The Heritage Foundation

SPECIAL REPORT
No. 201 | APRIL 16, 2018

After the Storms: Lessons from Hurricane Response and Recovery in 2017

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SR-201

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This paper, in its entirety, can be found at:
http://report.heritage.org/sr201

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Abstract

In 2017, three highly destructive hurricanes—Harvey, Irma, and Maria—brought consecutive waves of damage and destruction. This report examines the U.S. responses—what went well and what needs to be improved. Ultimately, the U.S. needs to improve its preparation and budgeting for disasters, and ensure economic flexibility to better recover from disasters. Policymakers should not forget the importance of local assets, such as the National Guard and civil society and faith-based organizations, that are essential to long-term recovery.

Executive Summary

After three destructive hurricanes in 2017, large areas of the U.S. were affected. Southern Texas, Florida, and the Caribbean were hit particularly strongly and will require significant time and resources to repair and rebuild. While these storms have sown destruction, their silver lining is that they also provide Congress and the Administration with evidence of which policies were effective and which are in need of reform. This *Special Report* reviews the key policies areas related to disaster preparedness, response, and recovery and provides recommendations for policymakers for the future. Congress and the Administration should:

- **Take steps to budget for and mitigate the impact of future disasters.** In the meantime, any additional funds should be focused on immediate response and recovery and must meet the five criteria of emergency spending. If Congress chooses to fund activities beyond that scope, they should be fully paid for with cuts to other domestic programs.
- **Reduce the federal share for all FEMA declarations to a 25 percent cost share.** This way, at least three-fourths of the costs of a disaster are borne by the taxpayers living in the state or states where the disaster took place. For catastrophes with a nationwide or widespread regional impact—such as Hurricane Katrina—a relief provision would provide a higher federal cost share if the total costs of the disaster exceed an inflation-adjusted threshold.
- **Modify the Stafford Act to establish clear requirements that limit the situations in which FEMA can issue declarations.** This should include eliminating some types of disasters from FEMA's portfolio. One way to do this is to raise the minimum-dollar threshold for requesting disaster declarations. FEMA is also considering a disaster deductible system for states that could also achieve similar results.
- **Phase out the deeply flawed National Flood Insurance Program and enable private**

insurance to replace it. Congress should eliminate the subsidies and other giveaways that secure the government's flood insurance monopoly.

- **Reject costly, symbolic gestures to reduce global warming.** Storms Harvey, Irma, and Maria have prompted calls for "action" on climate change. Such proposed actions include the regulation or taxation of carbon dioxide, a colorless, odorless nontoxic gas—and the subsidization of green energy technologies. These are costly nonsolutions and distract from more present-minded efforts to mitigate and adapt to the impacts of extreme weather. Communities and Congress should focus on adaptation and mitigation.

- **Liquidate the Strategic Petroleum Reserve (SPR).** Intended to mitigate U.S. economic vulnerability to major supply disruptions, the stockpile has been a more successful political tool than a policy tool. The abundance of domestic resources, the geographic diversity of oil production worldwide and the abundant quantities of private stocks demonstrate that the SPR has marginal strategic value both in practice and in perception. The federal government should instead respond to fuel shortages by waiving regulatory barriers to fuel access, as the Environmental Protection Agency did.

- **Introduce market competition in Puerto Rico's electricity market.** Puerto Rico's electricity sector was wracked by corruption and years of poor management. The hurricanes only underscored these problems and wiped out the island's infrastructure beyond the means of any one company to rebuild. The best way to attract much-needed capital is to break the Puerto Rico Electric Power Authority's (PREPA's) monopoly over electric generation, transmission, and distribution and create competitive electric markets. Forcing companies to compete for its customers will not only improve service but could also create space for other energy companies and technologies to meet needs and rebuild the island's grid more quickly.

- **Remove unnecessary impediments to economic flexibility.** The harm caused by a lack of economic flexibility during and after a disaster can be seen clearly in the Jones Act and Certificate of Need laws. Furthermore, policymakers should consider granting waivers to some safety regulations that make sense during normal times but could unnecessarily hinder relief efforts in a disaster.

- **Maintain a robust National Guard structure.** Although very different scenarios, the lesson is valid for both storm responses. Texas leveraged a large and experienced force to respond quickly and well. Florida, with a smaller structure, and no State Guard component to assist, used its even greater experience to offset these liabilities. The bottom line is that "small but good" will work, but being "big and good" provides more depth. Puerto Rico's less robust capabilities and much more comprehensive damages have led to a crisis that will not be resolved in anything close to an expedient fashion. The National Guard response has helped tremendously, but the overall governmental failure (and incredibly fragile infrastructure) has left a task that dwarfs any previous rebuilding challenge.

- **Expand National Guard cooperation and training with civilian authorities and organizations.** Active training and regular coordination with the federal and state agencies with whom they will need to interact in a disaster must happen regularly. Organizations responding to disasters must have deep relationships before the storm strikes. This lack of coordination seems to have harmed Puerto Rico's preparedness. Similarly, planning and training for disasters should consider how ad hoc civilian responders can be mobilized to save lives.

- **Incorporate faith-based organizations into federal and local disaster plans.** Coordination between faith-based groups and government agencies maximizes available resources and better serves those in need. Strong partnerships between the government and faith-based groups makes all parties more effective. Victims are best served when the federal government collaborates in advance with faith-based agencies and state and local agencies. The federal government should continue to reach out to civil society and faith communities through appropriate agencies, such as the White House Office of Faith-Based and Neighborhood Partnerships and the Department of Homeland Security's Center for Faith-Based and Neighborhood Partnerships.

After the Storms: Lessons from Hurricane Response and Recovery in 2017

David Inserra, Justin Bogie, Diane Katz, Salim Furth, PhD, Monica Burke, Katie Tubb, Nicolas D. Loris, and Steven P. Bucci

The 2017 Atlantic hurricane season ranked among the top 10 most active seasons to date, breaking more than one world record.[1] Three highly destructive hurricanes, Harvey, Irma, and Maria, brought consecutive waves of damage and destruction. These hurricanes wreaked havoc over the course of only two months, caused serious economic damage, and harmed countless people. Rebuilding will take time, but as the U.S. rebuilds, Congress and the Administration should also be looking to improve the U.S.'s disaster response and recovery policies. This *Special Report* will examine many of the critical policy areas related to disaster preparedness and response:

- Budgeting for disasters;
- The Disaster Relief Fund;
- The National Flood Insurance Program;
- Climate change, energy policy, and the electric grid;
- Regulations and economic flexibility;
- The National Guard and other military organizations; and
- The role of community and faith-based organizations.

This *Special Report* will consider what the U.S. did well, what it did poorly, and how its policies must change to be better prepared for the future.

The 2017 Hurricane Season Hits Hard

Hurricane Harvey was the first major hurricane of the 2017 hurricane season. Starting as a slow-moving tropical storm, Harvey gained power as it moved through the Gulf of Mexico. On August 25, Harvey hit Rockport, Texas, as a Category 4 storm. The strongest hurricane to hit the U.S. in over a decade, this storm carried high winds of 130 miles per hour (mph) and intense rain.[2] In the span of six days, Harvey hit three separate times affecting 13 million people in Texas and Louisiana. After nearly a week, Harvey was downgraded to a tropical storm before blowing through southern Arkansas. Torrential rain and flooding strewed a large amount of debris throughout cities and towns across these states. Hurricane Harvey broke the national record for the largest amount of rainfall in a single storm, accumulating over 27 trillion gallons of rain, and flooding one-third of Houston.[3]

More than 50 counties were almost completely submerged in water, resulting in destroyed houses, businesses, and cars.[4] This devastation displaced 39,000 individuals from their homes and destroyed 203,000 residences. The creation of temporary havens provided shelter for thousands of uprooted individuals. Weeks after the hurricane,

approximately 3,900 homes were still without electrical power.[5] Most estimates of the cost of Harvey fall between $70 billion and $110 billion, with some going much higher.[6]

Before the U.S. could recover from the effects of Hurricane Harvey, Hurricane Irma began to form in the Caribbean. In comparison to Harvey, Irma was even more powerful. Hurricane Irma broke a new record by accumulating the highest cyclone energy in a 24-hour period.[7] Irma first made landfall on September 6 in Barbuda before traveling throughout the British Virgin Islands, St. Martin, the U.S. Virgin Islands, Turks and Caicos, Puerto Rico, Haiti, the Bahamas, and Cuba as a maximum-strength Category 5 hurricane. Irma was later reduced to Category 4 prior to reaching the U.S. mainland. Ranked as one of the most powerful storms in Atlantic history, Irma maintained 185 mph winds for over 37 consecutive hours. Irma inflicted the most damage in the Caribbean, affecting 1.2 million people. Irma destroyed 90 percent of Barbuda's buildings and infrastructure and 80 percent of the British Virgin Island's boats.[8]

While people monitored Irma's effects in the Atlantic Ocean, weather reporters and government officials warned Americans to evacuate before the hurricane touched down on the U.S. mainland. Around seven million people in the southeast vacated their homes, making it one of the largest storm evacuations in U.S. history.[9] Irma lasted a whole 12 days before turning into a tropical storm and diminishing. The hurricane reached Florida on September 10, touching down on the southern coast, highly impacting the Florida Keys, Jacksonville, and Naples. Naples and Jacksonville were hit particularly hard, with Jacksonville receiving up to 15 inches of rain and record amounts of flooding.[10] School closures, extensive property destruction, flight cancellations, widespread fuel shortages, and electric-grid failures were all effects of the storm. Over half a million people were left displaced from their homes. This powerful storm tragically resulted in the deaths of at least 75 people in Florida and total deaths across the Caribbean and Florida came to as many as 134.[11] Heavy rain and flooding also affected Alabama, Georgia, Tennessee, and the Carolinas. Damage estimates range from around $50 billion to around $100 billion, and as with Harvey, some estimates go significantly higher.[12]

In the wake of two highly destructive hurricanes, Hurricane Maria, the 10th most powerful hurricane on record, hit Puerto Rico full force as a Category 5 storm on September 20.[13] Puerto Rico was still reeling from the effects of Hurricane Irma and thus was ill-prepared for the level of devastation that hit the island. Similar to the effects seen in Florida, Hurricane Irma had dealt serious damage to Puerto Rico's electric grid. At the time of Hurricane Maria's arrival, 60,000 people were still without power.[14]

The hurricane affected Dominica, the Dominican Republic, the U.S. Virgin Islands, Turks and Caicos, and most significantly Puerto Rico where at least 55 lives were lost with some reports indicating that total may be much higher.[15] The hurricane dropped up to 38 inches of rain and caused widespread devastation. Massive amounts of debris blocked highways and roads, and power outages led to school and hospital closures. Few hospitals were equipped with back-up generators, leaving many citizens without access to immediate care. Due to its inability to tend to those hurt in the storm, Puerto Rico sought outside help in receiving medical care and medical supplies.

The storm almost completely destroyed Puerto Rico's electric grid, affecting 95 percent of wireless cellular services and 80 percent of the island's transmission lines.[16] Unlike the mainland's ability to provide emergency communications during a time of crisis, citizens on the island remained unable to contact their families. Although Harvey and Irma caused just as much loss, this hurricane presented unique challenges because of the island's geographic isolation, financial instability, and poor electrical grid system. As of the middle of November, just over 50 percent of the electrical power had been restored.[17] Damage estimates vary from around $35 billion to around $100 billion.[18]

With limited food, water, gas, and electricity, and many of their homes and jobs destroyed, Puerto Ricans still face a dire situation.

With limited food, water, gas, and electricity, and many of their homes and jobs destroyed, Puerto Ricans are still facing a dire situation. Many Puerto Ricans fled the devastation to come to the mainland. Florida governor Rick Scott (R) opened up his state as a haven for displaced victims of Hurricane Maria.[19]

These natural disasters will have a lasting impact on the affected areas and the people in them. As they start to rebuild their lives, they will rely on help from outside sources as well as local communities. These catastrophes have shown the United States' resilience, as charities, individual citizens, military members, community programs, and federal agencies have stepped up and offered support to these areas. Support is continuing to Florida, Texas, and Puerto Rico. While it is not possible to foresee the specific location and size of a disaster, government policies must ensure proper disaster preparation and response from all stakeholders to provide relief to citizens whose lives have been forever changed by these disasters.

Congress Must Spend Emergency Supplemental Funding Properly

In the wake of three hurricanes and wildfire outbreaks in the western United States, as of the end of October 2017, President Donald Trump has made two separate emergency supplemental funding requests. Congress has enacted both requests, adding billions of additional dollars in funding for non-emergency purposes in the process. More requests and funding packages are likely to follow. Before appropriating any additional funds, Congress must ensure that additional activities meet the five criteria of emergency spending laid out under President George H. W. Bush: (1) that the spending is necessary, and that the emergency is (2) sudden, (3) urgent, (4) unforeseen, and (5) not permanent. If they do not, Congress should fully offset any additional funding.

Emergency supplemental requests differ from what are known as disaster designated appropriations. The Budget Control Act of 2011 placed caps on discretionary spending from fiscal year (FY) 2012 to FY 2021. However, it allowed certain upward adjustments to those caps for purposes such as disaster spending and Overseas Contingency Operations, among others.

In the FY 2017 Omnibus Appropriations Act, FEMA's Disaster Relief Fund (DRF) received $616 million in regular appropriations. It received an additional $6.7 billion through a cap adjustment, which was not subject to the confines of the Budget Control Act. The base funding for the DRF is used to respond to "normal," non-catastrophic events that cost less than $500 million per occurrence. Federal disaster declarations have increased sharply over the past few decades, meaning that DRF funds are quickly depleted. When this happens, Congress has the authority to appropriate additional funds for disasters as designated under the Stafford Act. Over the past five years, the annual cap adjustment for disaster relief has averaged more than $8 billion.

Whereas the DRF is used for "normal" disasters, when the $500 million threshold is breached Congress has generally turned to emergency supplemental appropriations. Unlike the more stringent guidelines for a disaster declaration, emergency funds can be provided for almost any purpose that is seen to be too urgent to be postponed until the next enactment of regular appropriations. In recent years, supplemental appropriations have been used for purposes such as increasing border security in the southwestern U.S., aiding recovery after Hurricane Sandy, and in response to the Ebola crisis in 2014.

Emergency supplemental appropriations are not subject to budgetary constraints and there is virtually no limit on the amount of additional spending that may be enacted through this process. Taxpayers and others concerned about fiscal responsibility should be extra vigilant whenever Congress is considering emergency funding requests.

Hurricane Harvey. President Trump submitted his first emergency supplemental request on September 1. This was in direct response to Hurricane Harvey, which brought devastating flooding to southeast Texas and portions of Louisiana. The President requested a total of $7.85 billion for initial response and recovery efforts. This included $7.4 billion for the DRF with the remaining $450 billion going to the Small Business Administration's (SBA's) disaster loan program. The President also called for the re-authorization of the National Flood Insurance Program (NFIP).

Between the time the request was made and its enactment less than a week later, the President forged a deal with congressional Democrats that would not only enact the request, but also extend government funding and the debt limit into early December. In addition to the $7.8 billion originally requested by the President, the final bill added $7.4 billion in funding to the Department of Housing and Urban Development's (HUD's) Community Development Block Grant (CDBG) program to be directed to those areas "most affected by 2017 disasters."

By providing emergency funding to the SBA and CDBG, the bill missed the mark. In 1991, the Office of

Management and Budget published a list of five criteria that a spending provision should meet in order to be designated as an emergency. It stated that to qualify as an emergency it must be necessary, sudden, urgent, unforeseen, and temporary.

The SBA disaster loan program is a government subsidy for private businesses. The program has a history of poor management and falls outside the proper scope of the federal government. Giving it the authority to provide grants to whomever it sees fit is an improper use of emergency funding and fails to prioritize aid to those who need it most.

The inclusion of $7.4 billion for the CDBG raises even more red flags due to its size. It gives broad grant authority to HUD to determine who is most deserving of the billions of dollars in federal aid. The program is not well-targeted to low-income communities and is not transparent, making it difficult to assess whether it is meeting its stated goals. It, too, falls outside the scope of activity that is appropriate for the federal government.

The Small Business Administration disaster loan program is a government subsidy for private businesses.

Ultimately, it is up to Congress to determine whether the SBA disaster loan program and the CDBG are within the scope of the federal government's duties. However, funding for these programs clearly falls outside the criteria of emergency spending for disaster relief and should not have been included in the Harvey relief package.

Continued Harvey Relief and Subsequent Storms. Shortly after Hurricane Harvey came Hurricanes Irma and Maria, which had devastating effects on portions of Florida and Puerto Rico. In response, the President submitted his second emergency supplemental funding request to Congress on October 4. The request included an additional $12.77 billion to FEMA's DRF and called for the cancellation of $16 billion in debt incurred by the NFIP. It added an additional $576.5 million to help fight wildfires in the western United States.

By the time Congress adopted the request, it ballooned from $29 billion to $36.5 billion. In addition to the funding outlined by the President, Congress added another $6.7 billion in DRF funding and $1.3 billion in supplemental nutrition assistance funds to low-income residents of Puerto Rico.

The three hurricanes that hit the U.S. mainland and its territories earlier this year had a devastating impact on some communities. Increased funding to the DRF for the immediate response and recovery efforts and to ensure the safety and health of U.S. citizens was appropriate and meets the five criteria of emergency spending. Still, Congress must be prudent and insure that any additional funding continues to meet these requirements.

Other activities funded by the bill were not appropriate and should not have been provided under the guise of emergency spending. The NFIP is in desperate need of reform. It is drowning in debt, already owing taxpayers $25 billion, and encourages development in flood-prone areas, which ultimately worsens the impact of national disasters. It should not have been provided as a deficit-increasing bailout by Congress and the President.

The same can be said of wildfire funding and what amounts to a bailout for the Puerto Rican government through additional supplemental-nutrition-assistance funding. Wildfire funding in its current form is ineffective and insufficient. However, it should be dealt with as a separate issue, with Congress pursuing structural reforms and a longer-term funding solution.

It is likely that there will be additional emergency supplemental funding requests. Moving forward, Congress must:

- **Budget for and mitigate the impact of future disasters.** In the meantime, any additional funds should be focused on the immediate response and recovery and must meet the five criteria of emergency spending. If Congress chooses to fund activities beyond that scope, they should be fully offset by cuts to other domestic programs.

Sustainable Disaster Response

While fiscal discipline is necessary after a disaster, the U.S. must do more to be prepared ahead of time. As mentioned above, the DRF receives large sums of money every year but, unfortunately, "normal"and past years' disasters regularly deplete the DRF. This leaves minimal funds ready for any of these larger, catastrophic disasters, forcing Congress to make use of emergency supplemental appropriations that are routinely abused.

This trend is largely due to the large growth in the number of federal disaster declarations. After Congress passed the Stafford Act in 1988, the number of disasters falling under the umbrella of federal assistance grew significantly. There was an average of 43.5 disaster declarations per year under President George H. W. Bush, 89.5 under President Bill Clinton, 129.6 under George W. Bush, and 106.8 under President Barack Obama. The result is that the amount of funding needed to respond to disasters has grown as more and more disasters have been federalized.[20]

This increase is largely due to at least two changes in policy and regulation under the Stafford Act. First, the act shifts at least 75 percent of disaster response costs to the federal government. In the event of a disaster, states normally have to pay for the costs of responding, but if the President declares the disaster a major disaster worthy of federal assistance, then the federal government covers at least 75 percent of response costs. The result has been that states now request federal help whenever they can, since it will bring significant federal dollars. This creates a vicious cycle as states respond to increased federalization of disasters by preparing less than they should. As a result, states are less prepared for disasters, they request more federal help, and the downward cycle is perpetuated.

The second problematic provision of the Stafford Act makes it far too easy for states to request disaster assistance. The act vaguely requires that a disaster be "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."[21] That requirement has been turned into regulation that demands that storm-related damages top approximately $1.46 per capita before states receive aid, which for 16 states is less than $5 million.[22] So, even local disasters that are centered in one state and cost as little as $5 million can be considered federal disasters. This combination of easy-to-acquire federal assistance and the substantial monetary benefit from federal involvement puts FEMA in high demand, leaving it unprepared—in terms of readiness and money—for truly catastrophic disasters. It also leaves states less prepared for disasters of any size.

Instead, DHS should reduce the number of disasters to which FEMA responds, leaving many smaller disasters fully in the hands of states and local governments. FEMA should also reduce the federal share of disaster costs so that only the large disasters receive a 75 percent federal cost share. For most medium-severity disasters, FEMA would cover closer to 25 percent of disaster costs. By limiting disaster declarations and limiting cost sharing, FEMA will be able to put more money aside for catastrophic disasters, which is when federal disaster funding is most needed. This will require that states cover more of the costs for smaller disasters. Such reform is not only better for disaster response—more prepared and invested state and local governments will improve overall disaster preparedness and response—it is also fairer. Taxpayers in states that do not have many disasters, or do a better job preparing for disasters, subsidize high-disaster risk and low-preparedness states through the current federal model. Returning more responsibility to state and local governments returns responsibility where it belongs.

- **Reduce the federal share for FEMA declarations to 25 percent.** This way, at least three-fourths of the costs of a disaster are borne by the taxpayers living in the state or states where the disaster took place. For catastrophes with a nationwide or widespread regional impact—such as Hurricane Katrina—a relief provision would provide a higher federal cost share if the total costs of the disaster exceeded an inflation-adjusted threshold.

- **Modify the Stafford Act to establish clear requirements that limit the situations in which FEMA can issue declarations.** This should include eliminating some types of disasters from FEMA's portfolio entirely. One way to do this is to raise the minimum-dollar threshold for requesting disaster declarations. FEMA is also considering a disaster deductible system for states that could achieve similar results.

Fixing Flood Insurance

The National Flood Insurance Program (NFIP) was already $25 billion in debt to taxpayers before Hurricanes Harvey, Irma, and Maria devastated much of the Gulf Coast and Puerto Rico.[23] Congress has since bailed out the program to cover the most recent storm losses, but the necessity to do so underscores the need for major reform.

The federal flood insurance program depleted its statutory borrowing cap of $30.4 billion on

September 20, following a request for $5.8 billion from the U.S. Treasury to partially cover hurricane claims.[24] Most of the outstanding debt resulted from losses related to Hurricane Katrina in 2005 and Superstorm Sandy in 2012. This time around, more than 3 million NFIP policies were in effect across the storm-ravaged regions, and officials expect payouts to exceed $16 billion.[25]

To fund this year's recovery efforts, Congress approved two supplemental appropriations, including $26 billion for FEMA's DRF and a write-off of $16 billion in NFIP debt to taxpayers.[26]

Beyond its alarming debt, the NFIP cannot keep up with risk assessments, and its subsidies actually promote development in flood zones.

As the General Accounting Office noted in its 2017 report on "high-risk" government agencies, "This lack of sufficient revenue highlights what have been structural weaknesses in how the program is funded."[27]

Beyond the alarming debt, the NFIP cannot keep up with risk assessments, and its subsidies actually promote development in flood zones. That explains, in part, why so much development has occurred along the flood-prone Gulf Coast. Nonetheless, the House recently rejected meaningful reforms in its re-authorization of the NFIP.

Tinkering at the margins will not remedy a program designed to be financially unsound and wholly dysfunctional. Allowing a private market in flood insurance is the ultimate solution.

How the NFIP Works. Congress established the NFIP in 1968 to provide flood insurance for at-risk properties and to mitigate flood risks through land-use regulation.[28] Congress noted at the time that ad hoc disaster relief was placing "an increasing burden on the nation's resources,"[29] which could be alleviated by insurance coverage.

Some five million properties are currently insured under the program. Property owners are eligible if their community adopts and enforces floodplain management regulations that meet or exceed federal standards.[30] Policyholders may see reductions on insurance premiums if their communities undertake mitigation to improve their status under FEMA's Community Rating System (CRS). The discount may range from as little as 5 percent to as much as 45 percent based on the degree to which mitigation actions exceed the minimum federal standards.[31] Federal grants are available for projects that reduce the risk of flood damage to insured structures.[32]

FEMA has little discretion in issuing policies regardless of the degree of flood risk or repetitive claims (à la Texas and Florida).[33]

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For purposes of rate-setting and mitigation planning, FEMA develops Flood Insurance Rate Maps (FIRMs) of flood-prone communities. Areas in which there is a 1 in 100 or greater risk of annual flooding are designated as Special Flood Hazard Areas (SFHAs). Properties within these areas require flood insurance if the mortgage was issued by a federally regulated lender, a federal agency lender, or a government-sponsored enterprise.[34]

For areas with moderate flood risk, the NFIP offers the less-expensive Preferred Risk Policies (PRP). Whether they are within a hazard zone or in an area with moderate risk, policyholders are required to purchase Cost of Compliance policies to cover the added expense of rebuilding to newer stricter construction codes than were originally in place.

Why the NFIP Does Not Work. NFIP coverage has two types of premiums: "full risk" and "subsidized." Full-risk rates are supposed to be actuarially sound, that is, they should cover anticipated losses and administrative expenses.[35] According to FEMA, about 80 percent of policyholders pay full-risk rates. However, absent accurate risk mapping, the agency cannot determine a credible full-risk rate.

Subsidized premiums, established by Congress to encourage enrollment in the NFIP, apply to properties built before a community's flood-risk map was issued or before January 1, 1974. Property owners who have maintained continuous coverage since originally enrolling in the NFIP, or whose property was built in compliance with NFIP standards, have the option of paying a "grandfathered" premium tied to a previous rate map.[36] Consequently, the

TABLE 1

NFIP Runs a Deficit of $1.4 Billion

The one-year costs for the National Flood Insurance Program total $5.7 billion, while premiums and other charges paid by those insured by the NFIP total only $4.3 billion, leaving a deficit of $1.4 billion.

COSTS	
EXPECTED COSTS*	
Expected claims	$3.7
Payments to companies selling/ servicing policies	$1.1
Salaries and operating expenses	$0.2
SUBTOTAL	$5.0
ADDITIONAL COSTS	
Floodplain mapping and management	$0.2
Mitigation assistance	$0.2
Interest on debt	$0.3
SUBTOTAL	$0.7
TOTAL	**$5.7**

PREMIUMS AND OTHER CHARGES	
Rate-based premium receipts	$3.3
Reserve fund assessment	$0.5
Surcharges	$0.4
Federal policy fee	$0.2
TOTAL	**$4.3**

* Costs associated with writing/servicing policies.
NOTES: Figures are in billions of 2016 dollars. Figures may not sum to totals due to rounding.
SOURCE: Congressional Budget Office, "The National Flood Insurance Program: Financial Soundness and Affordability," September 2017, https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53028-nfipreport2.pdf (accessed March 27, 2018).

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premiums for high-risk properties across the Gulf Coast are not actuarially sound.

Under the National Flood Insurance Reform Act of 1994, FEMA must assess the need to revise and update all floodplain areas and flood-risk zones identified once during each five-year period.

A large proportion of the flood-risk maps are obsolete, and thus the premiums charged under the NFIP do not reflect actual risk.

Of the mapping in FEMA's inventory, only 49 percent is designated as "valid," meaning that the map "adequately identifies the level of flood risk."[37] Another 11 percent is designated as "unverified," which is FEMA-speak for deficient. In addition, 39 percent is "unknown," as in yet to be validated.[38]

In its review, the Technical Mapping Advisory Council concluded, "Many populations across the Nation are not covered in updated, valid flood studies and are therefore subject to unknown flood risk."[39]

A Congressional Budget Office (CBO) analysis of 5 million policies in effect as of August 31, 2016, found that overall, considering all expenditures and premium income, the NFIP had an expected one-year shortfall of $1.4 billion. The CBO attributed the shortfall largely to premiums falling short of costs in coastal counties, which constitute three-quarters of all policies nationwide.

The CBO identified two primary factors contributing to the $1.4 billion forecast deficit: (1) the roughly $1.0 billion difference between the expected claims estimated by the CBO and FEMA's estimate of expected claims (which were used to set premiums), and (2) the roughly $0.3 billion difference between the $0.7 billion cost of charging discounted rates for certain policies and the $0.4 billion in receipts from a surcharge intended to help cover the cost of the discounts.

Lawmakers instituted premium discounts to encourage participation. The CBO estimates a net cost of roughly $0.7 billion for the rates that do not reflect actuarial risk.

Most coastal policyholders—such as those affected by Hurricanes Harvey and Irma—do not pay premiums that cover their anticipated losses, the CBO found. Those costs are covered by artificially higher premiums paid by inland policyholders, resulting in a cross-subsidy.

A significant share of the subsidies are enjoyed by a relatively small number of "repetitive loss properties," such as the Houston house submerged by Hurricane Harvey—which has been flooded 22 other times since 1979.[40] According to *The Wall Street Journal*, the house is valued at about $600,000. The government has spent $1.8 million to rehabilitate it.

The *Houston Press* reported on another Harvey-hit property flooded for the fifth time in 26 months. Since the house was built in 1979, the NFIP has paid out $850,000 in claims—some $25,000 more than the property's appraisal.[41]

How to Fix the NFIP. The House re-authorization bill would require FEMA to share claims data with private insurers and recognize private insurance as eligible to fulfill federal lending requirements for coverage. But private insurers cannot compete against taxpayer-subsidized premiums. Therefore, the real solution is to eliminate the subsidies and other giveaways that secure the government's flood insurance monopoly.

Private insurers are interested in underwriting wide swaths of properties in flood zones. The benefits of phasing out the NFIP are reflected in the differences between the government-run program and the private sector. The NFIP has fiscally irrational policy objectives, such as offering subsidized insurance premiums that do not reflect the full risk of flooding to encourage program participation and community-based floodplain management and reducing the reliance on federal disaster assistance.

Private insurers focus on a different set of objectives. These include ensuring rate and capital adequacy, maintaining solvency, and producing a return on investment. The differences between the NFIP and private insurers apply to rate-setting as well. For example, the NFIP generally accepts all applicants regardless of an individual's property risk and sets rates across a smaller number of broad rate classes. Private insurers generally insure applicants based on individual property risks and a larger number of more specific rate classes.

Opponents claim that private insurers will cherry-pick customers, leaving behind property owners with the highest risk. But according to the Reinsurance Association of America, this fear has not borne out.[42] Two data points in particular show this is not likely to be the case: (1) Most private companies in Florida are writing insurance in higher-hazard areas and are not choosing the least-risky properties, and (2) Private insurance "take outs" led to a much smaller and stronger state-run insurance program.

The availability of customized options through private companies is likely to increase the number of homeowners who insure against flooding. Such an arrangement would certainly enhance the finances of the NFIP—and unburden taxpayers.

Therefore, Congress should:

- **Phase out the deeply flawed NFIP and allow private insurance to replace it.** Congress should release aggregated claims data necessary for private insurers to price private insurance and eliminate the subsidies and other giveaways that secure the government's flood insurance monopoly.

Energy and Environmental Policies Are Key to Disaster Response

Beyond issues of government funding and programs dedicated to cleaning up after a disaster, U.S. policies that affect the production and transmission of energy and electricity play a critical role in rebuilding.

Misplaced Focus on Manmade Warming. Understanding the problem correctly is critical to developing solutions. Many people, including members of the media, environmental activists, and Democrats, misidentified anthropogenic global warming as the cause for Hurricanes Harvey, Irma, and Maria. Consequently, Members of Congress have advocated for costly non-solutions that are counterproductive.

First, it is important to dispel the notion that manmade greenhouse gas emissions caused an aggressive hurricane season in the United States. In fact, as domestic and global greenhouse gas emissions have increased, the U.S. was in a 12-year hurricane drought. Further, there appear to be no trends of increasing global tropical cyclone landfalls over the past 46 years.[43]

The United Nation's Intergovernmental Panel on Climate Change (IPCC) itself reported in its most recent scientific assessment that "[n]o robust trends in annual numbers of tropical storms, hurricanes, and major hurricanes...have been identified over the past 100 years in the North Atlantic basin," and that there are "no significant observed trends in global tropical cyclone frequency."[44] According to the National Oceanic Atmospheric Administration, "It is premature to conclude that human activities—and particularly greenhouse gas emissions that cause global warming—have already had a detectable impact on Atlantic hurricane or global tropical cyclone activity."[45] Nevertheless, Harvey, Irma, and Maria prompted calls for "action" on climate change. Such proposed actions include the prohibition, restriction, and taxation of natural resources that emit carbon dioxide (CO_2) when burned. These are costly non-solutions that distract from more present-minded efforts to mitigate and adapt to the impacts of extreme weather.

Climate change regulation and carbon taxes are costly non-solutions that distract from more present-minded efforts to mitigate and adapt to the impacts of extreme weather.

Using the Model for the Assessment of Greenhouse Gas Induced Climate Change, developed with support from the Environmental Protection Agency (EPA), climatologists Paul Knappenberger and Patrick Michaels estimate that the climate regulations will avert a meager tenth of one degree Celsius of warming by the year 2100. In fact, the U.S. could cut its CO_2 emissions by 100 percent and it would not make a difference in global warming. Using the same climate sensitivity (the warming effect of a doubling of CO_2 emissions) as the IPCC assumes in its modeling, the world would only be 0.137 degrees Celsius cooler by 2100. Even if the entire industrialized world cut its CO_2 emissions entirely, the averted warming would amount to 0.278 degrees Celsius by the turn of the century.[46]

However, policies to restrict the use of conventional fuels would force significant changes in energy markets, particularly for electricity generation, causing prices to rise. Coal, oil, and natural gas meet more than 80 percent of America's energy needs and have done so for more than a century. Curtailing their use through taxation or regulation will have significant harmful impacts on the economy by driving electricity and fuel prices higher. Higher energy prices would reverberate throughout the economy, resulting in an overall average loss of nearly 400,000 jobs and total income loss of more than $20,000 for a family of four by the year 2035 according to modeling done by The Heritage Foundation using the Energy Information Administration's (EIA's) National Energy Modeling System.[47]

The Resilience of the Refining Sector. The Gulf Coast is a major energy hub in the United States, representing nearly half of the country's refining capacity.[48] Hurricanes Harvey and Irma put the refinery industry to the test, with the industry proving to be resilient despite having to shut down or slow production. The weekly utilization rate of Gulf Coast refineries fell from 96 percent to 63 percent.[49] Gasoline prices increased across the country, and unsurprisingly, spiked in the southeast U.S.[50]

Unlike in 2005, when refineries took between six months and eight months to come back online in the wake of Hurricanes Katrina and Wilma, 23 of 24 refineries were restarted or in the process of restarting in little more than three weeks.[51] According to a Department of Energy Situation Report, all refineries were back to typical levels by October 5.[52] While it is difficult to compare one natural disaster to the next, it is clear that lessons learned from past storms have helped the industry better protect infrastructure from future ones.

The industry's top priority is to protect the safety of the workers, surrounding communities, and environment. The refining industry has an incentive to reduce outages, minimize time offline, and promote efficient coordination and communication to mitigate any problems. For example, during major storms, companies suspended approximately a quarter of the oil and natural gas production in the region and shut down most of the refineries.[53] Advances in technology have allowed more timely and improved communication between members of the refinery industry, government agencies, members of the public, and employees.[54]

To ensure safety, the industry follows a series of careful phases for a successful and safe restart.[55] The restarting process time can vary based on

the amount of damage incurred. Industry develops thorough preparedness plans in coordination with the government, local communities, and first-responders. The companies update these plans regularly, on top of ongoing, incremental process and facility improvements.

Strategic Petroleum Reserve: An Ineffective and Unnecessary Response Tool. The Strategic Petroleum Reserve (SPR) is a government-controlled stockpile of crude oil that holds nearly 700 million barrels to serve as an emergency stockpile for supply shocks that cause price spikes. The Department of Energy released 500,000 barrels of crude oil from the SPR in the wake of Harvey.[56] The Trump Administration's release had minimal impact on gas prices in the region and across the country.[57]

The oil industry and the market in general will appropriately and effectively respond to changes in oil prices. The federal government should not distort that role with its own SPR inventory.

Intended to mitigate U.S. economic vulnerability to major supply disruptions, the stockpile has been a more successful political tool than a policy tool. The executive branch can interpret the conditions rather vaguely, making an SPR release more about domestic party politics than policy. For instance, even though drawing down SPR reserves may have little market effect, it could help a President obtain favorable polling from the public by creating the perception that the Administration is "doing something" about an alleged crisis. A more appropriate response is to do as the EPA did in in response to Hurricane Harvey when it issued multi-state regulatory relief from requirements that gasoline meet certain summertime air quality standards, making fuel more accessible.[58]

It is impossible to know how the private sector would respond by unloading their inventories, which are larger than the government's, in a world without SPR. The reality is that the abundance of domestic resources, the geographic diversity of oil production worldwide, and the abundant quantities of private stocks all prove that the SPR has marginal strategic value both in practice and in perception. The oil industry and the market in general will appropriately and effectively respond to changes in prices. The federal government should not distort that role with its own inventory.

Grid Remained Resilient. Despite extensive outages, electric utilities were able to recover relatively quickly from the effects of Hurricane Harvey and Irma. Harvey and Irma affected electricity infrastructure, such as utility poles, distribution lines, and major transmission lines, causing extensive outages in southeast Texas, Louisiana, Florida, and Georgia, with limited impact in Alabama and the Carolinas. However, broad reliability of the regional grid was maintained.[59] Flooding and sustained winds were the principal causes for delays in accessing areas to restore power.

As the EIA states, utilities in Florida have made "significant improvements" since 2005 to prepare for hurricanes with measures like replacing wooden utility poles with concrete ones and better grid technology to generate more timely and detailed information about power outages.[60] Improvements in Florida seem to have paid off when comparing the experience of Hurricane Irma with the experience of Hurricane Wilma in 2005: While more people in Florida (as a percentage and number) lost power in 2017, power was restored more quickly than in 2005.[61] This is also due to the roughly 60,000 people from around the U.S. and Canada who worked to restore the grid, "one of the largest power-restoration projects in U.S. history," according to the Department of Energy.[62] As with Irma, grid recovery after Harvey involved thousands of workers from around the country.[63]

Of particular concern to some were the six operating nuclear power reactors in the direct paths of Harvey and Irma. Around the world, countries are questioning the value and safety of nuclear power in the wake of the Fukushima accident. The experience of Hurricanes Harvey and Irma again showed that, given planning and proper execution, nuclear power plants can withstand extreme weather and be critical components to restoring electricity after a storm.[64]

The Turkey Point and St. Lucie reactors in Florida and the reactors at the South Texas Project Generating Station—the nuclear facilities most directly in Harvey and Irma's paths—were designed and built to withstand extreme weather and flooding.

American nuclear plants are built with layered safety systems to mitigate and control emergency situations, including the case of serious damage. For example, should power to the reactors be significantly disrupted during a storm, reactors will automatically shut down and diesel generators will kick in to maintain safe operations and conditions. In the case of Hurricane Irma, there was an orderly shutdown of three reactors during the storm,[65] while the South Texas reactors were able to run at full power through Hurricane Harvey.[66] Both utilities prepared their facilities days in advance of landfall by the hurricanes and had additional Nuclear Regulatory Commission (NRC) staff onsite.[67]

Beyond plant design, federal law also requires nuclear plants to develop preparedness and emergency response plans with local, state, and federal groups approved by FEMA and the NRC before an operating license is granted. Nuclear facilities participate in full emergency exercises with state and local first responders at least once every two years.[68] Because of these preparations and routine review of emergency plans, America's nuclear reactors are among the world's safest.

Hurricane Underscores Puerto Rico's Debilitated Grid. Hurricane Maria made landfall in Puerto Rico on September 20. The Department of Energy reported that virtually all Puerto Ricans were without power and all generation units were offline, leaving homes, schools, hospitals, and businesses without electricity. Reportedly, 80 percent of the island's electric transmission and distribution lines were damaged.[69] Puerto Rico's slow recovery demonstrates the importance of energy as a building block to economic health and opportunity, as schools, hospitals, businesses, and government services are unable to operate normally, if at all, and many residents have left to wait out recovery efforts in the U.S.[70]

What followed was an effort to restore electricity access as quickly as possible and a bare minimum of fixes in transition to a complete overhaul of the grid. The Puerto Rican government set a goal of achieving 95 percent restoration of power by the end of 2017.[71] However, according to the Department of Energy, Puerto Rico had restored only 65 percent of peak generating capacity and a few municipalities were still waiting for power by that time.[72] With 51 percent of federal disaster relief assistance going to water and power infrastructure,[73] the Army Corps of Engineers began awarding several contracts to repair transmission and distribution, bringing thousands of workers to rebuild transmission and distribution lines. The EPA also issued waivers on power generators that do not meet Clean Air Act standards.[74]

Hurricane Maria underscored not only how woefully unprepared Puerto Rico's grid was for a storm of this proportion, but also its state of dysfunction.

Hurricane Maria underscored not only how woefully unprepared Puerto Rico's grid was for a storm of this proportion, but also its state of dysfunction. The overwhelming majority of Puerto Ricans are served by Puerto Rico Electric Power Authority (PREPA), a government entity created in 1926, which owns most of the island's electric generation and distribution.[75] PREPA's board and executive director are appointed by the governor and were notoriously corrupt.[76] Until 2014, there was no regulatory oversight or accountability of PREPA's management, which is now fulfilled by the Puerto Rico Energy Commission. PREPA filed for bankruptcy in July 2017.

Before Maria hit, Puerto Rico's grid was inefficient, expensive, and outdated, relying on petroleum for 47 percent of its electricity.[77] Petroleum provides less than one percent of electricity generation in the U.S. Moreover, the grid experienced frequent power outages and faced $2.5 billion in repair and maintenance before the hurricane, and PREPA itself has at least $2.3 billion in pension obligations.[78] PREPA's long history of corruption and reputation for resisting innovation made Puerto Rico an unattractive place to invest.[79]

The first independent audit of PREPA was conducted in 2016 and more accurately revealed the state of Puerto Rico's grid. In brief, the audit found that:[80]

- "PREPA's generation, transmission, and distribution systems are falling apart and reliability is suffering," despite PREPA reporting the opposite. Consequently, PREPA's "ability to provide safe and reliable service has declined substantially since FY2014, a fact underplayed by the Company's presentation";[81]

- "The utility has shifted from performing preventative maintenance to triaging outages as they occur through reactive maintenance";[82] and

- "PREPA's customer outage rate is far higher than other U.S. utilities, and this rate has been increasing over the last two years." Outages were four times to five times higher at the close of 2016 than experienced on average by U.S. customers.

The audit concluded that PREPA is "in dire need of capital infusion" both monetarily and in manpower. Hurricane Maria only exacerbated these problems; as Puerto Rico's governor stated, "The emergency plan was as follows: There is no way to fix the nature of the grid."[83]

Puerto Rico now faces an entire overhaul of its electric grid and the challenge of how to pay for it. Some have considered this an opportunity to use Puerto Rico as a testing ground for a green energy grid.[84] Instead, Puerto Rico should prioritize a sturdy, reliable grid and eliminate the corruption that lined Puerto Rico up for the disaster in which it finds itself now. Without rule of law, any efforts to rebuild the grid will only be half measures.[85]

In January and February 2018, Governor Ricardo Rossello and PREPA set out a draft plan to partially privatize Puerto Rico's grid.[86] PREPA formally adopted a "Vision for the Future of Power" on February 1 "to provide focus to efforts to transform the power utility."[87] The Vision is premised on the privatization of PREPA and pledges five principles for a new electric grid: customer centric, financially viable, reliable and resilient, a model of sustainability, and an engine of economic growth.

The Vision is a definite improvement in that it enables some private investment and vastly improves accountability, both to the benefit of customers. Over a period of 18 months, PREPA is to sell off its generation assets or retire aged facilities. New generation will be added through private-sector participation governed by a new independent regulator.

However, the draft plan could be improved. Though customers will undoubtedly see improvements through privatized generation, the plan does not seem to create the kind of competitive market that has served customers so well in places like Texas in terms of reducing customer prices, rationalizing investments, and encouraging innovation. Further, while it expresses intent to reduce subsidies and especially those that hurt the poor the most, it does not commit to eliminating all and hints that others may be added.[88]

Competition in U.S. electricity markets has served customers well and incentivized innovation even where markets have been implemented imperfectly. For example, customers in the mid-Atlantic area served by competitive markets have saved roughly $3 billion annually since 1997.[89] Customers in the Midwest have saved similarly, resulting in some $17.5 billion in savings over the past 10 years.[90] Competitive markets have also allowed innovative technologies and services to prove that they can better meet customer needs. As the president and CEO of the mid-Atlantic regional transmission organization described, "The impact of the markets was to open up the power industry to a much broader group of potential participants—many with new and more efficient technologies."[91] Puerto Rico can entice capital investment by providing regulatory certainty and clarity, establishing rule of law, and defining a free and fair, technology-neutral electricity market open to all participants.

Energy is a key to unlocking investment throughout the Puerto Rican economy. Puerto Ricans have experienced the opposite. Rebuilding the grid should not merely replace destroyed infrastructure but put in place the rule of law and market principles that will provide Puerto Rican families and businesses affordable, reliable, resilient energy.

Getting Energy Policy Right After the Storms. Congress and the Administration should:

- **Reject costly symbolic gestures to affect global warming.** Harvey, Irma, and Maria have prompted calls for "action" on climate change. Such proposed actions include the regulation or taxation of CO_2, a colorless, odorless nontoxic gas—and the taxpayer subsidization of green energy technologies. These are costly non-solutions and distract from more present-minded efforts to mitigate and adapt to the impacts of extreme weather. Communities and Congress should focus on adaptation and mitigation efforts.

- **Liquidate the SPR.** Intended to mitigate U.S. economic vulnerability to major supply disruptions, the stockpile has been a more successful political tool than a policy tool. The abundance of domestic resources, the geographic diversity

of oil production worldwide, and the abundant quantities of private stocks demonstrate that the SPR has marginal strategic value both in practice and in perception. The federal government should respond to fuel shortages by waiving regulatory barriers to fuel access, as the EPA has done.

- **Introduce market competition in Puerto Rico's electricity market.** Puerto Rico's electricity sector was wracked by corruption and years of poor management. The hurricanes only underscored these problems and wiped out the island's infrastructure beyond the means of any one company to rebuild. The best way to attract much-needed capital is to break PREPA's monopoly over electric generation, transmission, and distribution. Rule of law must be consistently enforced and legislation must be passed to create competitive markets in electric generation, transmission, and distribution. Making companies compete for its customers will not only improve service but could also create space for other energy companies and technologies to meet needs and rebuild the island's grid more quickly.

Economic Flexibility in Recovery Efforts

Economic regulation can help or hinder disaster recovery efforts in the flexibility it allows in the marketplace. While some specific laws loom large, there are many small regulations that put private-sector recovery efforts at risk by decreasing flexibility.

The Jones Act. The most notable such regulation is the Merchant Marine Act of 1920, better known as the Jones Act. The Jones Act requires that shipping between two U.S. ports be performed exclusively by U.S.-built and largely U.S.-crewed vessels. The act was intended (in 1920) to revitalize the U.S. shipbuilding industry. Instead, that industry has been smothered.

In smooth weather, the Jones Act–compliant fleet functions near capacity along well-defined routes. Since Jones Act–compliant vessels are expensive, it has little slack. When a natural disaster disrupts service, the fleet has very little surge capacity. Recognizing the lack of flexibility, Presidents have sometimes waived the Jones Act for specific ports in the brief periods following storms. The waivers have the virtue of allowing a foreign vessel to move commodities along the U.S. coast, something they normally would not be allowed to do.

In the case of Hurricane Maria's destruction of Puerto Rico, a brief Jones Act waiver by the Trump Administration was a fig leaf over a much deeper problem. As a non-contiguous territory, Puerto Rico faces much higher costs for shipping from the U.S. than nearby islands. The brief waiver did not even extend into the period when it would have been most useful: During the first few weeks after the storm, the island's distribution network was a worse bottleneck than the shipping lanes.

Even mainland natural-disaster recovery can be impeded by the Jones Act.

Even mainland natural-disaster recovery can be impeded by the Jones Act. Earlier in 2017, Hurricanes Harvey and Irma induced a Jones Act waiver intended to clear a backlog of fuel products from refineries in the Gulf of Mexico and get them to Florida, which had been cut off by the later storm.

More maddening was a 2014 episode where a series of winter storms left badly needed road salt stranded in Maine while New Jersey drivers were forced to drive on unsafe roads. *The New York Times* reported at the time, one of New Jersey's

> largest [salt] depots, a site in Port Newark run by International Salt, has nearly run out. So when International's staff said they had a spare stockpile in Maine, state officials pounced.
>
> State officials said they arranged on Feb. 7 to buy the salt and ship it immediately to Port Newark on a vessel that had just unloaded its cargo in Maine and would have delivered the entire load to New Jersey by last weekend.
>
> But then officials learned that the maritime law, which was passed in 1920 and is known as the Jones Act, stipulates that only ships with United States flags and crews can transport goods between American ports.[92]

Unlawful Good. For a variety of reasons, many specific types of work are limited to licensed individuals or businesses. Safety concerns dictate that operating a commercial vehicle requires a commercial

driver's license. Likewise, states regulate which types of work a journeyman electrician can perform unsupervised and which work requires a master electrician. In medical fields, scope-of-practice laws dictate a detailed division of labor among the medical professions. In normal circumstances, markets and workplaces adjust to these rules.

However, the calculus of risk changes in a natural disaster, when reaction time is crucial.

Thankfully, prosecutors have tended to exercise discretion in enforcement of licensure and scope-of-practice laws during disasters and recovery periods. Governors and state legislators may profitably revisit their statutes to ensure that professionals receive the maximum freedom to act in disasters without fear of criminal or civil prosecution.

Excess Capacity. A small class of regulations in the U.S. seeks to limit private-sector investment based on the belief that the private sector will overinvest if left to its own devices. In the medical field, these certificate-of-need laws constrain hospital capacity and investment in equipment that regulators deem redundant.

The balance of evidence suggests that certificate-of-need laws increase prices and decrease the supply of medical services.[93] In the absence of a disaster, an underserved area can lobby the state to allow an increase in supply. But during a disaster, excess medical capacity may be vital.

During a major post-disaster rebuilding effort, certificate-of-need regimes may impede progress in rapidly replacing lost medical capacity. Puerto Rico, for example, maintains an active *División de Certificados de Necesidad y Conveniencia*.[94] Repealing it and granting implicit approval to any new medical construction on the island could potentially speed the restoration of medical service.

In other fields, government limits on excess capacity are more implicit. Where the government is the main provider, infrastructure may be undersupplied relative to the need. A transportation, power, or water system that has no redundancy is at risk of system failure during a major crisis. States and cities should take adverse events into account as they plan maintenance and construction of their infrastructure.

Foreign Dredge Act of 1906

The Foreign Dredge Act of 1906 (46 U.S.C. § 55109) requires that any ship engaged in dredging domestic waters must be American-built, -owned, and -crewed, barring any foreign competitors in this crucial maritime industry. The law limits competition to a small number of U.S. firms, yielding higher prices and lower capacity than if U.S. dredging projects were open to bids from the world's largest and most experienced dredging firms.[95]

This restriction is especially detrimental following large hurricanes, which can have grave effects for ports and waterways. Violent storms can fill channels with sand, sediment, and other detritus, adversely impacting not only shipping activities that are vital to recovery immediately following the storm, but also long-term commercial shipping prospects and other key maritime industries.

For example, the Port of Houston estimates that Hurricane Harvey deposited millions of tons of sediment in the ship channel, which impaired ships' ability to navigate the ship channel and port safely.[96] Indeed, immediately following the storm, the Houston Port Commissioner declared that the Port is "in desperate need of additional relief to properly dredge the channel so that it can accommodate normal commerce at its authorized depth and width."[97] Even the Galveston District of the Army Corps of Engineers, the federal agency that oversees dredging activities, acknowledged that more numerous and cheaper dredges would have expedited the storm response.[98]

At a minimum, Congress should amend the Foreign Dredge Act to allow the President to waive the requirements in time of emergency and subsequent periods of recovery activities. Ultimately, this harmful protectionist law should be repealed, opening up the U.S. dredging industry to greater competition, expanding dredging capacity, and further stretching public funds for dredging projects.

State Prohibitions on Twin 33-Foot Trailers

Federal law (49 U.S.C. § 31111(b)) prohibits states from imposing vehicle-length limitations below a federal standard for trucks on the Interstate Highway System. For a twin-trailer configuration (truck tractor-semi trailer-trailer), the federal minimum length is 28 feet for each trailer, meaning states have the option to prohibit twin trailers that are longer than 28 feet each (56 feet total), but cannot prohibit lengths below that length.

In recent years, as shipping and logistics have

flourished, the industry has recognized the benefits of a twin 33-foot trailer configuration, which provides 18.6 percent more volume per trailer than a twin 28-foot configuration and more flexibility than a single long trailer.[99] This configuration allows for a 10 percent reduction in overall shipping costs and savings on door-to-door service for customers, as well as an overall reduction in the number of trucks on the road due to the greater capacity on each truck.[100] Because federal weight limits would still apply, allowing longer truck trailers would not contribute to any additional wear and tear to the nation's infrastructure. Though twenty states approve the use of twin-33s (and some approve of configurations that are even longer), many states limit trucks to twin-28 configurations on interstate highways.[101]

The benefits of allowing longer twin-33 configurations warrant the consideration of a permanent increase in the federal standard from 28 feet to 33 feet. However, if this change is not politically possible, Congress should amend current law to allow twin-33s to address the need for additional shipping capacity and increased logistical flexibility required in the immediate aftermath of natural disasters. This change would better allow much needed aid to reach distressed areas affected by storms or other disasters. The law could be amended to pre-empt state laws that limit the use of twin-33s in the event of declared emergency (and the period of immediate recovery), as trucks from all over the country travel across state borders to provide necessary supplies and aid to areas in need. Simply allowing shippers such flexibility would greatly benefit storm-battered regions and better enable Americans to do what they do best: help their fellow citizens in times of need.

Learning the Economic Lessons of Recovery. Artificially restraining the movement of goods, provision of services, and reconstruction of key infrastructure limits flexibility in the response and recovery efforts after a disaster. Economic flexibility has many other advantages—such as making an economy more resilient in the face of economic downturns.

Congress and the Administration should:

- **Remove unnecessary impediments to economic flexibility.** The harm caused by a lack of economic flexibility during and after disasters is seen clearly in Jones Act and certificate-of-need laws. Furthermore, policymakers should consider granting waivers to some safety regulations that make sense during normal times but that could unnecessarily hinder relief efforts in a disaster.

National Guard Engagement

The National Guard is a critical resource during a disaster and this was certainly the case during the 2017 hurricane season. Still, not all National Guard units and response measures are the same. This section of the *Special Report* will examine the response of the National Guard (Army and Air) in the lead up to and aftermath of Hurricanes Harvey, Irma, and Maria. This section will focus mainly on the National Guard elements of the three principal target areas of Texas, Florida, and Puerto Rico, and will also provide some insights into the activities of Guard units from numerous other states provided under the Emergency Management Activities Compact (EMAC). It will also include some comments on the coordination between the Guard and the state-level military units (State Guard) and unincorporated civilian elements (not part of normal disaster-response nongovernmental organizations).

National Guard Capabilities. Texas and Florida had formidable organic capabilities to deal with these storms, but Puerto Rico less so. Texas has three main components to its military department: the Texas Army Guard, the Texas Air Guard, and the State Guard. The Army guard has a standing Joint Forces Headquarters, an Infantry division, a large support command (combat service support units), an independent maneuver enhancement brigade, and an engineer brigade. The Air Guard has an airlift wing to move supplies and equipment, a combat communications wing that can augment coordination in stricken areas, a security forces squadron (military police), and a reconnaissance squadron with Predator drones that have proven to be a huge asset in previous disaster situations. The State Guard is a long-standing militia force specifically tailored to assist in state-level disasters. It has six ground regiments, two air wings, one maritime regiment, and three medical units. These elements all regularly train and exercise together and have one unified commander in the State Adjutant General. In total, this force is over 23,000 Guardsmen strong.[102]

Florida has a smaller and less-robust structure, totaling nearly 12,000 Guardsmen, supported by an additional 2,300 full-time federal and state

employees. They have a troop command, an infantry brigade, and some engineer support. In the Air Guard, the main hurricane relevant asset is a Red Horse engineer squadron, a particularly helpful unit in rebuilding efforts. Florida does not at this time have a state defense force. Despite a smaller force structure, Florida has more hurricane experience than any state in the union, much of which is resident in their National Guard units.[103]

Puerto Rico has about 10,000 Air and Army Guardsmen (3,000 and 7,000, respectively). The Army Guard includes a Maneuver Enhancement Brigade (engineers and military police) and a separate engineer battalion, which would prove to be exceptionally helpful in the crisis. The complete breakdown of transportation and communication capabilities across the island did significantly slow the mobilization. The totality of the damage also forced the chain of command to exempt a good number of its own capabilities, as Guardsmen were either unable to get to their units, or their situation at home was so dire that they could not muster. Other individuals were exempted because their civilian job was given precedence (police, fire fighters, medical personnel, etc.).

Overall, the National Guard's response in Puerto Rico was robust under very tough circumstances. The states took the lead, with the federal agencies providing assistance as needed.

National Guard Deployments. In Texas, at its peak on September 4, 19,345 Guardsmen from 27 states served in response to Harvey. The efforts focused on search and rescue, general support, and commodities distribution. Guardsmen conducted a total of 2,791 rescues and evacuations. Texas Guardsmen activated within 24 hours to 72 hours of receiving alert. Out-of-state National Guard forces were ready to deploy to Texas within 72 hours of a request for assistance. There were still 434 Texas Guardsmen in response at the time of writing.

In Florida, the peak was on September 10, when 17,567 Guardsmen from 24 states served in response to Hurricane Irma. The Irma response has focused on sheltering operations, law enforcement support, search and rescue, air traffic control, non-combatant evacuation operations, general support, route clearance, and commodities distribution. Guardsmen have conducted a total of 1,596 rescues and evacuations. Alabama, Georgia, Florida, Puerto Rico, and Virgin Islands Guardsmen activated within 24 hours to 72 hours of receiving alert. Given posturing for Harvey, out-of-state National Guard forces were ready to deploy to Florida within 48 hours of a request for assistance. As of September 25, 8,254 Guardsmen from 23 states had responded. This is broken down as Florida: 6,797 Guardsmen (including 818 from other states), supporting sheltering operations, commodities distribution, and sustainment; Puerto Rico: 414 Guardsmen, supporting sustainment and operations in the Virgin Islands, including possible evacuation; U.S. Virgin Islands: 1,043 Guardsmen (including 582 from other states), supporting law enforcement, sheltering operations, route clearance, commodities distribution, and air traffic control.

The full force that eventually deployed to Puerto Rico was about 6,200. It is expected that this force will remain, with some rotations, for the foreseeable future. Overall, the National Guard executed the following missions for the Maria effort in Puerto Rico and the U.S. Virgin Islands: route clearance, search and rescue, evacuation, support to law enforcement, commodity distribution and shelter resupply (such as meals-ready-to-eat, water, fuel, and generators), and joint reception; staging, onward movement, and integration; humanitarian supply and transporting medical personnel to isolated communities, sand bag operations, and road evaluation. To conduct these missions, Guardsmen used the following equipment and capabilities: Joint Incident Site Communications Capability (JISCC), Air National Guard airlift planes (C130s and C17s), rotary-wing helicopters (UH-60s, CH-47s, and UH-72s), high-profile vehicles, engineering vehicles, and reverse-osmosis water-purification units.

In addition to the organic units of the Puerto Rican National Guard, other unit capabilities included: engineers, an Area Support Medical Company, a Contingency Response Group, a Combat Support Company, the Public Affairs Department, a Regional Support Group, Military Police, a Transportation Company, a National Guard Bureau (NGB) Joint Enabling Team, aviation specialists, communications specialists, and an Infantry Brigade Combat Team.

The 6,200 National Guard personnel from various states supported Hurricane Maria relief operations in Puerto Rico. Overall, as of December 6, 2017, Puerto Rico's and the following 37 states' National Guard contributed to relief efforts in Puerto Rico: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Washington, Wisconsin, and West Virginia. All together they distributed 53,227,000 bottles of water and 17,9923,000 meals. This included a great many bottles produced via reverse-osmosis-water purification.

There remains a huge task ahead in Puerto Rico, but a great deal was done to relieve the suffering of the citizens of the island. Overall, this was a very robust response under very tough circumstances. The states took the lead, with the federal agencies providing assistance as needed.[104]

Observations on the National Guard Response. Given the enormity of the challenges presented by these storms, it is worth looking to the comments of National Guard leadership to understand the obstacles the Guard faced, as well as the mindset of the Guardsmen.

Speaking of the Hurricane Harvey response, General Joseph Lengyel, Chief of the National Guard Bureau, said: "It's a landmark event, and I'm thankful we've got a country that has the resiliency, the populations, where all of its American capacities both military and civilian can come together and respond. As bad as it is, it really is a picture of America at its best when everybody comes together in support of the people that need the help."

From one of the supporting units from outside the stricken states, Major General Max Haston, Adjutant General of Tennessee, stated: "This is a prime example of National Guard operations, Tennessee helicopters loaded on to New York and Rhode Island Air National Guard aircraft going to assist the Virgin Islands National Guard in their recovery efforts. Once again, the National Guard lives up to its motto, and is truly 'Always Ready, Always There.'"[105]

Brigadier General Wendul Hagler, Joint Force Commander said, "The National Guard expands the capacity and capability of local and state civil authorities to address the 'abnormal circumstances' a disaster creates. Where they have '30' and suddenly need '300' or '3,000,' we're there for them. When they need the capability to access flooded neighborhoods, we can provide them options. Very little of our force structure is committed to purely domestic purposes, but almost all of it can serve a dual purpose in some way. We figure out the best ways to make it work to the benefit of our citizens when they're most in need."[106]

The pride of these leaders in the accomplishments of their troops is expected, but in this case, it appears to be spot on.

Takeaways for the National Guard. There are five main takeaways from the performance of the National Guard in these two storms. The respective states, and the NGB, should investigate them further, as they can provide additional insight in the future.

- **Maintain training and experience.** The lessons learned by both state National Guard organizations (and the NGB) showed in both Harvey and Irma. It was clear that they have not forgotten 2008 or other previous hurricane seasons. This should not be taken for granted, and should be shared both internally and with other Guard elements.

- **Preserve a robust National Guard structure.** Although very different scenarios, the lesson is valid for all the storm responses. Texas leveraged its large and diverse force structure to enable them to respond quickly and well. Florida, with a smaller structure and no State Guard component to assist, used its even deeper experience to offset these liabilities. The bottom line is that "small but good" will work, but being "big and good" provides more depth. Puerto Rico's less-robust capabilities and much more comprehensive damages have led to a crisis that will not be resolved in anything close to an expedient fashion. The Guard response has helped tremendously, but the overall governmental failure (and incredibly fragile infrastructure) has left a task that dwarfs any previous rebuilding challenge.

- **Encourage the development of State Defense Forces.** Having a State Defense Force that can provide organized, trained personnel who are

familiar with their National Guard counterparts cannot but help. All states with disaster potential should consider a state defense force.[107]

- **Expand National Guard cooperation and training with civilian authorities and organizations.** Active training and regular coordination with the federal and state agencies with whom they will need to interact in a disaster must take place regularly. Organizations responding to disasters must have deep relationships before the storm strikes. This lack of coordination seems to have harmed Puerto Rico's preparedness.

- **Work with citizen responders to save lives.** The willingness to work with ad hoc civilian responders turned out to be a huge asset. The Cajun Navy and Team Rubicon, groups of citizens, some local and some from other states, along with a list too long to name of like organizations, packed up and brought their own assets (boats, trucks, waders, and strong backs) all wanting to help. Instead of turning them away, Texas and Florida welcomed them and helped coordinate their efforts. It was a necessary element in the field, as well as a wonderful example of the best in America. The Guard should be applauded for making the most of these brothers and sisters in arms who came to help.

Faith-Based and Other Community Groups Needed for Short-Term and Long-Term Recovery

Another takeaway from this hurricane season is the indispensable role that faith-based organizations play in disaster relief. Such groups are uniquely situated to serve communities in need, due to their firsthand knowledge of affected areas and their recognition within the community. These organizations can minister to the full range of needs experienced by victims: material, emotional, and spiritual. These organizations also maintain a presence in recovering communities after federal agencies leave, making them essential to long-term rebuilding efforts.

Local, faith-based organizations have on-the-ground knowledge of the communities they serve. After Hurricane Harvey, faith-based groups, such as Convoy of Hope, Samaritan's Purse, and others, responded quickly and effectively by collaborating with local congregations to provide humanitarian aid. Convoy of Hope mobilized 6,000 volunteers in response to Harvey,[108] Irma,[109] and Maria.[110] Samaritan's Purse brought over 10,000 volunteers to its Texas and Florida relief sites.[111] Samaritan's Purse works with local host churches, which provide volunteers from their congregations and existing facilities for community outreach.[112] Using a similar model, I-4, a grass-roots group formed after Harvey, responded to Hurricane Maria by teaming up with faith-based groups that have sister churches in Puerto Rico in order to reach remote rural areas of the island.[113] This collaboration between faith-based organizations dedicated to disaster aid and local faith communities has proved essential for relief efforts.

Not only do faith-based groups recognize who needs help; they are recognized in turn by those in need. Known and trusted religious groups can be important hubs for communicating reliable information so that both victims and benefactors can avoid scams. The Texas Catholic Conference of Bishops, for instance, published a list of charities accepting volunteers and donations in the dioceses affected by Harvey.[114]

> Faith-based groups are uniquely situated to help communities with immediate relief and long-term rebuilding—both physically and spiritually.

Southern Baptist Disaster Relief provided material relief to Harvey victims in the form of more than 2 million meals, more than 31,000 showers, and nearly 20,000 loads of laundry.[115] They also provided chaplains on-site and gave out over 150 teddy bears, ministering to the intangible but no-less-real needs of victims.[116] The Salvation Army Emergency Disaster Services, which responded to Hurricanes Harvey, Irma, and Maria, also provides this full spectrum of aid.[117] The Salvation Army considers "emotional and spiritual care" one of its six strategic disaster-relief services.[118]

Faith-based groups are also in an ideal position to help communities rebuild in the long term. The severity of the 2017 hurricane season put immense strain on FEMA's funding, reminding Americans

that the federal government cannot entirely rebuild devastated communities. Faith-based groups will remain involved in long-term recovery efforts long after FEMA leaves.

Looking at the aftermath of Harvey, former Texas governor and current Energy Secretary Rick Perry said: "The models that we've had historically, you can throw them out the window. This is going to be a really, really long recovery.... So the faith-based community may play one of the most important roles in this, long term. And that's what they've historically done."[119]

Faith-based groups are already looking to rebuild. Samaritan's Purse began rebuilding projects in Texas in November[120] at sites in Pearland[121] and Rockport.[122] By Christmas 2017, over 3,000 volunteers with Convoy of Hope had served over 300,000 individuals, removing debris, delivering drywall, and distributing over 16,000 Christmas toys.[123] The Salvation Army, too, shifted its attention from emergency assistance to intermediate and long-term recovery in response to Harvey and Irma.[124] The Salvation Army made a similar commitment to victims of Hurricane Maria and pledged that recovery teams would continue to move through Puerto Rico with material supplies and emotional and spiritual resources "as communities become accessible" and that this support "will continue until it is no longer needed."[125] By October 2017, The Salvation Army had already served 1.2 million individuals in Puerto Rico and the U.S. Virgin Islands.[126]

Not to mention the enduring presence that local churches, synagogues, and mosques will have as they support their local communities in long-term recovery.

FEMA also recognizes the integral role that faith-based groups play in rebuilding. In the aftermath of the devastating 2016 tropical storm Hurricane Matthew, FEMA released a statement early this year titled "Long-Term Recovery Begins at the Local Level," highlighting the long-term role of local committees like the North Carolina Voluntary Organizations Active in Disaster.[127] Twenty-three of the 33 member groups of that committee are religiously affiliated. The FEMA press release states: "[L]ong-term recovery depends on the behind-the-scenes work of local committees.... Who better to understand the unique needs of a survivor on the road to recovery than people from that survivor's community?"

Among these faith-based groups, many local houses of worship are helping their communities to rebuild while still in need of assistance themselves. For many years, FEMA policy did not allow assistance to go to houses of worship, despite the fact that it has granted such aid to nonprofit groups such as "an octopus research center, a botanical garden, and community centers that provide sewing classes and stamp-collecting clubs."[128]

In January 2018, FEMA reversed this policy to allow houses of worship to apply for the same aid available to other nonprofits.[129] The reversal followed a lawsuit filed in September 2017 against FEMA by Becket Law on behalf of three churches damaged in Hurricane Harvey. After a district court ruled against the churches in early December, Becket filed an emergency request with Supreme Court Justice Samuel Alito.[130] The Supreme Court asked FEMA to respond to Becket's request for an injunction by January 10, 2018.[131] Instead, the agency published a new policy before the deadline and announced the change to the Court on January 3, 2018.[132]

However, without legislative action, FEMA could still revert to its previous policy at any time, leaving these organizations vulnerable to exclusion in the future.

Fortunately, Congress took action to ensure that these groups would have access to the assistance they so desperately need. On February 9, 2018, Congress amended the Stafford Disaster Relief and Emergency Assistance Act to explicitly state that both houses of worship and religiously affiliated schools are eligible for federal disaster aid.[133]

This change in policy puts our nation in a better position to recover from devastating natural disasters. When faith communities have the resources they need to rebuild, they have an increased capacity to invest in the long-term recovery of their local neighborhoods.

In order to best promote the invaluable contribution made by faith-based organizations to disaster relief, the government should:

- **Incorporate faith-based organizations into federal and local disaster plans.** Coordination between faith-based groups and government agencies maximizes available resources and better serves those in need. Michael Orfitelli, territorial coordinator of Emergency Disaster Services for the Salvation Army, said: "Our deeper

collaboration with FEMA and other strategic disaster partners has allowed the Salvation Army to secure additional resources to help the Hurricane survivor."[134] Strong partnerships between the government and faith-based groups make all parties more effective. Victims are best served when the federal government collaborates in advance with faith-based agencies and state and local agencies. The federal government should continue to reach out to civil society groups and faith communities through appropriate agencies, such as the White House Office of Faith-Based and Neighborhood Partnerships and the Department of Homeland Security's (DHS's) Center for Faith-Based and Neighborhood Partnerships.

Time to Take Lessons to Heart

Many of these lessons learned from these disasters are similar to those that should have already been learned after previous disasters. Whether it is the budgetary lessons of the DRF or the NFIP, the importance of the National Guard and community organization, the effects of regulations on rebuilding, or others, the U.S.'s mechanisms and policies for disaster response and recovery are in need of significant reform. Indeed, if the U.S. is to be more prepared for disasters and better at rebuilding after them, Congress and the Administration should pursue the lessons and reforms outlined in this *Special Report* in earnest.

Endnotes

1. Jonathan Erdman, "2017 Atlantic Hurricane Season Among Top 10 Most Active in History," The Weather Channel, October 2, 2017, https://weather.com/storms/hurricane/news/2017-atlantic-hurricane-season-one-of-busiest-september (accessed January 4, 2018).
2. David Inserra, "As Houston Reels from Harvey, Here's Where Relief Funding Stands," The Daily Signal, August 31, 2017, http://dailysignal.com/2017/08/31/houston-reels-harvey-heres-relief-funding-stands/.
3. World Vision, "Hurricane Harvey: Facts, FAQs, and How to Help," September 21, 2017, https://www.worldvision.org/disaster-response-news-stories/hurricane-harvey (accessed January 4, 2018).
4. Luis Gomez, "Hurricane Harvey: 50 Counties Flooded, 30,000 People in Shelters, 56,000 911 Calls in Just 15 Hours," *San Diego Union-Tribune*, August 28, 2017, http://www.sandiegouniontribune.com/opinion/the-conversation/sd-hurricane-harvey-texas-flooding-displaces-thousands-20170828-htmlstory.html (accessed January 4, 2018).
5. "4,000 Texas Homes, Facilities Without Power Weeks After Harvey, Governor Says," CBS News, September 14, 2017, https://www.cbsnews.com/news/harvey-4000-texas-homes-facilities-without-power/ (accessed January 4, 2018).
6. News release, "RMS Estimates Hurricane Harvey Insured Losses from Wind, Storm Surge and Inland Flood Damage Will Be Between USD $25 and $35 Billion," Risk Management Solutions, September 9, 2017, https://www.rms.com/newsroom/press-releases/press-detail/2017-09-09/rms-estimates-hurricane-harvey-insured-losses-from-wind-storm-surge-and-inland-flood-damage-will-be-between-usd-25-and-35-billion (accessed January 4, 2018); "Impact of Hurricane Harvey," Wells Fargo Securities, September 8, 2017, http://image.mail1.wf.com/lib/fe8d13727664027a7c/m/2/harvey_impact_20170908.pdf?utm_source=SFMC&utm_medium=email&utm_campaign=&utm_content=&utm_term=7230679&sid=42857 (accessed January 4, 2018); and Tawnell D. Hobbs, "Two Months After Harvey, Houston Continues to Count the Cost," *The Wall Street Journal*, October 31, 2017, https://www.wsj.com/articles/two-months-after-harvey-houston-continues-to-count-the-cost-1509442203 (accessed January 4, 2018).
7. Kimberly Amadeo, "Hurricane Irma: Facts, Damage, and Costs," The Balance, September, 25, 2017, https://www.thebalance.com/hurricane-irma-facts-timeline-damage-costs-4150395 (accessed January 4, 2018).
8. Isabel Choat, "Caribbean Travel Update: After the Hurricanes–How the Worst-Hit Islands Are Recovering," *The Guardian*, November 26, 2017, https://www.theguardian.com/travel/2017/nov/26/caribbean-travel-update-after-hurricanes-how-islands-recovering-barbuda-puerto-rico (accessed January 4, 2018).
9. "More Than 7 Million Evacuated as Irma Hits Southeast U.S.," Axios, September 11, 2017, https://www.axios.com/irma-hits-tampa-continues-its-wrath-in-southeast-u-s-2483925875.html (accessed January 4, 2018).
10. "Irma Leaves Widespread Devastation, Flooding in Florida—Live Updates," CBS News, September 12, 2017, https://www.cbsnews.com/news/irma-live-updates-florida-power-outages-09-11-2017/ (accessed March 12, 2018).
11. "Hurricane Irma Death Toll Rises to 72 in Florida," Physics.org, September 27, 2017, https://phys.org/news/2017-09-hurricane-irma-death-toll-florida.html (accessed January 4, 2018), and "Civil Engineering Researcher Joins Team Investigating Devastation from Hurricane Irma," University of South Carolina, http://www.sc.edu/study/colleges_schools/engineering_and_computing/about/news/2017/inthuornsasanakul.php (accessed January 4, 2018).
12. Brian K Sullivan, "A $150 Billion Misfire: How Disaster Models Got Irma Wrong," Bloomberg, September 11, 2017, https://www.bloomberg.com/news/articles/2017-09-11/-150-billion-misfire-how-forecasters-got-irma-damage-so-wrong (accessed January 4, 2018), and "AccuWeather Predicts Economic Cost of Harvey, Irma to Be $290 Billion," Accuweather, September 11, 2017, https://www.accuweather.com/en/weather-news/accuweather-predicts-economic-cost-of-harvey-irma-to-be-290-billion/70002686 (accessed January 4, 2018).
13. David Inserra and Ceara Casterline, "Puerto Rico Needs Help. Here's What You Should Know," The Daily Signal, September 27, 2017, http://www.heritage.org/homeland-security/commentary/puerto-rico-needs-help-heres-what-you-should-know.
14. Brian Resnick and Eliza Barclay, "What Every American Needs to Know About Puerto Rico's Hurricane Disaster," Vox, October 16, 2017, https://www.vox.com/science-and-health/2017/9/26/16365994/hurricane-maria-2017-puerto-rico-san-juan-humanitarian-disaster-electricty-fuel-flights-facts (accessed January 4, 2018).
15. John D. Sutter, Leyla Santiago, and Khushbu Shah, "After CNN Investigation, Puerto Rico Asks Funeral Homes to Help Identify Hurricane Deaths," CNN, November 21, 2017, http://www.cnn.com/2017/11/21/health/pesquera-responds-puerto-rico-death-count-invs/index.html (accessed January 4, 2018).
16. Ibid.
17. Khushbu Shah and Ray Sanchez, "Puerto Rico Hit with New Power Outage," CNN, November 15, 2017, http://www.cnn.com/2017/11/15/us/puerto-rico-new-power-outage/index.html (accessed January 4, 2018), and Lydia O'Connor, "7 Numbers that Explain How Much Puerto Rico Is Still Suffering," *Huffington Post*, November 20, 2017, https://www.huffingtonpost.com/entry/puerto-rico-maria-by-the-numbers_us_5a134c85e4b0c335e996b89d (accessed January 4, 2018).
18. Ana Campoy, "How Hurricane Maria Will Be More Costly for Puerto Rico than Harvey Was for Texas," Quartz, September 27, 2017, https://qz.com/1088762/puerto-rico-hurricane-marias-devastating-economic-cost/ (accessed January 4, 2018), and Jill Disis, "Hurricane Maria Could Be a $95 Billion Storm for Puerto Rico," CNN Money, September 28, 2017, http://money.cnn.com/2017/09/28/news/economy/puerto-rico-hurricane-maria-damage-estimate/index.html (accessed January 4, 2018).

19. Richard Luscombe, "Arrival of Puerto Ricans Post-Hurricane Maria Could Have Big Impact on Florida," *The Guardian*, October 12, 2017, https://www.theguardian.com/us-news/2017/oct/12/florida-puerto-rican-influx-hurricane-maria (accessed January 4, 2018).
20. David Inserra, "Congress Must Re-Set Department of Homeland Security Priorities: American Lives Depend on It," Heritage Foundation *Special Report* No.175, January 3, 2017, http://www.heritage.org/homeland-security/report/congress-must-re-set-department-homeland-security-priorities-american.
21. 42 U.S. Code § 5191, https://www.fema.gov/media-library-data/1490360363533-a531e65a3e1e63b8b2cfb7d3da7a785c/Stafford_ActselectHSA2016.pdf (accessed January 4, 2018).
22. "Public Data: Population in the U.S.," Google search, June 15, 2017, https://www.google.com/publicdata/explore?ds=kf7tgg1uo9ude_&met_y=population&idim=state:30000:56000:02000&hl=en&dl=en#!ctype=l&strail=false&bcs=d&nselm=h&met_y=population&scale_y=lin&ind_y=false&rdim=country&idim=state:30000:56000:02000:54000:50000:49000:46000:44000:38000:35000:33000:32000:31000:28000:10000:05000&ifdim=country&hl=en_US&dl=en&ind=false (accessed January 3, 2018).
23. The first landfall was on the Texas Gulf Coast on August 25, followed by Irma on September 10, and Maria on September 20.
24. More than 1,000 claims from Hurricane Sandy in 2012 remain unresolved.
25. The White House, Office of Management and Budget, letter from OMB Director Mick Mulvaney to Vice President Michael R. Pence, October 4, 2017, https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/Letters/Letter%20regarding%20additional%20funding%20and%20reforms%20to%20address%20impacts%20of%20recent%20natural%20disasters.pdf (accessed January 9, 2017).
26. The legislation also appropriated $450 million for disaster loans by the Small Business Administration; $7.4 billion in Community Development Block Grants from the Department of Housing and Urban Development; and $576.5 million for fighting wildfires.
27. Government Accountability Office, "High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others," February 2017, https://www.gao.gov/assets/690/682765.pdf (accessed January 9, 2017).
28. The National Flood Insurance Act of 1968, as amended, 42 U.S. Code 4001, et seq.
29. Ibid., 42 U.S. Code 4001(a).
30. Key conditions of the NFIP minimum standards include, among many other conditions, that communities require permits for development in the Special Flood Hazard Area (SFHA); require elevation of the lowest floor of all new residential buildings in the SFHA to be at or above the Base Flood Elevation (BFE); restrict development in the regulatory floodway to prevent increasing the risk of flooding; and require certain construction materials and methods that minimize future flood damage. See Jared T. Brown, "Introduction to FEMA's National Flood Insurance Program (NFIP)," Congressional Research Service *Report for Congress* No. 44593, August 16, 2016, https://fas.org/sgp/crs/homesec/R44593.pdf (accessed June 16, 2017).
31. U.S. Department of Homeland Security, Federal Emergency Management Agency, "Answers to Questions About the NFIP."
32. For example, elevation of houses and buildings, acquisition of repetitive loss properties, or construction of flood defense systems.
33. Insurance may be written on any building eligible for coverage with two or more outside rigid walls and a fully secured roof that is affixed to a permanent site. Buildings must resist flotation, collapse, and lateral movement. Uninsurable property includes buildings that are located entirely over water or principally below ground, or which have gas and liquid storage tanks inside or outside, or which have animals, birds, fish, aircraft, wharves, piers, bulkheads, growing crops, shrubbery, land, livestock, roads, machinery, or equipment outside. See U.S. Department of Homeland Security, Federal Emergency Management Agency, "Answers to Questions About the NFIP," March 2011, https://www.fema.gov/media-library-data/20130726-1438-20490-1905/f084_atq_11aug11.pdf (accessed June 16, 2017).
34. Federal agency lenders, such as the Department of Veterans Affairs; government-sponsored enterprises—Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac); or federally regulated lending institutions, such as banks covered by the Federal Deposit Insurance Corporation or the Office of the Comptroller of the Currency.
35. Factors considered in determining a premium include: the amount of coverage purchased, the deductible selected, the flood zone, location, age of the building, building occupancy, and foundation type. For buildings in SFHAs and structures built after the community entered the NFIP, the elevation of the building in relation to the BFE is also a factor. See U.S. Department of Homeland Security, Federal Emergency Management Agency, "Answers to Questions About the NFIP."
36. See U.S. Department of Homeland Security, Federal Emergency Management Agency, "Answers to Questions About the NFIP."
37. U.S. Department of Homeland Security, Federal Emergency Management Agency, "Overview of Risk MAP CNMS and NVUE Status."
38. Ibid.
39. Technical Mapping Advisory Council, "2015 Annual Report Summary."
40. Ruth Simon, "One House, 22 Floods: Repeated Claims Drain Federal Insurance Program," *The Wall Street Journal*, September 15, 2017, https://www.wsj.com/articles/one-house-22-floods-repeated-claims-drain-federal-insurance-program-1505467830 (accessed January 10, 2018).
41. Meagan Flynn, "Flooded Houston Home Has Cost Taxpayers More than It's Worth," *Houston Press*, October 30, 2017, http://www.houstonpress.com/news/flooded-houston-homes-too-expensive-for-buyouts-9910979 (accessed January 10, 2018).
42. Reinsurance Association of America, "Private Flood Improves NFIP's Stability," *Fact Sheet*, http://www.reinsurance.org/RAA/News/2017/April_2017/Private_Flood_Improves_the_NFIP_s_Stability/ (accessed January 10, 2018).

43. Jessica Weinkle, Ryan Maue, and Roger Pielke, Jr., "Historical Global Tropical Cyclone Landfalls," *Journal of Climate*, Vol. 25, July 1, 2012, pp. 4729–4735, http://journals.ametsoc.org/doi/pdf/10.1175/JCLI-D-11-00719.1 (accessed November 9, 2017).
44. Dennis L. Hartmann et al., "Observations: Atmosphere and Surface," in *Climate Change 2013: The Physical Science Basis*, Intergovernmental Panel on Climate Change, http://www.climatechange2013.org/images/report/WG1AR5_Chapter02_FINAL.pdf (accessed January 10, 2018).
45. Geophysical Fluid Dynamics Laboratory, "Global Warming and Hurricanes," National Ocean and Atmospheric Administration, October 26, 2017, https://www.gfdl.noaa.gov/global-warming-and-hurricanes/ (accessed November 9, 2017).
46. Paul C. Knappenberger and Patrick J. Michaels, "0.02°C Temperature Rise Averted: The Vital Number Missing from the EPA's 'By the Numbers' Fact Sheet," Cato at Liberty blog, June 11, 2014, http://www.cato.org/blog/002degc-temperature-rise-averted-vital-number-missing-epas-numbers-fact-sheet (accessed November 9, 2017).
47. Kevin Dayaratna, Nicolas Loris, and David Kreutzer, "Consequences of Paris Protocol: Devastating Economic Costs, Essentially Zero Environmental Benefits," Heritage Foundation *Backgrounder* No. 3080, April 13, 2016, http://www.heritage.org/environment/report/consequences-paris-protocol-devastating-economic-costs-essentially-zero.
48. U.S. Energy Information Administration, "Gulf of Mexico Fact Sheet," https://www.eia.gov/special/gulf_of_mexico/ (accessed November 9, 2017).
49. U.S. Energy Information Administration, "Hurricane Harvey Caused U.S. Gulf Coast Refinery Runs to Drop, Gasoline Prices to Rise," September 11, 2017, https://www.eia.gov/todayinenergy/detail.php?id=32852 (accessed November 14, 2017).
50. U.S. Energy Information, "U.S. Average Retail Gasoline Prices Increase in Wake of Hurricane Harvey," September 6, 2017, https://www.eia.gov/todayinenergy/detail.php?id=32792 (accessed November 14, 2017).
51. Chet Thompson, "Like Houston, U.S. Refining and Petrochemical Industries Are Highly Resilient," *Houston Business Journal*, October 6, 2017, https://www.bizjournals.com/houston/news/2017/10/06/op-ed-like-houston-u-s-refining-and-petrochemical.html (accessed November 9, 2017).
52. U.S. Department of Energy, "Hurricanes Maria, Irma, and Harvey: October 5 Event Summary," *Report* No. 56, October 5, 2017, https://energy.gov/sites/prod/files/2017/10/f37/Hurricanes%20Maria%2C%20Irma%20and%20Harvey%20Event%20Summary%20October%205%2C%202017.pdf (accessed November 9, 2017).
53. U.S. Department of Energy, "Hurricane Harvey: Event Report," Update No. 2, August 26, 2017, https://energy.gov/sites/prod/files/2017/10/f37/Hurricane%20Harvey%20Event%20Summary%20%232.pdf (accessed November 15, 2017).
54. American Fuel and Petrochemical Manufacturers, "Safety & Preparedness," *Issue Brief*, September 13, 2017, https://www.afpm.org/uploadedFiles/Content/Policy_Positions/Facilities_Security/Safety_Preparedness_Issue%20Brief.pdf (accessed November 9, 2017).
55. American Fuel and Petrochemical Manufacturers, "Restarting After Harvey," September 4, 2017, http://blog.afpm.org/restarting-after-harvey/ (accessed November 9, 2017).
56. Matt Egan and Betsy Klein, "Trump Taps Emergency U.S. Oil Reserve After Harvey," CNN Money, August 31, 2017, http://money.cnn.com/2017/08/31/investing/strategic-oil-reserve-harvey-trump/index.html (accessed November 9, 2017).
57. Timothy Gardner, "U.S. Releases Oil from Strategic Reserve in Harvey's Wake," August 31, 2017, https://www.reuters.com/article/us-storm-harvey-crude/u-s-releases-oil-from-strategic-reserve-in-harveys-wake-idUSKCN1BB1MZ?il=0 (accessed November 9, 2017).
58. U.S. Department of Energy, "Hurricane Harvey: Event Report," Update No. 2.
59. U.S. Department of Energy, "Tropical Storm Harvey: Event Report," Update No. 6, August 28, 2017, p. 3, https://energy.gov/sites/prod/files/2017/10/f37/Hurricane%20Harvey%20Event%20Summary%20%236.pdf (accessed November 9, 2017).
60. U.S. Energy Information Administration, "Hurricane Irma Cut Power to Nearly Two-Thirds of Florida's Electricity Customers," September 20, 2017, https://www.eia.gov/todayinenergy/detail.php?id=32992& (accessed November 9, 2017).
61. Ibid.
62. U.S. Department of Energy, "Hurricane Irma & Hurricane Harvey: Event Summary," *Report* No. 29, September 13, 2017, https://energy.gov/sites/prod/files/2017/09/f36/Hurricanes%20Irma%20and%20Harvey%20Event%20Summary%20%2329.pdf (accessed November 9, 2017), and U.S. Department of Energy, "Hurricane Irma & Hurricane Harvey: Event Summary," *Report* No. 26, September 11, 2017, p. 3, https://energy.gov/sites/prod/files/2017/10/f37/hurricanes-irma-and-harvey-event-summary-26.pdf (accessed November 9, 2017).
63. U.S. Department of Energy, "Tropical Storm Harvey: Event Report," Update No. 8, August 29, 2017, p. 3, https://energy.gov/sites/prod/files/2017/10/f37/Hurricane%20Harvey%20Event%20Summary%20%238_0.pdf (accessed November 9, 2017).
64. Nuclear Energy Institute, "Through the Decades: History of US Nuclear Energy Facilities Responding to Extreme Natural Challenges," January 19, 2016, https://www.nei.org/Master-Document-Folder/Backgrounders/Fact-Sheets/Through-the-Decades-History-of-US-Nuclear-Energy-F (accessed November 9, 2017).
65. Will Davis, "Florida's Nuclear Plants Power Through Hurricane Irma," ANS Nuclear Cafe, September 12, 2017, http://ansnuclearcafe.org/2017/09/12/floridas-nuclear-plants-power-through-hurricane-irma/#sthash.BUrWazCd.dpbs (accessed November 9, 2017).

66. U.S. Department of Energy, "Tropical Storm Harvey: Event Report," Update No. 12, August 31, 2017, p. 4, https://energy.gov/sites/prod/files/2017/10/f37/Hurricane%20Harvey%20Event%20Summary%20%2312_0.pdf (accessed November 9, 2017).
67. For example, U.S. Nuclear Regulatory Commission, "Update: The NRC Readies for Hurricane Irma," November 7, 2017, https://public-blog.nrc-gateway.gov/2017/09/07/the-nrc-readies-for-hurricane-irma/ (accessed November 9, 2017).
68. For more detailed information on NRC safety requirements, see Nuclear Regulatory Commission, "Emergency Preparedness at Nuclear Power Plants," *Backgrounder*, April 2014, https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/emerg-plan-prep-nuc-power.pdf (accessed November 8, 2017).
69. "The Story of Puerto Rico's Power Grid Is the Story of Puerto Rico," *The Economist*, October 19, 2017, https://www.economist.com/news/united-states/21730432-even-hurricane-maria-hit-it-was-mess-story-puerto-ricos-power-grid (accessed December 21, 2017).
70. Arianna Skibell, "'No One Is Exempt from the Aftermath,"' E&E News, December 18, 2017, https://www.eenews.net/greenwire/2017/12/18/stories/1060069277 (accessed December 21, 2017).
71. "What Puerto Rico Is Doing to Get the Power Back After Storm," ABC News, October 20, 2017, http://abcnews.go.com/amp/International/wireStory/puerto-rico-power-back-storm-50601975 (accessed December 21, 2017).
72. U.S. Department of Energy, "Hurricanes Maria & Irma: December 20 Event Summary," *Report* No. 83, December 20, 2017, https://energy.gov/sites/prod/files/2017/12/f46/Hurricanes%20Maria%20and%20Irma%20Event%20Summary%20December%20 20%2C%202017.pdf (accessed December 21, 2017), and StatusPR, "Autoridad de Energia Electrica," Government of Puerto Rico, http://status.pr/Maps/Map/AEE (accessed December 21, 2017).
73. Government of Puerto Rico, "New Fiscal Plan for Puerto Rico," draft submission, January 24, 2018, p. 18, http://www.aafaf.pr.gov/assets/newfiscalplanforpr-01-24-18.pdf (accessed February 15, 2018).
74. U.S. Department of Energy, "Hurricanes Maria & Irma: December 20 Event Summary," *Report* No. 83.
75. Puerto Rico Electric Power Authority, "History of PREPA," https://www.aeepr.com/INVESTORS/History.aspx (accessed December 21, 2017).
76. "The Story of Puerto Rico's Power Grid," *The Economist*.
77. U.S. Energy Information, Profile Overview: Puerto Rico, September 21, 2017, https://www.eia.gov/state/?sid=RQ (accessed December 21, 2017).
78. Government of Puerto Rico, "New Fiscal Plan for Puerto Rico", pp. 7, 8, and 16.
79. Eric Wolff, "Regulatory and Legal Obstacles Cloud Visions of Puerto Rico's Grid Rebuild," *Politico*, December 28, 2017, https://www.politicopro.com/energy/article/2017/12/regulatory-and-legal-obstacles-cloud-visions-of-puerto-ricos-grid-rebuild-254118 (accessed February 15, 2018).
80. Jeremy I. Fisher and Ariel I. Horowitz, "Expert Report: State of PREPA's System, Load Forecast, Capital Budget, Fuel Budget, Purchased Power Budget, Operations Expense Budget," Report for the Puerto Rico Energy Commission, November 23, 2016, pp. 13 and 14, http://energia.pr.gov/wp-content/uploads/2016/11/Expert-Report-Revenue-Requirements-Fisher-and-Horowitz-Revised-20161123.pdf (accessed December 21, 2017).
81. Ibid., p. 13.
82. Ibid., pp. 13 and 14.
83. Nick Brown, Robin Respaut, and Jessica Resnick-Ault, "Special Report: The Bankrupt Utility Behind Puerto Rico's Power Crisis," Reuters, October 4, 2017, https://www.reuters.com/article/us-usa-puertorico-utility-specialreport/special-report-the-bankrupt-utility-behind-puerto-ricos-power-crisis-idUSKBN1C92B5 (accessed December 21, 2017).
84. Mark Mills, "Rebuild Strong, Not Green, in Puerto Rico," *The Wall Street Journal*, October 5, 2017, https://www.wsj.com/articles/rebuild-strong-not-green-in-puerto-rico-1507244226 (accessed December 21, 2017).
85. Nicolas Loris, "Economic Freedom, Energy, and Development," in Terry Miller and Anthony B. Kim, eds., *2015 Index of Economic Freedom* (Washington, DC: The Heritage Foundation and Dow Jones & Company, Inc. 2015), pp. 57–67, http://www.heritage.org/index/pdf/2015/book/chapter5.pdf.
86. Government of Puerto Rico, "New Fiscal Plan for Puerto Rico." See also, "Puerto Rico Electric Power Authority, Amended & Restated Fiscal Plan," draft submission, January 24, 2018, http://www.aafaf.pr.gov/assets/prepa-revisedfiscalplan-01-24-18.pdf (accessed February 15, 2018).
87. News release, "PREPA's Governing Board Adopts a New Vision for the Transformation Announced by the Governor of Puerto Rico," Puerto Rico Electric Power Authority, February 1, 2018, https://www.aeepr.com/Noticias/noticiasread.asp?r=YQVATMSJWX (accessed February 15, 2018).
88. Government of Puerto Rico, "New Fiscal Plan for Puerto Rico," p. 68.
89. News release, "PJM Marks 20 Years of the Competitive Electricity Market," PJM, March 27, 2017, http://www.pjm.com/-/media/about-pjm/newsroom/2017-releases/20170327-pjm-marks-20th-anniversary-of-competitive-electricty-market.ashx (accessed December 21, 2017).
90. MISO, "Value Proposition," https://www.misoenergy.org/WhatWeDo/ValueProposition/Pages/ValueProposition.aspx (accessed December 21, 2017).
91. News release, "PJM Marks 20 Years."

92. Corey Kilgannon and Marc Santora, "40,000 Tons of New Jersey Salt, Stuck in Maine," *The New York Times*, February 18, 2014, https://www.nytimes.com/2014/02/19/nyregion/rock-salt-bound-for-new-jersey-is-held-up-by-decades-old-maritime-law.html?mtrref=www.google.com&gwh=BE72ED53267C7CD380685AF14D83D356&gwt=pay (accessed January 11, 2018).
93. See, for example, Thomas Stratmann and David Wille, "Certificate-of-Need Laws and Hospital Quality," Mercatus Center at George Mason University, *Mercatus Working Paper*, September 2016, https://www.mercatus.org/system/files/mercatus-stratmann-wille-con-hospital-quality-v1.pdf (accessed December 4, 2017), and T. L. Eichmann and R. E. Santerre, "Do Hospital Chief Executive Officers Extract Rents from Certificate of Need Laws?" *Journal of Health Care Finance*, Vol. 27, No. 4 (2011), pp. 1–14.
94. Government of Puerto Rico Health Department, "Auxiliary Secretary for Regulation and Accreditation of Health Facilities," (in Spanish), http://www.salud.gov.pr/Dept-de-Salud/Pages/Unidades-Operacionales/Secretaria-Auxiliar-de-Reglamentacion-Acreditacion-de-Facilidades-de-Salud.aspx (accessed December 4, 2017).
95. Michael Sargent and Nick Loris, "Driving Investment, Fueling Growth: How Strategic Reforms Can Generate $1.1 Trillion in Infrastructure Investment," Heritage Foundation *Backgrounder* No. 3209, May 8, 2017, http://www.heritage.org/transportation/report/driving-investment-fueling-growth-how-strategic-reforms-can-generate-11.
96. John Burnett, "Houston Ship Channel and Galveston Bay Digging Out After Harvey," National Public Radio, December 10, 2017, https://www.npr.org/2017/12/10/569463500/houston-ship-channel-and-galveston-bay-digging-out-after-harvey (accessed March 9, 2018).
97. Olivia Pulsinelli, "Houston Ship Channel 'in Desperate Need' of Dredging After Harvey," *Houston Business Journal*, September 28, 2017, https://www.bizjournals.com/houston/news/2017/09/28/houston-ship-channel-in-desperate-need-of-dredging.html (accessed March 9, 2018).
98. Burnett, "Houston Ship Channel and Galveston Bay Digging Out After Harvey."
99. Ronald R. Kipling, "Twin 33 Foot Truck Trailers: Making U.S. Freight Transport Safer and More Efficient," Americans for Modern Transportation, undated, http://americansformoderntransportation.org/wp-content/uploads/Ron-Knipling-Twin-33-Study-vF.pdf (accessed March 9, 2018).
100. Americans for Modern Transportation, "The Economics of 33' Double Combination Trailers," *Fact Sheet*, undated, http://americansformoderntransportation.org/wp-content/uploads/Noel-Perry-Fact-Sheet.pdf (accessed March 9, 2018).
101. Americans for Modern Transportation, "Sizing Up Twin 33 Trailers," *Fact Sheet*, 2016, http://americansformoderntransportation.org/project/fact-sheet-sizing-up-twin-33-trailers/ (accessed March 9, 2018).
102. Texas Military Department, "December 2016 Biennial Report," December 2016, https://tmd.texas.gov/SharedFiles/Download.aspx?pageid=1291&mid=4369&fileid=75 (accessed January 4, 2018).
103. Florida Department of Military Affairs, "About Us," http://dma.myflorida.com/about-us/ (accessed January 4, 2018).
104. The actual deployment and employment information is current as of December 10, 2017. These numbers may have changed by the time of publication, as the efforts in both states and the nearby U.S. territories were ongoing. The data in this section were supplied by the National Guard Bureau's Public Affairs Office directly to the authors.
105. E-mail from the National Guard Bureau, Public Affairs Office.
106. Ibid.
107. See Jessica Zuckerman, Colonel Martin Hershkowitz, Brigadier General Frederic N. Smalkin, and James Jay Carafano, "Why More States Should Establish State Defense Forces," Heritage Foundation *Backgrounder* No. 2655, February 28, 2012, http://www.heritage.org/defense/report/why-more-states-should-establish-state-defense-forces.
108. Convoy of Hope, "Convoy of Hope Responds to Hurricane Harvey," https://www.convoyofhope.org/blog/features/disaster-response/convoy-hope-responds-hurricane-harvey/ (accessed January 11, 2018).
109. Convoy of Hope, "Convoy of Hope Responds to Hurricane Irma," https://www.convoyofhope.org/blog/features/disaster-response/hurricane-irma/ (accessed January 11, 2018).
110. Convoy of Hope, "Convoy of Hope Responds to Hurricane Maria," https://www.convoyofhope.org/blog/features/disaster-response/convoy-hope-responds-hurricane-maria/ (accessed January 11, 2018).
111. Samaritan's Purse, "In 2017, Samaritan's Purse Responded to Hurricanes in Texas, Florida, and the Caribbean," https://www.samaritanspurse.org/disaster/hurricane-relief-2017/ (accessed February 1, 2018).
112. Samaritan's Purse, "Volunteers Serve Homeowners in Need Following Hurricane Harvey," https://www.samaritanspurse.org/article/volunteers-serve-homeowners-in-need-following-hurricane-harvey/?&utm_source=SPTwitter&utm_medium=social&utm_campaign=m_YHHR-17SM_SocialMedia&utm_content=9-5Harvey-MaryHomeownerTweet (accessed February 1, 2018).
113. ClickOrlando.com, "I-4 for Puerto Rico Gets Creative Bringing Supplies to the Island," https://www.clickorlando.com/news/i-4-for-puerto-rico-gets-creative-bringing-supplies-to-the-island (accessed February 1, 2018).
114. Texas Catholic Conference of Bishops, "Recovery: Hurricane Harvey," https://txcatholic.org/harvey/ (accessed February 1, 2018).
115. Southern Baptists of Texas Convention, "Hurricane Harvey Response," http://sbtexas.com/evangelism/disaster-relief/hurricane-harvey-dr-information/ (accessed February 1, 2018).
116. Ibid.

117. The Salvation Army, "Services Delivered," https://disaster.salvationarmyusa.org/aboutus/?facts (accessed February 1, 2018).
118. The Salvation Army, "Emotional and Spiritual Care: An Essential Need in Disaster Response," http://disaster.salvationarmyusa.org/news/2017/09/20/emotional-and-spiritual-care-an-essential-need-in-disaster-response (accessed February 1, 2018).
119. The Daily Caller, "Former Texas Gov Says 'Faith Based Community' Will Play Important Role in Harvey Recovery," http://dailycaller.com/2017/08/28/former-texas-gov-says-faith-based-community-will-play-important-role-in-harvey-recovery/ (accessed February 1, 2018).
120. Samaritan's Purse, "Hurricane Harvey Response Updates: Still Going Strong Across Texas," https://www.samaritanspurse.org/article/hurricane-harvey-response-updates/ (accessed February 1, 2018).
121. Samaritan's Purse, "Pearland, TX Rebuild Site," https://www.spvolunteer.org/project-response/150 (accessed February 1, 2018).
122. Samaritan's Purse, "Rockport, TX Rebuild Site," https://www.spvolunteer.org/project-response/151 (accessed February 1, 2018).
123. Convoy of Hope, "Convoy of Hope Responds to Hurricane Harvey," https://www.convoyofhope.org/blog/features/disaster-response/convoy-hope-responds-hurricane-harvey/ (accessed February 1, 2018).
124. The Salvation Army, "Salvation Army Transitions from Response to Recovery for Harvey & Irma," http://disaster.salvationarmyusa.org/news/2017/10/20/salvation-army-transitions-from-response-to-recovery-for-harvey-&-irma (accessed February 1, 2018).
125. The Salvation Army, "Preparing for Impact of Hurricane Maria," http://www.salvationarmyusa.org/usn/news/the-salvation-army-prepares-for-impact-of-hurricane-maria/ (accessed February 1, 2018).
126. The Salvation Army, "In Puerto Rico, Over 1.2 Million Survivors' Needs Met by The Salvation Army," http://disaster.salvationarmyusa.org/news/2017/10/06/in-puerto-rico (accessed February 1, 2018).
127. News release, "Long-Term Recovery Begins at the Local Level," Federal Emergency Management Agency, February 7, 2017, https://www.fema.gov/news-release/2017/02/07/long-term-recovery-begins-local-level (accessed February 20, 2018).
128. News release, "Texas Churches Damaged by Harvey Sue FEMA," Becket Law, September 5, 2017, http://www.becketlaw.org/media/texas-churches-damaged-harvey-sue-fema-exclusion-disaster-relief-programs/ (accessed February 20, 2018).
129. Federal Emergency Management Agency, "Public Assistance Program and Policy Guide," http://s3.amazonaws.com/becketnewsite/FEMA-PAPPG-3d-Edition-1-2-18-Final.pdf (accessed February 1, 2018).
130. Supreme Court of the United States, "Emergency Application for Temporary Injunction Pending Appeal," https://www.supremecourt.gov/DocketPDF/17/17A649/24180/20171215211204155_Harvest%20Alito%20Application%20final.pdf (accessed February 1, 2018).
131. Supreme Court of the United States, "No. 17A659," https://www.supremecourt.gov/search.aspx?filename=/docket/docketfiles/html/public/17a649.html (accessed February 1, 2018).
132. U.S. Department of Justice, "Re: Harvest Family Church et al. v. Federal Emergency Management Agency et al., No. 17A649," http://s3.amazonaws.com/becketnewsite/17A649-Harvest-Family-Church-letter.pdf (accessed February 1, 2018).
133. CNN, "Read Senate's Full Bipartisan Budget Agreement," http://www.cnn.com/2018/02/08/politics/bipartisan-budget-deal-text/index.html (accessed February 14, 2018).
134. News release, "In Puerto Rico, Over 1.2 Million Survivors' Needs Met by the Salvation Army," The Salvation Army, October 6, 2017, http://disaster.salvationarmyusa.org/news/2017/10/06/in-puerto-rico (accessed March 9, 2018).

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