.⁴ The focus in this paper is the PA program, described in the next section. The Individuals and Households Program provides assistance to households. Over the period 2004 to 2011, PA was authorized in 94 percent of all disaster declarations,

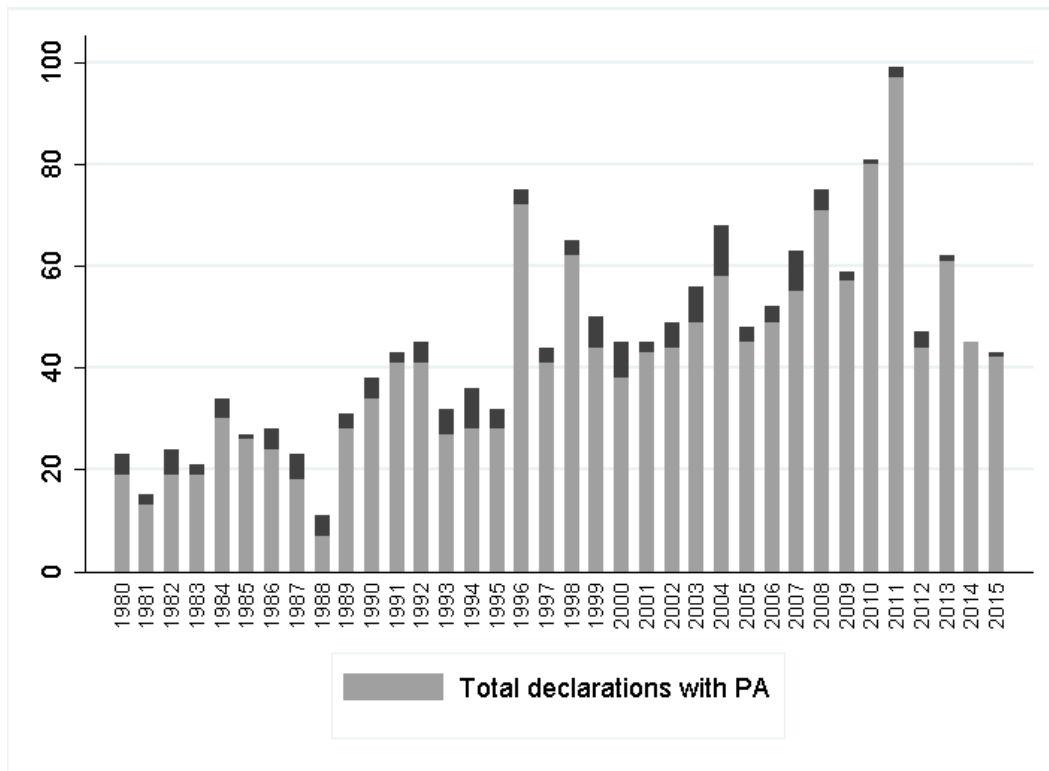
² 42 U.S.C. 5170 Online at: <https://www.law.cornell.edu/uscode/text/42/5170> (accessed April 21, 2016).

³ When passing supplemental legislation, Congress may also authorize spending on disaster response and recovery from other agencies beyond FEMA. This could include the Community Development Block Grant—Disaster Relief program in the Department of Housing and Urban Development, funding for recovery projects overseen by the Department of Transportation, or the US Army Corps of Engineers, for example.

⁴ There is also special assistance for wildfires.

while the Individuals and Households Program was authorized in only 45 percent of the declarations (GAO 2012). Figure 1 shows the total number of disaster declarations issued between 1980 and 2015; the number that authorized PA are shaded in lighter gray. Two things are clear from the figure: (1) the number of declarations has been increasing over time, although it hit a peak in 2011, and (2) the majority of declarations contain PA.

FIGURE 1. TOTAL DECLARATIONS BY YEAR



Source: Made by authors with data from OpenFema.

As stated, a disaster must be judged to exceed state and local capacity to respond before a declaration is issued. A GAO report examining disaster declarations between 2004 and 2011 found that FEMA generally used an estimate of statewide per capita damage to determine whether to recommend that the president authorize PA funds (GAO 2012). GAO pointed out, however, that FEMA used a threshold of \$1 per capita, set in 1986 and not continually adjusted for inflation or increases in per capita income. If FEMA had been continually adjusting the metric for inflation, then 25 percent of PA authorizations would not have been made. If the agency had been adjusting for increases in per capita income, 44 percent would not have been made (GAO 2012). Furthermore, GAO pointed out that this threshold may not be a good indicator of a jurisdiction’s ability to handle disaster costs on its own. Still, no further changes have been made.

2.2. Public Assistance

The PA program directs funds to states (applicants) and local governments (subapplicants)⁵ for debris removal, emergency protective measures, and the repair or replacement of public buildings and infrastructure. PA-funded work must be necessary as a result of the disaster, within the designated disaster area, and be the legal responsibility of the (sub)applicant (FEMA 2016). All costs must be “reasonable and necessary” to complete the work and must satisfy all federal, state, and local procurement policies. The program requires a 25 percent nonfederal cost share, but it can be lowered or waived at the discretion of the president.⁶ Looking at declarations between 2004 and 2011, GAO (2012) found that the cost share was lowered or eliminated in just over 20 percent of all declarations.

The PA program funds two types of work: emergency and permanent. Emergency work includes debris removal and emergency protective measures done to save lives, protect health and safety, protect property, or reduce the possibility of further damage; it must be completed within six months of the declaration (FEMA 2016). Some examples include medical care and transport, flood fighting, evacuation and shelters, search and rescue, slope stabilization, mold remediation, snow dumping, and salting. Permanent work is done to repair or restore public infrastructure to its pre-disaster design and function and is divided into five categories: roads and bridges; water control facilities; buildings and equipment; utilities; and parks, recreational facilities, and other items (FEMA 2016).

Once approved, PA grants are given to the state, which is responsible for distributing funds to the various subapplicants. The state generally decides how to divide the nonfederal cost share among subapplicants. The program operates such that subapplicants carry out their projects and are then reimbursed for the work approved for PA funding.⁷ Moreover, as a requirement of receiving aid, applicants and subapplicants must obtain and maintain insurance on buildings to cover the type of damage sustained (for example, flood damage would require the purchase of flood insurance).

⁵ Eligible applicants include state, local, and federally recognized tribal governments, any other political subdivision of the state, and certain private nonprofit organizations that carry out essential public services. For the purposes of this analysis, the terms “applicant” and “recipient” refer to the state, tribal, or territorial government that requests a disaster declaration, while the terms “subapplicant” and “subrecipient” refer to the local governments, agencies, and various political subdivisions of the state eligible for PA.

⁶ Following certain disasters, such as the Gulf of Mexico hurricanes in 2005 and Hurricane Ike in 2008, Congress has legislated cost-share adjustments for states that did not meet FEMA’s recommended per capita damage threshold.

⁷ For “small projects” (projects for which the cost is less than the annually updated cost threshold amount—\$121,600 in FY15) the federal cost share is paid upon project approval. For “large” projects, the federal cost share is paid as work is completed.

2.3 Deductible Proposal

FEMA recently issued a notice of proposed rulemaking on the concept of a disaster deductible (FEMA 2016a).⁸ The concept, as described by FEMA, is that a state would be required to spend a certain amount on a disaster (or on risk reduction investments for which they receive credit) prior to FEMA awarding PA dollars. When seeking comments, on its website FEMA had asserted that a disaster deductible could achieve many goals, including incentivizing hazard mitigation, reducing the costs of disasters, facilitating state and local government planning and budgeting for disasters, providing greater clarity on what assistance will be provided when, reducing federal assistance, and making more effective use of taxpayer dollars. Essentially, a deductible could potentially lower total costs (through increased investments in hazard mitigation) and lower the portion of the costs covered by the federal government.

FEMA anticipates the deductible would be calculated and implemented at the recipient level (i.e., the state, tribal, or territorial government that requests a declaration) as opposed to the subrecipient level (e.g., local governments, state subdivisions). FEMA has also indicated that once the deductible is set, recipients would be able to lower it by taking mitigation actions such as adopting improved building codes or creating a state-level disaster relief fund (examples suggested by FEMA). From January 20 to March 21, 2016, FEMA sought public comment on all aspects of the deductible, including calculation methods, scope, structure of mitigation incentives, and options for satisfying the deductible, among other topics.

In its proposed rulemaking, FEMA also notes that a disaster deductible could help bring the PA program into line with what FEMA calls one of the key principles underlying the Stafford Act: that there is a level of disaster activity that the state should be able to handle on its own. This state contribution is not achieved with the current policy of cost sharing, because the amount a state spends on a disaster could vary widely. FEMA gives the following example in its Advance Notice of Proposed Rulemaking. Consider a state that suffers \$999,999 in damage but does not receive a disaster declaration. The state will have to fund the full amount itself. Then consider a state that is hit with a disaster that has \$1 million in damage, and a declaration is issued. Now the state only has to pay \$250,000, the standard cost share. This is a very large difference in what the state is expected to finance on its own for similarly expensive disasters. FEMA thus suggests that a disaster deductible could be more equitable than the current cost-share requirement in that for any disaster event, the expected amount of state funding would be constant.

3. Public Assistance Grants 1998–2015

The PA data used in this analysis come from OpenFEMA, a FEMA website that makes mission data publicly available. We use two PA datasets. The first, organized by subapplicant, lists the disaster declaration number and date, hazard type, state and county of the

⁸ See: <https://www.federalregister.gov/articles/2016/01/20/2016-00997/establishing-a-deductible-for-femas-public-assistance-program>

subapplicant, number of funded projects associated with each, and PA grant funding available to the state for subapplicants' approved projects. The second dataset provides much of the same information, but it is organized by individual project and notes the category of work for each project.⁹ We examine data on all major disaster declarations from August 26, 1998 to October 20, 2015. Because FEMA's disaster deductible, as described in the proposal, would apply only to major disaster declarations and not emergency declarations, the latter are excluded from this analysis. Moreover, all monetary values are inflation adjusted to 2015 US dollars using the RS News Construction Cost Index.¹⁰

3.1. Overview of PA Spending by Year and State

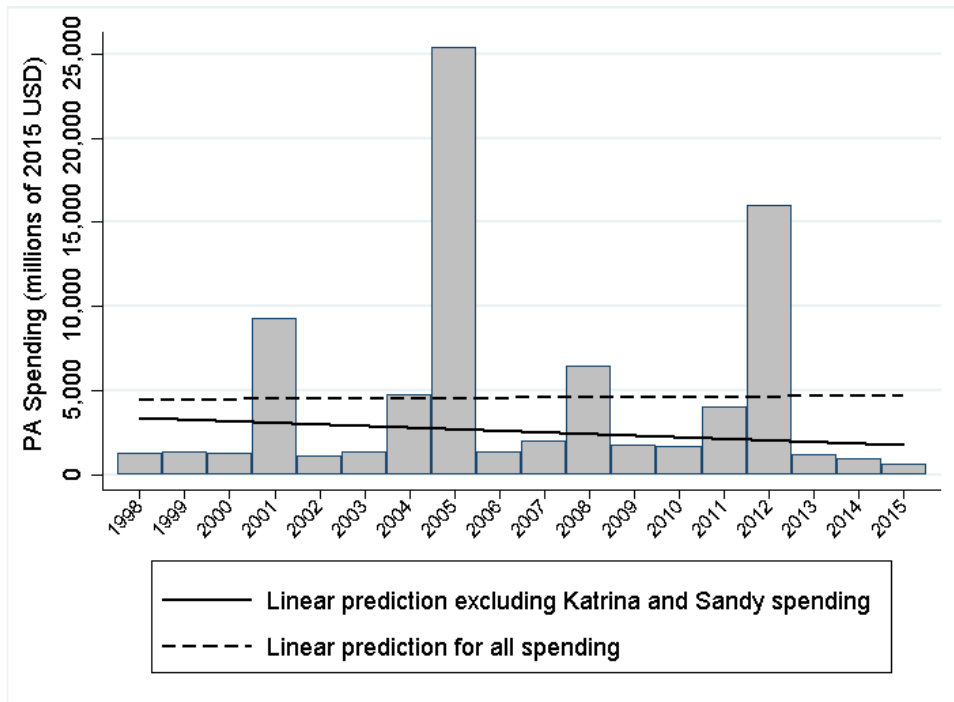
From August 1998 to October 2015, the PA program funded \$82 billion in disaster response and recovery projects. Total PA spending from disaster declarations by year is shown in Figure 2. The spending in 2005 for Hurricane Katrina and 2012 for Hurricane Sandy are noticeable outliers. Unlike the trend for the number of disaster declarations issued, which has been increasing (Figure 1), when a linear trend is fit to annual PA spending, it is fairly flat (dashed line) over the years examined. If spending from Hurricane Katrina and Hurricane Sandy are excluded, a linear trend in spending is slightly downward (solid line). Thus, while the number of declarations has been growing, spending on them has not been consistently increasing.

Across all the years, the average amount spent on PA per disaster declaration is \$87.5 million. If the declarations associated with Hurricanes Katrina and Sandy are excluded, the average drops to \$50 million. In contrast, the median differs little when we exclude these outliers. Across all declarations in the time period, the median spent on PA per declaration is just under \$9.75 million; if we exclude Katrina and Sandy, the median drops only slightly to just over \$9.69 million. Over this time period, the minimum amount of PA provided to a state was \$72,991—granted to Santa Clara Pueblo in New Mexico, following severe storms and flooding in September 2013. The maximum spending on one state was orders of magnitude larger—\$16 billion to Louisiana in the wake of Hurricane Katrina. (Second highest was \$13.1 billion to New York for Hurricane Sandy, followed by \$7.7 billion to New York for 9/11, \$4.33 billion to Mississippi for Katrina and \$2.56 billion to Texas for Hurricane Ike.)

⁹ In calculating the total PA funding for each disaster declaration, we found that for about half of the declarations, the totals derived from the two datasets differed slightly. Because of this, our analysis relies mostly on the dataset organized by subapplicant, rather than by project. However, information reported on categories of work is drawn from the dataset organized by project.

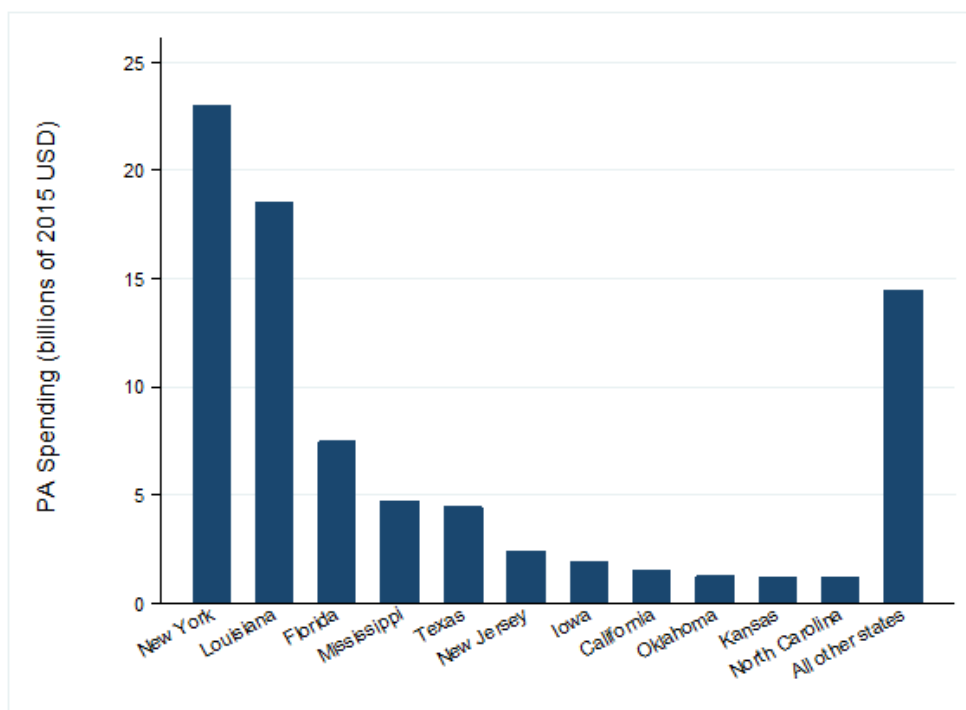
¹⁰ Available online at: <http://rsmeanonline.com/References/CCI/3-Historical%20Cost%20Indexes/1-Historical%20Cost%20Indexes.PDF>

FIGURE 2. PA SPENDING BY YEAR



New York has received the most total PA funding over the study time period, largely due to the attacks of 9/11 and Hurricane Sandy. Louisiana, from Hurricane Katrina, comes in second. Figure 3 shows all the states that have received over \$1 billion in PA spending between 1998 and 2015. New York and Louisiana have received more than twice the amount of the third highest state, Florida. All the remaining states combined, after subtracting off these 11 states, still received less than New York and Louisiana for their three disaster events. Note that if we exclude spending on Katrina and Sandy, only four states (NY, FL, TX, LA) with a combined population that represents 20 percent of the United States (2014 estimates), account for over half (approximately 52 percent) of all PA spending from 1982 to 2015. These patterns are characteristic of disaster losses more broadly: the worst events can be very extreme and thus responsible for a large share of total losses.

FIGURE 3. PA SPENDING BY STATE 1998–2015



3.2. PA Spending by Disaster and Hazard Type

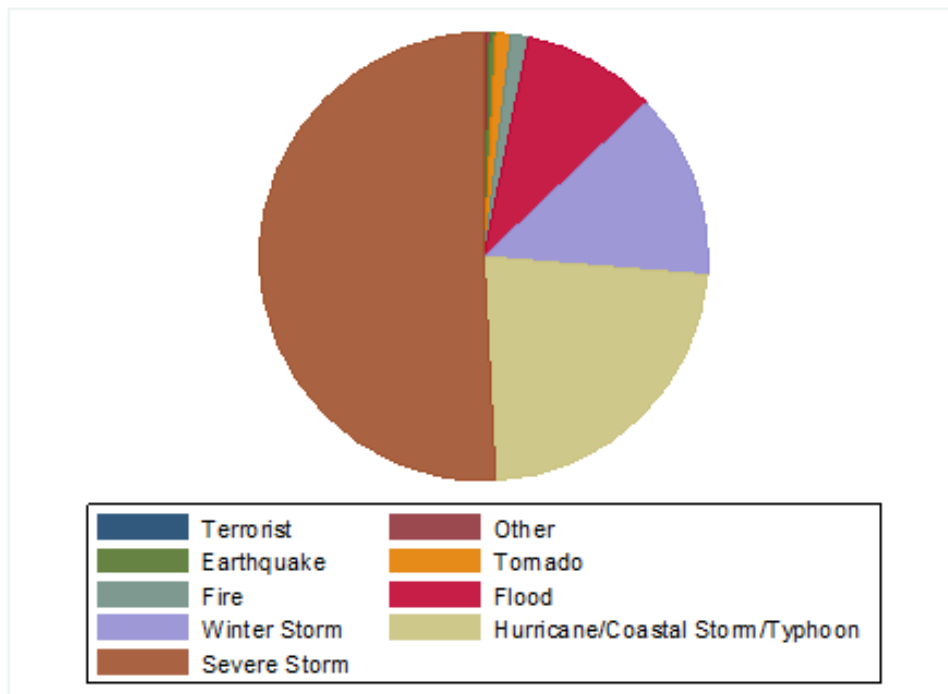
The majority of the total PA spending over our time period is associated with just a handful of disasters. Four hurricanes and the 9/11 attacks account for 59.2 percent of all PA dollars spent in these 17 years of data. Yet these disasters represent only 2.7 percent of major disaster declarations. Hurricane Katrina alone represents 25.2 percent of PA over this period. Hurricane Sandy makes up 18.5 percent of total spending. The attacks of 9/11 account for 9.3 percent of total spending. Hurricanes Ike and Wilma are 3.5 percent and 2.5 percent of spending, respectively (see Table 1).

TABLE 1. PA SPENDING BY DISASTER, 1998–2015

| Disaster | PA funding (in billions, 2015\$) | % of total funding | # of declarations | % of total declarations |
|------------------------|----------------------------------|--------------------|-------------------|-------------------------|
| All disasters | 82.0 | 100 | 937 | 100 |
| Top 5 | 48.50 | 59.15 | 25 | 2.72 |
| All others (not top 5) | 33.50 | 40.85 | 912 | 97.28 |
| Katrina | 20.70 | 25.24 | 4 | 0.44 |
| Sandy | 15.20 | 18.54 | 12 | 1.31 |
| 9/11 | 7.69 | 9.38 | 2 | 0.22 |
| Ike | 2.89 | 3.52 | 6 | 0.65 |
| Wilma | 2.01 | 2.45 | 1 | 0.11 |

While hurricanes (which include “super storm” Sandy) have been the most costly events, they are not the most common type of declaration. The majority of nationwide declarations issuing PA spending were due to severe storms. Severe storms can include heavy rain, high wind, thunder and lightning, and hail. The number of declarations by hazard type is shown in figure 4. Severe storms account for over half of all declarations. This category is followed by coastal events and then winter storms. Dollars, however, shown in table 2, follow a different pattern. Hurricanes account for over 60 percent of all PA spending, followed by severe storms second at just over 17 percent.

FIGURE 4. NUMBER OF PA DECLARATIONS BY HAZARD TYPE, 1998–2015



The predominant activities that have been funded vary by hazard event. For hurricanes and coastal storms, the majority of PA funds have been spent on repairs to public buildings. This can include repairs to the building, its structural components, interior systems, or contents. Building repairs are followed closely by spending on emergency protective measures (actions to protect lives, property, or public safety; see section 2.2 for examples) and debris removal, such as mud, silt, or wreckage. For severe storms, spending has been more even across categories, but repairs to roads and bridges and then repairs to public utilities are the two largest shares of spending. For terrorism, however, over half of spending has been allocated to state management. For ice storms, the largest share—almost half—has been spent on debris removal, whereas for fire and snow over half of all PA spending has been devoted to protective measures (snow dumping and salting of roads are protective measures).

TABLE 2. PA SPENDING BY HAZARD TYPE, 1998–2015

| Hazard | Total PA (millions of 2015\$) | Percent of Total |
|------------------|--|-------------------------|
| Hurricane | 52,100 | 63.52 |
| Severe storm | 14,400 | 17.56 |
| Terrorist | 7,690 | 9.38 |
| Severe ice storm | 2,420 | 2.95 |
| Flood | 2,190 | 2.67 |
| Fire | 858 | 1.05 |
| Coastal storm | 763 | 0.93 |
| Snow | 491 | 0.60 |
| Earthquake | 429 | 0.52 |
| Tornado | 303 | 0.37 |
| Typhoon | 204 | 0.25 |
| Tsunami | 54.7 | 0.07 |
| Mud/landslide | 38.7 | 0.05 |
| Other | 29.9 | 0.04 |
| Dam/levee break | 29.6 | 0.04 |
| Volcano | 10.4 | 0.01 |
| Freezing | 4.3 | 0.01 |
| Total | 82,016 | 100 |

Note: Values in table are rounded and thus total slightly exceeds 100% due to rounding error.

3.3 PA Spending by Project

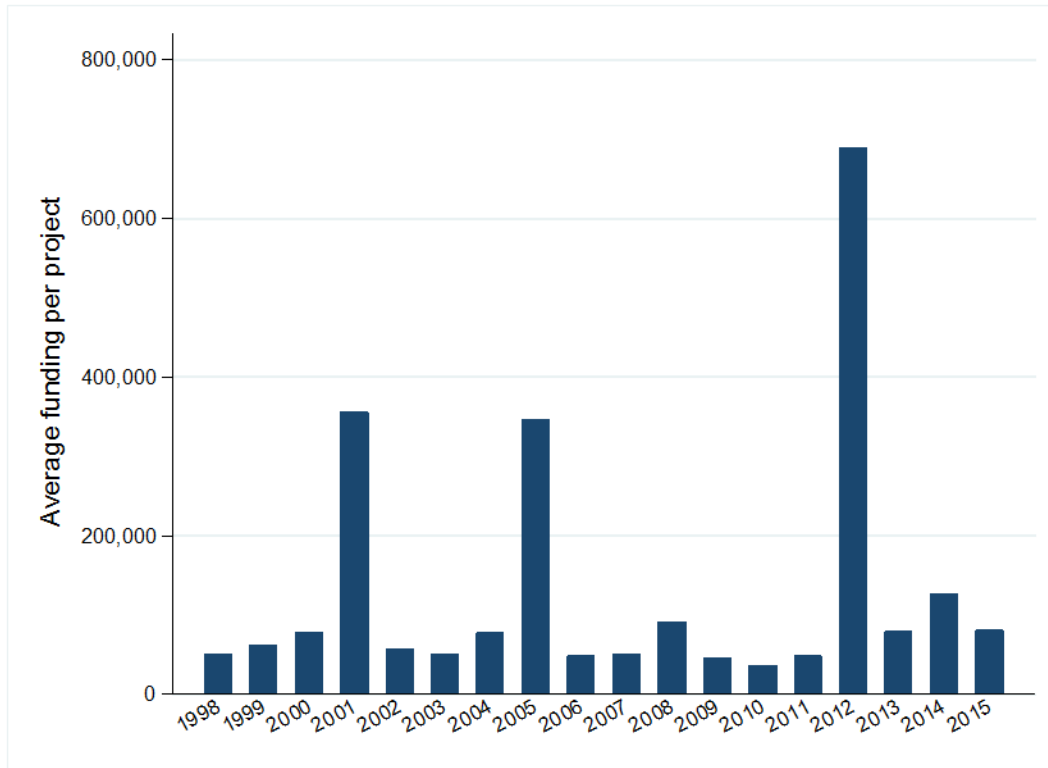
PA grants are used to fund specific disaster recovery projects for which subapplicants have sought funding. For every project a subapplicant hopes to carry out with PA, they must submit a Project Worksheet, a form that documents the scope of the work and cost estimates for a project. The Project Worksheet provides FEMA the information needed to approve or reject a project and is the basis for funding under the PA program (FEMA no date).

Over the study time period, the number of approved projects per declaration ranges from just 3 to over 19,000, with the majority falling somewhere in the hundreds.¹¹ For each subapplicant, the median number of funded projects is 2; the average is about 5. On average, PA funding per project is \$56,080, while the median is \$10,535. The average is inflated significantly by a small portion of projects that receive hundreds of thousands, or even millions, of dollars. For example, 75 percent of projects receive less than \$27,421 and 90 percent receive less than \$72,208. Excluding Katrina and Sandy, the average drops about 15 percent to \$47,424, while the median is essentially unchanged at \$10,305. For only those projects related to Katrina and Sandy, average funding is \$233,545—almost 5 times the average for all projects; the

¹¹ We cannot determine if any outliers are data entry errors.

median is \$18,580. Moreover, Figure 5 shows how average per-project funding has changed over time. While there does not appear to be any meaningful trend, it is very clear that 9/11, Katrina, and Sandy were significant outliers.

FIGURE 5. AVERAGE PA FUNDING PER PROJECT BY YEAR



4. Potential Effect of PA Deductibles on Authorizations and Spending

4.1. Number of Disaster Declarations and Amount of Federal Government Disaster Spending

Would a deductible reduce the number of disaster declarations? Would it reduce the amount the federal government spends on disasters? Each state gets its own declaration for a given disaster and this is the level at which FEMA anticipates applying the deductible. To evaluate the impact of potential deductible levels, we consider hypothetical deductibles of 12.5 percent, 25.0 percent, and 50.0 percent of the average PA grant per declaration, excluding the declarations for hurricanes Katrina and Sandy. These values are only meant to illustrate the effect of a variety of deductible levels on the number of PA declarations and the amount of spending; they should not be taken as recommendations for the deductible level.

Calculated in this way, the deductibles we consider are \$6.25 million, \$12.5 million, and \$25 million per recipient for a given declaration. Table 3 illustrates the effects these deductibles would have had on total PA authorizations. For each deductible, we look back at PA authorizations between 1998 and 2015, and if their totals are below the deductible, we mark that these authorizations would have been eliminated under that deductible policy. We then

look at the savings from these “eliminated declarations.” For each deductible, the retrospective effect is similar: the deductible would have reduced PA spending by a small percentage while eliminating a substantial number of declarations. That is, there have been many declarations of PA that fall below our hypothetical deductible, but these are for small amounts of money. For example, with a \$12.5 million deductible, 56 percent of declarations would have been eliminated as they had total PA spending below the deductible, but they accounted for only 3.5 percent of total PA dollars.

Disasters are such that a few events are responsible for a large share of the total damages. A deductible thus serves to eliminate spending on a large share of declarations but only a small share of total dollars. This saves not only those dollars that would have been given to the applicant but all the administrative costs as well. The total savings from a deductible to the federal government are thus larger than suggested by only examining eliminated spending. GAO has reported that for some disasters, the costs to administer the declaration exceeded the amount of assistance provided (GAO 2012). Of note, GAO found that it is generally smaller declarations where the administrative costs exceed the assistance, and not the case for large declarations (meaning a large level of disaster losses and thus spending). A deductible could thus effectively eliminate declarations where the costs to provide assistance exceed the value of that aid.

TABLE 3. HYPOTHETICAL DEDUCTIBLES AND THE ELIMINATION OF DECLARATIONS

| Deductible | Rationale | Number of declarations eliminated ¹ | Percent of declarations eliminated ² | Total saved from eliminated declarations (billions of 2015\$) | Percent of spending saved ³ |
|--------------|--|--|---|---|--|
| \$6,250,000 | 12.5% of mean PA per declaration (excluding Katrina and Sandy) | 312 | 33.30 | \$1.01 | 1.23 |
| \$12,500,000 | 25% of mean PA per declaration (excluding Katrina and Sandy) | 526 | 56.14 | \$2.89 | 3.52 |
| \$25,000,000 | 50% of mean PA per declaration (excluding Katrina and Sandy) | 686 | 73.21 | \$5.77 | 7.04 |

¹ An eliminated declaration is one for which total PA is less than the value of the deductible. Presumably, all funding up to the point of the deductible would be provided by the state, so no PA would be provided by the federal government.

² There were 937 declarations over the time period including Katrina and Sandy.

³ Total PA spending over the time period is \$82 billion including Katrina and Sandy.

Note that the analysis shown in Table 3 only looks at declarations that would not have been made under the hypothetical deductible. It does not address money saved from a deductible policy on the declarations that *are* issued, but for which the state would pay more

under a deductible policy than under the current cost-share policy.¹² This amount is difficult to estimate without specific knowledge of how much each state spent on its cost share under the current policy (data we do not have), and it is further complicated by the fact that cost-share requirements are sometimes waived (McCarthy 2010).

From the data, we can infer state spending by examining the difference between total project costs and the federal spending on a project, but this may not accurately capture state spending. If we do calculate this difference, however, it suggests that the median amount spent per declaration by a state is \$2.4 million, and the average is \$8.8 million. These amounts are less than our hypothetical deductible, suggesting that states would be paying more for most declarations issued under this hypothetical policy.

To look in more detail at the effect of a deductible across hazards, categories of work, and individual states, we selected the \$12.5 million deductible. This deductible would have affected the declarations given for certain hazards more than others. Looking back over the period 1998–2015, the 526 declarations that would not have been made amounted to \$2.89 billion (Table 3). Over 93 percent of these savings would have been from declarations due to severe storms, winter storms, floods, and coastal storms/ hurricanes/typhoons.¹³ The foregone \$2.89 billion is spread out among all categories of work, but roads and bridges suffer most, losing 12 percent of funding, while public utilities, debris removal, and protective measures lose about 6 percent, 5 percent, and 4 percent, respectively.

4.2. State Budgets

How would the deductible affect state budgets? The effect of our hypothetical deductible varies significantly by state. When examining declarations that would have been eliminated with a \$12.5 million deductible, PA funding over the study time period would have been entirely eliminated in Nevada, Utah, Idaho, Wyoming, the District of Columbia, and the US Virgin Islands. Five states¹⁴ and the Northern Mariana Islands would have lost more than half of their funds, while 34 states and territories would have lost 5–38 percent, and 11 states would have lost less than 5 percent. Notably, 5 of those 11 states would have lost less than 1 percent of their PA funding through eliminated declarations, and they are, predictably, those that have experienced some of the most costly disasters over the time period: New York, Florida, Louisiana, Texas, and California. The most costly disasters would still have received declarations under all hypothetical deductibles. Additionally, no state receiving more than \$1 billion in PA over the period would have lost more than 11 percent of its funding to declarations that would

¹² This would be the case if, for example, the estimated cost of assistance was \$25 million. Under the 25 percent cost-share policy, the state would pay \$6.25 million. But, under a \$12.5 million deductible policy, the state would pay \$12.5 million, resulting in \$6.25 million in savings to the program over the cost-share policy.

¹³ Winter storms include the FEMA categories of “snow” and “ice storms,” and floods include “floods” and “dam/levee breaks.”

¹⁴ Arizona, Maine, Delaware, Rhode Island, and Hawaii.

have been eliminated under the \$12.5 million deductible. Again, we cannot comment on how cost-share payments would compare with a deductible level.

To provide some insight into whether these eliminated declarations would impose a financial burden on states, we compare the *annual average*¹⁵ PA that each state would have lost to the taxes and fees collected by each state in fiscal year 2014 (FY14) (we have excluded federal funds in state budgets).¹⁶ We find that on average, eliminated PA represents 0.030 percent of FY14 state-collected revenues, but again, the states' budgets are not uniformly affected. At the high end, forgone PA represents 0.193 percent of South Dakota's FY14 state-collected revenues and 0.139 percent of Vermont's. For all other states, the PA dollars from eliminated declarations are on average less than 0.082 percent of their state-collected revenues. And at the other extreme, it is less than 0.0001 percent of California's, 0.001 percent of New York's, and 0.002 percent of Florida's. These numbers suggest that only a small portion of state-collected revenues would need to be dedicated to disaster response and recovery efforts to make up for PA declarations lost by this hypothetical \$12.5 million deductible.

If a deductible policy were implemented, states might develop mechanisms for funding a greater share of disaster damages. For example, they could create specific disaster accounts that are funded each year, include line items in agency budgets for disaster response, appropriate funding through supplemental legislation only when needed, and/or allow for certain officials to transfer funds in response to disaster needs (GAO 2015). Revenues could be raised through a variety of approaches as well, including simply using general tax revenue, cost sharing with localities, and/or having dedicated funding streams, such as from taxes on insurance (as is done in Florida), fireworks (as in Indiana), or oil and gas (as in North Dakota) (GAO 2015).

4.3. Investments in Hazard Mitigation and PA Expenditures

Would the deductible increase investments in hazard mitigation and reduce PA expenditures? The recent FEMA notice of intended rule making suggests that once the deductible is established, a state could take actions to lower the deductible (by a still unspecified amount) if it implemented certain predetermined hazard mitigation practices. Illustrations of the practices that might lower the deductible include adopting risk-reducing building codes and creating a state-level disaster relief fund. FEMA is seeking input on what actions would receive credit, but from the examples given, it appears they do not expect them to all be related to PA spending. For example, credit might be given for actions that reduce damages to private homes, even though that type of damage is not covered by PA. It is also unclear if credit will be awarded for all declarations or if they will be limited by hazard type.

¹⁵ Specifically, we take the total PA for each state that would not have been given since a declaration had spending under the deductible and divide by 17 years.

¹⁶ FY14 state-level funding is calculated by adding the values in each state's "general fund" and "other state funds" as reported in National Association of State Budget Officers (2015). Federal funds are excluded. Data are only provided for the 50 states, not US territories or the District of Columbia.

That is, if a state reduces flood risk, does this only reduce their deductible for flood-related disasters or does it also reduce the deductible for snow storms and terrorist attacks?

One way to evaluate the incentive effect of a reduced deductible is to compare the expected value of the larger PA payment (that would be received in the event of a disaster) with the cost of the mitigation actions that reduced the deductible. Presumably, a state could make such cost-effectiveness calculations. However, such a calculation depends on having the list of approved mitigation actions, a statement of the level of the deductible, and a description of the reduction that would be earned. Because none of these design features for the deductible have been set, we cannot comment on the extent to which any mitigation actions would be found cost-effective. Even when this information on these design features is available, making a cost-effectiveness calculation would require a judgment about the likelihood of future disasters occurring for which a PA declaration would be made. If the state judges that the probability of receiving PA is low or that the future PA amounts will be small, then investment in mitigation to receive a lower deductible may not be deemed worthwhile. The states that have most benefited from the PA program might expect future PA to justify mitigation investments, but states with limited expectation of future PA may not.

Further complicating the calculation is whether states expect the deductible to be enforced. Given past waivers for cost-share requirements under current policy, some states may wonder if such exemptions to deductible enforcement would also be made. For example, of the 543 PA-granting disaster declarations issued from August 1998 through May 2009, 63 have had their federal cost shares adjusted to 90 or 100 percent for at least some categories of work and for at least some period of time (McCarthy 2010).

We saw in the previous section, that if a deductible had been in place in the past, the number of events for which PA was offered would have been significantly lower, but total spending would have changed very little. A question is whether mitigation now would reduce PA spending in the future. Not all hazards are amenable to mitigation and not all mitigation would appreciably reduce PA spending. For example, public buildings can be retrofitted to be less vulnerable to flood damage, and PA for making repairs after a flood would presumably be lower on those retrofitted buildings; but there may not be similar actions to reduce PA spending on emergency measures such as debris removal after wind storms or snow events.

What we can conclude is that the incentive effect of the deductible, as well as the PA cost savings, will depend critically on how the deductible policy is designed (such as the type of actions that receive credit and how much credit is received) in relation to the cost to implement the mitigation measures.

References

- Cummins, D.J., M. Suher, et al. 2010. Federal Financial Exposure to Natural Catastrophe Risk, in *Measuring and Managing Federal Financial Risk*. D. Lucas (editor). Chicago, IL: University of Chicago Press Books: 61–96.
- FEMA (Federal Emergency Management Agency). 2016. Public Assistance Program and Policy Guide. Washington, DC: FEMA.
- GAO (Government Accountability Office). 2012. Improved Criteria Needed to Assess a Jurisdiction's Capability to Respond and Recover on Its Own. Washington, DC: GAO.
- . 2015. Approaches to Budgeting for Disasters in Selected States. Washington, DC: GAO
- Gillis, J., and F. Barringer. 2012. As Coasts Rebuild and US Pays, Repeatedly, the Critics Ask Why. *New York Times*. Nov. 18.
- Kousky, C., and L. Shabman. 2013. A New Era of Disaster Aid? Reflections on the Sandy Supplemental. RFF Issue Brief 13-05. Washington, DC, Resources for the Future.
- Lindsay, B.R. 2014. FEMA's Disaster Relief Fund: Overview and Selected Issues. Washington, DC: Congressional Research Service.
- Lindsay, B.R., and J. Murray. 2014. Supplemental Appropriations for Disaster Assistance: Summary Data and Analysis. Washington, DC: Congressional Research Service.
- McCarthy, F.X. 2010. FEMA Disaster Analysis Cost-Shares: Evolution and Analysis. Washington, DC: Congressional Research Service.
- Office of Management and Budget. 2015. OMB Sequestration Update Report to the President and Congress for Fiscal Year 2016. Washington, DC: OMB, Executive Office of the President of the United States.
- Wildasin, D.E. 2008. "Disaster Policies: Some Implications for Public Finance in the US Federation." *Public Finance Review* 36(4): 497–518.