

EXAMINING CLIMATE CHANGE: A THREAT TO THE HOMELAND

HEARING
BEFORE THE
SUBCOMMITTEE ON
EMERGENCY PREPAREDNESS,
RESPONSE, AND RECOVERY
OF THE
COMMITTEE ON HOMELAND SECURITY
HOUSE OF REPRESENTATIVES
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EXAMINING CLIMATE CHANGE: A THREAT TO THE HOMELAND

Tuesday, June 8, 2021

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON HOMELAND SECURITY,
SUBCOMMITTEE ON EMERGENCY PREPAREDNESS,
RESPONSE, AND RECOVERY,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:04 p.m., via Webex, Val Butler Demings [Chairwoman of the subcommittee] presiding.

Present: Representatives Demings, Jackson Lee, Payne, Green, Watson Coleman, Cammack, Miller-Meeks, and Garbarino.

Also present: Representatives Barragán and Clarke.

Mrs. DEMINGS. The Subcommittee on Emergency Preparedness, Response, and Recovery will come to order.

The subcommittee is meeting today to receive testimony on “Examining Climate Change: A Threat to the Homeland.”

Without objection, the Chair is authorized to declare the subcommittee in recess at any point.

I would like to say good afternoon to all of you and thank you so much for joining us today to our witnesses, as well as our amazing Members.

We are here today to discuss climate change and our Nation’s response. Climate change is a major threat to our country. The U.S. Department of Homeland Security’s mission is to, “secure the Nation from the many threats we face.” Therefore, the Department’s mission includes taking action to address the effects of climate change.

Already the impacts of climate change on communities across the country extract devastating human and financial costs. If we fail to address the challenges posed by climate change, those costs will only increase.

Science concludes that climate change is real, and it is increasing in the severity and the frequency of extreme weather events. According to NOAA, during 1980, the United States has sustained close to 300 weather and climate disasters, like catastrophic hurricanes, flooding, and wildfires, where overall financial damages reached or exceeded \$1 billion, and the total costs of these events now exceeds \$1.9 trillion.

In 2020, for example, multiple extreme weather events, like Tropical Storm Eta and Hurricane Sally, to name only 2, severely impacted the Ranking Member and my home State of Florida and

the southeastern U.S. region, and each storm respectfully resulted in more than \$1 billion of financial damages for the United States.

Last week, the Federal Reserve Chairman, Jerome Powell, acknowledged the serious risk the climate crisis poses to the United States and global economy, stating, “There is no doubt that climate change poses profound challenges for the global economy and certainly the financial system.”

Since 2013, including in 2021, the U.S. Government Accountability Office included the Federal Government’s fiscal exposure to the risk of climate change in the office’s High-Risk List report. To save lives and to lower the Federal Government’s fiscal exposure to climate change, GAO stated, “The Federal Government needs a cohesive, strategic approach with strong leadership and the authority to manage risks across the entire range of related Federal activities.”

Reports released by both the U.S. Department of Homeland Security and the U.S. Department of Defense categorize climate change as an urgent growing threat based on its ability to cripple critical infrastructure, deplete military resources, and fuel terrorism.

Despite the pressing need to address the risks posed by climate change and despite the progress that has been made by the Obama administration, President Trump disregarded these challenges, increased the likelihood that Americans would experience these risks and took steps to eliminate Federal research and response climate change programs.

In contrast, through multiple Executive Orders on the climate crisis and by providing \$1 billion to communities through FEMA’s Pre-Disaster Building Resilient Infrastructure and Communities program and through the Biden administration’s plan to invest in resilient critical infrastructure through the American Jobs Plan and the administration’s budget proposal, President Biden continues to take swift and bold action to restore America’s leadership on climate issues and confront the risks posed by climate change.

In preparing for and responding to the effects of climate change, DHS, FEMA, and the broader Federal Government must include conscious planning for racial and socioeconomic disparities, and that is why the Biden administration is taking action on environmental justice issues through the creation of the White House Environmental Justice Advisory Council and other initiatives.

Additionally, DHS Secretary Mayorkas has also taken steps to inform the Department’s climate response programs to include the goals of advancing equity and increasing resilience for vulnerable and high-risk communities. Responding to climate change will take a unified effort among Federal, State, local, Tribal, and territorial governments, and private-sector partners, and President Biden’s leadership, along with the sustained focus by Members of this subcommittee are essential to that effort.

It is with sincere gratitude that I again welcome our witnesses here today. Thank you all for agreeing to share your insight with this subcommittee and with the public. We look forward to hearing your testimony.

[The statement of Chairwoman Demings follows:]

STATEMENT OF CHAIRWOMAN VAL DEMINGS

JUNE 8, 2021

We are here today to discuss climate change and our Nation's response. Climate change is a major threat to our country.

The U.S. Department of Homeland Security's mission is to, and I quote, "secure the Nation from the many threats we face," unquote. Therefore, the Department's mission includes taking actions to address the effects of climate change. Already, the impacts of climate change on communities across the country exact devastating human and financial costs; and if we fail to address the challenges posed by climate change those costs will only increase.

The science is in, climate change is happening, and it is increasing the severity and frequency of extreme weather events. According to NOAA, since 1980, the United States has sustained close to 300 weather and climate disasters, like catastrophic hurricanes, flooding, and wildfires, where overall financial damages reached or exceeded \$1 billion, and the total cost of these events now exceeds \$1.9 trillion. In 2020, for example, multiple extreme weather events, like Tropical Storm Eta and Hurricane Sally, to name only 2, severely impacted my home State of Florida and the Southeastern U.S. region, and each storm, respectively, resulted in more than \$1 billion of financial damages for the United States.

Last week, the Federal Reserve Chairman, Jerome Powell, acknowledged the serious risks the climate crises poses to the United States and global economy, stating, and I quote: "There is no doubt that climate change poses profound challenges for the global economy and certainly the financial system." Unquote. Since 2013, including in 2021, the U.S. Government Accountability Office included the Federal Government's fiscal exposure to the risks of climate change in the Office's High-Risk List report.

To save lives, and to lower the Federal Government's fiscal exposure to climate change, GAO stated, and I quote, "the Federal Government needs a cohesive, strategic approach with strong leadership and the authority to manage risks across the entire range of related Federal activities," unquote. Reports released by both the U.S. Department of Homeland Security and the U.S. Department of Defense, characterize climate change as an urgent, growing threat based on its ability to cripple critical infrastructure, deplete military resources, and fuel terrorism.

Despite the pressing need to address the risks posed by climate change, and despite the progress that had been made by the Obama administration, President Trump, disregarded these challenges, increased the likelihood that Americans would experience these risks, and took steps to eliminate Federal research and response climate change programs. In contrast, through multiple Executive Orders on the climate crisis, and by providing \$1 billion to communities through FEMA's Pre-Disaster Building Resilient Infrastructure and Communities program, and through the Biden administration's plan to invest in resilient critical infrastructure through the American Jobs Plan and the administration's budget proposal, President Biden continues to take swift and bold action to restore America's leadership on climate issues and confront the risks posed by climate change.

In preparing for and responding to the effects of climate change, DHS, FEMA, and the broader Federal Government, must include conscious planning for racial and socioeconomic disparities. And that is why the Biden administration is also taking action on environmental justice issues through the creation of the White House Environmental Justice Advisory Council and other initiatives. Additionally, DHS Secretary Mayorkas has also taken steps to inform the Department's climate response programs to include the goals of advancing equity and increasing resilience for vulnerable and high-risk communities.

Responding to climate change will take a unified effort among Federal, State, local, Tribal, and territorial governments and private-sector partners, and President Biden's leadership, along with the sustained focus by Members of this subcommittee are essential to that effort. It is with sincere gratitude that I welcome our witnesses here today. Thank you for agreeing to share your insight with this subcommittee and with the public. We look forward to your testimony.

Mrs. DEMINGS. It is now my pleasure to recognize the Ranking Member of this subcommittee, the gentlewoman from Florida, Mrs. Cammack, for an opening statement.

Mrs. CAMMACK. Thank you, Madam Chairwoman. I hope you can all hear me. Can you hear me OK?

Mrs. DEMINGS. Yes.

Mrs. CAMMACK. OK. Awesome. It is a little difficult when we are all out in the field. You never know exactly what kind of broadband connection you are going to get, so I appreciate that.

Thank you, Chairwoman Demings.

2020 saw one of the worst fire seasons in history, burning millions of acres along the West Coast, and in February 2021, ice storms in Texas left millions without power or safe water to drink. In March of this year, a tornado outbreak caused wide-spread damage to several southern States, and in our home State of Florida, as the Chairwoman and I are both proud to call Florida home, you know, we are certainly no stranger to intense weather events. Just last year, Hurricane Sally flooded Florida's panhandle dropping 4 inches of rain in just 4 hours. In 2018, Hurricane Michael—well, we all know that it devastated Florida's Gulf Coast and was the first Category 5 hurricane to make landfall in mainland United States since 1992.

Now, as we move through the second week of Atlantic hurricane season, it is important to remember that while we cannot control the weather, we can take steps to prepare, and it is pre-disaster mitigation efforts by individuals and policy makers, first responders, and emergency preparedness professionals that ensure that no geographic region of our country is left unsupported.

Mitigation activities, such as strengthening and upgrading existing infrastructure from all hazards, raising structures in identified flood zones, buying flood insurance to protect personal property, installing hurricane shutters and other protective measures, as well as clearing dead vegetation to reduce the risk of wildfire all have the potential to limit the negative effects of natural disasters.

FEMA's Hazard Mitigation Grant Program has helped communities implement hazard mitigation measures following a Presidential major disaster declaration to reduce the risk of loss of life and property from future disasters.

Now, Florida's 2018 State Hazard Mitigation Plan highlights 4 main goals with corresponding objectives to include implementation of an effective comprehensive State-wide Hazard Mitigation Plan, supporting local and regional mitigation strategies, increasing public and private-sector awareness, and support for hazard mitigation in Florida, and support mitigation initiatives and policies that support the State's cultural, economic, and natural resources.

These goals have been realized through recent mitigation projects. For example, the Hallandale Beach drainage project was recently completed using hazard mitigation grant program funds to address drainage issues that caused flooding throughout the city during storms.

A new drainage project was also completed in Oakland Park using those same grant funds. Now, despite high tidal surges and high canal levels from Hurricane Irma in September 2017, no flood waters entered homes in Oakland Park communities that were served by this new system.

Not only do mitigation activities aim to reduce injuries, deaths, and property damage, but they also limit the potential for damage to the economic sector.

A December 2019 report by the National Institute of Building Sciences found that by designing buildings to meet the 2018 Build-

ing Code standards, the National mitigation benefit/cost ratio is \$11 for every \$1 invested. The report also found that the impacts of 23 years of Federal mitigation grants provided by FEMA, the Economic Development Administration, and HUD result in a National benefit of \$6 for every \$1 invested.

Our approach to mitigation needs to shift from a pre-disaster mindset so that we are anticipating the need and not responding after the fact and after the damage has been done.

I am encouraged by recent changes to pre-disaster mitigation funding, including the introduction of the Building Resilient Infrastructure and Communities grant program, BRIC, makes additional Federal funds available to States, U.S. territories, Indian Tribal governments, and local communities for pre-disaster mitigation activities.

Now, as we have hardened and continue to harden our defenses against a potential terrorist attack, we must also be prepared for the devastating effects of a severe weather event. As I have said, the Chairwoman and I being Floridians, I think we know this pretty much as well as anyone could. The reality is, quite frankly, that the natural disasters have always occurred, and they will continue to occur. We should use every single disaster as an opportunity to learn and improve our mitigation capabilities and strategies to decrease the loss of life and damage to our homes and infrastructure and to lessen the economic strain that these disasters present.

I look forward to hearing our witnesses here today on how to continue our preparedness and resiliency in the face of unpredictable future natural disasters and all hazard emergencies.

At this time, I ask unanimous consent to enter into the record this letter from the Florida Division of Emergency Management highlighting their mitigation and resiliency projects. With that—

Mrs. DEMINGS. Without objection.

[The information follows:]

LETTER FROM THE FLORIDA DIVISION OF EMERGENCY MANAGEMENT

June 8, 2021.

The Honorable KAT CAMMACK,
Ranking Member, Subcommittee on Emergency Preparedness, Response, and Recovery, Committee on Homeland Security, U.S. House of Representatives, Washington, DC 20510.

DEAR RANKING MEMBER CAMMACK: Thank you for the opportunity to share information regarding mitigation programs and projects overseen by Florida Governor Ron DeSantis and the Florida Division of Emergency Management.

The State is committed to ensuring communities have every resource they need for resilience planning and project implementation. In May, Governor DeSantis signed Senate Bill 1954. This bill, for the first time ever, requires the development of the Comprehensive Statewide Flood Vulnerability and Sea Level Rise Data Set, led by the Chief Science Officer. Additionally, it facilitates the development of Statewide sea level rise projections and other data necessary to determine the risks to inland and coastal communities. The data set is to be completed by July 1, 2022, and the Comprehensive Statewide Flood Vulnerability and Sea Level Rise Assessment is to be completed by July 1, 2023. The Statewide Flooding and Sea Level Rise Resilience Plan is to be submitted by Dec. 1, 2023.

This bill also authorizes local governments to develop Regional Resilience Coalitions to allow communities to join in resilience planning efforts and share technical assistance. It also creates the Florida Flood Hub for Applied Research and Innovation at the University of South Florida to coordinate efforts between the academic and research institutions of Florida.

This bill is part of the largest investment in the State's history—over \$640 million—to support efforts to ensure State and local communities are prepared to deal with the impacts of sea level rise, intensified storms and flooding.

In addition, the Division houses the Bureau of Mitigation, which is an integral part of the agency. Due to Florida's weather, geography and miles of coastline, the State is highly vulnerable to disasters. To assist communities in reducing the impacts of these disasters, the Bureau of Mitigation administers three Federal mitigation grant programs: the Hazard Mitigation Grant Program, the Building Resilient Infrastructure and Communities Program and the Flood Mitigation Assistance Program.

The Federal mitigation grant programs play a significant role in the development of mitigation programs throughout the State. To supplement those programs, the Division has taken additional efforts to support disaster resiliency including loss avoidance studies, a Statewide interagency working group called Mitigate FL to discuss ongoing mitigation efforts and the Local Mitigation Strategy system.

The Division's framework for mitigation starts with the State Hazard Mitigation Plan. The purpose of the State Hazard Mitigation Plan is to reduce death, injuries, and property losses caused by natural hazards in Florida. The 2018 plan serves several purposes, including the implementation of a comprehensive mitigation program and guidance to ensure that the State effectively uses available mitigation funding.

Though the State Hazard Mitigation Plan, the State is eligible to receive additional funding through the Hazard Mitigation Grant Program. This program supports projects that specifically reduce disaster losses. The Division works with local governments to develop projects that address an existing issue. For example, the Division recently completed the Hallandale Beach Drainage Project through this program. This project addressed drainage issues throughout the city that caused flooding during storms. To prevent future flooding, the city is constructing a system that would manage stormwater in 195 acres of residential and commercial properties. The project also includes the installation of drainage pipes and pressurized pump stations. Typically, projects within this program range from retrofitting public structures, drainage projects and elevation of private structures.

As of June 1, the State is currently managing \$1 billion in funding through the Hazard Mitigation Grant Program.

The Division also administers the Flood Mitigation Assistance Program. This program provides funding specifically for projects intended to reduce or eliminate the risk of repetitive flood damage to buildings and structures insurable under the National Flood Insurance Program. Eligible projects include property acquisition and structure demolition, structure elevation, dry floodproofing, soil stabilization and other community flood mitigation projects.

The Division also supports the Local Mitigation Strategy system. FEMA requires local governments to develop and adopt such hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects. These plans are referred to as local mitigation plans. Jurisdictions must update their hazard mitigation plans and re-submit them for FEMA approval every 5 years to maintain eligibility. Local mitigation plans identify the natural hazards that may affect a single or multiple local jurisdictions, such as a town, city, or county. Plans assess risks and vulnerabilities, identify actions to reduce losses from those hazards identified, and establish a coordinated process to implement the plan using a wide range of public and private investments.

To ensure jurisdictions continue to be eligible for funding, the Division provides technical assistance to counties as they update their plans and also provides approvals for local plans. The Division has also developed a Florida Review Tool for counties that streamlines the review process and has issued a local mitigation strategy manual that provides specific guidance during the planning process.

Although the State has seen great success through mitigation efforts, the Division has also identified challenges associated with mitigation funding and projects.

The biggest challenge will be ensuring local governments are able to receive funding quickly. The State receives certain mitigation funding, such as the Hazard Mitigation Grant Program, through FEMA obligations. Due to COVID-19, FEMA will be managing Public Assistance reimbursement funding from every eligible State, county, nonprofit and place of worship that has disaster-related costs associated with COVID-19. The agency will be simultaneously providing obligations to eligible applicants, while also supporting other disaster responses, such as hurricanes. The Division is anticipating a delay in funding due to the high volume of applicants, which may impact how quickly the Division can disburse funds to local governments. While we continue to await additional guidance, the Division will continue to work with local governments to ensure they have all available resources as they

continue to create resilient communities that are prepared to withstand any disaster.

Another challenge includes the Building Resilient Infrastructure and Communities program. The recent announcement regarding the increased funding for this program in fiscal year 2021–2022 is an exciting investment in mitigation. However, we continue to advocate for additional funding for this program. In Florida, there are currently mitigation projects totaling up to \$20 billion that are awaiting funding. We hope this program continues to grow so we can support all mitigation projects intended to reduce disaster impacts. Additionally, with the recent announcement, a portion of this funding will be required to support underserved communities in areas with a high Social Vulnerability Index, as defined by the Centers for Disease Control and Prevention. The Division is concerned that underserved communities may not be able to support the 25 percent cost share through this program. We recommend that the cost share either be reduced or waived for entities in areas with a high Social Vulnerability Index.

Overall, mitigation and supporting resilient communities continue to remain top priorities for the Division. The Division has compiled information related to all mitigation programs on the Division's website and we encourage our partners to visit FloridaDisaster.org/DEM/Mitigation for more in-depth information regarding mitigation efforts within the State.

The Division looks forward to continuing to work closely with local governments as they develop mitigation projects for their communities. Thank you again for providing us with the opportunity to share information on our programs within the State and please let me know if we can be of further assistance.

Sincerely,

KEVIN GUTHRIE,
Director.

Mrs. CAMMACK. Thank you. With that, I yield back to the Chairwoman.

[The statement of Ranking Member Cammack follows:]

STATEMENT OF RANKING MEMBER KAT CAMMACK

2020 saw one of the worst fire seasons in history—burning millions of acres along the West Coast. In February 2021, ice storms in Texas left millions without power or safe water to drink. In March of this year, a tornado outbreak caused widespread damage to several southern States.

And in my home State of Florida, we are certainly no stranger to intense weather events. Just last year, Hurricane Sally flooded Florida's Pan Handle—dropping 4 months of rain in just 4 hours. And in 2018, Hurricane Michael, that devastated Florida's Gulf Coast, was the first Category 5 hurricane to make landfall in mainland United States since 1992.

As we move through the second week of Atlantic Hurricane Season, it's important to remember that while we can't control the weather, we can take steps to prepare. Pre-disaster mitigation efforts by individuals, policy makers, first responders, and emergency preparedness professionals ensure that no geographic region of the country is left unsupported.

Mitigation activities such as strengthening and upgrading existing infrastructure from all-hazards, raising structures in identified flood zones, buying flood insurance to protect personal property, installing hurricane shutters and other protective measures, and clearing dead vegetation to reduce the risk of wildfire all have the potential to limit the negative effects of natural disasters.

FEMA's Hazard Mitigation Grant Program helps communities implement hazard mitigation measures following a Presidential Major Disaster Declaration, to reduce the risk of loss of life and property from future disasters.

Florida's 2018 State Hazard Mitigation Plan highlights 4 goals with corresponding objectives to include:

- Implement an effective comprehensive State-wide hazard mitigation plan;
- Support local and regional mitigation strategies;
- Increase public and private-sector awareness and support for hazard mitigation in Florida; and
- Support mitigation initiatives and policies that protect the State's cultural, economic, and natural resources.

These goals have been realized through recent mitigation projects. For example, the Hallandale Beach Drainage Project was recently completed using Hazard Mitigation Grant Program (HMGP) funds to address drainage issues that caused flooding throughout the city during storms. A new drainage project was also completed

in Oakland Park using HMPG funds. Despite high tidal surges and high canal levels from Hurricane Irma in September 2017, no flood waters entered homes in Oakland Park communities served by the new system.

Not only do mitigation activities aim to reduce injuries, deaths, and property damage, but they also have the potential to limit the economic impact of disaster recovery efforts.

A December 2019 report by the National Institute of Building Sciences found that by designing buildings to meet 2018 building code standards, the National mitigation benefit-cost ratio is \$11 for every \$1 invested.

The report also found that the impacts of 23 years of Federal mitigation grants provided by FEMA, the Economic Development Administration, and the Department of Housing and Urban Development, result in a National benefit of \$6 for every \$1 invested.

Our approach to mitigation needs to shift to a pre-disaster mindset, so we are anticipating the need, and not responding after the damage is done.

I am encouraged by recent changes to pre-disaster mitigation funding, including the introduction of the Building Resilient Infrastructure and Communities Grant Program (BRIC). BRIC makes additional Federal funds available to States, U.S. territories, Indian Tribal governments, and local communities for pre-disaster mitigation activities.

As we've hardened and continue to harden our defenses against a potential terrorist attack, we must also be prepared for the devastating effects of a severe weather event.

The reality is that natural disasters have always occurred and will continue to occur. We should use every disaster as an opportunity to learn and improve our mitigation capabilities and strategies to decrease loss of life and damage to our homes and infrastructure, and to lessen the economic strain that disasters present.

I look forward to hearing from our witnesses today on how to continue to improve our preparedness and resilience in the face of the unpredictable nature of disasters and all-hazard emergencies.

Mrs. DEMINGS. I want to thank the Ranking Member for her remarks.

Also, I would like to remind the committee that we will operate according to the guidelines laid out by the Chairman and Ranking Member in their February 3 colloquy regarding remote procedures.

Without objection, Members not on the subcommittee shall be permitted to sit and question the witnesses. Members may also submit statements for the record.

[The statements of Chairman Thompson and Honorable Jackson Lee follow:]

STATEMENT OF CHAIRMAN BENNIE G. THOMPSON

JUNE 8, 2021

Climate change is very real and creating more frequent and extreme natural disasters. Extreme weather and its accompanying negative impacts make climate change one of the biggest threats to our homeland.

For evidence of the impacts of climate change, you can look to the 2020 Atlantic hurricane season, which was the most active and the fifth-costliest Atlantic hurricane season on record. The 2020 Atlantic hurricane season was so active that we ran out of names and proceeded to use the Greek alphabet. Also in 2020, we witnessed devastating California wildfires. By the end of the year, we had nearly 10,000 fires that had burned through more than 4 million acres, making 2020 the largest wildfire season on record in California.

We are also seeing the impacts of climate change in my home State. Over the past year, Mississippi has dealt with several catastrophic weather events and, as a result, the State has received 6 storm-related Major Declarations and 5 Emergency Declarations. The damage from these horrific storms has caused more than \$100 million in damages. In addition to the cost of extreme weather events, recent disasters are shining a light on long-standing inequities in which low-income and underserved communities suffer disproportionate impacts of climate change. These communities will continue to suffer disproportionately from severe weather unless we make equity a priority in addressing climate change.

Policy makers cannot afford to ignore climate change as it threatens our infrastructure, agriculture, economy, health care, population, and so much more. For example, Federal Reserve Chairman Jerome Powell acknowledged that the climate crisis “could impact the broader economy, including inflation, jobs and the financial sector.” America lost years of progress on addressing climate change due to the Trump administration’s outright refusal to accept science and its work to dismantle climate science programs across the Federal Government.

I am proud that the Biden administration is taking climate change seriously. President Biden is committed to rebuilding our communities by investing in preparation for extreme weather events while also ensuring that policies tackling the climate crisis are more inclusive.

We must be bold in addressing climate change. We need to make critical investments in mitigation and adaption investments today, to reduce damage from future extreme weather occurrences. I hope to hear from our witnesses today about how we can take bold steps to combat the on-going climate crisis. I look forward to working with the Biden administration and my colleagues in supporting communities in our fight to combat climate change and build stronger, more resilient communities.

STATEMENT OF HONORABLE SHEILA JACKSON LEE

JUNE 8, 2021

Thank you Chairwoman Demings, and Ranking Member Cammack for convening this important hearing on “Examining Climate Change: A Threat to the Homeland.”

I welcome today’s witnesses and look forward to their testimony.

- Bill Nye, science educator and CEO, The Planetary Society;
- Alice C. Hill, David M. Rubenstein senior fellow for energy and environment, Council on Foreign Relations;
- Curtis Brown, State coordinator, Virginia Department of Emergency Management, co-founder, Institute for Diversity and Inclusion in Emergency Management; and
- Pamela S. Williams, executive director, BuildStrong Coalition (Minority witness).

This hearing will give Members an opportunity to hear testimony on the impacts of climate change, including extreme weather events, and their implications for homeland security.

Climate change is a long-term change in the average weather patterns that have come to define Earth’s local, regional, and global climates.

These changes have a broad range of observed effects that are synonymous with the term.

Changes observed in Earth’s climate since the early 20th Century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth’s atmosphere, raising Earth’s average surface temperature.

These human-produced temperature increases are commonly referred to as global warming.

Increases in Earth’s climate has led to unprecedented melting of Arctic ice, which eventually contributes to ocean rise.

Additional water contributes to extreme weather by impacting the process of cloud formation, which increases the size of rainstorms and large weather systems that form hurricanes and typhoons.

The stress that extreme weather is placing on the Nation’s critical infrastructure cannot be understated.

It is the task of the Committee on Homeland Security to take action to direct the work of the U.S. Department of Homeland Security (DHS), to address any threat to the homeland, no matter the source of the threat—including dangers posed by climate change.

Climate change is not simply an issue—it is a threat with credible and uncompromising dangers.

In January 2021, Secretary of Defense Lloyd Austin announced that the Defense Department “will immediately take appropriate policy actions to prioritize climate change considerations in our activities and risk assessments, to mitigate this driver of insecurity.

On April 22, 2021 Secretary of Homeland Security Alejandro N. Mayorkas made this statement, “the impacts of the climate emergency on both our National and collective global security are vast,” and continued by noting that, “DHS will implement

a new approach to climate change adaptation and resilience, and we will do so with the sense of urgency this problem demands.”

Since 1980, the United States has sustained close to 300 weather and climate disasters ranging from catastrophic hurricanes to raging wildfires.

The total cost of these disasters now exceeds \$1.9 trillion according to the U.S. National Oceanic and Atmospheric Administration.

Nevertheless, we know the true cost of climate change is real human pain and loss—the incalculable grief of losing loved ones, homes, and communities.

To fail to address climate change is to fail our citizens.

And by these standards, State officials in my home State categorically failed when a severe ice and snowstorm in the form of a polar vortex hit Texas in February 2021.

It is expected that the costs incurred through lost income, property damage, and long-term reduction in economic activity due to the storm will amount to between \$195 billion and \$295 billion.

The State of Texas official record of deaths caused by the ice storm currently stands at 151 dead, with the majority of the deaths centered in Harris County (home to Houston), Travis County (Austin), and Dallas.

However, *Buzzfeed News*, using a method called “excess deaths” analysis, which has also been employed to calculate the full toll of the COVID-19 pandemic, found that even by the most conservative estimates, the true number is at least 3 times higher.

The analysis, also reviewed by 3 independent experts, suggests that between 426 and 978 more people died during the week ending Feb. 20 than what the State has accounted for.

The best estimate from the analysis on excess deaths suggests that 702 people were killed in the storm that week, which is nearly 4 times higher than the State’s tally.

Hurricane season 2021 began on June 1, 2021 and we may see storms that bring damaging destruction to the Gulf and Atlantic coasts and tropical areas of the Nation.

HURRICANE HARVEY

Death of Family

It is a particularly painful tragedy from the Hurricanes of 2017, which took so much from us including 6 members of the Saldivar family.

I still recall where I was when I learned that the family’s bodies had been discovered in their van that was swept away by raging Harvey flood waters.

My office received desperate calls from constituents who were trapped by flood waters.

One instance involved over 100 men, women, and children at a gas station parking lot—the only patch of dry land in a residential area surrounded by flood water.

Many elderly were without medication and there was no water or food for children who were in need.

I worked to get city dump trucks, the only city vehicles capable of driving through flood waters, to that location before night when rescue operations would stop until dawn the next day.

My work over the days following Harvey involved getting medical help, food, and water to people in areas cutoff by flood waters or damaged streets.

The recovery from Hurricane Harvey is not finished.

Today, there are still blue-tarped roofs in neighborhoods that have not gotten repaired following Harvey.

HARVEY BY THE NUMBERS

The 9-county Houston metro area impacted by Hurricane Harvey covers 9,444 square miles.

Harris County covers 1,778 square miles, enough space to fit New York City, Philadelphia, Boston, Chicago, Seattle, Austin, and Dallas, with room still to spare.

There was over 41,500 square miles of land mass impacted by Hurricane Harvey and the subsequent flooding that covered an area larger than the States of Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont combined.

Hurricane Harvey dropped 21 trillion gallons of rainfall on Texas and Louisiana, most of it on the Houston Metroplex.

In September 2017, NASA’s Jet Propulsion Laboratory reported that Hurricane Harvey’s rainfall created 275 trillion pounds of water, which caused the crust in and around Houston to deform and sink nearly 2 cubic centimeters because of its weight.

At its peak on September 1, 2017, one-third of Houston was under water, and leaving 34,575 in shelters across Texas.

Hurricane Harvey is the largest housing disaster to hit the United States which left 203,000 damaged homes, of which 12,700 were destroyed.

Thousands of others with severe damage to their homes were living with family or friends.

Hurricane Harvey followed Hurricanes Katrina and Maria in 2005 and Hurricane Ike in 2008 with each hurricane season more damaging than the previous.

The damage is real, the threat present, and the consequences grave.

And there is no way to divide climate change from these catastrophes—one emerges from the other, and the science speaks to this in unyielding and irrefutable terms.

According to the National Aeronautics and Space Administration (NASA), “temperatures are increasing due to human activities, specifically emissions of greenhouse gases, like carbon dioxide and methane,” and in 2020, Earth’s global average surface temperature tied 2016 as the warmest year on record, and even “edged out 2016 by a very small amount, within the margin of error of the analysis.”

Those who wish to reject science must understand that the evidence of climate change speaks louder than anything else and we must listen to what the climate is telling us.

President Biden is listening and acting in the best interest of our Nation and our people.

The President will not waiver in his fidelity to science and his commitment to the safety of the American People.

The National Institute of Building Sciences (NIBS) reports that disaster losses across the country are growing about 6 percent a year, costing an average of \$100 billion.

However, there are policy tools at our disposal to greatly reduce these costs and make communities more resilient to the impact of damaging weather.

The National Institute of Building Sciences found that every \$1 of mitigation funding saves approximately \$6 on future disaster costs.

The Biden administration’s directive for FEMA (Federal Emergency Management Agency) to provide \$1 billion to communities through the Pre-Disaster Building Resilient Infrastructure and communities (BRIC) program is proof of the President’s data-driven and human-centered approach to the climate crisis.

President Biden is moving fast in the right direction.

His Executive Order on Tackling the Climate Crisis at Home and Abroad and the Executive Order on Climate-Related Financial Risk represent a departure from his predecessor’s failure to reckon with the threats of climate change.

Moreover, President Biden’s plan to invest in resilient critical infrastructure through the American Jobs Plan and the administration’s budget proposal will shore up our communities, safeguard our country, and once again restore our global leadership.

Our response to climate change necessitates coalition-building between activists, communities, the private sector, and Government.

This will require a unified effort among Federal, State, local, Tribal, and territorial governments.

The GAO’s 2021 High-Risk Series reports testifies to the urgency and need for whole-of-Government coordination:

The Federal Government needs a cohesive, strategic approach with strong leadership and the authority to manage risks across the entire range of related Federal activities.

This strategy must also account for vulnerability, specifically the pre-existing vulnerabilities in many communities of color around the country who are disproportionately affected by the impacts of climate change.

Texas is no exception.

Following the winter storm, I worked to bring much-needed assistance to Houstonians through water and food deliveries, and the Austin Justice Coalition delivered food to more than 40 families around Austin.

Around 90 percent of those families were Black or Latino.

João Paulo Connolly, director of housing and community development at Austin Justice Coalition, spoke to this disparity.

He observed that while the storm hit everyone, families of color in low-income areas often do not have a car or the funds to make speedy repairs on busted pipes—meaning the recovery process extracts a higher burden on them.

Chauncia Willis, chief executive of the Institute for Diversity and Inclusion in Emergency Management, puts it bluntly:

“What you will see, as with COVID-19 and with any disaster, is disproportionate death and negative impacts for those who are most vulnerable among us. “These inequities are easily identifiable before disaster and, of course, they’re rooted in systemic bias, racism, and the country’s anti-poverty mindset.”

The toll that climate change is taking on low income and poor households should not be forgotten as we look at solutions for climate.

The President’s American Jobs Plan takes a broad view of the need to address failing infrastructure and the need to have more resilient infrastructure to better weather climate change.

I look forward to witness testimony in today’s hearing.

Mrs. DEMINGS. I now want to again welcome our panel of witnesses.

The first witness is Mr. Bill Nye, appearing in his own capacity. Mr. Nye is the CEO of The Planetary Society, a nonprofit organization working to advance scientific study and co-founded by the famous planetary scientist Carl Sagan, Mr. Nye’s former astronomy professor. Well-known for his work in the fields of science and engineering and his popular television show, “Bill Nye, the Science Guy,” Mr. Nye has made it his life’s mission to help foster a scientifically literate society, one ready to confront the threats posed by climate change.

Our second witness is Ms. Alice Hill, the David M. Rubenstein senior fellow for energy and the environment at the Council of Foreign Relations. Ms. Hill’s work for the council focuses on climate change. Ms. Hill also served as a special assistant to President Obama and senior director for resilience policy on the National Security Council staff where Ms. Hill led the NSC’s work on developing National policies to increase resilience to biological threats and climate change. Ms. Hill’s public service also includes service with NDHS, as senior counselor to the Secretary in 2009. During her time there, Ms. Hill led the Department of DHS’s first-ever climate adaptation plan and the formulation of strategic plans regarding catastrophic, biological, and chemical threats, including pandemics.

Our third witness is the Virginia State coordinator for emergency management, Mr. Curtis Brown. Mr. Brown is the first African American to serve in that role. Mr. Brown is also the co-founder of the Institute of Diversity and Inclusion in Emergency Management. As a State official, Mr. Brown has a key role in the State’s climate change response efforts and has worked to ensure Virginians, including those in the vulnerable and high-risk communities, have access to resources, information, and support.

Mr. Brown has also served as deputy secretary of public safety and homeland security, regional emergency management administrator for the Hampton Roads Planning District Commission, and was also a professional staff member on the U.S. House of Representatives Committee on Homeland Security.

Mr. Brown, welcome back. Thank you so much for being with us.

Finally, but certainly not least, our fourth and final witness is Pamela Williams, the executive director of the BuildStrong Coalition, a group of individuals and organizations with the stated purpose of building a more resilient America. Prior to her time with the coalition, Ms. Williams served as counsel for the U.S. House Transportation and Infrastructure Subcommittee on Economic Development, Public Building, and Emergency Management. Ms. Wil-

liams also has experience working within the Federal Emergency Management Agency as associate chief counsel for legislation and policy and as deputy director of Congressional affairs.

Ms. Williams, welcome back. We are so glad to have you with us.

To all of our witnesses, thank you so much for being here.

Without objection, the witnesses' full statements will be inserted in the record.

I now ask each witness to summarize their statement for 5 minutes, beginning with Mr. Bill Nye.

**STATEMENT OF BILL NYE, SCIENCE EDUCATOR AND CEO, ON
BEHALF OF THE PLANETARY SOCIETY**

Mr. NYE. Chairwoman Demings, Ranking Member Cammack, and distinguished Members of this subcommittee, thank you indeed for the opportunity to testify before you today. It is an honor to share my thoughts on climate change and the threats our Nation faces because of it.

My name is Bill Nye, as you may infer. These days I am a science educator and a television presenter. I may be known to you and your families as The Science Guy. I began my career as a mechanical engineer working at Boeing. My professional license is still in Washington State. I worked on aviation's FEMA acronym, Failure Effects and Modes Analysis. I was paid to solve physics problems and figure out what could go wrong on a 747 airplane. I learned a great many things.

First, a modern jetliner is an amazingly reliable, extraordinarily safe machine largely because it is subject to good regulations.

Second, commercial airplanes only get into trouble when they take off with something that is already broken: A system the crew thought was working isn't working; then several things go wrong at once.

When it comes to climate change, the analogy to things already broken, along with multiple problems developing at the same time, is compelling.

Suppose Russian hackers had attacked the Colonial Pipeline while a hurricane was coming ashore at Gulf Port, Mobile, or Gainesville. Recently, the entire State of Texas, as was mentioned earlier, was shut down because of a snap of cold weather. It was the product of years of insufficient failure effect and modes analysis. It killed almost 200 people. Along with the heartache, the cost is estimated at \$130 billion.

These miserable outcomes could have been avoided for a fraction of what we will all end up paying. The pipeline hack was a mean-spirited thing and a lot of trouble. The mess in Texas was a disaster. But the next time or the next times may be much, much worse.

Back in 1977, as you may have heard, I took a course from Professor Carl Sagan that eventually led to my day job as CEO of The Planetary Society, and Dr. Sagan often spoke of what he called comparative planetology. By comparing Earth's atmosphere with those of Mars and Venus scientists came to understand the importance of carbon dioxide and the greenhouse effect. You may have heard researchers at Exxon understood this too and wrote about

the potential for disasters back in that same 1977, but we have done almost nothing about it.

Greenhouse gases are inducing climate change here on Earth, and it is happening now on larger and larger scales. We are seeing bigger storms, more floods, more droughts, more fires, more loss of shoreline, and more businesses and people displaced as the ocean swells.

Therefore, the sooner we stop adding greenhouse gases to our air, the better off we have a chance of being. If we don't stop, more of these events will happen, more of them will happen at the same time, and that will increase the likelihood of convergent problems.

It was stated earlier in her opening statement, the Ranking Member said we can't control the weather. It turns out we are controlling the weather. Inadvertently, by accident, we are controlling the weather, and we have got to cut it out.

Now, everything on an airplane, from the wheel under the nose to the light on the tip-top of the tail, is there for a reason. Anything extra that you put on an airplane would add weight, which would shorten the range, make the plane less efficient, make it more costly to fly. But even with that in mind, airplanes are required to carry all sorts of emergency equipment, life vests, rafts, exit doors right in the middle that no one ever uses. You want the plane to have everything it needs to fly normally but also everything it needs when things go wrong.

These regulations are good. They keep us safe. So just like extra pieces and parts of an airplane that you don't need, we don't want regulations that we don't need. But when it comes to addressing climate change, regulations are essential. Having healthy neighborhoods where things do not stop working is a way to keep people healthy and working. It is why we have infrastructure, like smoke detectors, fire hydrants, and all of that plumbing so firefighters can keep us and the built environment we rely on safe.

Now this is where you all come in, Members of this subcommittee. We want all of the rules we need to create all of the systems we need to address climate change.

As you may know, I grew up right here in Washington, DC. I rode my Schwinn bicycle to the first few Earth Day events on the National Mall. I locked my bicycle to a flagpole, probably not allowed these days, but back then we emphasized individual actions. Every little bit hurts. That was one of the slogans. But when it comes to climate change, everybody——

Mrs. DEMINGS. Mr. Nye.

Mr. NYE [continuing]. Has these big ideas——

Mrs. DEMINGS. Mr. Nye.

Mr. NYE. Yes.

Mrs. DEMINGS. Can you hear me?

Mr. NYE. Yes. I have 13 seconds?

Mrs. DEMINGS. You are actually out of time. But if there is something more that you would like to say, please do so during the question-and-answer period.

So thank you so much.

Mr. NYE. OK. I apologize for running over. I thought I set a stopwatch dead on. I apologize.

[The prepared statement of Mr. Nye follows:]

PREPARED STATEMENT OF BILL NYE

TUESDAY, 8 JUNE 2021

MORE THAN ONE PROBLEM AT A TIME

Chairwoman Demings, Ranking Member Cammack, and distinguished Members of this subcommittee, thank you for the opportunity to testify before you today. It is an honor to share my thoughts on climate change and the threats our Nation faces because of it.

My name is Bill Nye. These days, I am a science educator and television presenter. I may be known to you and your families as the Science Guy. I began my career as a mechanical engineer working at Boeing. My professional license is still in Washington State. I worked on aviation's F.E.M.A. acronym, Failure Effects and Modes Analysis. I was paid to solve physics problems and figure out what could go wrong on a 747 airplane. I learned a great many things: First, a modern jetliner is an amazingly reliable, extraordinarily safe machine, largely because it is subject to good regulations. Second, commercial airplanes only get into trouble, when they take off with something already broken. A system the crew thought was working isn't working, then several things can go wrong at once.

When it comes to climate change, the analogy to things already broken, along with multiple problems developing at the same time, is compelling. Suppose Russian hackers attacked the Colonial Pipeline, while a hurricane was coming ashore at Gulfport, Mobile, or Gainesville. Recently, the entire State of Texas was shut down, because it got a little chilly. It was the product of years of insufficient Failure Effects and Modes Analysis. It killed almost 200 people. Along with the heartache, the cost is estimated at \$130 billion. These miserable outcomes could have been avoided for a fraction of what we'll all end up paying. The pipeline hack was mean-spirited and a lot of trouble; the mess in Texas was a disaster. But next time—or the next times, may be much, much worse.

Back in 1977, I took a course from Professor Carl Sagan. It eventually led to my current day job as CEO of The Planetary Society. Dr. Sagan often spoke of what he called comparative planetology. By comparing Earth's atmosphere with those of Mars and Venus, we have come to understand the importance of carbon dioxide and the greenhouse effect. Per predictions by researchers at Exxon going back at least to that same 1977, greenhouse gasses are inducing climate change here on Earth, and it is happening now on larger and larger scales: Bigger storms, more floods, more droughts, more fires, more loss of shoreline, and more businesses and people displaced as the ocean swells. Therefore, the sooner we stop adding greenhouses gases to our air, the better off we have a chance of being. If we don't stop, more of these events will happen; more of them will happen at the same time, and that will increase the likelihood of convergent problems. Ask any Martian or Venusian.

Everything on an airplane, from the wheel under the nose to the light on the tip-top of the tail is there for a reason. Anything extra would add weight, which would shorten the range, make the plane less efficient and more costly to fly. Even with that in mind, airplanes are required to carry all sorts of emergency equipment: Life vests, rafts, exit doors right in the middle that no one ever uses. You want the plane to have everything it needs to fly normally, but also everything it needs, when things go wrong.

In the same way, we don't want regulations we don't need. But when it comes to addressing climate change, regulations are essential. It is in everyone's best interest to have rules that require us to stop adding greenhouse gasses to our skies as soon as possible, while providing reliable clean energy, reliable clean water, and reliable internet service to everyone. Having healthy neighborhoods where things do not stop working, is a way to keep people healthy and working. This is where you all come in. We want all the rules we need to create all the systems we need.

I grew up here in Washington, DC. I rode my Schwinn bicycle to the first few Earth Day events on the National Mall. Back then, we emphasized individual actions. Every litter bit hurts, was one of the slogans. But when it comes to climate change, we need big ideas, huge ideas. Recycling water bottles alone will not address climate change or prepare us for disaster.

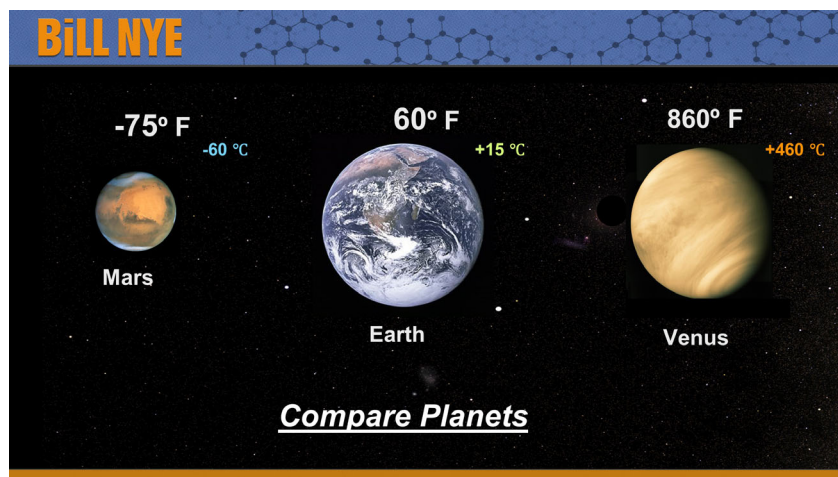
I know what many of us are feeling. Climate change is frightening. The effects and changes are so big and coming so fast that many of us are in denial about the consequences. I've come to believe that climate change contrarians especially are just scared. So am I. You've probably read recent reports concerning decreasing birth rates world-wide. Ask around. Women and men everywhere are thinking twice about bringing kids into a world that's on fire. It's time to take action now. Let's build utility systems that work all the time. Let's invest in robust electrical grids,

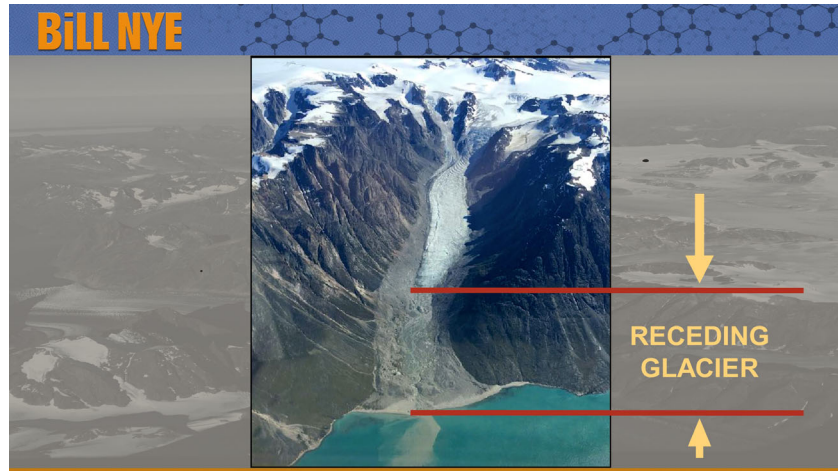
excellent water supplies, and cyber-secure control schemes for all of our infrastructure, especially the internet. Let's stop pumping and dumping greenhouse gasses into the air we all share. We can do this.

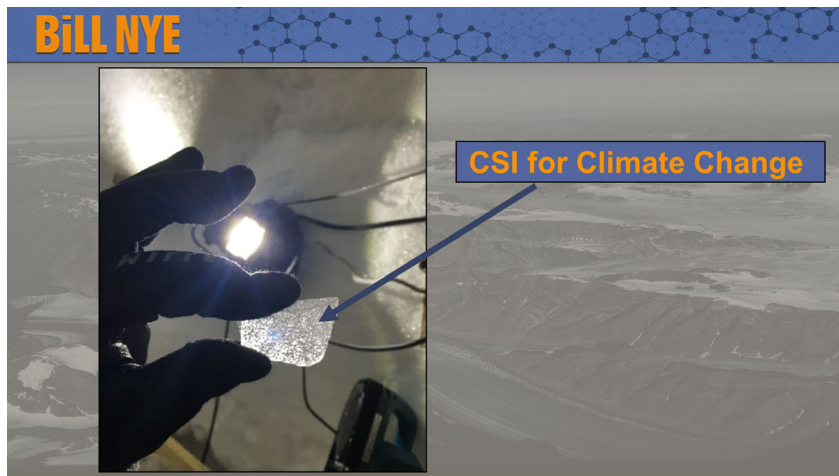
In conclusion, I thank Chairwoman Demings, Ranking Member Cammack, and the Members of the subcommittee for allowing me to speak before you today. I appreciate the leadership this subcommittee has demonstrated on this important issue.

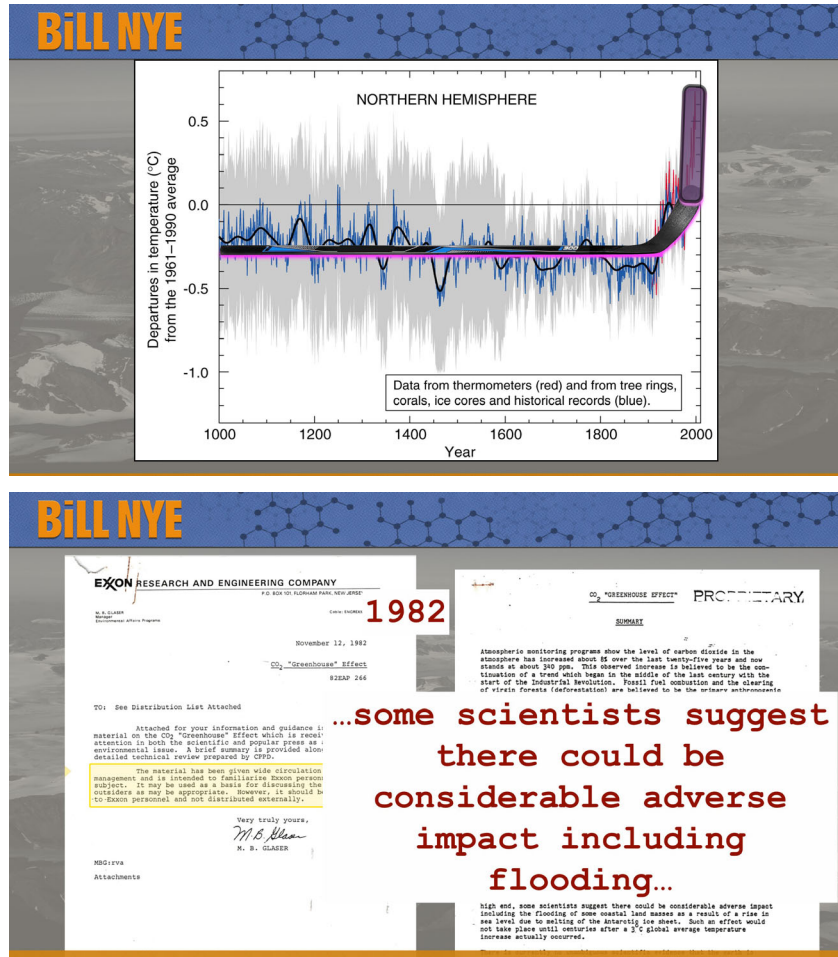
I look forward to your questions.

ATTACHMENT









Mrs. DEMINGS. It is OK. But thank you so much for your opening comments.

At this time, I now recognize Ms. Alice Hill to summarize her statement for 5 minutes.

STATEMENT OF ALICE C. HILL, DAVID M. RUBENSTEIN SENIOR FELLOW FOR ENERGY AND ENVIRONMENT, ON BEHALF OF THE COUNCIL ON FOREIGN RELATIONS

Ms. HILL. Thank you so much, Chairwoman Demings and Ranking Member Cammack and Members of the subcommittee, for inviting me to testify today.

As we have heard, climate change impacts are no longer a matter for the distant future. Last year, in the midst of a global pandemic, our country suffered 22 separate extreme weather events influenced by climate, each costing over a billion dollars, and that has been going on for quite a long time, seeing the United States pummeled by worsening disasters from climate change.

America is simply not doing enough to prepare for the heightened threats posed by a changing climate. The Nation, in short, suffers from a large resilience gap. That gap needs to be closed to safeguard homeland security. Development of a National resilience strategy is essential, as you have noted, Chairwoman. Without a comprehensive approach, individual agency efforts could lead gaping holes in the Nation's resilience to climate threats.

The Department of Homeland Security can and should play a central role in the effort to build a National resilience plan. Core to resilience is improved risk communication. The United States lacks comprehensive risk mapping that is sufficiently downscaled to inform Americans regarding the risks they face now, much less those they face in the near future. That means that we have many families and businesses who today rent and buy facilities that are destined to burn and flood.

The Federal Government should compile risk information in a way that is easy to understand, interactive, has a visual format that permits people to determine what is ahead, what does it mean for me, what does it mean for my family, what does it mean for my company, and what does it mean for the United States. Without that, it is difficult for us to make the kinds of risk reduction choices that we need to make. As Representative Cammack stated, we need to prepare ahead. A National resilience plan would help us do that, and it would provide incentives to improve decision making about where and how we build.

As you know, land use and building code choices rest almost entirely in the hands of State and local governments in the United States. Currently those officials encounter a moral hazard when they make choices about where buildings should occur and how it should occur since they know that the Federal Government may well end up footing most or all of the disaster costs after disaster strikes. This moral hazard has led to risky development occurring in many places across the Nation.

We also need stronger building codes. As you have heard, according to the National Institute of Building Sciences, for every \$1 we spent in disaster resistant building codes, we can avert \$11 in damages. But despite this astonishingly high cost-benefit, 65 percent of cities and towns across this Nation have failed to adopt modern disaster resistant codes. The Nation needs to accelerate the development and adoption of modern building codes that account for future climate risks.

To protect homeland security, the Nation also must work to ensure that critical infrastructure continues to perform under new extremes. We saw this in Texas. Since it has been mentioned, we will see this in California this summer when wildfires streak across that State, and we will see it as hurricanes that are predicted to occur this season hit the United States.

When the infrastructure fails, particularly the electric sector, it cascades, the damage cascades through all sectors, public health, transportation, communication, and we need to have resilient infrastructure that can take what we know will come with climate change.

Climate change will also drive increased migration. We know that changing conditions can affect transnational crime, including

terrorism. During extreme events, organized crime and extremists have been known to take advantage of a failed Government response to expand their territory and increase recruitment.

We will also see increased pressure at our borders, as we are currently seeing with Central America immigrants. Immigrants that are seeking survival will move in the face of devastating climate events, either droughts or hurricanes, as we saw 2 back-to-back hurricanes this year in Central America. We need frameworks to get ahead and do this better, plan for where people will move.

DHS should also continue to close the environmental justice gap—

Mrs. DEMINGS. Ms. Hill.

Ms. HILL. Yes.

Mrs. DEMINGS. I am sorry, your time has expired.

Ms. HILL. All right. Thank you.

Mrs. DEMINGS. Thank you so much for your testimony.

Ms. HILL. Thank you.

[The prepared statement of Ms. Hill follows:]

PREPARED STATEMENT OF ALICE C. HILL

Thank you Chairman Demings, Ranking Member Cammack, and Members of the subcommittee for inviting me to testify before you today about climate change as a threat to the homeland. My remarks will focus on how the Department of Homeland Security (DHS) could better address the homeland threats posed by climate change to our country.

INTRODUCTION

Climate change impacts—bigger wildfires, heavier precipitation causing “rain bombs,” deeper droughts, greater temperature extremes, and sea-level rise—are no longer a matter for the distant future. They are already wreaking extensive damage to all 50 States and 6 territories. Last year, in the midst of the coronavirus pandemic, the country suffered 22 separate weather events each costing over \$1 billion, according to the National Oceanic and Atmospheric Administration (NOAA). Americans in 2020 witnessed so many named storms in the Atlantic basin that meteorologists had to resort to the Greek alphabet for names; wildfires scorched over 10 million acres in the American west, spawning a new vocabulary word—“gigafire”—to describe a fire that burns more than a million acres; and probably the highest-ever recorded temperature on earth—130 degrees Fahrenheit—registered in the aptly named Death Valley in California. Experts anticipate that this year will offer little respite.

The 2021 hurricane season will likely bring above-average storm activity and firefighters across the American west are already bracing for a severe wildfire season. The property research firm, CoreLogic, has estimated that more than 31 million homes on the Gulf and Atlantic coasts, with a combined value of \$8.5 trillion, face risk of damage from hurricane winds, and nearly 8 million homes are vulnerable to flooding from storm surge during the Atlantic hurricane season. The firm opined that as “climate change continues to reshape the way storms behave, the risk . . . will continue to increase.”¹ Close to 90 percent of the American west is currently in drought, with over half of the area in extreme to exceptional drought. According to the U.S. Drought Monitor, this is the most intense and expansive drought this century. Snowpack fell to new record lows in some areas. Not surprisingly, wildfire researchers have forecasted a “grim” 2021 wildfire season.²

These and other climate-worsened extremes do not only bring significant economic damage. They also cost lives, undermine public health, and threaten National security. Climate-fueled impacts cause cascading failures of infrastructure. As the Nation witnessed during Superstorm Sandy in 2012, the failure of the electric grid can

¹“The 2021 Hurricane Report,” CoreLogic, June 1, 2021, https://www.corelogic.com/insights/storm-surge-report.aspx?WT.mc_id=crlg_210527_MTXQB.

²Nicole Karlis, “Wildfire researchers have a ‘grim’ forecast for 2021’s fire season, say it could be worse than 2020,” Salon, April 14, 2021, <https://www.salon.com/2021/04/14/wildfire-researchers-have-a-grim-forecast-for-2021s-fire-season-say-it-could-be-worse-than-2020/>.

pull down critical systems like transportation, communication, and wastewater treatment systems. Without sustained power, hospitals evacuated over 6,000 patients down darkened stairwells. Researchers have identified climate change as the cause of \$8 billion of the estimated \$70 billion in damages caused by the storm.³ According to the National Institute of Building Sciences (NIBS) 2020 report, disaster losses across the country are growing about 6 percent a year, costing an average of \$100 billion.⁴

America is not doing enough to prepare for the heightened threats posed by climate change. NIBS estimates that America's resilience investment gap exceeds \$520 billion. The Center for Climate Integrity and Resilient Analytics calculates that \$400 billion is needed for coastal protection in 22 States.⁵ To safeguard homeland security, the United States needs to better prepare itself for the new, harmful extremes that accompany rising temperatures. It needs to get smarter about risk reduction and resilience to future climate-worsened disasters. The Department of Homeland Security can and should play a central role in that effort.

DHS WORK ON CLIMATE CHANGE PREPAREDNESS DURING THE OBAMA ADMINISTRATION

In 2009, President Obama issued an Executive Order requiring Federal agencies to develop adaptation plans.⁶ As senior counselor to DHS Secretary Janet Napolitano, I was responsible for developing DHS's first-ever adaptation plan. To embark on this important effort, I assembled a task force from across DHS's almost 2 dozen agencies tasking them with answering a basic question, "Should the Department of Homeland Security in 2009, with all of its other responsibilities, care about the impacts of climate change?"

During a multi-month effort, the task force met with dozens of scientists, planners, and security experts, including those from the Department of Defense, NOAA, and NASA. As our work progressed, task force members realized that climate change would have profound effects on virtually all the systems humans have come to rely upon, both natural and human-built. As we learned about the projected hurricanes, wildfires, and droughts that could pummel America in the near future, causing catastrophic, permanent harm, the task force had its answer: DHS should care deeply about climate change.

To satisfy President Obama's order, DHS published the DHS Climate Change Adaptation Roadmap in 2012.⁷ The Roadmap states that climate change "must be accounted for in Departmental policy, strategy, plans, business processes, programs, institutional practices, and operations in order to best position the Department for success over the long term . . . Understanding how major strategic drivers such as climate change may evolve is at the crux of effectively and decisively managing risks to the Nation's security." It warned that climate change could directly and indirectly impact core homeland security missions and identified 4 strategic objectives:

1. Manage climate risks for cross-cutting or other key homeland security issues.
2. Protect and ensure the resilience of critical infrastructure and key resources to potential impacts of climate change.
3. Ensure the Nation's resilience to more frequent or extreme weather events and natural disasters.
4. Contribute to safety, stability, security, and environmental protection in the Arctic.

In 2013, President Obama issued additional guidance regarding climate change, prompting DHS to create its Climate Action Plan.⁸ The Plan again warned that climate change would impact DHS's missions. For example, with regard to preventing terrorism, the Plan foretold that more extreme weather could provide opportunities for militant groups to extend influence when foreign governments lacked the ability

³Andrea Thompson, "Climate Change Added \$8 Billion to Hurricane Sandy's Damage," *Scientific American*, May 18, 2021, <https://www.scientificamerican.com/article/climate-change-added-8-billion-to-hurricane-sandys-damage1/>.

⁴Multi-Hazard Mitigation Council, *A Roadmap to Resilience Incentivization*, ed. K. A. Porter and J.Q. Yuan (Washington, DC: National Institute of Building Sciences, 2020), https://www.nibs.org/files/pdfs/NIBS_MMC_RoadmapResilience_082020.pdf.

⁵"Study: U.S. Coastal Communities Face More Than \$400 Billion in Seawall Costs by 2040," Institute for Governance & Sustainable Development, June 20, 2019, <https://www.igsd.org/study-u-s-coastal-communities-face-more-than-400-billion-in-seawall-costs-by-2040/>.

⁶E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed on October 5, 2009.

⁷*Climate Change Adaptation Roadmap* (Washington, DC: U.S. Department of Homeland Security, 2012), https://www.dhs.gov/sites/default/files/publications/Appendix%20A%20DHS%20FY2012%20Climate%20Change%20Adaptation%20Plan_0.pdf.

⁸*DHS Climate Action Plan* (Washington, DC: U.S. Department of Homeland Security, 2013), <https://www.dhs.gov/sites/default/files/publications/DHS%20Climate%20Action%20Plan.pdf>.

to provide aid. The Plan predicted increased pressures on our borders from climate-induced migration, including migrants from Central America. It apprised that climate change could curtail DHS's ability to safeguard lawful trade and travel as well as impede the Department's efforts to stop smuggling and trafficking. It also recognized that higher temperatures and more intense storms could damage and disrupt "telecommunications and power systems, creating challenges for telecommunications infrastructure, emergency communications, and cybersecurity." The Plan forecast that climate change could challenge continuity of operations, delivery of emergency services, and response capabilities.

Under the Trump administration, the Department slowed its climate-related activities to a trickle at best. It omitted the words "climate change" from its core documents, including FEMA's 2018–2022 Strategic Plan and the 2019 National Preparedness Report.⁹ Unfortunately, the change in policy did not mean that climate change impacts lessened. The lull in planning activities has come at a cost. DHS will need to act with alacrity to fulfill its mission of protecting the Nation from the harmful effects of rising temperatures.

In the close to a decade since DHS first embarked on adaptation planning, many of the events that the Department predicted have come to pass. Time after time, the Department and the Nation have struggled to handle climate-fueled extremes, be it a record-breaking hurricane season in the Atlantic, wildfires in the west, temperature extremes in the south, or melting permafrost in the Arctic. As the climate changes, bringing new, unprecedented weather and sea-level rise, DHS has an important role to play in ensuring that not only that it can fulfill its missions effectively under the new conditions, but also that it can assist its partners in State, local, and Tribal governments, as well as the private sector, to prepare and respond.

Both the Roadmap and the Plan created under the Obama administration should serve as guiding documents for DHS's continued planning. Since many of the recommendations have still not been implemented, these strategic documents provide solid ground for DHS to recommence its climate preparedness efforts.

DHS AS PART OF THE NATIONAL EFFORT TO PREPARE FOR CLIMATE CHANGE

DHS has an essential part to perform when it comes to climate change. Perhaps of all the Federal agencies, it has the deepest reach and most consistent contact with State, local, and Tribal governments, other Federal agencies, as well as the private sector. It operates in every State and territory and is frequently asked to help people after disasters have driven them from their homes and caused physical harm. Its responsibilities for protecting our borders, coastal areas and inland waterways, critical infrastructure, and emergency response make it a very big cog in the wheel of climate preparedness. But, as the Government Accountability Office (GAO) has repeatedly stressed, the Federal Government will need "a cohesive, strategic approach with strong leadership and the authority to manage risks across the entire range of related Federal activities."¹⁰ The GAO has correctly noted that a Government-wide strategy would allow for a more comprehensive approach, including the ability to prioritize investments that address the country's highest climate risks.

The failure to develop a National adaptation plan has made the United States an outlier among developed nations. The Netherlands, one of the most climate-prepared nations in the world, has had a national adaptation plan since 2007. China has had a national plan since 2013 and Russia since 2019. Canada is in the process of drafting its plan.¹¹ Without such an approach, individual agency efforts risk falling short of meeting the mark to effectively reduce the Nation's climate risk.

DHS should therefore work with the White House and other agencies to develop the Nation's first climate adaptation plan. In the absence of a National strategy, DHS efforts may include gaping holes that leave the Nation even more vulnerable to climate change, for example, by failing to prioritize investments to help people relocate to safer areas.

Even in the absence of a National adaptation plan, however, there is much that the Department can do to improve its climate risk reduction efforts. These include improving risk communication, prioritizing risk reduction, planning for climate-driv-

⁹ Alice Hill, "What will it take for FEMA to take climate change seriously?" *the Hill*, August 21, 2020, <https://thehill.com/opinion/energy-environment/513012-what-will-it-take-for-fema-to-take-climate-change-seriously>.

¹⁰ J. Alfredo Gómez, "Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks," Government Accountability Office, <https://www.gao.gov/highrisk/limiting-federal-governments-fiscal-exposure-better-managing-climate-change-risks>.

¹¹ Chris Field and Alice Hill, "Climate adaptation: The gaping hole in American environmental policy," *the Hill*, April 15, 2021, <https://thehill.com/opinion/energy-environment/548527-climate-adaptation-the-gaping-hole-in-american-environmental>.

en displacement and migration, improving emergency response for concurrent and consecutive disasters, closing the environmental justice gap, and preparing for changes in the Arctic.

IMPROVE RISK COMMUNICATION

DHS already creates the Nation's flood maps, but if a homeowner, a business owner, or a Government planner wants to identify future climate risks that could affect them in significant ways, there is no single place offered by the Federal Government to obtain that information. The United States lacks comprehensive risk-mapping that is sufficiently down-scaled to inform Americans regarding future climate risk. Without such information, developers and city planners continue to oversee new development in areas that are at great risk of future damage from climate impacts. Families rent and buy homes destined to burn. The Federal Government should compile risk information in an easy to understand, interactive, visual format that allows people to determine projected risks for their homes and/or places of business. DHS, in conjunction with the science agencies, should undertake responsibility for that work. Better, more easily available risk information could drive more-informed decision making across the Nation. That information could then inform outreach and planning efforts by the Department.

In addition to providing improved, downscaled risk information, DHS should deploy its capabilities to assist the Federal Government writ large as well as State, local, and Tribal governments, in addition to the private sector, to plan for climate risk. Three areas hold particular promise.

- *Development of common climate risk scenarios.*—The Federal Government has yet to establish a set of climate scenarios with which it conducts planning. DHS should, in conjunction with the Federal science agencies, develop climate change scenarios for use across the Government and in planning with State, local, and Tribal governments, and the private sector. Use of common scenarios will help increase awareness and understanding of the risks and the range of possible mitigation solutions.
- *Development of planning exercises.*—DHS should develop planning exercises, including table-top exercises, based on the scenarios to help the Federal Government, communities, and regions understand and plan for their climate risks. To the extent possible, these exercises should include advanced model projections that reflect downscaled impacts. At the conclusion of each exercise, DHS should help coordinate outreach with other Federal agencies to assist participants in accessing Federal programs to close identified gaps. During the Obama administration, FEMA's exercise division developed a pilot project offering exercises based on scenarios to several communities to assist their planning efforts. Norfolk, Virginia, credits the pilot offered in that region with contributing to its robust climate planning efforts.
- *Conduct Federal Government-wide exercises.*—DHS should offer Federal Government-wide exercises on climate change based on the scenarios. These exercises would serve as an educational tool, base-line setting mechanism, avenue for identifying gaps, and opportunity to build relationships across agencies. DHS should collaborate with other Federal agencies to identify programs that would proactively address any vulnerabilities identified in the exercise.

PRIORITIZE RISK REDUCTION

The Federal Government currently funds large portions of disaster recovery. Many decisions that affect the amount of damage disasters cause, namely land use and building practices, rest almost entirely in the hands of State and local governments. This means that local decision makers can choose to build and develop in risky ways knowing that the Federal Government will likely foot the recovery bill. DHS should explore ways to improve State and local land use and building choices with a focus on reducing risks. In other words, it should develop policies to decrease the moral hazard created by Federal disaster practices.

Promote Stronger Building Codes

Research from the National Institute of Building Science has determined that every \$1 spent complying with disaster-resistant building codes can avert \$11 in damages.¹² FEMA estimates that adding features to protect against natural disasters adds little to the cost of construction—an average of 1 to 2 percent of the total

¹²“National Institute of Building Sciences Issues Interim Report on the Value of Mitigation,” National Institute of Building Sciences, January 8, 2019, <https://www.nibs.org/news/national-institute-building-sciences-issues-interim-report-value-mitigation>.

cost of building.¹³ Despite the risk-reduction benefits of stronger building codes, 65 percent of cities and towns have failed to adopt modern disaster-resistant codes. Moreover, even if these jurisdictions have adopted the most recent model codes, those codes may not reflect the future risk of climate change.

DHS should work with the model building code organizations to inform development of model building codes that account for future climate risk. While the model code organizations work to develop new codes, the Department should work, in collaboration with the National Institute of Standards and Technology (NIST), to develop Federal risk management standards for damaging climate risks, including wildfire and heat, for any construction that uses Federal taxpayer funding. The Department's prior role in developing the Federal Flood Risk Management Standard should inform this process. Creation and adoption of such standards for climate-worsened hazards could lead to substantial savings for the Federal Government in averted damage and lives saved.

Focus on Critical Infrastructure

Climate change impacts can cause cascading failures of infrastructure that lead to physical and financial harm. As the February cold spell in Texas, rolling blackouts in California, and extended outages in the wake of storms show, once power is lost, other critical infrastructure systems also tend to fail—from transportation to communications to public health. Failures of interconnected infrastructure can quickly turn cataclysmic. These events can prove particularly damaging given the poor state of the Nation's infrastructure, which according to the American Society of Civil Engineer's 2021 report card only deserves a C–.¹⁴

Through its National Risk Management Center (NRMCC), DHS should amplify efforts to assist vital infrastructure owners and operators in understanding their climate risk and what they can do to reduce that risk. Modelling of critical failure points for interconnected infrastructure could inform climate scenarios and exercises offered by DHS. DHS should also expand its Regional Resiliency Assessment Program to include a strong focus on climate threats. The Department should recruit and train Protective Security Advisors to provide expert climate risk advice and support State, local, and private-sector owners and operators of critical infrastructure with preparing for escalating threats.

Improve Cost-Benefit Analysis

DHS should work with the Office of Management and Budget to adjust the cost-benefit analysis of projects. Existing cost-benefit analysis may not accurately account for the benefits of resilience measures that will protect against climate impacts in the future nor may it consider that some communities lack the economic wherewithal to meet traditional cost-benefit analysis.¹⁵ Adjusting the cost-benefit analysis would lower the hurdle for investments in added resilience.

Address Land-Use Choices

One of the hardest issues facing the Nation with regard to climate impacts is that as a result of rising temperatures some land may become uninhabitable. To the extent the Department's programs provide support for new development in at-risk areas, it may be inadvertently exposing people and property to greater harm. DHS should determine how it can improve local land-use decisions through incentives or withdrawal of Federal investment. For example, the Department should consider whether it should condition grant funding on more ambitious efforts to reduce development in areas vulnerable to climate impacts.

PLAN FOR CLIMATE-DRIVEN DISPLACEMENT AND MIGRATION

Increased migration, both within the United States and globally, will affect homeland security. According to a report from the Internal Displacement Monitoring Centre, the number of new people forced to move within their own countries by climate disasters—like storms and floods—rose to the highest in at least a decade in 2020, even in the midst of a pandemic. Extreme weather events caused over 30 million people, equal to 75 percent of those uprooted within their borders, to migrate domes-

¹³*Protecting Communities and Saving Money: The Case for Adopting Building Codes* (Washington, DC: FEMA, 2020), https://www.fema.gov/sites/default/files/2020-11/fema_building_codes-save_brochure.pdf.

¹⁴"2021 Report Card for America's Infrastructure," American Society of Civil Engineers, March 3, 2021, <https://infrastructurereportcard.org/>.

¹⁵David Espinoza, Jeremy Morris, and Alice Hill, "Time is not Money, Risk is! A step toward a sustainable and equitable financial analysis practice," *The Solutions Journal*, December 1, 2020, <https://www.thesolutionsjournal.com/2020/12/01/time-is-not-money-risk-is-a-step-towards-a-sustainable-and-equitable-financial-analysis-practice/>.

tically.¹⁶ Displacements can occur as a result of slow-moving events like droughts that desiccate crops or acute events like floods and wildfires. Every year, Americans are also displaced from their homes by climate-worsened events like the flooding that resulted from extreme precipitation in Houston in 2017 or the wildfires in California that same year. DHS needs to prepare for those that will migrate to our borders as well as for those displaced inside our borders.

The crush of Central American migrants at our Southern Border has provided a vivid illustration of the challenge that migration poses. When I served as senior counselor to the Secretary at DHS, I oversaw the first surge of migrant children from Central America's Northern Triangle, the countries of Guatemala, Honduras, and El Salvador. In 2009, DHS apprehended approximately 20,000 children at our Southern Border. More than 80 percent were Mexican. But over the next 2 years, the number of children encountered at the border grew dramatically, and the number of children from the Northern Triangle surpassed the number from Mexico. Sixteen thousand child migrants from the Northern Triangle were apprehended in 2011, 25,000 in 2012, 38,000 in 2013, and 70,000 in 2014. In 2019, 85 percent of the nearly 70,000 children at the border came from the Northern Triangle. The influx has strained the Federal Government beyond capacity. The number of unattended children arriving at the southern U.S. border surged to a record high this spring amid the on-going immigration crisis. In March 2021, Homeland Security Secretary Alejandro Mayorkas announced that the United States was "on pace to encounter more individuals on the Southwest Border than we have in the last 20 years," and in April, the number of detentions at the border reached the highest level in over 2 decades. The DHS Office of Inspector General (OIG) recently concluded that, in light of past large influxes of migrants, if the Department "does not develop a DHS-wide framework for surges and address day-to-day fragmentation, [it] will face the same challenges in future surges."¹⁷

The reasons these children travel to the United States are many, but among them are climate change. Northern Triangle countries are highly vulnerable to climate-worsened events, including greater temperature extremes, altered rain patterns, droughts, and bigger storms. The region depends on agriculture and in particular, coffee cultivation, which is susceptible to damage from drought, heavy rainfall, and higher temperatures. In 2020, 2 back-to-back Category 4 hurricanes further battered the region, leaving many people homeless and robbing them of their livelihoods.

DHS should, as identified in its Obama-era climate adaptation plans, "Coordinate a Departmental review of the effects of climate change on mass migration." That review should examine how climate affects migration and displacement. In addition, DHS should address the OIG recommendations aimed at ending DHS's fragmented approach to migration and improving planning.

To fulfill its mission, DHS also needs to understand how changing conditions could affect transnational crime, including terrorism. During extreme events, organized crime and extremists have been known to take advantage of a failed government response to expand their territory and increase recruitment. The pandemic has shown us how this can work. Drug cartels in Mexico provided essential supplies to populations struggling with the spread of the coronavirus, making daily home deliveries to disadvantaged areas. The head of the Cartel of the South was quoted saying, "If we protect [local populations], they'll protect us as well."¹⁸

DHS should also focus on developing frameworks to assist local, State, and Tribal governments cope with internally displaced Americans. The Government Accountability Office (GAO) conducted a review of Federal efforts that provide support to communities displaced by climate change and concluded that little support exists.¹⁹ This means that when displacements occur, they risk becoming chaotic. That is what occurred in the wake of the 2018 Camp Fire that killed over 80 people and obliterated almost 14,000 residences. As a result of the fire, 16,000 people moved virtually overnight to nearby locations. The city of Chico, which had a population

¹⁶ Vicente Anzellan et al., *Global Report on Internal Displacement* (Geneva: Internal Displacement Monitoring Centre, 2020) <https://www.internal-displacement.org/global-report/grid-2020/>.

¹⁷ Office of Inspector General, *DHS' Fragmented Approach to Immigration Enforcement and Poor Planning Resulted in Extended Migrant Detention During the 2019 Surge* (Washington, DC: U.S. Department of Homeland Security, 2021), <https://www.oig.dhs.gov/sites/default/files/assets/2021-03/OIG-21-29-Mar21.pdf>.

¹⁸ Falko Ernst, "Mexican criminal groups see Covid-19 crisis as opportunity to gain more power," the Guardian, April 20, 2020, <https://www.theguardian.com/world/2020/apr/20/mexico-criminal-groups-covid-19-crisis-opportunity-gain-power>.

¹⁹ J. Alfredo Gómez et al., *A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure* (Washington, DC: Government Accountability Office, 2020), <https://www.gao.gov/assets/gao-20-488.pdf>.

of 110,000, added 19,000 people, straining the city's ability to absorb the influx. To help local communities avoid negative repercussions like increased real estate prices, over-crowded schools, and unplanned urbanization, DHS, in coordination with other agencies, should assist the Nation by identifying areas for future relocation and help those receiving communities to prepare. DHS should develop modeling capabilities to help communities understand where displacements may occur and assist interested communities to determine how they can plan better.

IMPROVE EMERGENCY PREPAREDNESS FOR CONCURRENT AND CONSECUTIVE DISASTERS

DHS should plan for and acquire the capabilities to respond with ever-greater frequency to disasters worsened by climate change. With climate change, disasters may occur in multiple locations concurrently or close-in-time. DHS needs to make sure that it has the capabilities to respond. That means ensuring it has adequate personnel and resources to effectively manage consecutive and successive extremes. DHS should evaluate its emergency capabilities in light of increased disaster frequency with particular attention to surge capacity, the ability to respond to multiple locations simultaneously, and the delivery of mental health services in the immediate wake of a disaster. It should improve its modelling of complex events to inform its staffing, response, and resource needs. It should also conduct research on the efficacy of early warning systems and promote Nation-wide best practices to drive the Nation to an easy-to-understand uniform system. Variations in warning systems can lead to unnecessary confusion and cause people to fail to heed messages to take shelter.

CLOSE THE ENVIRONMENTAL JUSTICE GAP

DHS should continue to close the environmental justice gap, including bolstering efforts to evaluate the benefits of investments in light of their impacts on people rather than solely economic return. It should expand work to consider and address the disproportionate impact of climate-fueled disasters on disadvantaged communities, people with disabilities, older people, and children.

The Department should review disaster aid programs with the goal of removing barriers to access for low-income and disadvantaged communities. The application requirements of FEMA's competitive grant programs can impose barriers to some communities who lack the planning resources, staff, and expertise to navigate the process. FEMA records reveal that the new Building Resilient Infrastructure and Communities (BRIC) program has failed to attract applications from many poor communities with fewer than 3,000 residents even though the program will cover 90 percent of the project costs for those communities.²⁰ For some communities, the BRIC cost share of 10 percent may prove too high a hurdle.

PREPARE FOR CHANGES IN THE ARCTIC

Last, DHS should continue to prepare for changes in the Arctic as eco-tourism, damage to infrastructure from melting permafrost, resource competition, and global security tensions escalate with the opening of the Arctic Ocean for navigation.

CONCLUSION

With its enormous responsibilities, reach across all sectors of society, and deep capabilities, DHS should play a pivotal role in improving the Nation's preparedness for climate risk. The Department, of course, should start by making sure that it can continue to fulfill its missions in the face of changing conditions. But it needs to move quickly beyond looking inward to find ways to lend significant assistance to State, local, and Tribal governments, as well as the private sector, to understand, prepare for, and respond to climate risk. Fortunately, the Obama administration has given the agency a strong head start.

The risks, however, are mounting. There is no time to waste. For DHS to keep the United States safe, it needs to adopt and implement a robust strategy for tackling climate change.

Thank you for the opportunity to speak with you today. I look forward to answering any questions you may have.

Mrs. DEMINGS. At this time, I would like to recognize Mr. Curtis Brown to summarize his statement for 5 minutes.

²⁰Thomas Frank, "FEMA climate grants pose challenge for poor communities," E&E News, June 1, 2021, <https://www.eenews.net/stories/1063733777>.

STATEMENT OF CURTIS BROWN, STATE COORDINATOR AND CO-FOUNDER, VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT, COMMONWEALTH OF VIRGINIA, ON BEHALF OF THE VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT AND INSTITUTE FOR DIVERSITY AND INCLUSION IN EMERGENCY MANAGEMENT

Mr. BROWN. Good afternoon, Chairwoman Demings, Ranking Member Cammack, and Members of the subcommittee. My name is Curtis Brown. I serve as State coordinator of emergency management in the Commonwealth of Virginia. I am also co-founder of the Institute for Diversity and Inclusion in Emergency Management.

I appreciate the opportunity to discuss the rising threat of climate change to the homeland from the perspective of an emergency manager, with a keen focus on the disproportionate impact of disasters on marginalized and frontline communities.

Emergency managers all over the country have witnessed firsthand the consequences of climate change. We are responsible for working with communities to prepare for, mitigate against, respond to, and recover from disasters. The last decade has demonstrated the reality of the challenges we face with climate change. More frequent and devastating disasters that have stretched our limited resources and disproportionately impacted marginalized communities.

In addition to coordinating the response to COVID-19 over the last year, emergency managers and communities were faced with major wildfires out West, a historically busy Atlantic hurricane season, heat waves, and more frequent flooding events across the country. These frequent disasters, both big and small, negatively impact marginalized individuals and communities in numerous ways.

Research and data confirms that people of color, people with disabilities, women, low-income individuals in communities suffer greater disaster losses. This is demonstrated in higher risks of death, injury, physical and mental, economic loss and poverty, abuse, and other lasting impacts.

Systemic and structural racism, environmental injustices, and other inequitable and discriminatory policies and programs are the root cause for creating and enhancing the vulnerability faced by at-risk and marginalized individuals and communities.

The threat of climate change requires bold action from the Federal Government, leadership, resources to support emergency managers and ensure that we prioritize those most at risk. That is why I commend President Biden for recently announcing the dedication of \$1 billion for the Pre-Disaster Mitigation Program, with the bulk portions specifically focused on supporting marginalized communities.

Executive Orders focus on advancing racial equity and supporting underserved communities and tackling climate change through a comprehensive whole-of-Government strategy is the support State and locals need. All levels of Government sectors have responsibilities to respond to the threat of climate change and support at-risk communities.

In Virginia, Governor Northam's administration has taken significant steps to address the challenge of climate change and fur-

ther equity. We have initiated comprehensive adaptation planning efforts, ensured cross-agency and -sector collaboration, and prioritized marginalized communities.

Last year, Virginia was 1 of 5 States to submit over \$200 million in projects for the 2020 BRIC Pre-Disaster Mitigation Grant Program. Forty percent of our grant projects submitted were from local governments with the highest vulnerability in high-risk populations according to an equity analysis we conducted. We look forward to furthering our equitable mitigation efforts here in 2021 with the additional BRIC funding.

I appreciate FEMA Administrator Criswell's leadership in prioritizing diversity and equity inclusion and responding to the climate crisis that will go a long way with furthering FEMA's efforts and also support the entire emergency management enterprise. A recently-released Request for Information from FEMA is intended to solicit input on how to integrate equity from FEMA within FEMA programs and regulations and policies.

These are all welcome steps that will hopefully further disaster equity, but integrating equity in emergency management will not be easy or a quick fix. It requires a long-term sustainable commitment, resources, and a willingness to support innovation to solve complex and deeply-rooted inequities in programs and policies.

Emergency managers need to be trained on how to integrate equity. Disaster equity leaders should be leveraged. We will need to empower marginalized communities and front-line organizations and support and—and add support and support efforts to increase diversity within the emergency management profession.

Simply put, doing things the same way will result in the same inequities we have seen as disasters increase. By taking these courageous steps and others, we will be better prepared to meet one of the greatest challenges of the 21st Century.

Thank you, Chairwoman Demings, and I look forward to offering recommendations and answering questions from the subcommittee.

[The prepared statement of Mr. Brown follows:]

PREPARED STATEMENT OF CURTIS BROWN

TUESDAY, JUNE 8, 2021

Good afternoon Committee Chairman Thompson, Committee Ranking Member Katko, Subcommittee Chairwoman Demings, Subcommittee Ranking Member Cammack, and Members of the subcommittee. My name is Curtis Brown, and I serve in Governor Ralph Northam's administration as State coordinator of emergency management at the Virginia Department of Emergency (VDEM). Additionally, I am the co-founder of the Institute for Diversity and Inclusion in Emergency Management (I-DIEM). I-DIEM's mission is to serve as a resource and an advocate for the value of diversity and inclusion in emergency management (EM). I-DIEM serves as the conduit for research on diversity and inclusion (D&I), social equity, and the practical application of equitable EM practices to improve outcomes and build resilience.

It is a pleasure to provide testimony before the subcommittee. As a former professional staff member working on Chairman Thompson's staff, I understand the critical oversight role of the House Committee on Homeland Security. It was truly one of the highlights of my career to staff this subcommittee and support the Legislative branch's important responsibility of influencing a range of emergency management and homeland security issues to support the American people. The perspective gained in that role has been useful in serving within a State emergency management agency.

The decision to hold today's hearing is an acknowledgment of the serious need to focus attention on the threat of climate change on the homeland, in particular on

our most vulnerable communities. The Biden administration, Congress, Department of Homeland Security, Federal Emergency Management Agency (FEMA), State, local, non-profit, and private-sector partners must all work together to respond to this threat. Thank you for your service and all the efforts of the Congressional staffers who do the hard work in the background.

I appreciate the opportunity to participate in this panel to provide the perspective of an emergency manager and as an advocate for disaster equity. Emergency managers must deal with the consequences of climate change. Across the country, emergency managers are responsible for preparing communities for, mitigating against, responding to, and recovery from disasters. These critical responsibilities help to save lives and reduce the negative short- and long-term impacts on people and communities. The repeated impacts of climate change on the homeland require additional emergency management resources, especially at the State and local levels. This includes, but is not limited to increased numbers of personnel, enhanced capabilities, funding to support mitigation and adaptation, and the prioritization of marginalized communities that are most at risk of climate change impacts.

CLIMATE CHANGE AND GLOBAL WARMING IMPACTS

Climate change is real and its impacts are being experienced annually. As the Intergovernmental Panel on Climate Change states, “Scientific evidence for warming of the climate system is unequivocal.” Additionally, scientific research and data confirms that the cause of warming trends is related to human activity. This scientific data affirms the need for courageous efforts from across the globe to address the climate crisis. It is possibly the most pressing issue for the rest of the 21st Century and the impacts are being experienced now.

Climate change has resulted in more frequent and impactful disasters including droughts, wildfires, hurricanes, and flooding events. The last several years have been non-stop with multiple, and in some cases, simultaneous disasters. The attention over the last year was rightfully focused on the on-going response to the unprecedented deadly impacts of COVID-19. 2020 also represented a historic year for extreme weather events. Wildfires ravaged communities in California, hurricanes battered the Gulf and Southeast, flooding events are becoming more frequent and deadly disaster has continued to rise. According to the Fourth National Climate Assessment, U.S. coastal flooding has doubled in the last few decades.

In Virginia, we have seen a significant increase of events requiring the issuance of State of Emergency Declarations. State and local government public safety officials work closely with impacted communities. For major events, impacting larger regions or multiple States, full engagement of the emergency management enterprise (FEMA, State, local, non-profit, and private) is required. The National Oceanic and Atmospheric Administration (NOAA) reports that the 2020 hurricane season experienced 29 named storms in the Atlantic season breaking the record for the highest number of tropical/subtropical storms in a single year. This year, 2021, is also anticipated to be an above-normal season with a likely range of 13 to 20 named storms, of which 6 to 10 could become hurricanes. The increase in extreme weather and natural disasters has a profound impact that threatens public health and safety, natural resources, and our communities. It also affects the economic well-being of the Commonwealth, including the port, military installations, and critical infrastructure. It is clear the impacts of climate change have stretched already limited resources within State and local emergency management agencies. Last year, 22 extreme weather events resulted in losses of over \$1 billion each.

THE NEED FOR EQUITY: DISPROPORTIONATE IMPACTS ON MARGINALIZED COMMUNITIES

Climate change impacts are being experienced across the country, but are disproportionately felt by marginalized communities. Numerous natural disasters have indiscriminately impacted large swaths of the United States over the last decade. Communities of color and other underserved or underrepresented populations are disproportionately impacted by extreme weather and other emergencies due to inadequate infrastructure, limited financial resources, and poor environmental conditions. The factors contributing to increased vulnerabilities within communities of color during disasters have been caused by decades of institutional racism, divestment, environmental injustices, and other discriminatory policies that contribute to widening inequities.

Marginalized communities suffer greater loss of life, physical injuries, economic loss, and mental health after disasters. Disaster planning efforts fail to fully consider our most vulnerable populations such as communities of color, women, low-income individuals, people with access and functional needs, and other underserved individuals. A review of past and present inequities helps explain the myriad issues

underlying these negative outcomes. Historical and existing exclusionary and discriminatory practices increase the risks and impacts of disasters on specific individuals and communities which heightens vulnerability. Disasters act as “shocks” to communities, amplifying and exacerbating the existing inequities experienced by those lacking resources.

Several studies have highlighted inequities in disaster impacts related to heat waves, hurricanes, flooding, and other extreme weather events. The disaster inequities are not solely due to weather itself but the systems, policies, and programs are also inequitable. FEMA, other Federal agencies, and policy makers need to intentionally and dramatically change policies and programs to prioritize those most vulnerable and ensure equity is a primary performance measure. By doing so, we can begin to equitably support communities that are on the front line of climate change threat. The Fourth National Climate Assessment echoed the need to prioritize marginalized communities and promote equitable mitigation and adaptation practices.

“Prioritizing adaptation actions for populations that face higher risks from climate change, including low-income and marginalized communities, may prove more equitable and lead, for instance, to improved infrastructure in their communities and increased focus on efforts to promote community resilience that can improve their capacity to prepare for, respond to, and recover from disasters.” (Fourth National Climate Assessment, Volume II Impacts, Risks, and Adaptation in the United States, Page 55).

VIRGINIA EFFORTS TO ADDRESS CLIMATE CHANGE AND INTEGRATING EQUITY

Governor Northam’s administration and the Commonwealth of Virginia have taken significant steps to address the challenge of climate change. Utilizing a “whole-of-Government approach,” Virginia has taken bold actions to support our communities, to ensure a continued thriving economy, and to protect critical infrastructure. Virginia is leading the way in combating this rapidly-evolving threat. The secretary of natural resources advises the Governor on natural resources issues and works to advance top environmental priorities. The Commonwealth also has a special advisor to the Governor for coastal adaptation and protection. This role addresses the effects of sea-level rise and land subsidence along Virginia’s coast, and spans across numerous Commonwealth agencies to ensure a consistent and streamlined effort. Virginia continues to introduce policies focused on slowing climate change and its impacts, mitigation, and adaptation.

An innovative, science-based approach uses cost-effective, nature-based, and equitable strategies to protect our people, communities, infrastructure, and economy. The guidelines and planning of one of the most groundbreaking, comprehensive actions to champion coastal resilience are enshrined in:

- Executive Order 24: Also known as the Master Planning Framework (Framework), the Framework was initiated to lead the Commonwealth in making the coast more resilient to the impacts of climate change and sea-level rise. It details the core principles of Virginia’s approach to coastal adaptation and protection and calls for implementation of Virginia’s first Master Plan by the end of this year 2021.
- Executive Order 71: Establishing the Virginia Coastal Resilience Technical Advisory Committee (TAC) which will create and implement a Coastal Resilience Master Plan. TAC has representatives of State agencies, coastal planning districts and regional commissions, and academic advisors, among others who facilitate the coordination and the development of the Master Plan.
- Executive Directive 13: Integral in the Virginia Coastal Zone Management (CZM) Program’s support of the Coastal Resilience Master Planning Framework, and
- The Virginia Coastal Policy Center (VCPC) at William & Mary Law School assists in support of the Framework, working with State offices and agencies. VCPC also works with scientists, local and State political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. In 2015, Virginia successfully competed and was awarded \$120.5 million from the National Disaster Resilience Competition (NDRC) grant through the U.S. Department of Housing and Urban Development awarded to the Virginia Department of Housing and Community Development in 2017. The grant serves to implement innovative solutions to combat sea-level rise in the Hampton Roads area. \$5.25 million portion of the grant award established the Nation’s first-of-its-kind resilience innovation hub (RISE), a city of Norfolk, VA-based nonprofit incubating resilience-building solutions for coastal communities.

INTEGRATING EQUITY IN EMERGENCY MANAGEMENT

Due to the disproportionate impact on marginalized communities, Virginia is intentionally focused on embedding equity into emergency management by taking full advantage of one of FEMA's resilience funding opportunities through the Hazard Mitigation Assistance (HMA) Grants programs; specifically, the grant program known as Building Resilient Infrastructure and Communities (BRIC). Since 2017, Virginia Department of Emergency Management (VDEM) has made an intentional effort to utilize the HMA funding opportunity to benefit Virginia's most vulnerable communities. Purposefully holistic solutions to flooding issues have led to larger, more comprehensive projects. In 2020, we revised our grant priorities to reduce inequities that were unintentionally embedded within the scoring criteria. Fortunately, the BRIC priorities as announced by FEMA encompassed many of the key priorities on which Virginia had already been focused.

VDEM partnered with the Virginia Health Equity Leadership Task Force to support and empower local governments by performing an equity analysis of localities across the Commonwealth. As part of the Hazard Mitigation Equity Analysis, a vulnerability score for Virginia households was developed and used to identify Virginia's most vulnerable populations across the Commonwealth in the event of an environmental disaster. Population vulnerability was determined by several factors including:

1. Communities of color
2. Elevated health risk
3. Low income
4. No. of people in the household
5. No. of children in the household
6. Lack of English in the primary language
7. Unemployment risk
8. Age (older adults)
9. Mobile homes
10. Lack of vehicle access.

The equity analysis encompassed population vulnerability plus hazard risk (which accounts for households within a flood or hurricane zone) plus past mitigation projects. Upon identifying the top 40 localities with the highest average of household vulnerability in a flood or hurricane zone, VDEM will host 13 subregional hazard mitigation workshops focused on equity throughout the summer. The 13 subregional workshops will provide local governments with an opportunity to share their knowledge on flood risk in vulnerable communities and further explore how the Commonwealth can provide support through technical assistance in scoping relevant projects. Last year, Virginia was 1 of 5 States to submit over \$200 million in projects for the 2020 BRIC Grant Program. Thirteen of the 33 projects submitted by Virginia were from localities with the highest vulnerability according to the equity analysis. The Commonwealth is dedicated to equitably leveraging BRIC and other mitigation funding to support our most at-risk communities.

BIDEN ADMINISTRATION EFFORTS

President Biden's recent announcement of allocating \$1 billion in 2021 BRIC funding for communities, States, and Tribal governments to support pre-disaster mitigation efforts is a great step in the right direction. There are numerous Biden administration priorities and investments to support climate resilience. As I've presented, the threat of climate change to the homeland is significant and stretches the limited capabilities and resources of State and local emergency management agencies. Support from the Federal Government is needed in order to mitigate and adapt to climate change. The Biden administration's commitment and focus on equity are the bold steps needed to face this threat head-on. FEMA Administrator Criswell has prioritized diversity, equity, and inclusion and the agency has released a Request for Information to identify ways to integrate equity. These are welcomed steps that will hopefully further disaster equity. But integrating equity in emergency management will not be a quick fix and requires a long-term, sustainable commitment and willingness to support innovation to solve complex and deeply-rooted inequitable programs. I encourage FEMA to leverage disaster equity leaders, empower marginalized communities and front-line organizations, and support efforts to diversify the emergency management enterprise to mirror the Nation's diverse communities.

CONCLUSION

The threat of climate change presents a great challenge to the Nation. Marginalized communities are most at-risk for disaster impacts and should be empowered and prioritized in all our efforts. Policy makers and emergency officials must be willing to take bold and equitable steps to respond to climate change and make investments in mitigation and adaptation. Doing so will help us better prepare for the years ahead which will continue to test us. For marginalized communities, equitable investments will save lives and improve disaster outcomes by focusing resources where they are needed most. Thank you for this opportunity to discuss these important topics and I look forward to answering the Members' questions.

Mrs. DEMINGS. Thank you so much, Mr. Brown, for your testimony.

At this time, the Chair now recognizes Pamela Williams to summarize your statement for 5 minutes.

**STATEMENT OF PAMELA S. WILLIAMS, EXECUTIVE DIRECTOR,
BUILDSTRONG COALITION**

Ms. WILLIAMS. Thank you, Chairwoman Demings and Ranking Member Cammack and the distinguished Members, of this committee.

It is an honor for me to join you today to discuss cost mitigation and how it intersects with climate adaptation and homeland security, and this conversation must serve as a core component of the National conversation of resilient infrastructure in communities.

The BuildStrong Coalition was actually formed a decade ago and is made up of an extremely diverse group dedicated to building a more resilient Nation. We represent firefighters, emergency responders, emergency managers, insurers, architects, contractors, manufacturers, as well as consumer organizations and code specialists.

Like you, the coalition recognizes that the increase in the frequency and severity of natural catastrophes in this country clearly illustrate the need for investments in the resilience of structures, the ones in which we live and work and then, of course, the critical lifeline infrastructure that support our daily lives.

In 2018, Congress did take several key steps in recognition of the unsustainable impacts of disasters by passing the Disaster Recovery Reform Act, or DRRA. The true game changer, as we discussed, was the creation of an additional set-aside of 6 percent in spending for the purpose of funding greater investments in mitigation before a disaster occurs.

FEMA has taken that authority and last year launched the BRIC program, and certainly we applaud FEMA for their unprecedented efforts in developing and implementing this transformational program. But in its inaugural year, FEMA offered \$500 million through BRIC, but they received almost \$3.6 billion in requested projects.

FEMA Administrator Deanne Criswell has stated that one of her top priorities is to build a new culture of disaster resilience. But we know that the resilience needs in this country far exceed the resources available, and new funding alone is not going to solve a problem of this magnitude.

So the friends and alliances of the BuildStrong Coalition have developed the following policy recommendations that we will share with you.

First, increase the funding for resilience before the next disaster, climate impact, or catastrophic failure. Mitigation saves lives, property, and taxpayer money. Mitigation also saves the environment, and we know it is the smart use of Federal resources and will save taxpayer dollars, anywhere from \$4 to \$11 for every dollar invested. But, again, the resources are woefully inadequate.

Second, we need to create incentives for building stronger and tie existing Federal funding streams to the adoption and enforcement of strong modern building codes. Disaster resilient and sustainable construction and the use of stronger building codes has proven to save lives, reduce damage of natural disasters, and protect the environment. Adopting building codes is the single most effective thing that we can do to save lives and property.

Third, promote the hardening of lifeline infrastructure. Lifeline infrastructure provides indispensable services that enable continuous operations of critical businesses and Government functions and, without the prompt restoration, would risk health, safety, and economic security, key elements to homeland security.

We also need to incentivize investments through tax benefits. We need to make it easier for individuals, businesses, and Government to invest in resiliency. We need to ensure the use of resilient American-made products in the construction and retrofit of our key lifeline infrastructure.

Finally, and maybe most importantly, we need to build capacity. We must ensure that States, locals, Tribal governments, regional entities are given the tools and resources that they need to increase capacity and capability to even identify risks and hazards and mitigate those risks before the next crisis occurs.

For this country to be successful in enhancing our resiliency, we must focus on capacity building at all levels of government and then turn to considerations of sustainability, adaptability, and creative financial instruments that can be leveraged to drive socially responsible investments and resilience.

This is also going to involve simplifying and streamlining programs, and this committee is going to need to focus on effective grants management and oversight so that we can leverage these investments systematically and systemically for National resilience.

As we launch into the 2021 hurricane season, we are very excited to join thought leaders like you to identify opportunities for policy changes. We must invest in these Federal resources so that we ultimately save lives and livelihoods.

Thank you, ma'am.

[The prepared statement of Ms. Williams follows:]

PREPARED STATEMENT OF PAMELA S. WILLIAMS

TUESDAY, JUNE 8, 2021

Chairwoman Demings, Ranking Member Cammack, and distinguished Members of the committee, I would like to thank you for holding this important hearing today regarding the risks and effects of climate change on homeland security, particularly how disasters impact our communities, our homes, and lifeline infrastructure.

I am Pamela Williams, the executive director of the BuildStrong Coalition, and it is an honor for me to join the distinguished panel of witnesses today to discuss how disaster mitigation intersects with climate adaptation and homeland security and must serve as a core component of the National conversation on resilient infrastructure and communities. Investments in mitigation and resilient construction,

particularly before the next major storm, not only drives down disaster costs and losses, but also builds resilience in our citizens, neighborhoods, regions, and across the United States.

BACKGROUND AND INTRODUCTION

My journey began over 20 years ago, aiding the city of Des Moines, Iowa in recovery from the devastating 1993 Midwest floods. During my career, I have served at the Federal, State, and local levels, dealing with disaster policy. I have helped local governments adopt and enforce codes and standards as they attempted to rebuild from catastrophe, guided States toward prioritizing disaster preparedness and mitigation efforts, and worked in the trenches with the Federal Emergency Management Agency (FEMA) addressing the consequences of this country's most catastrophic disasters. I was honored to serve the House Committee on Transportation and Infrastructure for 5 years, particularly as Members developed the legislative response to the unprecedented 2017 disaster season. I have a deep appreciation for the emergency management profession, the challenges in driving responsible disaster policy, and the tremendous, tireless efforts put forth every day by FEMA, all levels of government, and our private-sector partners in trying to get to a better answer on disasters.

Today, it is my privilege to serve as the executive director of the BuildStrong Coalition and to testify before you today on its behalf. The BuildStrong Coalition, formed in 2011 to respond to an increasing number of severe disasters, is made up of a diverse group of members representing firefighters, emergency responders, emergency managers, insurers, engineers, architects, contractors, and manufacturers, as well as consumer organizations, code specialists, and many others committed to building a more disaster-resilient Nation. The BuildStrong Coalition has been a partner with Congress in its work to investigate causes of, and devise the solutions to, the rising cost of disasters in the United States. We have been honored to help identify opportunities for policy changes that promote mitigation and the smart investment of Federal resources to address our country's increasing number of severe and costly weather events, including informing several provisions of the landmark Disaster Recovery Reform Act of 2018.

In the face of growing climate risk, we must be focused on what legislative changes and policy initiatives are needed to appropriately incentivize smart mitigation and resilience activities and practices, while also removing the challenges and obstacles that may stand in the way or hinder the progress of disaster resilience. We implore the committee to use this hearing to shape the resilience conversation across this country—in order to create a Resilient America.

This committee stands poised to increase disaster resilience in the United States and ensure that resilience remains at the forefront of the infrastructure, COVID-19 recovery, and disaster assistance reform conversations. The committee must seize the opportunity to influence the overall National resilience strategy and establish the framework for the next chapter in increasing disaster resilience in the United States. This committee must fill the leadership role in addressing climate impacts by incentivizing and providing resources to facilitate smart, climate-conscious behaviors and mitigation and removing the moral hazards and policy impediments inhibiting decision makers from creating resilient systems and communities.

BuildStrong is excited to join Congressional leaders like you as we identify opportunities for policy changes that promote disaster resilience and the smart investment of Federal resources to address our country's vulnerable homes and communities, aging infrastructure, and the increasing number of severe and costly weather events. Together, we can help save the lives and property of our citizens.

DRRA AND BRIC: TRANSFORMING DISASTER RECOVERY AND MITIGATION

The increase in the frequency and severity of natural catastrophes in the United States clearly illustrates the need for our country to invest in the resilience of the structures in which we live and work and the lifeline infrastructure that supports the essential aspects of our everyday lives. According to Munich Re, hurricanes, wildfires, and other disasters across the United States caused \$95 billion in damage last year, the fourth-highest cost on record.¹ In 2020, North Atlantic hurricane season records were broken with 30 named storms forming, and 12 making landfall. It was the most active wildfire year on record across the west with nearly 10.3 mil-

¹"Record hurricane season and major wildfires—The natural disaster figures for 2020," Munich Re, January 7, 2021. <https://www.munichre.com/en/company/media-relations/media-information-and-corporate-news/media-information/2021/2020-natural-disasters-balance.html>. Accessed June 4, 2021.

lion acres consumed. And according to National Oceanic and Atmospheric Administration (NOAA), in 2020, there were 22 weather and climate disaster events with losses exceeding \$1 billion each across the United States—shattering the previous annual record of 16 events that occurred in 2011 and 2017—which included tropical cyclones, severe storms, drought, wildfire event, and a derecho.²

In 2018, Congress took several key steps in recognition of unsustainable impacts of disasters by passing the bipartisan Disaster Recovery Reform Act of 2018 (DRRA). These changes to disaster law and policy support and incentivize States and localities to adopt enhanced mitigation measures to protect lives and taxpayer dollars, remove some of the moral hazards that increase risk, and transform disaster resilience in this country. This legislation provides FEMA, in particular, more tools to help impacted communities recover smarter and stronger and end the cycle of build, damage, rebuild.

The true game changer in DRRA is the creation of an additional set-aside of 6 percent annual disaster spending for the purpose of funding greater investment in mitigation before a disaster. This change represents a significant increase in reliable funding for grants for State, local, Tribal, and territorial governments and communities that will enable them to better plan and execute cost-effective risk mitigation projects. With the enactment of the DRRA, FEMA was given the opportunity and the challenge to create a new, permanent mechanism to provide substantial funding for cost-effective, risk-reducing pre-disaster mitigation projects.

FEMA took these new and expanded authorities and in 2020 launched the Building Resilient Infrastructure and Communities (BRIC) Grant Program. We applaud FEMA for their unprecedented efforts in developing and implementing this transformational program. FEMA has endeavored to be transparent and to engage stakeholders throughout the process. Thanks to this leadership, BRIC is now a Nationwide, pre-disaster mitigation grant program that will impact both public infrastructure and individual preparedness by increasing residential resilience through structural retrofits and smart building techniques.

In its inaugural year, FEMA offered \$500 million through the BRIC program. In its first year of funding, during a global pandemic when emergency managers were overwhelmed and strapped for resources, FEMA received almost \$3.6 billion in requested projects. While we look forward to the award announcements later this summer, FEMA and the administration have already announced a funding increase to \$1 billion for fiscal year 2021. It will be critical for FEMA to provide the official Notice of Funding Availability as soon as possible to give States and sub-applicants as much lead time and guidance as possible. We will have much to learn from the initial round of BRIC awards, what is working and what is not working, what is discouraging communities from applying, what aspects of the program ignore issues of equality and fairness, and where improvements can be made.

FEMA Administrator Deanne Criswell has stated that one of her top priorities is to build a new culture of disaster resilience. But we know that the infrastructure and residential needs of the Nation far exceed the resources available. And new funding alone cannot solve a problem of this magnitude. Investments must be deployed wisely and in a manner that realizes its full benefit.

RECOMMENDATIONS

The BuildStrong Coalition has developed the following policy recommendations and principles, supported by data and science, that are critical to driving resilience across the homeland.

I. Secure More Resources for Mitigation

Increase the funding for retrofits and investments in resilience before the next disaster, climate impact, or catastrophic failure.

Mitigation saves lives, property, and taxpayer money. Mitigation also saves the environment. But the Federal resources to help build State and local capacity and fund risk-reducing, cost-effective mitigation projects that harden critical lifeline infrastructure and help individuals invest in residential resilience are woefully inadequate. FEMA and other Federal agencies need more tools to help impacted communities recover smarter and stronger and end the cycle of build, damage, rebuild. For example, while doubling the amount of funds available under FEMA's BRIC program represents a historical increase in resources available for pre-disaster mitigation and resilience projects, the fact that FEMA received almost \$3.6 billion in

²Smith, Adam B., "2020 U.S. billion-dollar weather and climate disasters in historical context," National Oceanic and Atmospheric Administration (NOAA), January 8, 2021. <https://www.climate.gov/news-features/blogs/beyond-data/2020-us-billion-dollar-weather-and-climate-disasters-historical>. Accessed June 4, 2021.

project applications illustrates the scope of the need for far greater investment in resilience.

And we know that this is a smart use of Federal resources that will save taxpayer dollars. Federal funding that promotes better land use, modern science applied to home construction, and increased mitigation measures can dramatically reduce the devastation brought by these disasters. Based on the findings of the National Institute of Building Sciences (NIBS):

- Adopting Model Building Codes Saves \$11 per \$1 Invested
- Federal Mitigation Grants Save \$6 per \$1 Invested
- Exceeding Codes Save \$4 per \$1 Invested
- Mitigating Infrastructure Saves \$4 per \$1 Invested

II. Create Resilient Homes and Communities Through Strong Building Codes

Create incentives for building stronger and tie existing Federal funding streams to the adoption and enforcement of strong, modern building codes, in order to better protect homes, families, and communities.

Individuals and communities are kept safe in times of disasters through the strength of their homes and the infrastructure that provides critical resources and services in affected areas. This is particularly prevalent as we learn lessons from COVID-19 and begin to understand how to increase resilience to wildfires. Disaster-resilient and sustainable construction and the use of stronger building codes have been proven to save lives, reduce the damage of natural disasters, and protect the environment. In fact, one of the most cost-effective ways communities can guard against disasters is to adopt and enforce hazard-resistant building codes. Unfortunately, only a handful of States have adopted the most modern building codes, and many lack the resources to adequately implement codes. To help correct this paradigm at the Federal level involves creating incentives that encourage State and local governments to adopt modern building codes, while simultaneously equipping communities with the tools and resources needed to carry out meaningful enforcement regimes.

In November 2020, FEMA completed a landmark building code study which concluded that modern building codes lead to major reductions in property losses from natural disasters. This study showed that over a 20-year period cities and counties with modern building codes would avoid at least \$32 billion in losses from natural disasters, when compared to jurisdictions without modern building codes.³ Adopting building codes is the single most effective thing we can do to save lives and protect property into the future. Further, the additional cost of construction features that allow buildings to survive natural disasters are not expensive and on average are less than 2 percent of total construction costs.⁴

With the return on investment and the level of resilience these investments help communities achieve, Federal programs need to drive the adoption and enforcement of building codes, provide resources to help communities, and make the critical link between program requirements and smart decisions.

III. Resilient Lifeline Infrastructure

Require investments in lifeline infrastructure and those resources should be directed at risk-reducing, cost effective investments to promote the hardening of lifeline infrastructure and disaster-resilient construction and the adoption and implementation of risk-reducing standards.

Disaster-resilient and sustainable construction and infrastructure is important to reduce the damage of natural disasters and protect the environment. Lifeline infrastructure refers to electric power, water and wastewater systems, natural gas and liquid fuel, telecommunication, and transportation. Disruptions in these systems due to disasters threaten lives and impede community recovery. Lifelines provide indispensable services that enable the continuous operation of critical business and Government functions, and without prompt restoration would risk health, safety, and economic security. Focusing on these lifelines allow decision makers to better identify key risks and facilities and more readily target projects that can help protect or restore critical functions during a disaster. By investing in the resilience of these systems, we can reduce, if not eliminate, the impact of disasters, allowing key infrastructure to be restored and reducing the duration and cost of recovery.

Through the application of the highest building codes, standards, and technologies to these systems and ensuring access to resources to invest in mitigation by owners

³“Protecting Communities and Saving Money: The Case for Adopting Building Codes,” Federal Emergency Management Agency, November 2020. https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_brochure.pdf. Accessed June 4, 2021.

⁴NIBS, “Natural Hazard Mitigation Saves: 2019 Report,” 2019.

of infrastructure, we can ensure system-wide increases in resilience in key lifeline infrastructure. This not only involves applying the highest codes and standards, but also leveraging resources to support and incentivize the adoption and enforcement of building codes and professional standards. This includes standards that strengthen and harden infrastructure, including the Nation's electric grid, against all hazards including wind, wildfire, flood, seismic, and ice. Disaster recovery and mitigation projects should also incorporate smart technologies to improve monitoring and distribution for lifeline infrastructure and require the use of resilient materials standards for lifeline infrastructure.

Tremendous strides have been made in disaster resilience policy, with the passage of DRRRA, but there is much more to be done and the progress we have made must be protected. As the leaders in disaster policy, you must remain steadfast and ensure that infrastructure, COVID recovery, and other disaster-related legislation continues to leverage the investment of Federal resources in a smart way to increase resiliency.

IV. Incentivize Investments in Resilience

Incentivize investments in resilience through tax benefits, grant conditions, and easing administrative burdens.

In addition to more resources for mitigation and communities, both public and private entities need incentives to drive their investments in mitigation. Whether by supporting the creation of Federal tax incentives that reward resilient behavior, the development of mitigation tax breaks, or other incentives, individuals and businesses will find it easier to invest in resiliency, including undertaking activities like retrofitting homes, if these resources are available. This would also foster private-sector investment in mitigation through new financing opportunities. Targeted tax incentives and removing tax penalties will encourage resilient construction techniques to withstand damage from strong winds or flooding and prevent losses from wildfires and seismic events. Through these investments, homeowners and communities ultimately save money through tax savings and avoided recovery costs and losses in the next disaster.

The tax code and financial instruments can also be leveraged to drive creative financing and solutions that target underserved populations. By leveraging existing, publicly available data, like FEMA's National Risk Index,⁵ both community leaders and private investors can come together to analyze key risk factors, including social vulnerability, to help prioritize communities and projects for resources and technical assistance.

V. Use Resilient American Products

Ensure the use of resilient, American-made products in the construction and retrofit of lifeline infrastructure.

Now more than ever, we need to support American jobs and American products. An investment in resilience across American communities must include long-term, non-emergency construction projects, including the hardening of lifeline infrastructure, that maximize the use of American-made goods, products, and materials. These efforts create jobs and fuel the economic engines in our communities.

VI. Build Capacity

Ensure that State, local, Tribal, and regional entities are given the tools and resources to increase capacity and capability to identify risks and hazards and mitigate those risks before the crisis occurs.

For this country to be successful in enhancing our resiliency, we must focus on capacity building for State and local governments and turn to considerations of sustainability, adaptability, and creative financial instruments that can be leveraged to drive socially responsible investments in resilience. State, local, and Tribal governments must increase their ability to mitigate against all hazards. Accordingly, they must increase their ability to identify hazards and successfully implement these funds to accomplish selected risk-reducing projects. Every level of government must understand how funding, programs, and resources can be applied and leveraged to make homes, businesses, and communities less vulnerable to severe weather. They need help connecting the dots between resources and brick and mortar programs that can strengthen the build environment for the future. We all have a role to play to help increase engagement and education efforts on mitigation planning, program requirements, and opportunity awareness.

⁵Federal Emergency Management Agency, "National Risk Index for Natural Hazards (NRI)," <https://www.fema.gov/floodmaps/products-tools/national-risk-index>. Accessed June 4, 2021.

Building capacity also involves simplifying and streamlining Federal programs to make the resources more accessible and equitable to the communities most at risk. As resources are increased and spent, FEMA, the Department of Homeland Security (DHS), and this committee, will need to focus on effective grants management and oversight, including oversight by the DHS inspector general, and how to leverage them to invest systemically and systematically in national resilience, even across agencies.

Further, regulatory controls must be loosened to facilitate and encourage public-private partnerships. Governments must work with the private sector to increase community and National resilience. The private sector owns the vast majority of the Nation's critical lifeline infrastructure and key—roughly 85 percent.⁶ The private sector is currently conducting high-level work throughout the resilience and mitigation arena and there is tremendous opportunity to utilize expertise and industry knowledge, take advantage of existing programs, identify best practices, and incorporate lessons learned from the private sector. By leveraging the private sector and encouraging and facilitating public-private partnerships, we can maximize available resources for the benefit of the entire country. Community leaders need to be connected with partners that can catalyze financial resources and human capital. Organizations like BuildStrong, the Institute for Business and Home Safety, and the International Code Council, among others, are serving as force multipliers, helping build capacity for investments in resilience.

CONCLUSION

As the 2021 Atlantic Hurricane Season gets under way, we are once again reminded that time is of the essence to ensure that we do everything we can to continue to incentivize and facilitate mitigation throughout this country. And in the face of climate risk, the BuildStrong Coalition will continue to work to create and enact policies, as the Coalition has done for the past decade, that have a real impact on helping individuals, businesses, and communities prepare for, and survive disasters.

Chairwoman Demings and Ranking Member Cammack, thank you for convening this hearing and raising these important issues. I look forward to answering any questions you may have.

Mrs. DEMINGS. Thank you so much, Ms. Williams.

Thank you to all of your witnesses for your testimony.

I will remind the subcommittee that we will each have 5 minutes to question the panel.

I will now recognize myself for questions.

While the impacts of the climate crisis will vary depending on the specific U.S. region, in my home State of Florida, policy makers must grapple with the challenge of a longer and more intensified hurricane season. Additionally, as I am sure you all know, sea level rise continues to impact our coastal communities, contributing to flooding and erosion hazards, salt water intrusion, and changes to coastal ecosystems.

Mr. Nye, please comment on the climate challenges in States like Florida and elaborate, if you will, on the impacts you expect the climate crisis to have on other regions of the United States.

Mr. NYE. Thank you very much.

So, in Florida, we have a problem where water is coming over the shore. As everybody—as the ocean gets warmer, it gets bigger. This is what causes sea level rise. The water is coming over the shore at places like Cape Canaveral, for example, and then water is also coming up through the limestone. So there is an irony, when you talk about diversity and equity, where people wanted to live near the shore in Miami Beach and Miami, 2 closely-related but separate cities, but then, as sea level rise comes over the top and

⁶ Government Accountability Office, *The Department of Homeland Security's (DHS) Critical Infrastructure Protection Cost-Benefit Report*, June 26, 2009.

up through the limestone, people want to live on higher ground. So the areas that used to be for lower—favored by lower-income people are now being gentrified, and this is evidence of climate change, and it is difficult to get insurance in some places where you park your car because salt water gets in the wheel wells. So this is only going to get worse. We have got to stop putting greenhouse gases in the air, and we have got to come up with new ways to provide electricity that is renewable and reliable to everybody.

The co-Chair—the Ranking Member made reference to you never know what broadband you are going to get. Well, let's make it so that the broadband is always good for everybody. When neighborhoods are healthy for working, then people work more and stay healthier. But we need big changes, everybody.

I just reflect all the time on my parents who were both in World War II. My father was a prisoner of war for almost 4 years. My mother was one of the code girls working to decrypt German submarine radio traffic. Everybody in the country was involved in solving this global problem. Everybody was on it. So——

Mrs. DEMINGS. Mr. Nye, you know what I loved so much about what you just said, though, everybody cared about it. This was not a Republican issue, a Democratic issue. Everybody in the country cared about this issue, and I think it is so critical to us getting to where we need to.

I want to go quickly to Mr. Brown. You know, you talked about your perspective as an emergency manager. You are there on the ground. What are some of the on-the-ground emergency preparedness and response improvements you have seen at the local level since President Biden took office?

Mr. BROWN. You know, I think the conversation around climate change and the realness of the threat and the need to prepare has increased, and I think there is a greater focus on the mitigation and the pre-disaster mitigation.

The additional funding, we have leaned forward and started to plan and work with our less-resourced communities to support them in developing their grant projects. We anticipate that grant being released later this year. There are limited resource communities, both urban and rural, that we have to provide some additional resources to. They have a part-time emergency manager or one-person shop. These are very vulnerable communities that we need to support.

So, as these grant dollars are released, I hope that we can really talk about building capacity amongst emergency managers across the country. We should not have any part-time or one-shop emergency management offices. These are full-time responsibilities related to preparedness, mitigation, response, and recovery.

By broadening the field and the capacity also in emergency management, we can also build a diverse work force that we need so we have people from the community who understand the community needs and are able to respond more effectively.

Mrs. DEMINGS. Mr. Brown, thank you so much.

I am going to at this time recognize the Ranking Member, Mrs. Cammack, for her questions.

Mrs. CAMMACK. Thank you, Chairwoman Demings, and thank you again to all of our witnesses here today and to our colleagues who have joined us.

So this question is for all of our witnesses. Like so many of the challenges that we face, borders and countries all share similar challenges. So I am going to pose this question to you all, starting with Mr. Brown.

According to a recent media report, China now accounts for 27 percent of total global greenhouse gas emissions, which is now more than all other developed countries combined. Now, to me, this just seems like one more reason to add to the list of why China poses an increasing threat to our homeland security. I am concerned when it comes to climate change, climate change issues, that Beijing will benefit the most if we hamper American innovation via new regulations and efforts to stifle innovation.

So to what extent do you see China's climate impacts as a concern to the United States' homeland security?

Mr. BROWN. Thank you, Ranking Member.

I think that this is a global challenge that requires every country, every State and local government to rise up to the challenge and become energy efficient. We have started to pursue looking at changing our fleet to promote energy efficiency. That is occurring across the State government as well, and so every policy change to promote energy efficiency and, as Mr. Nye mentioned, change the human impacts related to greenhouse gases would be appreciated and help to minimize the threat of climate change.

Again, emergency managers are consequent managers. We deal with the impacts of climate change and—

Mrs. CAMMACK. Mr. Brown, I hate to reclaim my time here, but I asked specifically about China. I understand the States' perspective.

With that, I am going to have to turn on over to Mr. Bill Nye.

Mr. Nye, could you comment on China's climate impacts as a concern to United States homeland security?

Mr. NYE. Well, as we say, everything every single one of us does affects everyone in the world because we all share the air. So, as people in China try to reach the level of service that we have in transportation and energy use here in the States and the Western World, they are going to use more and more energy, and what we want is for China and places in the developing world everywhere to skip the greenhouse-gas-intensive step and go to more energy-efficient, more renewably-produced energy systems and retrogrades everywhere.

So this—you know, as a guy, I was born in the States. I am from the United States. I want the United States to be the world leader in this. Look around you. Almost everything that you are touching and using right now is manufactured in another country. This is the up and on the downsize of globalization. But as those other countries go into more manufacturing-intensive economies, they are going to produce more greenhouse gases.

So what we want to do is lead. Yes, I understand your—very much understand your concern about competition from China, and so on. But this idea that if you give something to somebody, it means you have taken it from somebody else, this zero-sum idea,

is not going to work in the long run because we all have only one atmosphere. So let's be leaders.

I will advocate again for wind, solar, geothermal energy, heat storage, and I would like us to take some risks and invest in fusion technologies. This could, as I like to say, change the world.

Mrs. CAMMACK. Now, Mr. Nye, before—and thank you for your comments. Before I jump to Ms. Williams, just quick yes or no—

Mrs. DEMINGS. The gentlewoman's time—I am sorry. Please, you have 47 seconds.

Mrs. CAMMACK. I was going to say don't short me, don't short me, Chairwoman Demings.

Mr. Nye, do you consider China to be a developing country?

Mr. NYE. No. It is in between. It is—it is not easy to categorize it as one thing or the other. When you go there, there are extraordinary cities with cranes on every block and then the rural areas where people don't have clean water—

Mrs. CAMMACK. I need to turn it over to Ms. Williams for the remaining 20 seconds that I have got. Thank you.

Ms. Williams, same question to you with regard to China's climate impacts as it relates to homeland security.

Ms. WILLIAMS. Well, I think we have very much established that increasing risks that are driving climate impacts and disaster impacts are a tremendous threat to our homeland, and we need to look at this globally. I think Mr. Nye and Mr. Brown highlighted the fact that this is a global conversation that the United States has an opportunity to lead, but we don't even talk about climate adaptation using the same language that other countries use. Adaptation, mitigation have different means here and there, and we need to make sure that we are leading by example but that we are also engaged in the conversation using the same terms, a same common understanding of what we are trying to accomplish so that we can tackle those that are the greatest offenders at driving these risks and impacts.

Mrs. CAMMACK. Thank you.

Mrs. DEMINGS. The Chair thanks Ms. Williams for her response and thanks the Ranking Member for her line of questions.

At this time, the Chair will also recognize other Members for questions they may wish to ask the witnesses. In accordance with the guidelines laid out by the Chairman and Ranking Member, I will recognize Members in order of seniority, alternating between Majority and Minority. Members are also reminded to unmute themselves when recognized for questioning.

The Chair now recognizes for 5 minutes the gentlewoman from Texas, Ms. Sheila Jackson Lee.

Ms. JACKSON LEE. Thank you so much, Madam Chair, and thank you to both of you, the Ranking Member and as well the Chair, for this particular very important hearing.

If I am reminded, the reason why this is extremely important is because we are aware that, despite the pressing need to address the risks proposed by climate change, the Trump administration disregarding these challenges increased the likelihood that Americans would experience these risks unfortunately.

Very grateful that we are beginning to turn the corner with the Biden administration and the American Jobs Plan and the admin-

istration's budget proposal, which has aggressively looked to rectify President Trump's failures and directly address the challenges that are so very important.

I want to pose a question to Mr. Nye, and I thank you for recounting the history that suggests, in the work of your parents, that when there is a crisis, we all pull together. Let me put on the record, of course, what I experienced in 2017 and what I recently experienced as the beginning of 2021.

2017, 21 trillion gallons of rainfall fell on Texas, Louisiana. Most of it was in the Houston Metroplex. I watched constituents of mine, a family of 6, wash away not in an ocean, not in a river, but in a bayou that flowed over into the main streets. Harris County covers 1,778 square miles, and 41,500 square miles of land mass were impacted by Hurricane Harvey. That I might say was a catastrophic climate crisis.

Then, again, in 2021, unbeknownst to us came a—when I say “unbeknownst,” unexpected—unbeknownst came a freeze here in Texas with a grid that did not work which saw about a hundred people die.

So, if I might, Mr. Nye, taking those 2 catastrophic incidences, quite different, one coming in the summer months unexpectedly, still trying to overcome, one coming in what is supposed to be winter, but we in Houston don't really know it that way, but life was lost, could you explain the scientific relationship between greenhouse gases and larger-scale climate events such as what I have just represented to you and for America to understand that the loss of life can continue to grow and grow under these natural—or maybe I should say unnatural disasters that have come about through the harshness of climate change and the inattentiveness that we have had over the decades?

Mr. Nye.

Mr. NYE. Thank you very much.

So the problem fundamentally, as the world gets warmer, the ocean gets warmer. The ocean then drives these storms. So it is—as the water vapor goes up in the sky and condenses back to liquid and rains, the circulation is driven harder and harder, and so climate models—and the word “model” refers to computer programs—will try to predict the fluid mechanics, the way the air and water move around, the storms are getting bigger, and they are moving more slowly so they are dropping more water in places like Houston.

Then the other subtle problem, or once was a subtle problem, is the jet stream; the circulation in the Northern Hemisphere gets pushed up and down as the world's climate becomes less stable as these storms move around. That caused this cold snap in Texas.

Then, you know, I used to work in the oil field, and I have a sense of the prideful nature of Texans. I understand you have your own electrical grid, but it wasn't well-enough secured against the weather.

Ms. JACKSON LEE. Absolutely.

Mr. NYE. So straightforward things were not done for years through, what my understanding, through free market ideas that this stuff would take care of itself, that any electrical grid—any electrical supplier would, of course, would, of course, invest in the

necessary things to make sure things were safe. But apparently that is not what happened, and it was a catastrophe. This is what I talk all the time; we need all the regulations we need but no more, but we do need regulations.

Ms. JACKSON LEE. Can I quickly go to Mr. Brown for just a second? Thank you very much, Mr. Nye.

When these disasters occur—you are the State coordinator of Emergency Management Services. I imagine you deal with a lot of first responders, police, EMS, firefighters. Can you explain how, when these disasters occur, you put real human beings in the line of danger as they have to rescue persons, provide the first line of defense for saving people? Could you just give us that information?

Mrs. DEMINGS. The gentlewoman's time has expired, but the witness may answer the question. Thank you.

Ms. JACKSON LEE. Thank you. I apologize, I cannot see the clock, but I thank you for your courtesy. Thank you so much.

Mr. Brown.

Mr. BROWN. Thanks, Congresswoman. Thanks, Chairwoman.

Yes, we help to coordinate all the first responders who put their lives on the line. When it comes to search and rescue, swift water rescue for the flooding events, they are right there to support our communities. Again, the capacity has been stretched using the grants that have been provided from the Federal Government. More is needed because of the higher frequency of these disasters, and they are occurring back to back, even overlapping. As I mentioned, as we responded to COVID-19, we are still responding to all of these other events as well.

Ms. JACKSON LEE. Thank you so very much.

I yield.

Mrs. DEMINGS. Thank you. The gentlewoman's time has expired.

The Chair now recognizes the gentlewoman from Iowa, Ms. Miller-Meeks, for 5 minutes.

I believe you are on mute.

There—no, OK. Yes, one more time.

You are—I think you are—there we go.

Mrs. MILLER-MEEKS. OK. Thank you so much, Chair Demings and Ranking Member Cammack and all of our panelists.

With the rise in extreme weather events, it is worth noting that, according to FEMA, roughly 40 percent of small businesses hit by natural disasters never reopen, and I have certainly seen this within our State of Iowa.

Further, 90 percent of smaller companies fail within a year unless they can resume operations within 5 days. This is obviously devastating to the livelihoods of so many of my constituents, many of whom are small business owners and are facing severe catastrophic threats all year around, from flooding, to tornadoes, and to the derecho that we had last year. We know that increased pre-disaster mitigation activities and strong modern construction standards are the best line of defense in the face of catastrophes and will ultimately save taxpayer dollars while protecting lives.

On that note, Ms. Williams, can you talk about the importance of Congress working to create incentives that encourage business owners, homeowners, and communities to build more resiliently?

Ms. WILLIAMS. Thank you, ma'am.

I think the first question that these companies and businesses need to answer is, what are the risks that I face? The lack of knowledge of risk across this country is tremendous, not—you can't attack a risk that you aren't aware of. So I think that that is the first line of defense, is helping coming together as a community to identify risks and hazards as a system, not as an individual structure or an individual piece of infrastructure, but systemically, and that is how we build community resilience.

Insurance is a key aspect of this. Individuals and businesses are not aware of the lack of coverage that they are facing in the wake of a disaster, and the Federal Government is not going to provide the resources to make them whole. So we spend a tremendous amount of time trying to educate people on how to cover their risks in a very meaningful way. But as you noted, the most important thing that people can do is identify that risk, draw down that risk through investments in pre-disaster mitigation, and we will change the trajectory of the risk profile across this country.

Mrs. MILLER-MEEKS. Thank you.

As I stated, as one who represents a Midwestern State that runs along the Mississippi River, my district does not border the Missouri, but I also have the Missouri, we had flooding there, and then we had the derecho this past year, I have a deep understanding of the massive loss caused by flooding and other natural disasters.

Because of this, I also know of the endless cycle of destruction where homes are built over and over again in the same subpar standards that often help lead to their destruction and have put communities, lives, and taxpayer dollars at risk.

Ms. Williams, again, can you talk about the power of strong construction in the face of catastrophes, how you in the insurance industry help to mitigate that risk and identify that risk, and any examples you have, based on research performed by the Insurance Institute for Business and Home Safety, which you mentioned in your testimony, where the use of more modern building standards are proven to help homes withstand extreme climate events? What policies can we be working to create in Congress that will better shield communities like mine in Iowa from severe disasters?

Ms. WILLIAMS. Thank you again. We have some very exciting things happening across this country as States are leading the way in helping individual homeowners invest in strengthening their homes. I know Mr. Brown probably has some comments on this too, as he has been keenly focused on underserved communities and how we can help strengthen their homes.

If COVID taught us anything, it is the importance of housing as infrastructure. So our friends at IBHS have done a tremendous job, not only identifying those retrofits of the existing housing stock that need investments for roof tiedowns, for cripple wall stabilization, and for wildfire mitigation techniques that can significantly impact the risk posed to a homeowner.

We are working with States across the country to help put resources in the hands of homeowners to draw down their risk and invest in their homes.

So I think Congress helping certainly remove, as Ms. Hill said, the moral hazard of not doing the right thing and not investing in

your homes, I think, is one of the most important things that Congressional leaders can do.

As I mentioned in my testimony, tax incentives can also play a tremendous role for those that have the resources to be able to invest, to just get them over the hump to do the right thing before a disaster and not when we are worried about recovering from catastrophe.

Mrs. MILLER-MEEKS. Thank you. Then I just wanted to make a mention to Mr. Nye—or Dr. Nye. Thank you so much. We found during the pandemic that there are regulations we no longer need. So, as important as regulation is—and safety—it is also important to realize when regulation is not needed, and I appreciate your comments on fusion and nuclear power as also an upcoming power source, so thank you.

Mrs. DEMINGS. Thank you so much. The gentlewoman's time has expired.

The Chair now recognizes the gentleman from New Jersey, Mr. Payne, for 5 minutes.

Mr. PAYNE. Well, thank you, Madam Chairwoman. That was quick. I didn't even get a chance to recognize myself, but it is a real honor and privilege to be here once again, and thank you for this timely, timely hearing that we are having today.

Mr. Brown, as we continue to combat the effects of climate change, I would like to know how historically disadvantaged people, and specifically people of color, could benefit from the new green technology, additional infrastructure spending, and private-sector innovation.

What are the steps that the Federal Government can take to deliver equitable relief to disadvantaged communities as we respond to climate crisis and extreme weather events?

Mr. BROWN. Thank you, Congressman.

I really think we need to be intentional in terms of getting resources to the communities that we know are on the front line of these disaster impacts.

We have a lot of great innovative tools, we have data, we have Census information, and we have the lived experiences of the communities in marginalized communities. Now we need to connect the dots and make sure that the resources, the BRIC program priority on marginalized communities actually get to these communities to reduce the impacts of climate change.

We know that these communities are more at risk because of systemic and structural issues from the racism and discrimination from the past, such as redlining. There was a good study that was done from some Virginia professors that looked at the heat impacts within housing projects because of redlining.

We need to be able to promote natural mitigation efforts and directly target those communities, and that is what we have done here in Virginia, prioritizing the communities that need the resources the most.

Mr. PAYNE. Thank you. You know, it is clear we have seen that situation before. So we can remember the faces of Katrina and what most of those folks looked like that were stuck in that terrible situation.

Let's see. Mr. Nye and Ms. Hill, vulnerable communities that were severely impacted by coronavirus remain vulnerable to other types of hazards such as those brought on by climate crisis. Please share a few ways in which the Federal Government can help poor and disadvantaged communities minimize those risks.

Ms. Hill and then Mr. Nye.

Ms. HILL. Thank you. The Federal Government has a critical role to play in assisting disadvantaged communities. One of the key ways is let's look at first the emergency response. We need to have better early warning systems in the United States.

We could have 2 adjoining communities that have a very confusing system, and that would affect the ability of people to seek shelter in advance of event.

We also know that, unfortunately, many Americans don't have ready cash to evacuate easily, quickly from their communities. This was front and center with Katrina. We need to make sure that we build plans so that Americans can seek shelter immediately and have ready cash—perhaps just send them cash immediately—so they are out of their homes and headed toward safety.

We also need to look at the cost-benefit analysis of how we build infrastructure. Our infrastructure tends to favor wealthier communities than it does those who may be in most need and for whom it is most meaningful to have protective infrastructure. So that is changing the cost-benefit analysis.

Finally, the last—

Mr. PAYNE. Thank you.

Ms. HILL. Oh, thank you.

Mr. PAYNE. Mr. Nye.

Mr. NYE. Well, I understand this idea that you want better evacuation routes, better early warning, and so on, but we need big ideas to protect everybody. For example, in redlined areas, apparently there are fewer—not apparently—there are fewer trees. So, if you want to stay cool in the summer, you actually have to spend more money on air conditioning. It is a subtle thing, but it is a real problem.

What we want to do is to have access to good food, access to good schools, and access to good health care for everybody, and that means providing all 3 of those things, and especially the internet to everybody in every community.

Because when you don't have access to the internet, you are not included in our economy. You are not included in opportunities for jobs or saving money on purchases. So we want that for everybody: Clean water, renewable electricity, access to the internet for everybody. That takes investment.

I will just say again, this idea of being resilient is a fine idea, but just everyone on my side of this, be very cautious of that word because it has been used as a substitute for addressing the problem of putting too much greenhouse gas—too many greenhouse gases in the air.

Mr. PAYNE. Thank you, and I yield back.

Mrs. DEMINGS. The gentleman's time has expired.

The Chair now recognizes the gentleman from New York, Mr. Garbarino, for 5 minutes.

Mr. GARBARINO. Thank you very much, Madam Chairwoman.

My first question is for Ms. Williams. Specifically, the Biden administration recently announced that a billion in funding would be made available in fiscal year 2021 for the Building Resilient Infrastructure and Communities Grant Program.

In response to that announcement, you say that the new resources in BRIC have made it even more imperative we continue to work around the Nation to prepare States and communities as they apply for funds.

Going back to fiscal year 2020, what challenges did communities face when applying for BRIC funds, and how can FEMA ensure that communities are better equipped to apply for funds and grants in the future?

Ms. WILLIAMS. Thank you, sir. Certainly we are continuing to learn lessons from the 2020 iteration of BRIC. Those announced awards probably will not go out until July or August from FEMA.

But as a community, emergency managers and State leaders alike are really taking a look at what were the obstacles that needed to overcome, what communities were not engaged in this conversation.

I am excited to say that every State, save 1, across the country, submitted applications for BRIC. FEMA did take an unprecedented step to try to inform folks of what would be required, the new requirements, standard criteria, under which BRIC would be awarded.

But there was so, so much more we need to do, and that is really where we need to leverage our private-sector partners, our inter-governmental partners, to help build that capacity.

One of the things that I think FEMA can do that will make the greatest impact as we go into 2021 is get out that Notice of Funding Availability. We need to know what we are dealing with, the criteria under which we are applying for these programs so that we can prioritize that.

As Mr. Brown said, we can identify those communities that are falling through the gaps and get them additional technical assistance. Last year, FEMA only targeted 10 communities for special technical assistance, where they actually deployed FEMA personnel to help leverage and increase that capability to apply for BRIC.

We need to see more of that as we target these communities that we really are seeing underserved in these mitigation resources.

Mr. GARBARINO. Thank you. I appreciate it.

Mr. Brown, would you add anything in additional to what FEMA should be doing with this new round of funding, or did Ms. Williams hit everything?

Mr. BROWN. Thank you, Congressman.

I think Ms. Williams hit everything. I go back to that technical assistance part of it. There is a designation for distressed communities that I don't think really comprehensively looks at all of the communities that need support.

So we need to be more expansive in terms of how we provide technical assistance and really guide folks through the whole mitigation grant development process and also the management of it as well.

These communities, again, are strapped and stressed with the consistent impacts of disasters and need a little bit more support.

Mr. GARBARINO. Great. I appreciate that.

My next question is for Mr. Nye. As the Republican co-chair for the Climate Solutions Caucus in Congress, I would love to actually work with all of you and find out some ideas legislatively that you think we could add on and the caucus can get behind.

But, Mr. Nye, your testimony mentions that to thwart climate change, larger actions need to take place, but preparedness and mitigation for extreme weather events begin at the individual, local level.

How should communities prepare for the unpredictability of future weather systems, and what mitigation techniques can best prepare a community so they are not overwhelmed by response and recovery efforts?

Mr. NYE. That is a great question. We have an interstate highway system. You ask people to get on the road, I guess. But what we want to do is not have the storms be so severe to begin with. You know, this idea that—like for example, in the case of a fire, if you have a house that is fire-proof, you still have to leave. You can't be there during the fire, and when you get back, there is nothing left.

So what we want to do is address these problems in a much bigger way at the same time as we address them on local levels. As you all know, all politics is local, but still the Federal Government has an enormous role in making sure that everybody is looked out for.

I think everybody agrees with these broad ideas, but when it is time to get going, that is when we have to, I believe, we have to invest. I really encourage everybody to just stop and take a moment and understand the difference between getting a loan, getting into debt, versus spending money you don't have. They are 2 different big ideas, and I think it is time for the Government to invest in a big way.

Mr. GARBARINO. I appreciate that, and thank you very much. I yield back.

Mrs. DEMINGS. The gentleman yields back.

The Chair now recognizes the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. Thank you ever so much, Madam Chair. I thank the Ranking Member, and, of course, I thank the Chair of the full committee for all of his endeavors in this area.

Mr. Nye made a salient point. He indicated that we must invest, and I completely, totally, and absolutely agree. But I do have a question for each of the witnesses because there is something fundamental that we have to embrace before we can invest, and it is this.

You have to acknowledge that the problem exists. We have a good many people who are opinion-makers and opinion-shapers who will not acknowledge that the problem exists.

If you acknowledge that it exists, then you do something about it. If you decline to acknowledge that it exists, then you have no reason to do anything about a problem that doesn't exist.

So let's start with Ms. Williams—and you will each have approximately 1 minute, and I will let you know when your time is up—tell me, what would you say to my contemporaries, my colleagues,

the opinion-makers and opinion-shapers, who have refused to acknowledge that the problem exists?

What would you say to cause them to conclude that, yes, we have the problem, and, yes, we must invest?

Ms. Williams.

Ms. WILLIAMS. All we need to do is turn to facts and science. We have seen a tremendous uptick in the severity and frequency of these climate impacts and of disaster impacts.

I am excited to say that IBHS has led the way for the insurance industry even issuing a statement on the importance of adaptation, and the science that has supported the movement across the industry and the sector, that we have to do something about it. This—

Mr. GREEN. Ms. Williams, let me intercede for a second and do this for you. I am going to give you a little bit of additional time because of what you said.

What do you say to people who have their own set of facts? They conclude that what you say is not necessarily what the facts reveal. What do you say to them?

Ms. WILLIAMS. I have experience here. I was with your staff and Ms. Jackson Lee's staff even in the wake of Hurricane Ike. Let's just look at over the last 8 years what we have experienced in the increase in just what Texas has experienced.

My experience is wholly different. Science supports that experience that these disasters are being driven by climate change and that they are increasing, and that if we don't do anything about it, we cannot sustain this trajectory.

Mr. GREEN. Let me move on to Mr. Brown. Mr. Brown.

Mr. BROWN. Thank you, Congressman.

Again, as an emergency manager dealing with the consequences of the impacts of climate change, we believe in the science and the data in Virginia. We have seen the consequences of more frequent flooding events, hurricanes. It was our busiest hurricane season as it was last year with the Atlantic hurricane season. Mudslides out in Southwest Virginia and in the mountains.

We have seen the impacts of more and more of these disasters, tornadoes, et cetera. We have had more State of emergency declarations in the last 5 years than we have—

Mr. GREEN. I have to intercede.

Ms. Hill, please.

Ms. HILL. Yes. Well, I draw on my background for this. I was a judge for 13 years on the Los Angeles Superior Court. In that capacity, I heard evidence, guided jury trials, based on scientific evidence. The science is clear here, beyond any standard of proof in any courtroom, and that is why you are seeing courts across the United States accept that climate change is occurring.

The question for all of us, as this panel is very focused on, is, what do we do about it? So, going forward, we need to focus on what the science has told us and the choices that are ahead.

Mr. GREEN. Thank you, Your Highness.

Mr. Nye, please.

Mr. NYE. Well, as you may know, I first was—I fought this for 30 years, trying to get people to accept the science of climate change. I offered 4 bets to 2 notorious climate deniers. I offered

them \$10,000 that 2016 would be the hottest year on record, 2010–2020 would be the hottest decade on record.

Neither one of them would take either of the bets. I had \$40,000 right there. They wouldn't take the bets because I think they are scared. We are all frightened. This thing is overwhelming.

If you don't believe me, look, there have been these studies lately, world-wide, people are having fewer and fewer children. That is because women and men are a little reticent to bring a kid into the world where the world is on fire. So, everybody, we are in this together. We have got to fight this fight together. I am scared too, so let's get to work. Clean water, renewable energy, access to the internet for everybody, and we can change the world.

Mr. GREEN. Mr. Nye, let me just close with this. Clear and convincing evidence does exist, but there are some people who decline to accept clear and convincing evidence, evidence beyond a reasonable doubt.

Thank you, Madam Chair.

Mrs. DEMINGS. Thank you so much. The gentleman's time has expired.

The Chair now recognizes the gentlewoman from New Jersey, Mrs. Watson Coleman, for 5 minutes.

Mrs. WATSON COLEMAN. Thank you, Madam Chair, and thank you to all of our witnesses who presented today. Your information has been very enlightening to me.

I am really interested in exploring this whole issue of modern, disaster-resilient codes in municipalities, and I am wondering, what are the kind of incentives or support that the Federal Government needs to engage in and provide that would help these municipalities update their codes?

Or what is stopping them from doing that? I will start with you, Ms. Williams.

Ms. WILLIAMS. Thank you, ma'am.

As I stated, the single most important thing we can do is get people in modern—not only adopted but enforced building codes, and the Federal Government does have a tremendous role that can be played. Certainly with the passage of DERA, making eligible activities related to the adoption and enforcement of building codes eligible for mitigation assistance was a key step, providing these Federal resources to help communities.

But, again, we are still at the education stage. We need to help communities understand what gains they will accomplish in resiliency by adopting these codes. FEMA, last November, did a tremendous job, did a study that showed that, over the last 20 years, in communities that have adopted building codes, \$32 billion of damages are being avoided. That is huge.

Again, data, science is showing that the proof is in the pudding. The best investments you can make are in the adoption of building codes.

Furthermore, they found that, on average, the increased cost of these resiliency measures in home construction is less than 2 percent. So, again, we have a tremendous opportunity to not only leverage education but resources, particularly at the most underserved communities to help get them to not only building smarter but literally retrofitting the existing housing stock.

Mrs. WATSON COLEMAN. Thank you.

Hey, Mr. Brown, would you like to comment on that, and do you have any idea what we would be talking about, about the additional resources, the amount of resources that we are lacking here?

Mr. BROWN. Thank you, Congresswoman.

You know, I think incentives and support, as Ms. Williams mentioned, the proof is in the pudding, stronger building codes result in better resilience. I am happy to say Virginia has some of the strongest building codes in the country. We have seen the impact and result of that. So, working with local governments, providing additional resources, showing them the data and the information—

Mrs. WATSON COLEMAN. Yes.

Mr. BROWN [continuing]. Will hopefully get them to support enhancing their building codes.

Mrs. WATSON COLEMAN. So we already have resources that are available to municipalities that wish to embrace these additional—and modern and resilient building codes. Some municipalities have not.

Do we need additional resources to help them get there? If so, what do you think we are talking about?

Mr. BROWN. I do know that the BRIC program building code support is allowable expense, and so with that additional \$500 million hopefully that will promote incentives for educating and supporting and enhancing building codes on the local level.

Mrs. WATSON COLEMAN. So thank you.

This is a New Jersey question, and this is just sort-of a general question having to do with, you know, findings of the United Nations Intergovernmental Panel on Climate Change when they released their report stating, in order to avoid temperature rising 1.5 degrees Celsius, et cetera, the world had to take drastic changes to reduce greenhouse gases in 12 years.

That was 3 years ago, and even with the writing on the wall, we still see people who are denying, and we are also seeing incremental steps being taken where we think we need bold action.

In the State of New Jersey, we had a horrific storm with Hurricane Sandy, and not only did we lose significant properties on the coastline, but we even lost interior properties where you found even lower-income individuals.

They are still recovering. We still need resources, and we still need changes. What is the role of the Federal Government in terms of bold versus incremental that will help us get there? Dr. Nye, Ms. Williams, and Ms. Hill, I would like to hear from you quickly on that.

Mr. NYE. Well, if you want to do something bold, let's invest in fusion energy. I am not saying it will work, but let's take a chance.

Then another thing that just is an accident—by that, legislatively—the Jones Act, where you can't erect a wind turbine off the coast of Virginia without taking your ship to Nova Scotia to bring it back down to Hampton Roads, to erect a wind turbine.

This is going to take—look, I am in 2 unions, I understand. I understand what it is to work union. It is going to take negotiation with unions, negotiation with ship builders, it is going to take investment in building those big ships that can erect those things.

Then if we could somehow negotiate with the shipping industry so that we didn't burn this bunker fuel oil. This is the dirtiest petroleum product going, and it is all over the world, and we all rely on these ships.

If we had standards that required ships to have cleaner emissions, and you couldn't dock your ship in the U.S. port unless you had a clean emissions ship that was certified by the clean emissions ship council someplace, you could change the world.

Mrs. WATSON COLEMAN. Yes, thank you, Dr. Nye.

Mr. NYE. There are incremental steps that would have a huge effect.

Mrs. WATSON COLEMAN. I appreciate that. I just read some stuff about that that was very telling.

Ms. Hill, may I have some comments on——

Mrs. DEMINGS. The gentlewoman's time——

Mrs. WATSON COLEMAN. OK.

Mrs. DEMINGS. The gentlewoman's time has expired. We may have time for a second round of questions. So thank you so much.

The Chair now recognizes the gentlewoman from New York, Ms. Clarke, for 5 minutes.

Ms. CLARKE. I thank you, Madam Chair, and I thank our Ranking Member for the very important hearing today. I want to thank our panel of experts for providing us with some insights and certainly your expert opinions and factual-based opinions on what our Nation needs to do to really mitigate the damages and address fully the climate crisis that is before us.

I want to pick up on a theme that my colleague, Congresswoman Bonnie Watson Coleman, just expressed during her comments, and it is the fact that a new 2021 report from the United Nations found the average global temperature is now consistently 1 degree Celsius hotter than it was only about a hundred years ago in the late 1800's, and meteorologists expect the global temperature to continue rising to 1.5 degrees Celsius, or warmer, by the middle of this century unless drastic action is taken to lower global greenhouse gas emissions, full stop.

So, Dr. Nye, can you describe some of the most dangerous global implications of climate change on human population, such as migration, such as drought, such as agricultural capacity, as we move toward that pivotal 1.5 degree Celsius benchmark?

Mr. NYE. [Inaudible.]

Ms. CLARKE. Dr. Nye, I think you may be muted.

Mr. NYE. Excuse me. The effects are potentially quite large, astonishingly large. If we get these 5 storms happening around the world at the same time, which, as some computer models suggest, we would have to invent a Category 6 hurricane. This would be devastating to coastal communities, people live there, especially people of lower income live in lower elevation neighborhoods. As the water pattern, rainfall patterns shift from West to East with the shifting jet stream, there will be more fires out West, and there will be less agriculture there.

If you live in the Eastern Time Zone, as half of the United States and Canada do, a lot of your food comes from that agricultural area. If it is not possible to grow food there and we continue to tap

into the aquifer and drain the water, the ancient water, that we rely on for agriculture right now, we will run out of food.

I have colleagues at the University of Copenhagen who are very concerned about what happens in the heartland of North America because that is where their food is grown.

When we displace coastal populations, people who live on the coast are going to go looking for jobs. Where are they going to go? Where are they going to live when they get there? What is going to happen to all the material that they left behind, the copper pipes and wiring and all that electrical grid equipment? What is going to happen to that?

If you like to worry about things, you are living at a great time. If we accidentally destroy the electrical grid, we do not have the capability right now to build new transformers.

Those of you who live in Texas remember this infamous picture of the sparks going down the wire and the transformers exploding. Well, we will just make new transformers. No. In order to make transformers, you need electricity. But you can't get electricity because you don't have a transformer.

OK. It is the kind of thing that we need to prepare for. These are huge problems, and the sooner we get started and the sooner we accept that we are all in it together, the sooner we are going to get it done.

Ms. CLARKE. Thank you, Dr. Nye.

Ms. Hill, could you please describe how these climate changes will lead to, and in some instances, are already leading to international instability such as the rise in extremism and violence? Because I don't think we are really talking about the global impact that we face.

Ms. HILL. Thank you. This is a very important question. We have seen that these types of extreme events can have dramatic impacts on National security and global security.

Because climate change affects human security, access to fresh water, livelihoods, food, it really cuts at the heart of the stability of people's lives. So we saw in Syria, a migration after the worst drought in 1,200 years, millions of people to other areas in Syria, mostly young men, highly destabilizing for the receiving communities. Then, in addition to many other factors, we saw migration heading toward Europe.

We have seen bad actors, terrorists, organized crime, take advantage of extreme events to recruit and expand their territory. During flooding in Pakistan, the Taliban used the opportunity of the government's ineffective response to the flooding to attempt to recruit new members within their ranks. We see this also occurring with ISIS and other terrorist organizations.

It is a huge vulnerability for the United States. As these impacts cut across the globe, there will be people who are suffering, and in their time of need, they will be highly vulnerable to organized crime and other networks, including extremists who want to increase their influence. So we need to help them at home.

Mrs. DEMINGS. The gentlewoman's time—

Ms. CLARKE. Thank you, and I yield back, Madam Chair.

Mrs. DEMINGS. Thank you so much.

The Chair now recognizes the gentlewoman from California, Ms. Barragán, for 5 minutes.

Ms. BARRAGÁN. Thank you, Chair Demings, for holding this important hearing on the National security threats that climate change poses to the security of our country and our constituents.

Without major action by the United States and countries around the world to reduce emissions, we are at risk of global temperature increases of 3, 4, or even 5 degrees Celsius.

I believe that we need to make clear to the American people that this would mean that we have to take bold action to head off this dangerous future, something that we will start to do with the American Jobs Plan.

We heard, Mr. Nye, you give the analogy that I really loved about climate and our planet and a 747 airliner. That really resonated with me, and I thought it was a great analogy, and I want to take that analogy one step further. You know, if our Earth were the 747, right now we have seen the 1 percent degree Celsius warming.

We are experiencing, with only that 1 percent, significant turbulence from that change in our climate—stronger droughts and wildfires and hurricanes.

So, Mr. Nye, I was going to ask you, what would the state of that 747 be, and our planet and our homeland be, if we were to get to the 3 percent, the 4 percent, or the 5 percent degrees Celsius of warming? I know you spoke a little bit about this. Is there anything else that you want to add?

Mr. NYE. Well, the climate models are accurate. The computer models have proven repeatedly to be robust. I referred earlier to the study that Exxon kept internal in the 1970's, and then in 1982 is the famous document or infamous document.

They were concerned with, the state-of-the-art of the computer modeling at that time was doubling of carbon dioxide in the atmosphere, and they predicted that the poles would be more severely affected or have greater swings in temperature and more ice melting. That has proven to be true.

They talked in doubling the amount of carbon dioxide would take it from, in those days, 340 parts per million to 680. Well, my friends, we are well over in 400 parts per million. We are at 415, world-wide.

As it gets bigger and bigger, the effects are going to get stronger and stronger. Now, you have heard people say this, but trust the science, everybody, it is a real thing. I like to remind everybody who is watching—

Ms. BARRAGÁN. Thank you.

Mr. NYE [continuing]. In the United States, this is available in table 8, clause 8, refers to the progress of science and useful arts. This is in the Constitution. The progress of science is in our economic interest.

So, everybody, the computer models have proven to be true. Let's get to work, reduce greenhouse emissions, and do these other financial and investment things that people have discussed at this meeting.

But, first, as we have all discussed, we have to acknowledge that we have the problem and get to work.

Ms. BARRAGÁN. Thank you so much for that.

Ms. Hill, you spoke about how climate will drive increase in migration. On an international scale, a warming climate is impacting migration patterns. We have to think through humane solutions to accommodate migrants displaced by climate change.

Ms. Hill, there are many factors that contribute to immigration, but climate change isn't discussed enough. Upwards of 20 million people are displaced by weather-related disasters each year. This is happening in our own backyard, driving people from their homes and to our borders.

Could you describe how extreme weather events worsened by climate change are causing displacement and migration that could undermine homeland security?

Ms. HILL. Yes. We are seeing the pressure right now at our Southern Border. We are seeing Central Americans come in unprecedented numbers. When I was at the Department of Homeland Security, I oversaw the first surge of unaccompanied alien children from those countries.

We have examined the factors that are causing that drive in migration. There are many, as you have said, but one of them is new extremes that are affecting agriculture, drought, coffee rust.

Then, as livelihoods are affected, it gives opportunity for criminal gangs to expand their territory. It becomes more dangerous for those, and we see young people on the move, headed north, in search of a better life.

We do not have the legal framework internationally to accommodate what we call—are commonly referred to as climate refugees. Under our international law, there is no such thing as a climate refugee.

So, as you so importantly point out, we need to come up with a better system to address flows of migration that will be driven by climate change. We are already seeing unprecedented people on the move, just this year in terms of even in the midst of a pandemic.

Three-quarters of—approximately 40 million people on the move were driven by climate extremes, droughts, floods, and other acute events that caused people to leave their homes. We need a plan, and we don't have one yet.

Ms. BARRAGÁN. Thank you.

Mrs. DEMINGS. The gentlewoman's time has expired. Thank you so much. I want to thank our panel for their expertise and their patience. As you can see, this is such a critical topic, and this is so timely.

We do have time for another round. If you, Members, would like to ask additional questions, please turn on your cameras, and at this time, the Chair now recognizes the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. Thank you, Madam Chair. I am grateful for the second round, and I have a continuation of the first, but with just a different twist. I was hoping that we would have a second round to be quite candid with you. Here is the twist.

Let us assume that we have the legislation to do the big bold things that you would have us do, dear friends, and let us assume that to do these big bold things, we have to do them without the consent of everyone.

Let's just assume that we have people who have similar ideas willing to move forward together, and these persons who are willing to move forward together happen to be of the same party.

Here is a question for you. I ask this because everybody wants bipartisan support for what we do, and as do I, by the way. I welcome bipartisan support.

But if we get to the big things, the things that you talked about, and we want to accomplish these big things and we don't have the bipartisan support, do we move forward and do the big things? Or do we wait until we can get the support that everybody wants?

Mr. Nye, what say you?

Mr. NYE. Well, you got to work the problem from both ends. I will say—

Mr. GREEN. Mr. Nye. If I may intercede, Mr. Nye. Let's take the world that I live in and deal with it, if you don't mind. The world that I live in, dear brother, dear friend, Mr. Nye, whom I have great respect for—I hold you in the highest of esteem—but the world that I live in, is one wherein we have some who believe one thing and some who believe another. They are guided by their beliefs to the extent that they are directed with their votes.

So now my question is, what do I do, if I can go forward and do these big things, but I can't do them in a bipartisan way? What do I do?

Mr. NYE. Well, if you are asking me, you go for it. The problem, I think, everybody should be aware of—

Mr. GREEN. Well, but I appreciate that. Your answer is that we should go for it. OK. I appreciate that.

Ms. Hill, what do you say we do?

Mr. NYE. Hang on.

Mr. GREEN. I am going to come back to you—

Mr. NYE. That is an attention-getting opening line, sir.

Mr. GREEN. I understand that. I am going to have to go off. I will come back to you.

Ms. Hill, what do we do?

Ms. HILL. I think that we should lay as much foundation as we can for the time when we will have bipartisan support for this—

Mr. GREEN. So your answer is, until we get bipartisan support, we shouldn't go forward.

Ms. HILL. No. We should be laying the ground work—

Mr. GREEN. Let's assume we have laid the foundation, and we don't have the bipartisan support. This is the world that I live in, and we don't have the support. What do we do?

Ms. HILL. I think there is much we can do without bipartisan support and, of course, in partnership with the administration.

Mr. GREEN. So you would say go forward?

Ms. HILL. I think there are Executive actions that can be taken—yes, we need to move forward in every area—

Mr. GREEN. Move forward? All right. Thank you, Ms. Hill. I greatly appreciate it. I am so sorry about the time.

Mr. Brown, what do we do, in the world that I live in?

Mr. BROWN. Congressman, I think bold action is needed. These are life-or-death and urgent issues, and that is why I mentioned appreciating the Executive action that the administration has taken to provide more resources and—

Mr. GREEN. So is your answer go forward?

Mr. BROWN. Bold action is needed, sir, to move forward.

Mr. GREEN. So does that mean move forward, Mr. Brown? Unfortunately, I have been trained to ask questions to the extent that I get an answer.

Mr. BROWN. It means move forward, sir.

Mr. GREEN. All right.

Ms. Williams—and Professor Nye, believe me, I am coming back to you, Mr. Nye—Ms. Williams, what do you say?

Ms. WILLIAMS. Absolutely move forward. We laid foundation 20 years ago of things that we are accomplishing today that at one time was not bipartisan. You must move forward. It is imperative for us to be transformational and to act big.

Mr. GREEN. Thank you.

Now, Mr. Nye, I am coming back to you, and my clock is not up, so I don't see how much time that I have left, because I have a comment that I would like to give.

Madam Chair, can you just quickly tell me how much time—

Mrs. DEMINGS. You have 46 seconds.

Mr. GREEN. OK. Well, Mr. Nye, you can have 20 of my 46.

Mr. NYE. Well, we got to make sure that the next election is secure, and I mean it in the traditional way. If we end up with a situation in the United States where we have Minority rule through gerrymandering, through these extraordinary laws that people are trying to pass, it is going to be trouble for everybody, for the Minority especially.

I lived in Washington State for a long time. I vote in California now. I voted mail-in for over 40 years, and look, I am fine. Everybody, we can do this.

Mr. GREEN. I am got to take care of my seconds, Mr. Nye, so I take it, you still say move forward?

Mr. NYE. Yes. My understanding, it is different in the House of Representatives from the Senate—

Mr. GREEN. Let me close out with this.

Madam Chair, if I could just have just a second.

This committee does do a lot of things in a bipartisan fashion, so I don't want you to think that these comments were directed to the persons on this committee. But I live in a world that is outside of the committee.

Thank you, Madam Chair.

Mrs. DEMINGS. Thank you so much.

The gentleman from Texas yields back, and the Chair now recognizes the gentlewoman from California, Ms. Barragán, for 5 minutes.

Ms. BARRAGÁN. Thank you, Madam Chairwoman, and the conversation is just so interesting, I had to stay on for the second round.

Mr. Nye, I am going to start with you. I am going to let you finish your answer that you were giving on—given that we are limited to 5 minutes. So, Mr. Nye, is there something that you want to conclude with on that last thought that you had?

Mr. NYE. Well, it is not in anybody's best interest to not have everybody's vote count, and it certainly looks like people are working to try to suppress votes. This is catastrophic, everybody. I know

everybody waves their hands about this, but I want—we are all in this together.

When we have this situation with continual deadlock, it is keeping us from taking action on climate change. So let's—everybody, let everybody vote. Let's get people who accept the science as per the Constitution, and let's move forward.

I understand; it is a frightening time. I get it, but we are all more alike than we are different. We have more in common than we have differences. So let's get together, and this notion of trying to pass these enormous bills—I don't work in your world, but if we can pass a few bills and chip away—you know, the longest journey begins with a single step—perhaps we can get things done.

But I just encourage everyone to realize how serious this problem of climate change is, how it affects everyone on Earth, and how we have got to work together to move forward. Everything is bad when we let these climate effects affect so many people.

Ms. BARRAGÁN. Thank you, Mr. Nye. I could not agree with you more, and it is hard when, in Congress, you have the leader of one party say, "Hey, we are just going to oppose everything the President is trying to do," and that makes it more challenging to reach that bipartisanship.

But I wholeheartedly support it and do hope that we get our friends, as we have been hearing on this very hearing, on both on sides of the aisle, talking about climate change and the threat to our homeland. We have got to work together.

Mr. Nye, I want to go back to something you wrote in your testimony about building utility systems that work all the time and robust electric grids. One resilient solution I have strongly supported is clean energy microgrids to help keep the lights on when there are wide-spread power outages from a disaster.

Can you talk about how clean energy microgrids can be a resilience and climate solution?

Mr. NYE. Oh, that is a great question. There is a wonderful analogy. When our electrical grid was created, we developed power plants; the bigger, the more efficient they could be. Well, now, with solar and wind and geothermal, the smaller, in many regards, the more efficient they are.

In the same way, we hand a phone call from one cell to another, a mobile phone goes from cell to cell, now with the satellite systems, we will hand the internet from constellation member to—satellite to satellite.

We can use that same sort of technology to have distributed power generation on the roof of every, for example, big-box store, and then connect it with a much more sophisticated set of software systems, so that when the power is not available one place, it is available somewhere else.

If you want to invest in something, and I hope we all do, let's invest in battery technologies, let's invest in heat storage and geothermal.

As I said earlier, I have met some people that make me think that fusion is not as strange as it used to be.

So I would like to have us invest in all those things and have the power distributed in a much more sophisticated way than we do now.

Ms. BARRAGÁN. Thank you, Mr. Nye.

Mr. Brown, with the 1 minute left, can I also get your perspective on clean energy microgrids as a resilience solution?

Mr. BROWN. Yes, Congresswoman, yes. I definitely think that is needed. You know, we saw the impacts just a couple weeks ago on the pipeline cyber attacks. So we need to focus on building resilience, using the best technology possible, doing things a different way.

During disasters, you know, first responders need these tools in order to save lives, and so we need to make those investments.

Any Federal support to support innovation on the State level for implementing those strategies would be definitely supported.

Ms. BARRAGÁN. Well, thank you for that, and thank you, again, Chairwoman, for this hearing. I think we have heard a little bit about how it is so important we invest in our infrastructure, our critical infrastructure, in particular, and what it means if it goes down, and what kind of a threat that would be for the homeland and for being a terrorist threat. With that, Madam Chairwoman, I yield back.

Mrs. DEMINGS. The gentlewoman yields back, and thank you so much.

You know, I really appreciate all of the participants in this hearing. This issue is real, and people expect for us to, No. 1, acknowledge it, not just say something but to do something. I want to thank all of you but particularly the gentleman from Texas—Texas and Florida but all of you.

We would rather not go it alone, but we certainly have to be prepared to go it alone because we have to do something about this critical issue.

I don't see any more Members on my screen at least, so I would just like to end with 2 additional questions if I may. I did have to step out for a minute, so if we have discussed this, please forgive me. But, recently, Secretary Mayorkas announced the launch of the DHS Climate Change Action Group, and we are excited about that commitment and really the potential for what this group can do to address this issue. So this question goes to all of the witnesses.

What issues would you recommend the group examine to help our Nation confront the threats posed by the climate crisis, and what are some of the actions you recommend the Department of Homeland Security take to respond to the climate crisis? So, Ms. Williams, we will start with you.

Ms. WILLIAMS. Thank you, ma'am. I do think that investment in our critical lifeline infrastructure is one of the most important focuses that we can have with regard to climate impacts and disaster impacts.

One of the things that does concern me is making sure that disaster impacts and severe catastrophic weather is something that is at the forefront of the homeland security conversation because when our communities aren't safe, our homeland is not safe. With those increased vulnerabilities, we must—must—tackle that.

Mrs. DEMINGS. Thank you so much.

Ms. Hill.

Ms. HILL. Yes. Well, I led the creation of the DHS Roadmap for Climate Adaptation for President Obama. There are a number of

things that the Department could immediately do. The thing that I would call out is the Department should be a leader in this space. Of all our Departments across the Federal Government, it has the broadest reach, the deepest reach, into our State, local, Tribal leaders. Those communities, everyone needs assistance.

Risk communication, understanding how to bolster critical infrastructure, deal with cascading impacts of climate change, and the DHS should step forward and lead among its fellow Federal agencies to accomplish real resilience for the United States, including that National resilience plan that you mentioned, Chairwoman Demings.

Mrs. DEMINGS. Thank you so much, Ms. Hill.

Mr. Brown.

Mr. BROWN. Thank you, Chairwoman. I really believe the Federal Government, and DHS in particular, can support State, local, and Tribal Governments with additional resources and technical assistance, streamline some of their processes to get resources to communities that need the support the most, the marginalized communities, the front-line communities, that are going to continue to face the greatest impacts of climate change as we move forward.

Mrs. DEMINGS. Mr. Nye, you talked earlier about, you know, looking at other countries. Yes, we need to do that, but the United States should be a world leader on this issue. What would your answer be to this question?

Mr. NYE. Let's be a world leader. What I am hoping is that we will cultivate a generation of civil servants, that people believe in and trust, and the civil servants in this case are people that do land-use planning, people that fund the robust electrical grid that has distributed generation sources, and hiring the kind of engineers, coders, developers, who will prevent a cyber attack of any kind.

They would work for the U.S. Government. They would take pride in their work. We would trust them. They would prefer to work for the Government rather than the private sector because of the job satisfaction you get from that.

Mrs. DEMINGS. Ms. Jackson Lee, I see you.

Go ahead, Mr. Nye.

Mr. NYE. When I think about my colleagues in Denmark, a friend of mine married a Danish guy because she says she could live the American Dream. People are right now saying that Venezuela is a model of socialism. Maybe. But in Denmark, they have these distributed systems. They have public health care. They have these things. And they have huge corporations.

So, if we were to invest in—I keep bringing up fusion—if we were to invest a hundred million in fusion companies, then private investors would show up after the Government has showed leadership in this. That's an example, but we can do this. Let's go.

Mrs. DEMINGS. Thank you so much.

With the time that I have left, to all of the witnesses again, what actions specifically do you think FEMA should take to better address the climate crisis? FEMA. We will start with you, Mr. Nye.

Mr. NYE. Distribute—make sure that people have access to the internet so they know what is going on in the world—

Mrs. DEMINGS. Thank you. Thank you so much.

Mr. Brown, we are going to go to you.

Mr. BROWN. Thanks, Chairwoman. There are multiple reports that talks about the inequities in FEMA programs that need to be eliminated to support the marginalized communities that are on the front line. I think addressing that will be the most urgent issue.

Mrs. DEMINGS. Thank you.

Ms. Hill.

Ms. HILL. Review all the programs in light of the risk placed by climate change, as well as on the disproportionate impact on certain communities in the United States.

Mrs. DEMINGS. Ms. Williams.

Ms. WILLIAMS. I think all of that can be also summed up in capacity and capability for our State, local, and Tribal Governments. If they can't be successful, it doesn't matter how many resources we throw at it. So that capability building is just key and crux to this issue, and FEMA is in the best position to do that.

Mrs. DEMINGS. Thank you so much.

The Chair now recognizes the gentlewoman from Texas, Ms. Jackson Lee, for 5 minutes.

Ms. JACKSON LEE. Madam Chair, thank you so very much, and I wish to raise my questions with Ms. Hill, and I will try to combine them.

Whenever we begin to talk about climate change, opponents consistently say that mitigation efforts are too costly. I would like your response as to whether or not there is a cost-benefit analysis in investing in mitigation.

Then, in your experience at DHS, do you perceive, as I do, that the climate catastrophes really impact on domestic and National security? If you could combine those questions, and then I have another question. Thank you so very much. Ms. Hill.

Ms. HILL. Yes. For those who say that it is too costly to reduce our emissions, I can only respond, look at the costs we are already incurring right now from climate impacts, and as we have heard, these impacts will worsen over time. They are permanent, and they will cause lasting change.

Virtually every system we have depends on a stable climate. We no longer have a stable climate. So we will have enormous economic costs involved. When we have economic loss, we have threats to the National security. We are seeing those play out already across the globe, and it will be a challenge for the United States to respond to the number of humanitarian crises that we will see as a result of climate events.

We can't, in any way, respond to the type of events that we will see, in a meaningful way, unless we cut our emissions, as we have heard here today, so—military is already busy at work preparing itself, but there is tremendous amounts to be done.

Our military installations are not operational and effective yet in the face of what we will see. We will need to bolster them as well at also an enormous cost.

Ms. JACKSON LEE. Well, I think we will find out—if we can educate the American public how broad the landscape is, that climate change impacts their very life, their very degree of security, their

very bottom-line dollar, then maybe we would be able to be very successful in going big on the American Jobs Plan.

But I had to deal with, believe it or not, the question of risk-mapping in my own community, dealing with a whole series of neighborhoods that were mapped into a high flood area, losing their property, in terms of its worth and asking them literally to move out.

We gathered FEMA and began to be able to reorder that map and save their homes, got them to shore up their homes, if you will. So I would be interested in your testimony.

You state, the United States lacked comprehensive risk-mapping that is sufficiently down-scaled to inform Americans. I agree with you. Would you expand on that concept, please, because I think that is extremely important? Thank you.

Ms. HILL. Well, thank you. Well, suppose you are a homeowner or prospective renter or you are a part-time mayor of a small town somewhere and you want to figure out what are the risks I am going to face, my community faces, you cannot get an answer to that today. In the world's wealthiest Nation, you cannot get to a property-level answer.

You might be able to get it if you have a lot of money and could pay a consultant, but that is no way for us to operate in the United States. Everyone should be able to determine what is ahead and then make better decisions going forward.

That will take an enormous investment by the Federal Government, but it is one we need to make now, and we will see if we don't, that we will have developed in areas that are at greatest risk in ways that are risky, and then we will have even greater economic impacts in the future. So it is a step, very important step, the Nation needs to take now.

Ms. JACKSON LEE. Mr. Nye, just a quick question to you. Everybody says it is the buck, it is the buck, too expensive, and we can't go big on the American Jobs Plan, dealing with infrastructure, climate change, job creation.

What do we say to those who want to use money, as I have asked Ms. Hill, to be an excuse for not going big on climate infrastructure rebuilds?

Mr. NYE. Well, try what I say to all climate change—sometimes they call themselves extreme skeptics. What is it about it that you think is not true? What is it about the situation you think that makes you mistrust all the world's scientists?

Then, in Texas, you are the perfect—in a grim way—a very good example of the money you could save by addressing climate change. The estimates—the latest estimates of the last blackout were \$130 billion. That certainly could have been a fraction of that. I have seen 2 numbers, but let's say about \$4 billion, as a fraction of what it will ultimately cost to deal with that.

By the way, we are all going to pay for it. It is the United States. We are all in this together. So what we want to do is anticipate this, not in a disrespectful way, but you guys, we have got to take care of this. We got to take care of each other. So, I say all the time, this is doable, and the longest journey starts with a single step. Let's get going.

On the social justice issue, or whatever it is called—diversity, inclusion, equity, intersectionality—everybody, when you have people living near you who are disadvantaged, it affects everybody's quality of life.

Certainly it affects the disadvantaged people, people who live at lower elevations, the flood hits them harder, they have to move and so on. But it affects everybody because we are in this together, and we all end up having to take care of each other.

Now this sounds like common sense, but I understand that your job is quite difficult because you have to do these big negotiations. But I want everybody to embrace the idea that taking care of each other actually saves money. We actually come out ahead when we anticipate these problems and address them before there is a cold snap and the grid goes down.

Ms. JACKSON LEE. Thank you very much.

Thank you, Madam Chair. Thank you all for this very good hearing. Thank you.

Mrs. DEMINGS. Thank you. The gentlewoman's time has expired.

With that, I want to thank the witnesses for their valuable testimony and, to our Members, for your questions.

The Members of the subcommittee may have additional questions for the witnesses, and we ask that you respond expeditiously in writing to those questions.

Without objection, the committee record shall be kept open for 10 days.

Without objection, the subcommittee stands adjourned.

Thank you all so very much. Take care. Stay safe.

[Whereupon, at 4:03 p.m., the subcommittee was adjourned.]

