

GENERATION CLIMATE: YOUNG LEADERS URGE CLIMATE ACTION NOW

HEARING BEFORE THE SELECT COMMITTEE ON THE CLIMATE CRISIS

ONE HUNDRED SIXTEENTH CONGRESS

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THURSDAY, APRIL 4, 2019

U.S. HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON THE CLIMATE CRISIS,
Washington, DC.

The committee met, pursuant to call, at 9:02 a.m., in Room 2318, Rayburn House Office Building, Hon. Kathy Castor [chairwoman of the committee] presiding.

Present: Representatives Castor, Luján, Bonamici, Brownley, Huffman, Levin, Casten, Neguse, Graves, Palmer, Carter, Miller, and Armstrong.

Ms. CASTOR. The committee will come to order. Good morning. Welcome to the first committee hearing of the Select Committee on the Climate Crisis.

Without objection, the chair is authorized to declare a recess of the committee at any time.

Today, we are going to hear from young Americans who are concerned about climate change and who are working to be part of the solution.

I now recognize myself for 5 minutes to give an opening statement.

This committee is explicitly charged with finding solutions to solve the climate crisis so that we can, quote, “honor our responsibility to be good stewards of the planet for future generations.”

So, today, we are starting with the Americans who are the most affected by the climate crisis: young people, who are growing up in it, who are going to bear the cost and the burdens, and who will help us find opportunities and solutions.

The last time global monthly temperatures were below average was in February of 1985. That means all of our witnesses and everyone who is 34 years or younger have grown up in a world that has been forever altered by climate change. In fact, this is the first Congress with Members who have grown up in the climate crisis. Six of our colleagues were born after that last below-average month.

And the severity of the climate crisis this generation will have to deal with in their lifetimes depends on the actions that we take now. We have made some progress in recent years in cutting carbon pollution, but it has not been enough to stop the climate crisis. Communities across the country are feeling the impacts and bearing enormous cost, here and now.

When I was in science class, back in the day, I didn’t learn about how burning fossil fuels could change the climate, but students

learn about that now. I am Gen X, but Millennials and Generation Z have grown up knowing we are in a climate crisis, and they are demanding that we address it.

And I want to be clear: We need this young, vibrant, smart generation that is central to America's democracy. They work, they pay taxes, they vote. And, increasingly, they are doing everything they can to solve the climate crisis. In their schools, in their houses of worship, in their communities, they are taking action, and they are demanding that elected officials do the same.

Solving the climate crisis offers opportunities for them. Some of the fastest-growing jobs in American are solar installers and wind turbine technicians, clean-energy engineers. These are no longer the jobs of the future; they are the jobs that this generation is doing to solve the climate crisis right now.

This is a transformative generation. The March for Our Lives, the Peoples Climate Movement, the massive student climate strikes we saw all around the world—these are movements led by young people who are demanding climate justice for their generation and the generations of young people who will come after them.

Seventy percent of young people in America say they worry about climate change. And based on the latest science from the administration's own National Climate Assessment and the Intergovernmental Panel on Climate Change, they have reason to worry. Seas are rising, snow pack is melting away, and, in many parts of the country, droughts are getting worse. Hot, humid heat waves are becoming more intense. We are faced with more days where people cannot safely work or play outside. And higher temperatures mean that other pollutants, like ground-level ozone from car exhaust, will become even more damaging to our health.

What is necessary to address the climate crisis is to stop carbon pollution from accumulating in the atmosphere. That requires action—urgent action, ambitious action. Every ton of carbon pollution we avoid, every new solar panel and wind turbine we bring on line, brings us one step closer to solving the climate change challenge.

So I want all the young people who are with us here today and those who are watching at school and across the country to hear our promise. We can't afford to let you down or disappoint you.

The time for rejecting climate science is over. The time for frustration and despair in the face of the climate crisis must end. This is a time for hope. This is a time for solutions. This is a time for all of us to come together—all generations, all political persuasions—for action. You all are rising to the occasion. We must rise with you.

Finally, when I was preparing for this hearing, I was reminded that April 4, today, is the anniversary of the date in 1968 when we lost one of our great spiritual and political leaders, Dr. Martin Luther King, Jr.

Dr. King understood how powerful young people are when it comes to fighting for justice. In 1960, amid some of the most intense student activism of the civil rights movement, Dr. King told students at Spelman College, "Keep moving, for it may well be that the greatest song has not yet been sung, the greatest book has not yet been written, the highest mountain has not been climbed. This is your challenge."

Today, solving the climate crisis is not just your challenge; it is the challenge that we all share. And this committee is dedicated to ensuring that Congress meets it with you.

I now recognize the ranking member, the gentleman from Louisiana, Mr. Graves, for an opening statement.

[The statement of Ms. Castor follows:]

**Opening Statement (As Prepared for Delivery) of Rep. Kathy Castor, Chair,
U.S. House Select Committee on the Climate Crisis**

This is the first of many Select Committee hearings that is focused on *solutions* to the climate crisis. The need for solutions is increasingly urgent.

The first major warning Congress received about the impending climate crisis was in 1988. But the Congress didn't act then. Today we know that oil companies' own scientists warned them about climate change, too. But instead of action, executives chose to tell Congress and the American people to ignore the scientists . . . and that we could afford to wait.

Now the scientific consensus is too unequivocal to deny. What is clear from the science and what diverse voices, including young people across America, are telling us every day is that if Congress continues to delay, we lose. If Congress chooses the status quo, we lose.

In fact, scientists have told us that the world needs to hit net-zero carbon emissions by 2050 to avoid the worst consequences of the climate crisis. Getting there means cutting greenhouse gas pollution 45 percent below 2010 levels by 2030.

To get there—and to give ourselves a chance of avoiding the most catastrophic consequences of climate change—we have to cut carbon pollution smartly and soon. Taking action *now* gives us the best opportunity to transition to a clean energy economy efficiently and equitably.

We still have time to solve the climate crisis because we've made some good choices: raising fuel economy standards, supporting wind and solar jobs, and investing in research and development that is coming to fruition now. America chose to lead the world in the Paris Climate Agreement, an agreement vital to the clean energy jobs and innovations underway across America now.

But every time Congress and the administration choose delay, American families and business are asked to pay a higher price whether it's through climate catastrophes, extreme heat, dirtier air or higher electric bills.

But as daunting as the climate crisis is, we can make choices and rise to the challenge.

Many businesses and communities across America have been leading the way. More than 3 million Americans work in the clean energy economy. Existing energy efficiency standards will save consumers and businesses \$2 trillion on utility bills by 2030. And fuel economy standards will save the average household another \$2,800 a year at the pump. Still, there is no substitute for bold federal policy initiatives that meet the scale of the challenge we face.

When we choose clear policies with clear goals, businesses innovate. They reduce costs. They put clean technology to work.

Our witnesses today will help us examine and prioritize our policy choices. We're going to look at infrastructure, at deploying more wind and solar, at electrifying home heating and transportation, at cutting the most powerful climate pollutants and more.

We're also going to look at funding research and development and establishing public-private partnerships that move technology from the lab to the market. We are going to look at capturing and storing carbon and pulling it out of the atmosphere.

But we have to be clear: technological breakthroughs are not guaranteed. Choosing to invest in innovation doesn't give us an excuse to choose the status quo elsewhere.

At the end of the day, technology is just a tool. It's *people* who will solve the climate crisis.

The clean energy economy employs millions of people and we can choose policies that will make those jobs family-sustaining jobs.

That includes elevating transition for workers in the fossil fuel industry. They deserve a clean energy economy that delivers for them, in their communities. We need good and patriotic policies for them, too.

And we need climate solutions that work for people who are on the front lines of the climate crisis. That means putting an end to environmental racism and mak-

ing sure the jobs at the heart of the clean energy economy are accessible to everyone.

We have to pursue many options to meet our goals by 2030 and 2050. The one option we don't have any more is delay. We must choose climate action now.

Mr. GRAVES. Thank you, Madam Chair. And thank you for holding this hearing today.

And I want to thank all of you all for coming here today to share your perspective.

I have the opportunity often to visit with students and go talk to college classes and high school and elementary school classes. And I remind them, and I remind our kids, that the decisions that we make here, just statistically, you all have to deal for with a longer period of time than we do, right? Just looking at life expectancy, it is simple numbers.

And whenever Congress comes in and starts appropriating money and adds to our \$22 trillion debt and proposing legislation that would just continue adding to that, it is a debt that is going to have to be paid at some point. It is one example of a long-term consequence that is going to adversely affect young folks, and it is going to disproportionately affect young folks.

And so I want to commend every one of you for being here, for participating in your government, for recognizing the decisions that we make are going to affect you, and they are going to affect you for a longer period of time than they are going to affect people of my generation and older.

You know, I agree with some of the statements that the chair made in regard to our obligation to be good stewards of this planet and protect the environment.

Not a very well-known occupation of mine for a number of years is I was a mountaineering instructor. I was a wilderness instructor, educator. And there were years of my life where I spent more time living outside than I did inside. Doing that job, being in the outdoors, being in the incredible environment that we have here in the United States and other countries—absolutely amazing and one of the most important parts of my life.

When I came up and I started doing policy work up here in my young 20s, I was so aggravated that I didn't have the opportunity to be outside. I actually used to drive every weekend over to Mrs. Miller's State from April to October to go be a river guide so I could be outside again on weekends.

Growing up in south Louisiana, we fish and have a very unique swamp and coastal area that—it is an environment unlike anywhere else I have ever seen, and it is absolutely amazing. In fact, U.S. Fish has called it one of the most productive ecosystems on the North American continent. It is an amazing place.

We need to be good stewards and—let me be clear—we need to be better stewards of our environment, of our earth. And we need to ensure that the science that we gain, the technology that we gain, that we are able to apply it into logical solutions that actually make a difference.

After spending a little bit of time up here doing some policy work, I learned a lot about what was going on in south Louisiana. I found out that we had lost about 2,000 square miles of our coast,

that same coast that I made reference to earlier as one of the most productive ecosystems on the North American continent.

And we immediately began working together with Republicans, Democrats, independents. We literally got to the point to where we had environmental organizations and Lisa Jackson, who was the EPA Administrator under President Obama, and energy companies all working together toward a common goal of a sustainable ecosystem and sustainable communities.

And despite, at one point, death threats and other charges against me and the folks who were working on our team, we ended up putting a plan together that united everyone, a sustainability plan for the ecosystem and for the community, that ended up getting unanimous support through four committees and through our entire legislature.

I believe we have an opportunity to make progress on this issue. I do. I think we have an opportunity to help bring down energy costs. I think we have an opportunity to truly pursue an all-of-the-above energy strategy that helps to reduce emissions. I think we have the ability to apply American innovation and know-how to reducing emissions in the United States and to being a global leader on this topic.

Today—today—the United States spends more money on climate science and technology than any other country in the world. Are we spending these dollars in the places where we need to be spending them? Are we investing in strategies that are going to actually yield outputs and gains that, again, help to improve our environment, help to reduce emissions, help to bring down energy costs? Or are we spending money and studying things that aren't ultimately going to yield outputs or outcomes?

I am really looking forward to hearing you all's thoughts today. I am really looking forward to getting your input and figuring out how we can work together to next steps to truly try to redefine this issue and stop this partisan ridiculousness that surrounds this issue and make progress that we can truly be proud of and turn over a planet, turn over an environment to my kids, to the next generation, and theirs that we can all be proud of.

I thank you and yield back.

Ms. CASTOR. Thank you, Mr. Graves.

Without objection, members who wish to enter opening statements into the record may have 5 business days to do so.

[The information follows:]

Statement for the Record of Hon. Suzanne Bonamici

Statement for the Record Climate change is one of the greatest existential threats of our time; we cannot wait any longer to take bold action to address it.

The U.S. Global Change Research Program's Fourth National Climate Assessment (NCA) and the most recent Intergovernmental Panel on Climate Change (IPCC) report add to the overwhelming research demonstrating that the consequences of inaction on climate change will be serious and swift.

Findings from the IPCC report indicate that an increase in global warming by 1.5 degrees Celsius above pre-industrial levels would result in extreme heat, rising sea levels, melting glaciers, water scarcity, lower crop yields, more acidic ocean water, and bleached coral reefs. The report demonstrated that limiting global warming to 1.5 degrees Celsius by 2040 would require a reduction in net global greenhouse gas emissions by 45 percent below 2010 levels by 2030, and 100 percent below 2010 levels by 2050. The NCA makes clear that greenhouse gas emissions from human ac-

tivities are the most substantial factor that account for the observed global warming over the past six decades, and carbon dioxide concentrations in the atmosphere are now higher than at any time in the last three million years.

Without intervention, we will continue to see record heat waves, more acidic oceans, raging wildfires, unprecedented hurricanes, rising sea levels, and a surge in extreme weather patterns—all in our lifetime. Our inaction creates significant consequences for every person in our country, particularly and disproportionately young children, seniors, and other vulnerable populations.

We must face this challenge. We have the opportunity and the imperative to reverse and mitigate the worst effects of climate change by reducing greenhouse gas emissions and transitioning to clean energy sources while creating new, good-paying jobs.

In the district that I represent in Northwest Oregon, and across the country, people are demanding bold action on climate change. I have been inspired by the advocacy of young people across the country who are speaking out and demanding that the federal government act on climate change. These young leaders are reminding us that all three branches of the federal government, along with local and state governments, the private sector, and individuals, must all take immediate action to address the climate crisis.

Confronting climate change will require ambitious action that acknowledges the scale of the crisis and uses the best available science in crafting solutions. I am excited to work with my colleagues on this Committee to fight for comprehensive policies that will strengthen the economy and protect our planet for future generations.

Ms. CASTOR. Now, I want to welcome our witnesses.

First, we have Mr. Chris Suggs, who describes himself as a speaker, activist, community leader, and entrepreneur. He hails from Kinston, North Carolina, and is a student at the University of North Carolina at Chapel Hill.

Ms. Lindsay Cooper is a recent college graduate who served as a Louisiana Governor's fellow while studying at Tulane. After graduation, she joined the Governor's Office of Coastal Activities as a policy analyst.

Mr. Aji Piper is a plaintiff in the landmark climate change case called *Juliana v. The United States*. He lives in Seattle, near Puget Sound.

And Ms. Melody Zhang is a climate justice coordinator at Sojourners and serves as co-chair for the steering committee of Young Evangelicals for Climate Action. She just moved to D.C. after growing up and attending school in Michigan.

Without objection, the witnesses' written statements will be made part of the record.

With that, Mr. Suggs, you are now recognized to give a 5-minute presentation of your testimony.

STATEMENTS OF CHRIS J. SUGGS, STUDENT AND ACTIVIST, KINSTON, NORTH CAROLINA; LINDSAY COOPER, POLICY ANALYST, OFFICE OF COASTAL ACTIVITIES, OFFICE OF THE GOVERNOR OF LOUISIANA; AJI PIPER, PLAINTIFF, JULIANA V. UNITED STATES, SEATTLE, WASHINGTON; AND MELODY ZHANG, CLIMATE JUSTICE CAMPAIGN COORDINATOR, SOJOURNERS, AND CO-CHAIR, STEERING COMMITTEE, YOUNG EVANGELICALS FOR CLIMATE ACTION

STATEMENT OF CHRIS J. SUGGS

Mr. SUGGS. Chair Castor, Ranking Member Graves, and members of the committee, thank you for this opportunity today to testify about my personal experience with natural disasters and our Nation's changing climate.

My name is Chris Suggs. I am 18 years old, and I am a sophomore at the University of North Carolina at Chapel Hill, where I am studying political science and religious studies. I am from Kinston, North Carolina, where I was born and raised and my parents were born and raised.

I am here today to talk about the impacts of climate change that I have seen in my community firsthand and my personal experiences, urging Congress to take action now.

Kinston is a small town with just a little over 20,000 people located in the heart of eastern North Carolina. My mom, who is here with me today, is an elementary school teacher and city councilwoman, and my father is a part-time recreation supervisor. I love my hometown. Everybody knows everybody, and it is truly a great place to live.

Once a bustling community with a strong economy based on textiles and tobacco, today Kinston faces a lot of economic challenges. Before I was born, lots of industries left the area, and Hurricanes Fran and Floyd in the 1990s wiped out lots of businesses and damaged many of our neighborhoods.

This led to disinvestment, lack of community morale, and a significant population loss. Between 1990 and 2010, Kinston lost more than 16 percent of its population. East Kinston was particularly hit hard. A neighborhood there known as Lincoln City was wiped out by Hurricane Floyd in 1999, the year before I was born.

From what I have read and heard from members of my community, that hurricane was devastating—it was beyond devastating. But from what I have seen, driving down streets that were once full of homes and businesses but now overgrown with brush and wildlife thanks to flooding and FEMA buyout programs, I know it was beyond devastating.

To this day, there continues to be concentrated poverty and crime in my neighborhood, in part due to lots of abandoned structures, outdated and dense public housing, and a lack of economic development.

At a very young age, my parents instilled in my siblings and I the importance of serving our community and uplifting others. That is why, in October of 2014, when issues in Kinston began getting really bad, I knew I needed to make a change.

Throughout 2014, gun violence became a serious issue in Kinston, especially among young people. This combined with a 2014 study stating that my neighborhood of East Kinston was the most economically distressed census tract in the entire State of North Carolina made me decide that enough was enough.

So I decided to start my nonprofit organization, Kinston Teens Incorporated, with a mission of empowering young people through service, leadership, and civic engagement. We host youth leadership seminars, arrange college visits for high school students, work to register voters, and make sure our voices are heard at State and local government meetings.

In my neighborhood of East Kinston, we launched a vacant-lot transformation program to transform vacant lots into small parks, community gardens, and other community amenities. A big part of our work has been to respond to disasters like Hurricane Matthew and Florence and work to build community resilience.

The thing about Kinston is that hurricanes aren't even the worst part of the storm for us; it is the catastrophic flooding that follows. Kinston sits along the banks of the Neuse River, which cuts right through our town. That river is one of our greatest natural assets but also one of the most dangerous. It has flooded again and again, cutting off parts of our community, wiping out neighborhoods, and flooding our main business corridor along U.S. Highway 70.

As a result, my town's socioeconomic challenges cannot be divorced from the extreme weather we have experienced. Poverty and hurricanes are deeply intertwined for us in eastern North Carolina.

In 2016, Hurricane Matthew hit. Following the storm, the river flood stage hit about 28.3 feet. And within 3 or 4 days, it was swamping entire apartment complexes, flooding businesses and churches, and cutting the town in half.

My organization, Kinston Teens, had been in existence for about 2 years then, and we immediately sprang into action. Parts of Kinston were cut off from food assets for about 25 days because of flooding. So it took a serious community effort to make sure that our neighbors were provided with the resources to survive. It took 3 or 4 weeks for the waters to completely recede.

When Hurricane Florence hit in September 2018 and caused that same level of destruction, many families, neighborhoods, and businesses were once again under water. They were still recovering from Matthew, though.

But Kinston Teens again sprang into action. We worked with our city officials and police department to go door to door notifying people about the evacuation process, telling them where their local shelters were, and even in some cases helping people to physically evacuate. We coordinated volunteers to distribute food, groceries, and phone chargers to families in the shelters and our first responders.

My community is still rebuilding from Florence and from Matthew on top of that. And with hurricane season starting in just a few months, people in Kinston are hesitant about what might happen this year. In just my 18½ years on this earth, my community has experienced two 500-year floods on top of the floods after Hurricane Floyd in 1999. For these catastrophic events to happen at such a fast rate, a rate that my community can't recover from, is deeply alarming.

Climate change is an extra kick to communities and populations that are already down, especially with how often these major hurricanes and floods are occurring. My testimony is a call to action. We have to do something now to address the threat of a changing climate, reduce our impact on the environment, and mitigate the effects of these natural disasters.

Thank you so much for this opportunity to share my story and my community's story. I look forward to answering your questions.

[The statement of Mr. Suggs follows:]

Prepared Statement of Chris Suggs

INTRODUCTION

Chair Castor, Ranking Member Graves, and members of the House Select Committee on the Climate Crisis, thank you for the opportunity to testify today about

my personal experience with climate change, and the need for urgent and equitable action to address this crisis. Chair Castor, thank you also for your recent leadership in introducing H.R. 9, the Climate Action Now Act—I'm excited to see Congress taking the first steps in a long time to act on climate.

My name is Chris Suggs and I am 18 years old. I'm a sophomore at the University of North Carolina at Chapel Hill, where I'm double-majoring in Political Science and Religious Studies. I'm from Kinston, North Carolina, where I have lived my whole life and my parents have lived their whole lives.

In September 2018, my town was hit by Hurricane Florence—the second major hurricane in a 2-year period. The storm led to historic flooding that left entire neighborhoods underwater and caused massive damage to homes, businesses and infrastructure. Now, more than six months later, things are finally starting to get back to normal—just a few weeks ago, the last flood-damaged business finally reopened. I'm here today to talk about the impacts of climate change that I've seen in my community firsthand and why we must take climate action now.

KINSTON BACKGROUND & KINSTON TEENS

Kinston is a small town with just a little over 20,000 people, located in the heart of eastern North Carolina. I was raised in East Kinston, a mostly poor, predominantly black neighborhood in the southeast part of town. My mom is an elementary school teacher and a city councilwoman, and my father is a parks and recreation supervisor. I love my hometown—everybody knows everybody, and it is truly an awesome place to live.

Once a bustling community with a robust economy based on textile manufacturing and tobacco, today Kinston faces a number of economic challenges. Before I was born, many industries left the area, and Hurricanes Fran and Floyd in the 1990s wiped out a lot of businesses and damaged many of our neighborhoods, leading to disinvestment, a lack of community morale, and significant population loss. Between 1990 and 2010, the population of Kinston fell more than 16 percent. East Kinston was particularly hit hard—a neighborhood known as “Lincoln City” was completely wiped out by Hurricane Floyd in 1999. To this day, there continues to be concentrated poverty and crime in part thanks to lots of abandoned structures, outdated and dense public housing, and a lack of economic development.

But despite these challenges, I believe Kinston is a great community, an awesome community. I grew up loving it and have always been actively engaged in my school, community, and in my church, Sand Hill Free Will Baptist Church. At a very young age, my parents instilled in my siblings and I the importance of serving our community and uplifting others. That's why, in October 2014, when I was 14 years old, and issues in Kinston began getting too bad, I knew I needed to make a change. Shootings were happening nearly every other day, especially among young people—to people I knew, people I considered friends. My classmates were shooting each other or getting shot. This combined with a 2014 study showing that my neighborhood of East Kinston was the most economically distressed census tract in the state, led me to decide that enough was enough.

We needed an outlet for young people to be empowered, and to make changes in their own lives. I'd been involved with Boy Scouts all throughout middle school, but I knew we needed more—a way to get people civically engaged and talk directly to our elected officials.

So, I decided to start a nonprofit called Kinston Teens with a mission of empowering young people through service, leadership, and civic engagement. We've been going strong for a little over four and a half years now, working to ensure young people are involved in the decisions that most affect us.

We host youth leadership seminars, arrange college visits for high school students, work to register voters, create mentoring programs at elementary schools, and make sure our voices are heard at state and local government meetings. In my neighborhood of East Kinston, we launched a Vacant Lot Transformation Program to transform vacant lots into small parks, community gardens and other amenities. We've been able to accomplish a lot in just over four years, but there is much more to be done. A big part of our work has been to respond to disasters, like Hurricanes Matthew and Florence, and work to build community resilience.

HURRICANES MATTHEW & FLORENCE, AND CLIMATE CHANGE

As I mentioned, the year before I was born, in September 1999, Hurricane Floyd hit. From what I've read and heard from my parents and members of my community, it was beyond devastating. I grew up continuously hearing about how Floyd and Fran, which was an earlier hurricane in the 90s, forever changed Kinston and our community.

The thing about Kinston is that the hurricanes aren't even the worst part of the storm . . . it's the catastrophic flooding that follows. Kinston sits on the banks of the Neuse River, which cuts right through our town. That river is one of our greatest natural assets, but also one of the most dangerous. It has flooded again and again and again—cutting off parts of our community and damaging homes, apartments and our biggest business corridor, which lies along U.S. Highway 70. As a result, my town's socioeconomic challenges cannot be divorced from the extreme weather we've experienced. Poverty and hurricanes are deeply intertwined for us in Eastern North Carolina.

In 2016 when I was 16, Hurricane Matthew hit. Within three or four days after the hurricane, entire neighborhoods were under water. During Matthew, the flood stage hit 28.3 feet—swamping apartment complexes, flooding businesses and churches, and cutting the town in half. My organization, Kinston Teens, had been in existence for two years when Matthew hit, and we immediately got to work. It was a month-long fiasco. Parts of Kinston were cut off from food access for 25 days because of the flooding. It took three or four weeks for the flood levels to completely recede.

Fast forward two years, to last year: September of 2018 when Hurricane Florence hit. At the time, many families, neighborhoods and businesses were still recovering from Hurricane Matthew—and Florence and its floods made sure that these places that were just starting to get stable again were right back under water.

Kinston Teens again sprang into action. We worked with our city officials and police department to go door to door before the Hurricane hit and in the days following ahead of the floods, notifying people about the evacuation process, telling them where their local shelters were, and even in some cases helping them to physically evacuate. We had businesses donate funds, coordinated volunteers to distribute food, groceries, phone chargers and other supplies to families in shelters and first responders impacted by the storm. I remember one lady we helped was a single mother of two kids, who lived in southeast Kinston and worked at a restaurant on highway 70. Her home was flooded, and her job was too. We were fortunate to be able to provide food and clothes for her family while they were displaced in the shelter. It's been eight months, though, and she's still not fully back on her feet. As the greatest country in the world, there's no way we can sit idle while these storms cause such detrimental effects on our citizens' lives.

NEXT STEPS & CLIMATE ACTION NEEDED

My community is still rebuilding from Florence, and from Matthew on top of that. And there's hesitation and fear in Kinston around what might happen this year. Hurricane season starts in just a few months. In just my eighteen-and-a-half years on this Earth, my community has experienced TWO 500-year-floods—on top of the floods after Hurricane Floyd in 1999. They're not supposed to happen this often, but they occurred within the span of just two years—back to back. For these kinds of catastrophic events to happen at such a fast rate—a rate that my community can't recover from—is deeply alarming.

For me, the saddest thing about these recurring natural disasters that are exacerbated by climate change, is that the communities that are the most affected—like mine—are often the communities that have ALREADY been hit the hardest by all of society's other problems. You have poor, rural communities that are completely underwater or get cut off from their access to food, hospitals, and medical supplies. You have communities that rely heavily on the farming industry just devastated by these storms, causing farmers, migrant workers and their families to lose income while the farms are underwater. And you have predominantly poor communities, black communities and housing projects that were built in the flood plains—because those were the only places they were allowed—that become completely submerged. That's the story of Kinston, and much of eastern North Carolina.

I've never known a world that wasn't impacted by climate change, and it's time for that to change. My generation knows we have no time to waste, and while Kinston Teens and I are here to help Kinston rebuild and become as resilient as possible— it shouldn't just fall to us. We need action. I voted for the first time in the November of 2018 and like millions other young people and first-time voters across the country, I was voting to keep our communities safe and resilient, and to protect our families and our homes. We turned out in record numbers last year, and we're not going away.

Climate change is an extra kick to communities and populations that are already down . . . especially with how often these major hurricanes and floods are occurring. My testimony is a call for action. We have to do something now to address

the threat of a changing climate, reduce OUR impact on the environment, and mitigate the effects of these natural disasters.

Thank you so much for the opportunity to tell my story today. I look forward to answering your questions.

Ms. CASTOR. Thank you, Mr. Suggs.

Ms. Cooper, you are now recognized for 5 minutes.

STATEMENT OF LINDSAY COOPER

Ms. COOPER. Good morning, Chair Castor, Ranking Member Graves, and members of the committee. My name is Lindsay Cooper, and I want to thank you for the opportunity to discuss a Louisiana perspective on climate concerns.

Louisiana really is, in many respects, the perfect case study for this committee as it grapples with a path moving forward for action in regard to climate change and its associated impacts.

But before further detailing the role of Louisiana in this discussion, let me first introduce myself. I was born, raised, and educated on the north shore of Lake Pontchartrain in Louisiana. I attended Tulane University, where I majored in marine biology and public policy, and I graduated this past December.

During college, I served as an environmental advocacy volunteer with No Waste NOLA, a local nonprofit seeking to reduce plastic waste throughout the city. I also interned for the Gulf Restoration Network, a local nonprofit focused on science-based coastal protection. I served as a research assistant for the Tulane Institute of Water Resources Law and Policy, and I became president of the Tulane University Green Club my sophomore year.

Last year, as Chair Castor recognized earlier, I served as a Louisiana Governor's fellow, where I had the privilege to work alongside Governor John Bel Edwards in his coastal office directly on statewide policy initiatives.

It was in this time that I discovered the extent of our Louisiana coastal crisis and the imperative with which it must be addressed. Therefore, upon graduation, I joined Governor John Bel Edwards in his coastal office, where I serve as a policy analyst. I work diligently alongside the Coastal Protection and Restoration Authority to move forward policies that promote coastal wetland protection and restoration in my state.

However, it did not take this experience in coastal policy to teach me about devastation from unparalleled climate threats. In states vulnerable to hurricanes, floods, and coastal degradation, my family and countless other lifelong friends have confronted devastation after devastation from these increasingly intense weather events. In the wake of Hurricane Katrina, my own family had to relocate for months while our schools were closed, but many of my neighbors and friends never returned.

In light of these circumstances, I am compelled to use my education and experience to fight for the culture, people, and environment into which I was born.

The Louisiana coast serves many national interests: fisheries, energy production, port, navigation, and trade activities. It provides countless ecosystem services and is home to over 2 million people.

Our coastal wetlands are a key first line of defense to protect our interests and our people. Louisiana is home to approximately 30

percent of these national wetlands. But, tragically, we are losing roughly a football field's worth every hour and a half due to sediment starvation, saltwater intrusion, and erosion.

In the decades to come, sea-level rise will play a larger and larger role in sustainability of our coast. Our communities have not moved from the Gulf for waterfront views, but the Gulf has moved to us.

In 2005, Hurricanes Katrina and Rita underscored the importance of these coastal wetlands for protection of inland communities, including urban areas like the city of New Orleans but also less densely populated areas of the southwest.

Some call us a canary in a coal mine or a harbinger of bad things soon to happen all around us. As Ranking Member Graves noted earlier, we have already lost 2,000 square miles of wetlands since the 1930s, and we stand to lose much more in the years to come without significant action.

To others, we are a living laboratory, a testing ground for new opportunities and a place where community needs, cutting-edge science, effective natural and manmade infrastructure, and good public policy can come together to balance interests of economy and environment.

But regardless of if you take the pessimistic or optimistic view, it cannot be denied that we have all of the elements necessary to craft a large-scale solution for our country. We have a long, painful history of natural disasters and lived experience of coastal land loss. We have a strong culture of appreciation for our natural environment from a recreation and commercial point of view. And we have an economy that is deeply connected to access and utilization of energy resources.

We have also found a way to deal with the impacts of our changing coast that prioritizes science-based decisionmaking and minimized politics. And since 2007, through our Coastal Master Plan, we have completed 111 projects across 20 of our coastal parishes.

So, in conclusion, as a Louisianan, I understand climate change. It is something my State lives with every day. Even as we sit here today, our Louisiana coastline is shrinking. People are migrating inland, and unique Louisiana cultures are being swept into the Gulf.

So, for these reasons, I ask you to consider my testimony and the urgency with which we must address this massive problem.

Thank you for allowing me this opportunity to share the urgency of what we face and what I am doing back home to help shape a better future for our coast, my state, and our nation.

[The statement of Ms. Cooper follows:]

Statement of Lindsay Cooper, The Louisiana Governor's Office of Coastal Activities

Good morning Chairwoman Castor, Ranking Member Graves, and Members of the Committee. My name is Lindsay Cooper, and I want to thank you for the opportunity to discuss a Louisiana perspective on climate concerns. Louisiana is, in many respects, the perfect case study for this committee as it grapples with a path forward for the nation in regard to climate change and its associated impacts. Before further detailing the role of Louisiana in this discussion, let me first introduce myself. I was born, raised, and educated on the north shore of Lake Pontchartrain in Louisiana. I attended Tulane University for my bachelor's degree where I graduated

in Marine Biology and Public Policy in December 2018. During college I served as an environmental advocacy volunteer with No Waste Nola, a local nonprofit that fights to reduce waste in New Orleans; interned for the Gulf Restoration Network, a nonprofit focused on science-based coastal protection; served as a research assistant with the Tulane Institute of Water Resources Law and Policy; and, became President of the Tulane University Green Club my sophomore year.

Last year, I also served as a Louisiana Governor's Fellow where I had the privilege to work with Louisiana Governor John Bel Edwards and his Coastal Activities Office directly on state-wide policy initiatives. It was in this time that I discovered the extent of our Louisiana coastal crisis and the imperative with which it must be addressed. Therefore, upon graduation, I joined Governor John Bel Edwards's Office of Coastal Activities where I serve as a policy analyst. I work diligently alongside the Coastal Protection and Restoration Authority to move forward policies that promote coastal wetlands protection and restoration in Louisiana. However, it did not take my experiences in coastal policy to teach me that Louisiana faces unparalleled climate threats. In a state vulnerable to hurricanes, floods, and coastal degradation, my family and countless other lifelong friends have confronted devastation after devastation from increasingly intense weather events. In the wake of Hurricane Katrina, my own family had to relocate for months while our schools were flooded, but many of my neighbors and friends were never able to return. In light of these circumstances, I am compelled to use my education and experience to fight for the culture, people, and the environment into which I was born. The Louisiana coast serves many national interests: fisheries, energy production, port, navigation, and trade activities; it provides countless ecosystem services and is home to over two million people. Our coastal wetlands are a key first line of defense to protect these interests and our people. Louisiana is home to approximately 30 percent of the nation's wetlands. Tragically, we are losing roughly a football field's worth of coastal wetlands every hour and a half due to sediment starvation, saltwater intrusion, and erosion. In the decades to come, sea level rise will play a larger and larger role in the sustainability of coastal Louisiana. Our communities have not moved to the Gulf for waterfront views, but the Gulf has moved to us. In 2005, Hurricanes Katrina and Rita underscored the importance of our coastal wetlands for the protection of inland communities including urban areas like the City of New Orleans and less densely populated portions of the southwest. In 2006, the Louisiana Legislature created the Coastal Protection and Restoration Authority (CPRA), a first in the nation organization tasked with coordinating the local and state efforts to save our coast. CPRA is responsible for developing the state's Coastal Master Plan every six years which calls for a \$50 billion investment in over 100 coastal protection and restoration projects over the next 50 years. These projects are essential both to create a stronger and more resilient coast and to reduce wetlands loss. The Master Plan is based on sound science, public input and bipartisan approval from the state legislature.

Some call us a canary in the coal mine or harbingers of bad things soon to happen around us. We have lost 2,000 square miles of coastline since the 1930s and stand to lose much more in the years to come without significant action. To others, we are a living laboratory, a testing ground for new opportunities, and a place where community needs, cutting edge science, effective natural and manmade infrastructure, and good public policy can come together to balance the interests of economy and environment.

Regardless of whether you take the pessimistic or optimistic view of the outcome, it cannot be denied that we have all the elements necessary to craft a large-scale solution for the country. We have a long, painful history of natural disasters and lived experience of coastal land loss. We have a strong culture of appreciation for our natural environment from a recreation and commercial point of view. And we have an economy that is deeply connected to access and utilization of energy resources located offshore. We have also found a way to deal with the impacts of our changing coast that prioritizes science-based decision making and minimized politics. And we have completed 111 projects across all 20 of our coastal parishes since 2007.

In 2017 the Louisiana Legislature unanimously approved the third iteration of our Coastal Master Plan. When we developed our first plan in 2007, we had no money, but we knew that we needed a principled approach to make hard decisions and allocate scarce resources. We amended our state constitution with tremendous public support to dedicate all revenues we receive from the federal government from offshore oil and gas development to coastal protection and restoration. And in the aftermath of the Deepwater Horizon oil spill, the state also has relied on the Coastal Master Plan to guide our recovery and drive the investment of nearly \$8 billion that will come to the State through 2032 as part of the settlement.

In conclusion, as a Louisianan, I understand climate change. It's something my state lives with every day. Even as we sit here today, our Louisiana coastal wetlands are shrinking; people are migrating inland; some unique Louisiana cultures are being swept into the Gulf. For these reasons, I ask you to consider my testimony and the urgency with which we must work together to confront this massive problem. Thank you for allowing me this opportunity to share the urgency of what we face and what I am doing back home to help shape a better future for our coast, our state and our nation.

Ms. CASTOR. Thank you, Ms. Cooper.

Mr. Piper, your turn. You are recognized for 5 minutes.

STATEMENT OF AJI PIPER

Mr. PIPER. Chair Castor, Ranking Member Graves, and distinguished members of the Select Committee on the Climate Crisis, thank you for inviting me to provide testimony.

My name is Aji Piper. I am 18 years old and one of the 21 young Americans who filed the landmark constitutional climate lawsuit, *Juliana v. United States*.

While I am not a lawyer nor a climate scientist and I only recently came of voting age, I know that I have constitutional rights at stake in the actions you take. And I know from studying climate science and living with the consequences of climate change today that my health, my community, and my future and that of my generation is at stake. And I am here to speak to you as a young person on the greatest issue of our time: climate change.

It is the constitutional duty of the government to protect public-trust resources on which we all depend and to protect us from any damages that it may inflict upon its citizens. Instead, the government is taking actions that are directly contributing to the destruction of our planet. It is actively abusing the trust of its most vulnerable citizens, the youth.

Growing up, my mom always told me that to be an adult is to take responsibility for my actions and the way that those actions impact others. She told me that to be a leader is to take responsibility for the well-being of my community and to actively work to make it safer and healthy for everyone. I took that advice to heart. I got involved in activism from an early age, planting trees with a nonprofit organization.

But as I got older, I began to realize that the environmental issues facing my community were much larger than could reasonably be dealt with just by planting trees. Seeing the skies of my hometown filled with smoke, seeing our snow pack diminish and our oceans become a rising threat to coastal communities and an unsafe acidic home to shellfish in Washington, I knew that in order to fulfill my responsibility to myself and my community, I needed to broaden the scope of my civic engagement in order to truly address the issue of climate change.

Like youth who have come before us in the civil rights movement and other social justice movements, it is often the young among us that shine the light on systems of injustice. And just as my federal government orchestrated systems of racial segregation in housing policies and sanctioned discrimination in schools until the middle of the last century—policies that harmed children—my federal government has also orchestrated and sanctioned a system of fossil fuel energy that is harming children in another way, that is irre-

versibly threatening our personal security, our health, our homes, and our communities by creating a dangerous climate system.

So, in 2015, 21 young people, myself included, filed a lawsuit against the United States and agencies of the executive branch to safeguard our constitutional right to a stable climate.

Since then, first the Obama administration and now the Trump administration has done everything in their power to stop our case from going to trial, making unprecedented requests of the courts, and this is simply because they are scared of what trial will reveal.

During the litigation, our attorneys found hundreds of documents demonstrating the United States Government's knowledge of the threats of greenhouse gas emissions and climate change since 1961. In short, our government has consciously sanctioned climate destruction for more than five decades.

And because climate change is a systemic issue, it requires systemic change to address it. The burdens of the system's problems cannot be placed on the shoulders of an individual, especially not a young person. To combat the systemwide government actions that have led to the climate crisis, we need a systemwide reform at the governmental level to address this emergency.

And for this to happen, we need all three branches of government to act in concert. The courts need to declare our constitutional rights and mandate the standard to protect us. This branch should also recognize our constitutional rights, make legislative findings on the best science, and enact legislation not based on political will but scientific necessity of stopping this catastrophe. The executive needs to be held accountable to the rule of law and stop promoting propaganda in support of fossil fuels and promoting lies about the climate crisis.

While government may play an important role in providing for our nation's energy, housing, and schools, we don't need segregated housing and schools and we don't need dangerous fossil energy. We need policies that don't discriminate and don't harm children.

All of you took an oath to uphold our Constitution and secure the blessings of liberty to ourselves and our posterity. In 2016, Judge Ann Aiken issued a historic opinion in our lawsuit, writing that "the right to a climate system capable of sustaining human life is fundamental to a free and ordered society."

And so I ask the committee: What is your plan to honor your oath and ensure my right and the rights of young people around the nation to liberty and a stable climate, as mandated by the Constitution?

You have a choice. Will you deprive your children and young people across the country of their fundamental right to liberty, or will you fight to protect us and our nation for posterity? What will you tell your children about responsibility if you fail to act now in the face of crisis?

When you leave office, I want you to be able to walk away knowing you gave it your all, knowing you can be proud of the legacy that you leave. The moment is now. The moment is not for fear or incrementalism. This is the moment for heroism, for humanity, for standing with children around our country, standing with me.

Please join your colleagues and publicly support our lawsuit. Join any future amicus—sorry—curiae—thank you. I always forget how

to pronounce that word—amicus curiae briefs that Members of Congress file in support of our constitutional rights and the judiciary exercising its Article III powers in our case and show children everywhere you care about their future and the future of all generations to come.

Thank you so much.

[The statement of Mr. Piper follows:]

Aji Piper, Climate Activist and Youth Plaintiff, *Juliana v. United States*

Chair Castor, Ranking Member Graves, and distinguished Members of this Select Committee.

Thank you for inviting me to provide testimony to your Select Committee on the Climate Crisis. My name is Aji Piper. I'm 18-years-old. I love vanilla bean ice cream, snowboarding, and writing songs on my ukulele. I love my family and my friends and my home near the Puget Sound in Seattle. And I am suing the United States government for knowingly causing climate change as the largest historic contributor to the problem and for continuing, even now, to make a dangerous situation worse.

I have been reading climate science literature since I was 13-years-old. I have also been studying what my governments have done about the climate crisis during my lifetime, and even before I was born. For much of my life, I saw climate change as a problem that would be solved by adults in nice suits in a faraway Capitol. But as I grew up, and the coal and oil trains kept rolling through my hometown of Seattle, and the oil tankers kept sailing in and out of Puget Sound, I became apprehensive.

The late summer skies over Seattle now regularly fill with wildfire smoke, people walk around in gas masks, our ocean waters around my hometown are acidifying and rising, and yet there are still politicians in Washington, D.C. talking about climate change as if it is an issue to debate and still talking about promoting fossil fuel energy as if the pollution from that energy source is not dangerously destroying the one planet we've got, and the lives and futures of children along with it. I got to a point where I felt like I could no longer wait for the solutions to come from the Capitol or the adults that are responsible to protect young people like myself.

I am one of the 21 Youth Plaintiffs in the constitutional climate lawsuit, *Juliana v. United States*. Our complaint asserts that, through the federal government's affirmative actions in causing climate change, it has violated my constitutional rights, and those of my generation, to life, liberty, property, and equal protection under the law, as well as failed to protect vital public trust resources.¹ While I am not a legal expert, nor a climate scientist, and I only recently came of voting age, the goal of my testimony is to explain my perspective on the most consequential and far-reaching issues of our time, an issue that all three branches of this government are duty bound to address.

¹First Amended Complaint, *Juliana et al. v. United States et al.*, No. 6:15-cv-01517-AA (D. Or. Sept. 10, 2015) (Exhibit DD).



The Juliana Plaintiffs

As a young black man, I have grown up with the long-lasting consequences of unconstitutional discrimination from government-sanctioned and -engineered segregation. My childhood was shadowed by trauma from an abusive father. The trajectory of his life was formed in part by generational trauma of unlawful discrimination. Generations of black families have lived with the lasting legacy of government-sponsored racial discrimination, not just in the South, but in places like Seattle, where white suburbs formed out of federal government policies with restrictive covenants on housing developments and federally-guaranteed loans to homeowners that only whites could take advantage of. Cities across the country are segregated because of these federal policies that were finally declared unconstitutional after World War II by the Supreme Court, and that this branch of government attempted to redress decades later in the Fair Housing Act of 1968.² But the damage had been done and the legacy of that unconstitutional government conduct remains today in the color and shape of our communities, the makeup of our schools, the voting districts, and the disparity in those who were able to acquire home equity and wealth and those who were not. Unconstitutional systemic government actions have long-lasting social consequences. Innocent children inherit those legacies.

In response to decades of unconstitutional discrimination, in May of 1963, thousands of children led marches through Birmingham, Alabama to demand the desegregation of the city in a movement now known as the Birmingham Children's Crusade. On the first day of the protest, hundreds of children were arrested. By the second day, police officers tried to stop the marches by using fire hoses and police dogs to attack the children. On May 10, 1963, within one week of the first march, the city acquiesced to the children's demands, agreeing to desegregate businesses and to free all who had been jailed during the demonstrations. These youth stood at the forefront of one of the most pivotal moments in civil rights reform in the United States, using non-violent protest as a means to advance human rights.

Young people are often on the frontlines of human rights abuses, experiencing the most severe impacts of bigotry, oppression, and violence, sometimes in their own homes and often at the hands of adults in positions of power who do not act in the best interest of children. They are also inevitably at the forefront of the movements that emerge to address these issues, as we saw in the Child Labor Law Movement or the Civil Rights Movement.

Climate change is no different. My generation, and generations to come, have the most to lose from the sweeping impacts of climate change. As a result, youth throughout the world have taken the lead in the movement to address this existential threat. Just last month, over a million students the world over walked out of class to demand urgent and sane climate action from the adults in charge.

²*The Color of Law: A Forgotten History of How Our Government Segregated America*, Richard Rothstein (2017).

The entrenched federal government policies of orchestrating, promoting, supporting, subsidizing, sanctioning, and permitting a fossil fuel energy system will perpetrate as long-lasting harm on generations of innocent children as did this body's legal sanctioning and promotion of segregation. When government sanctions and controls a system that unconstitutionally deprives children of their basic fundamental rights to life, liberty and property, that system must be dismantled, and it is up to all three branches of this federal government to act now while there is still time to uphold the rights of my generation, to stop the perpetuation of intergenerational injustice.

Our case, Juliana v. United States

I, along with 20 other youth plaintiffs, Dr. James Hansen as guardian for future generations, and a youth-led organization called Earth Guardians, filed the landmark *Juliana v. United States* lawsuit in August 2015. Since the time our case was filed, when President Obama was in the White House, the federal defendants³ have done everything in their power to stop *Juliana* from going to trial. They have made unprecedented and drastic efforts to have it thrown out before we get our day in court. Nonetheless, we have won every step of the way. In November 2016, we received a historic opinion from U.S. District Court Judge Ann Aiken, who aptly began her decision by referring to *Juliana* as "no ordinary lawsuit."⁴

Judge Aiken's opinion stated that:

Exercising my 'reasoned judgment,' . . . I have no doubt that the right to a climate system capable of sustaining human life is fundamental to a free and ordered society. Just as marriage is the 'foundation of the family,' a stable climate system is quite literally the foundation 'of society, without which there would be neither civilization nor progress.'⁵

As part of her decision, the district court properly found the right "to a climate system capable of sustaining human life" is both fundamental to ordered liberty and deeply rooted in our Nation's history and traditions. The district court also found we should have an opportunity to present evidence to show that my federal government has knowingly violated this fundamental right.⁶ In response, the Executive Branch defendants say that: "Plaintiffs' purported right to a 'climate system capable of sustaining human life' has no basis whatsoever in this Nation's history or tradition and is therefore not a fundamental right."⁷ My government leaders are denying that the very foundation of life on Earth, our climate system, is one of my unalienable rights as a human living in this Nation. They say it is not one of the rights that I was endowed with when I was born. They say that my government can deprive me and all human civilization of the climate foundation of life, and discriminate against me, other children and all future generations in favor of supporting a fossil fuel-based economy and the narrow interests fossil fuels support, over policies that power clean energy and don't threaten my life and my security.

Our lawsuit makes a number of other claims, including that the United States government has a fiduciary responsibility to protect our public trust resources, such as the air, fresh water, the sea and the shores of the sea, not just for my generation, but for future generations as well. My co-plaintiffs and I are beneficiaries of rights under the public trust doctrine, unalienable rights that are secured by the substantive due process clause of the Fifth Amendment and the Posterity Clause of the Constitution. Defendants have failed in their duty of care to safeguard the interests of my generation as the present and future beneficiaries of the public trust.

We have a tremendous amount of evidence, mostly from government documents, showing that the U.S. government has knowingly endangered our health and welfare by creating and promoting a national fossil fuel-based energy system, through controlling (1) Energy planning and policies; (2) fossil fuel extraction and production; (3) subsidies, financial and R&D support; (4) imports and exports; (5) interstate fossil fuel infrastructure and transport; (6) power plants and refineries; (7) energy standards for appliances, equipment, and buildings; (8) road, rail, freight, and air

³The United States Of America; The Office Of The President Of The United States; Council On Environmental Quality; Office Of Management And Budget; Office Of Science And Technology Policy; The United States Department Of Energy; The United States Department Of The Interior; The United States Department Of Transportation; The United States Department Of Agriculture; The United States Department Of Commerce; The United States Department Of Defense; The United States Department Of State; The United States Environmental Protection Agency.

⁴*Juliana v. United States*, 217 F. Supp. 3d 124 (D. Or. 2016) (Exhibit S).

⁵Exhibit S.

⁶See also District Court order granting in part and denying in part Defendants Motion for Summary Judgment and Motion for Judgment on the Pleadings (Exhibit T).

⁷Defendants' Reply Brief on Interlocutory Appeal (Exhibit EE).

transportation; (9) government operations.⁸ All of these deliberate orchestrated actions by the United States have cumulatively resulted in dangerous levels of atmospheric CO₂, which deprive us of our fundamental rights to life, liberty, and property. Importantly, the Defendants have admitted many of the allegations in our complaint, including that greenhouse gases “pose risks to human health and welfare” and “threaten the public health and welfare of current and future generations;” that the U.S. has emitted 25 percent of cumulative global CO₂ emissions from 1850 to 2012; and current CO₂ concentrations are “unprecedented for at least 2.6 million years.”⁹

While the Defendants have been unsuccessful at stopping our case, they have certainly delayed it, and time is not on our side. Just weeks before we were set to begin what would have been, and certainly will be, the most important trial of the century for my generation, the Supreme Court issued a temporary stay of our trial in order to consider whether to stay our case and review it before a final decision.¹⁰ While the Supreme Court ultimately denied the defendants’ request and lifted the stay, the case has bounced up and down between the U.S. Supreme Court, the Ninth Circuit Court of Appeals and the District Court, while fossil fuels continue to be extracted and burned.¹¹ As our planet drifts ever-closer to the point of no return, we knew we had to do something.

Our request for a Preliminary Injunction during the Delay on Appeal

In February, we filed a motion to the Ninth Circuit Court of Appeals seeking an injunction to stop the actions by the U.S. government that are continuing to put me and other young people in danger by worsening climate change. Specifically, we asked:

This Court should preliminarily enjoin, for the pendency of this interlocutory appeal, Defendants from authorizing through leases, permits, or other federal approvals: (1) mining or extraction of coal on Federal Public Lands; (2) offshore oil and gas exploration, development, or extraction on the Outer Continental Shelf; and (3) development of new fossil fuel infrastructure, in the absence of a national plan that ensures the above-denoted authorizations are consistent with preventing further danger to these young Plaintiffs.¹²

This injunction is urgently needed because, despite long-standing knowledge of the resulting destruction to our Nation and the profound harm to myself and my co-plaintiffs, the federal government’s ongoing development of the fossil fuel-based energy system is actively harming us and making it more difficult for us to ever solve this crisis. While a complete halt on these actions may seem like a radical request to some of you, scientists tell us that nothing short of stopping these kinds of additional fossil fuel development can avert the worst effects of climate change, and prevent us from entering a period of irreversible baked-in, or runaway, heating. I wish incremental actions were enough, but the government’s long-standing actions perpetuating a fossil fuel energy system have put us in this situation. But here’s the upshot, our top experts say that neither the injunction we seek, nor our ultimate remedy in the case will hurt the economy. In fact, they say that it will *help* the economy and create new jobs, and is our only real shot at preventing our economy from tanking from the increasing costs of climate disasters, the enormous economic threats that climate change poses, and the lost opportunity to lead the market transition away from fossil fuels that other nations are outpacing us on.¹³

⁸Expert Report of James Gustave (“Gus”) Speth (Exhibit U); Declaration of Peter A. Erickson (Exhibit E).

⁹Defendants Answer ¶¶ 5, 151, 208–09; 213 (Exhibit FF); Exhibit R.

¹⁰*In re United States*, 139 S. Ct. 16, *vacated*, 139 S. Ct. 452 (2018).

¹¹For the briefing before the Ninth Circuit Court of Appeals on the government’s interlocutory appeal see Exhibit P (Defendants’ Opening Brief); Exhibit Q (Plaintiffs’ Answer Brief); Exhibit EE (Defendants’ Reply Brief); *see also* Exhibit O (*Amicus* brief submitted by 80 law professors in support of Plaintiffs).

¹²Exhibit A.

¹³Declaration of Joseph E. Stiglitz (Exhibit I).

Please listen to the experts; The harm is real and is happening to us now

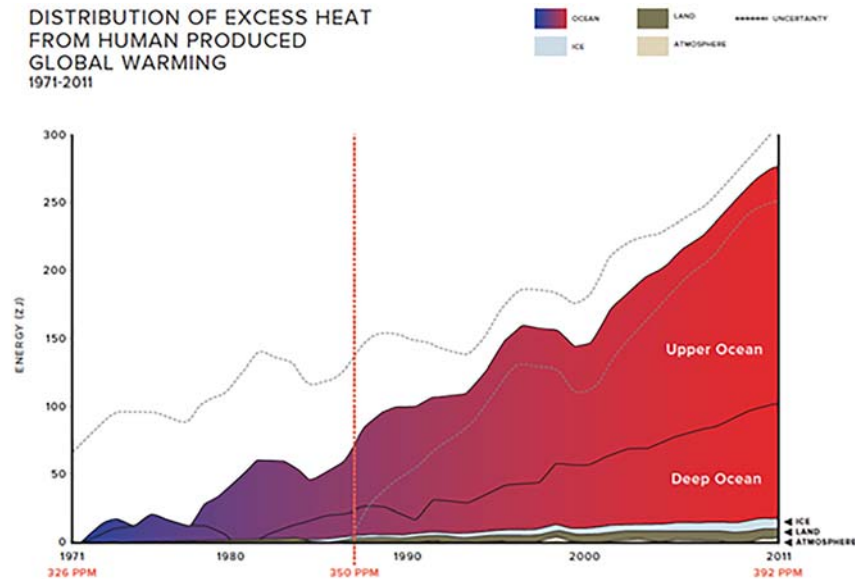
In *Juliana v. United States*, my co-plaintiffs and I are very fortunate to be supported by some of the world's top climate change science and solution experts. I've included some of their written expert testimony as attachments to my testimony and I encourage you to read them.

According to Dr. Jerome Paulson, Professor Emeritus at George Washington University who submitted a declaration in support of our preliminary injunction filing: "Each month that passes by without action by the federal government to reduce fossil fuel extraction and GHG emissions exacerbates this already grave public health emergency facing our nation's most vulnerable population—our children."¹⁴

Nobel Prize-winning economist Joseph Stiglitz testified: "There is no urgency to promote more fossil fuels. There is no urgency for energy supply. There is no urgency for employment or economic growth. There is, however, real urgency to stop the climate crisis and the already-dangerous status quo from worsening, and to protect these young people's constitutional rights. There are very real and substantial societal costs and risks of moving forward with these fossil fuel enterprises while this lawsuit is pending."¹⁵

Dr. Steve Running, Professor Emeritus at the University of Montana and Nobel prize winner testified: "The Federal Government has for many years had knowledge, information, and scientific recommendations that it needed to transition the Nation off of fossil fuels in order to first prevent against, and now try to stop, catastrophic climate change. We are well beyond the maxim: 'If you find yourself in a hole, quit digging.'"¹⁶

Dr. Ove Hoegh-Guldberg, Professor of Marine Studies and the Director of the Global Change Institute at The University of Queensland stated in his declaration: "Th[e] absolute amount of excess heat absorbed by our oceans is tremendous: the equivalent of energy from approximately 1.5 Hiroshima-sized atomic bombs per second over the past 150 years, at-present the equivalent of approximately 3 6 Hiroshima-sized bombs every second" (see Figure 1).¹⁷



¹⁴ Exhibit D, p. 7.

¹⁵ Exhibit I, p. 15.

¹⁶ Exhibit G, p. 26.

¹⁷ Exhibit F, p. 4.

Figure 1: Distribution of global-warming energy accumulation (heat) relative to 1971 and from 1971 to 2011. Half of the human-produced global warming heat has entered the ocean since 1997.¹⁸

Over the past month, we have heard stories on the news of entire towns in the midwest wiped off of the map by massive flooding events triggered by a historic ‘bomb cyclone.’ Hurricane Florence, which hit North Carolina last fall and brought historic flooding, Hurricane Michael, which flattened the community of Mexico Beach, Florida in 2018, and Hurricane Maria that decimated Puerto Rico in 2017, have become our new normal. These storms will only get worse unless we take urgent action.¹⁹

My fellow plaintiff Jayden experienced one of these climate change-driven super storms first hand in 2016, when she woke up to find feet of standing water in her bedroom. Her house in Rayne, Louisiana had been flooded in a ‘thousand-year storm’, yet these storms seem to be coming year after year. Her family is still making repairs on their home after three years.²⁰

Wildfire

It’s not just storms that we have to worry about. I have experienced firsthand how wildfire seasons extended by two and a half months throughout the west are shrouding our communities with smoke for months on end, causing innumerable respiratory health issues, and taxing our emergency response funds (see Figure 2). It is not just rural communities that are experiencing this smoke, it is urban areas as well. I never thought that living in the United States would come with air quality warnings advising me to stay inside and school and youth sports activities being canceled so we aren’t harmed by breathing the air. I can’t tell you how scary it is to see people walking down the street in gas masks in August in Seattle, which used to be the most beautiful time to be outside in the Pacific Northwest.²¹



Figure 2: Wildfire smoke shrouds Seattle.²²

¹⁸ Chart is a modified version of a chart found in Nuccitelli, D. et al., *Comment on Ocean heat content and Earth’s radiation imbalance. II. Relation to climate shifts*, Physics Letters A, Vol. 376, Issue 14 (2012).

¹⁹ Declaration of Kevin E. Trenberth (Exhibit B).

²⁰ Exhibit W.

²¹ Declaration of Steven W. Running (Exhibit G); Declaration of Aji. P (Exhibit X).

²² Agueda Pacheco-Flores, *Puget Sound air-quality warnings: Beware of smoke from British Columbia fires*, The Seattle Times (Aug. 13, 2018); available at: <https://www.seattletimes.com/seattle-news/british-columbia-wildfire-smoke-is-impacting-air-quality-warnings-issued-for-vulnerable-groups/>.

Sea Level Rise

If we don't make serious change now, in just a few decades some the largest cities in the United States will first become uninhabitable and then be entirely submerged, as well a vast majority of the state of Florida. My fellow plaintiff, Levi, will watch his family home and the entire island that he grew up on go underwater with just a few feet of sea level rise, which could hit by mid-century. He will become a climate refugee long before then (see Figures 3 and 4).²³

²³ Declaration of Levi D. (Exhibit Y); Declaration of Dr. James Hansen (Exhibit L); *see also* Hansen, J., et al., (2016). *Ice melt, sea level rise and superstorms: Evidence from paleoclimate data, climate modeling, and modern observations that 2°C global warming could be dangerous*. Atmos. Chem. Phys., 16, 3761–3812, doi:10.5194/acp-16-3761-2016.

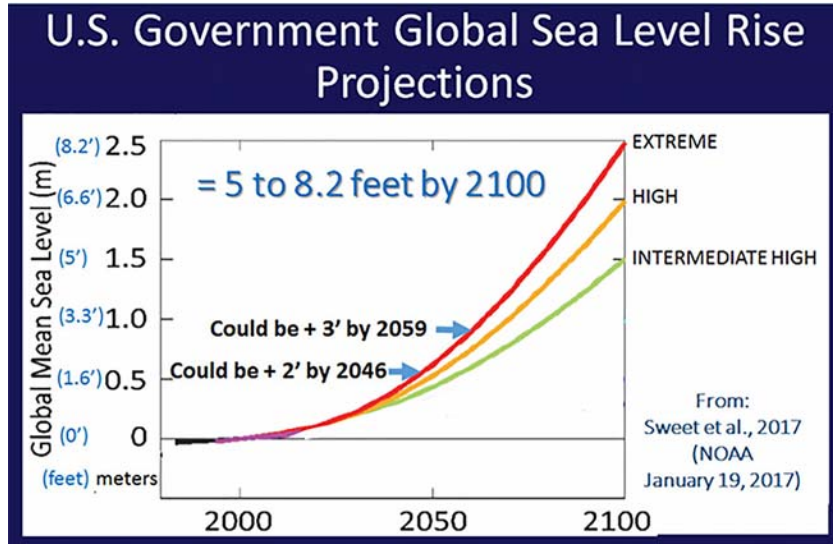
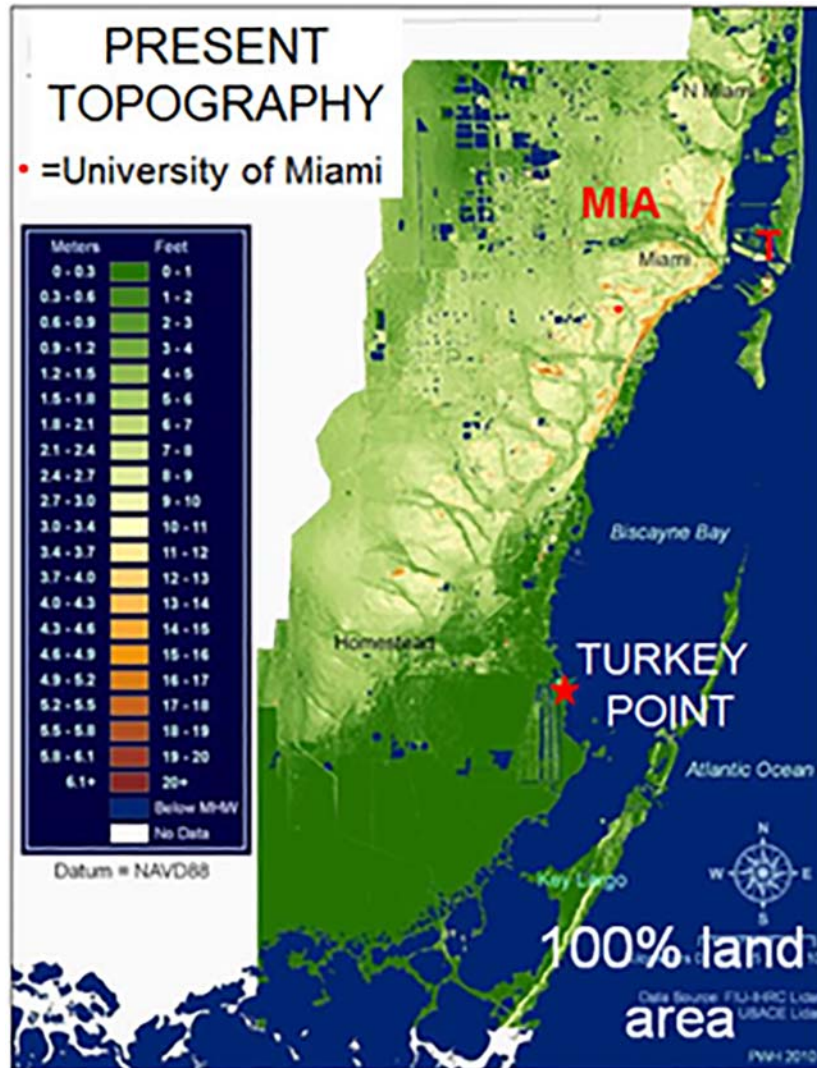
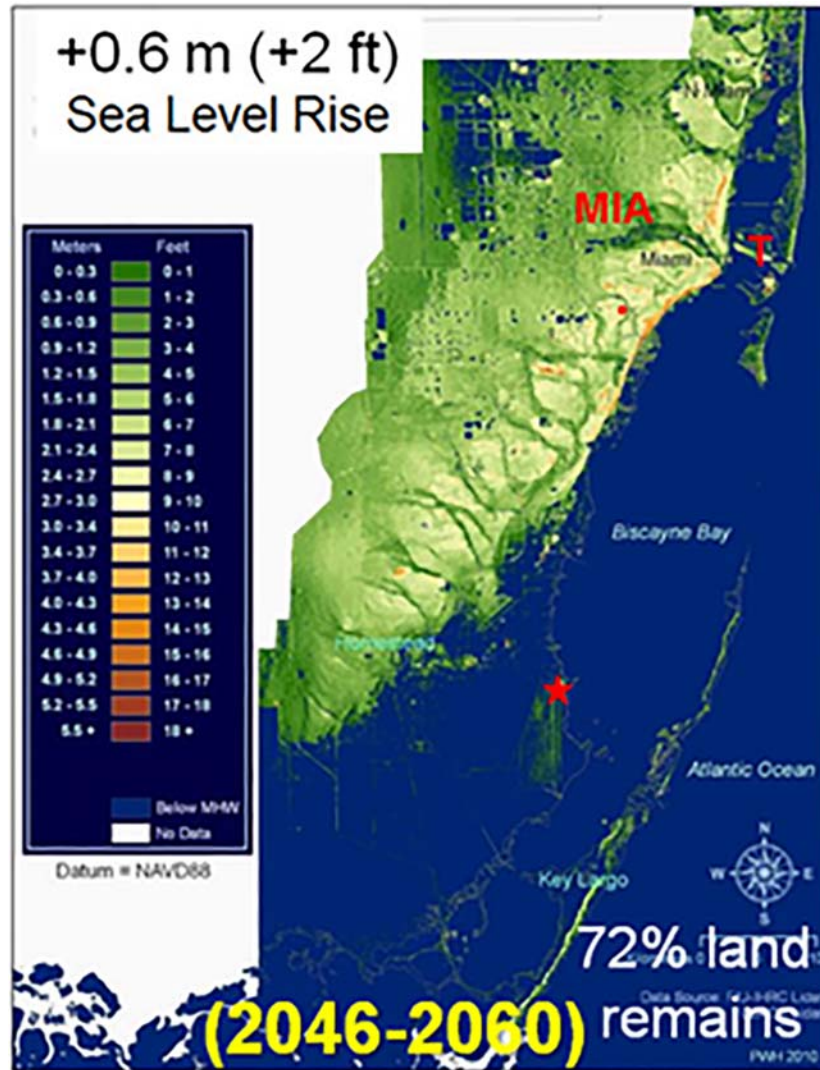
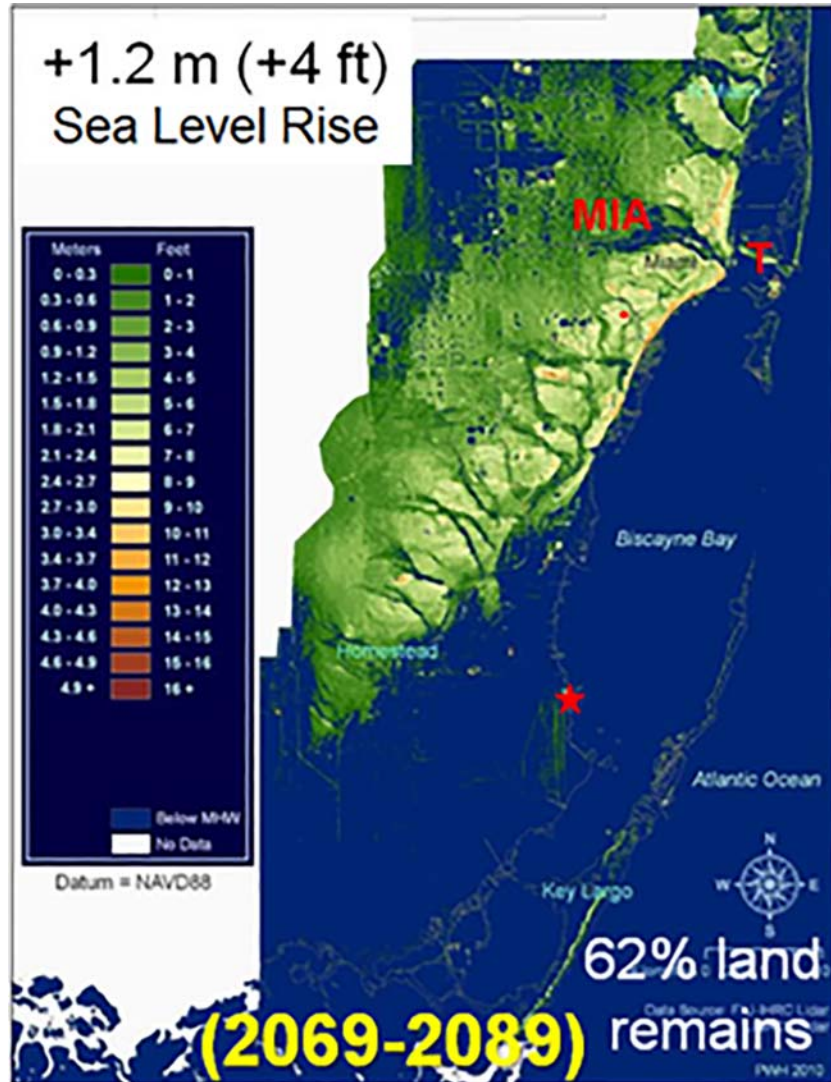


Figure 3: U.S. government sea level rise projections through 2100.²⁴

²⁴ Exhibit Z.







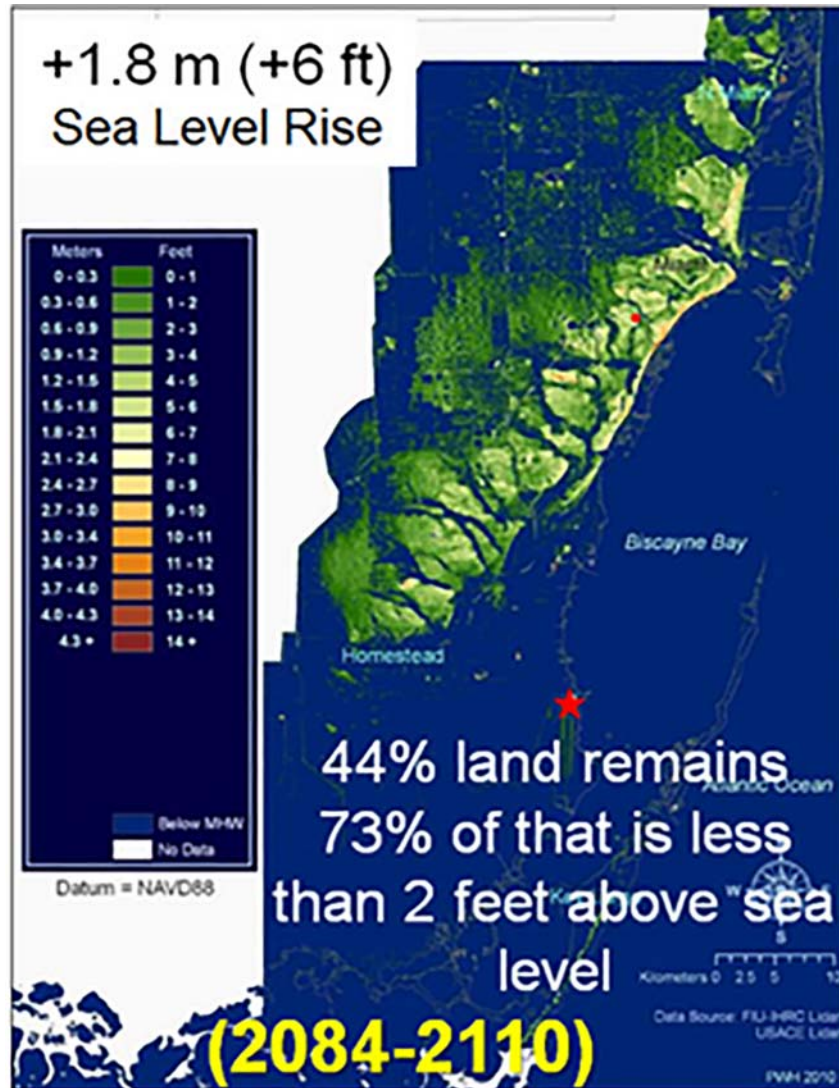


Figure 4: Sea level rise projections for southern Florida.²⁵

The economic impacts of sea level rise to our country will be astronomical. Just 25 years from now, coastal properties in the U.S. worth some *\$136 billion* will be at risk of chronic flooding. By the end of the century, that rises to *\$1 trillion* in properties at risk of chronic flooding—not to mention the billions of dollars that would be lost in other sectors.²⁶

National Security Threat

Many people in communities throughout the United States, including some along the Washington coast, are already being forced from their homes because of flooding

²⁵ Exhibit Z.

²⁶ Union of Concerned Scientists, *Underwater: Rising Seas, Chronic Floods, and the Implication for US Coastal Real Estate* (2018), available at: <https://www.ucsusa.org/global-warming/global-warming-impacts/sea-level-rise-chronic-floods-and-us-coastal-real-estate-implications>.

and sea level rise. All of these people, and many more, will be displaced permanently if we do not act now. This displacement would in turn lead to massive geopolitical destabilization. An expert declaration provided by retired Vice Admiral and Former Inspector General of the United States Department of the Navy, Lee Gunn, states:

Climate change is the most serious national security threat facing our Nation today. Climate change contributes to increased extreme weather events, rapidly changing coastlines, and conflicts over basic resources like food and water, which lead to humanitarian crises with increased migration and refugee flows. Climate change is a “threat multiplier” and “catalyst for conflict” and directly threatens our military and the “Department of Defense’s ability to defend the Nation.” Climate change poses unprecedented risks to our Nation’s economic prosperity, public health and safety, and international stability.

Vice Admiral Gunn goes on:

The great danger for young people, is that they are being handed a situation that is out of their control, a situation made more egregious due to the fact that the Defendants have a complete understanding of precisely how dangerous the situation is that they are handing down to these Plaintiffs.²⁷

Public Health

The medical community across the country is sounding alarm bells about the public health emergency that climate change is causing. As an *amicus brief* filed in support of my case in the Ninth Circuit, on behalf of 78 doctors and medical professional and 14 medical organizations,²⁸ stated:

The medical community widely considers the health effects of human-induced climate change, GHG emissions, and the other air pollutants that are emitted when fossil fuels are combusted to be significant public health threats, representing an unacceptably high level of risk for the current and future health of the U.S. population.²⁹

The Targets You Set Will Matter

What is clear now is that climate change is already dangerously affecting people within the United States with 1 degree of warming. It is not just scientists who have come to that conclusion. My co-plaintiffs and I, along with other communities and individuals that are experiencing the devastating impacts I have just described, understand the perils of living in this climate system. The situation is only going to get worse if the planet becomes 1.5°C warmer than pre-industrial levels. This is the temperature target that is called for by the Paris Climate Accord. It is the target called for in the Green New Deal, and by the countless cities, states, and climate advocacy groups around the country that have endorsed it. To be clear, 1.5°C of warming, or approximately 425 parts per million (ppm) of carbon dioxide in the atmosphere, is genocide, and a death sentence for human civilization as we know it. Even the 2018 IPCC report on the impacts of 1.5°C concluded that allowing the globe to warm to 1.5°C will involve devastating impacts. Chapter 5 of the report states plainly that 1.5°C is not safe:

Warming of 1.5°C is not considered ‘safe’ for most nations, communities, ecosystems, and sectors and poses significant risks to natural and human systems as compared to current warming of 1°C (*high confidence*) (see Chapter 3, Section 3.4, Box 3.4, Box 3.5, Cross-Chapter Box 6 in Chapter 3).

This body should never endorse a target that destroys Levi’s island and much of Florida or my Puget Sound, damages the lungs of children in the West, decimates the rich croplands of the midwest, or floods homes across the country from fossil fuel-fed unprecedented storms.

²⁷ Exhibit K.

²⁸ The organization are: American Academy of Allergy, Asthma and Immunology; American Academy of Pediatrics; American Association of Community Psychiatrists; American Heart Association; American Lung Association; American Pediatric Society; American Thoracic Society; Infectious Diseases Society of America; International Society for Children’s Health and the Environment; Medical Society Consortium on Climate and Health; National Association of County and City Health Officials; National Environmental Health Association; National Medical Association; and Society for Academic Emergency Medicine.

²⁹ Exhibit N, p. 8.

The now-pervasive 1.5°C target first appeared in the lead up to the 2009 UNFCCC Conference of Parties in Copenhagen, Denmark (COP 15), as a result of the advocacy of the Alliance of Small Island States (AOSIS). At a time where international political negotiations still revolved around 2°C, AOSIS advocated for “well below 1.5°C,” and relied on the work of Dr. James Hansen, one of our experts, and his colleagues’ research arguing that a 350 ppm CO₂ target was necessary to preserve a habitable climate.³⁰ In later research, Hansen and his colleagues determined that 350 ppm would only lead to 1°C of long-term warming, which was an important target to aim for by 2100.³¹ Yet as time went on and contentious climate negotiations ran their course, the “well below” portion of AOSIS’s “well below 1.5°C” position was lost, and the world’s governments settled on 1.5°C as a compromise goal. But they did so without any scientific support for the notion that we would be safe with 1.5 degrees of warming.

We have to ask ourselves: Are we willing to ‘compromise’ on our safety and our future?

In the long term, 1.5°C warming means melting most of the ice sheets on the planet and more than 70 feet of sea level rise (see Figure 5).³² The reason we know this is because this is what sea levels were the last time carbon dioxide levels were as high as they are today. According to a study by McGranahan et. al., over 600 million people live within 30 feet above sea level.³³ The Fourth National Climate Assessment, using modest estimates of sea level rise, found that “[s]ea level rise might reshape the U.S. population distribution, with 13.1 million people potentially at risk of needing to migrate due to a SLR of 6 feet (about 2 feet less than the Extreme scenario) by the year 2100.”³⁴



Figure 5: Map of the south Atlantic and Gulf coasts showing the inundation that would occur with 70 feet of sea level rise.³⁵

All of these people, and more, will be displaced if we allow the 1.5°C target to remain in place. Even the 2018 IPCC report plainly states that 1.5°C warming is not safe, but governments and groups continue to push us towards this disaster. At 1.5°C we also lose the world’s coral reefs and ocean life becomes threatened, meaning our food sources disappear and the rich biodiversity of our planet crashes.

³⁰Hansen, J., et al., (2008). *Target atmospheric CO₂: Where should humanity aim?* Open Atmos. Sci. J., 2, 217–231, doi:10.2174/1874282300802010217.

³¹Hansen, J., et al., (2013). *Assessing “dangerous climate change”: Required reduction of carbon emissions to protect young people, future generations and nature.* PLOS ONE, 8, e81648, doi:10.1371/journal.pone.0081648.

³²Expert Report of Dr. Harold R. Wanless, p. 6–7 (Exhibit Z); Declaration of Eric Rignot (Exhibit H).

³³McGranahan, G., Balk, D., & Anderson, B. (2007). *The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones.* Environment and urbanization, 19(1), 17–37.7.

³⁴U.S. Global Change Research Program. “Ch. 8 Coastal Effects”. *Fourth National Climate Assessment, Volume II, Impacts, Risks, and Adaptation in the United States* 335 (2018), <https://nca2018.globalchange.gov>.

³⁵Exhibit Z.

The writing is on the wall: this body needs to look beyond the arbitrary 1.5°C target for one that is based in the best available science, and that will allow us to avoid the most grievous impacts of climate change. Scientists tell us that 1°C (350 ppm CO₂) is the maximum level of long-term warming that our civilization can survive this century. And we likely need to return even closer to preindustrial CO₂ levels of 280 ppm over the longer term. So why aren't we acting like it?

Is it radical to seek integration of all schools instead of just some? Is it radical to stand up for the rights of children and future generations? Is it radical to want to stop the danger we face? Is it radical to want to save what you love?

A Remedy is Still Possible but the Window is Closing

We have the technology to follow the path of emissions reductions the experts say we need to in order to have a chance at health and survival for us and our planet. It is within reach to transition to a decarbonized energy system by 2050, and to increase natural carbon sequestration through reforestation and sustainable agriculture to bring us back to 350 ppm by the end of the century.³⁶ The U.S. needs to do its part in the world to make that happen. It will not happen without us.

While many critics often cite the expense of a transition to renewable energy, experts expect a transition off of fossil fuels would have a minimal increase on national energy costs, and the costs would be well below the historic spikes in energy costs due to volatile fossil energy prices (see Figure 6).³⁷ This temporary increase in energy system costs is trivial compared to the oppressive costs we can expect if we continue to stumble our way into an unmitigated climate catastrophe.

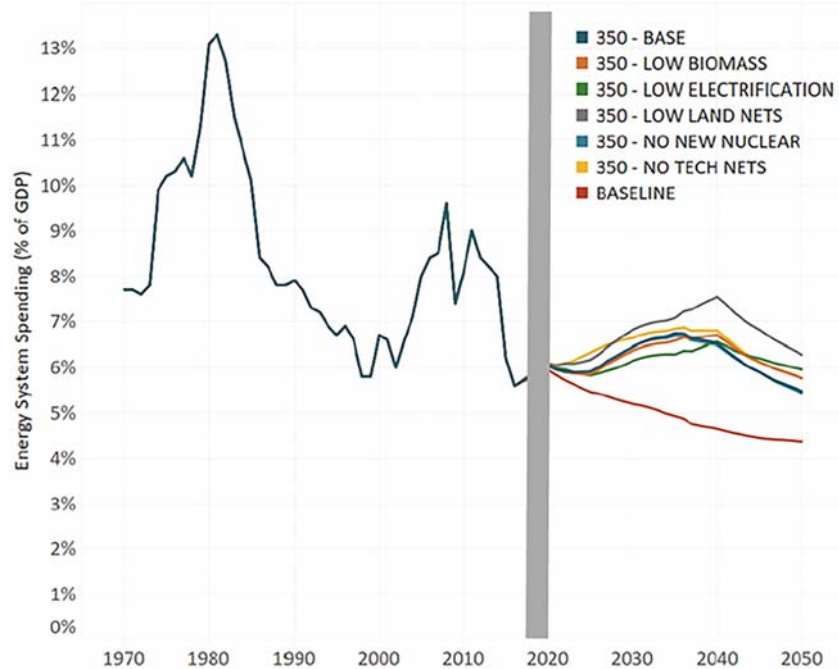


Figure 6: Total spending on the U.S. energy system represented as a percentage of GDP. Historical spikes from the 1970s oil crisis and high oil prices in 2006 2010. Modeled variations on the right illustrate the cost of multiple scenarios that transition the U.S. off of fossil fuels by 2050.³⁸

Because CO₂ is the primary driver of climate destabilization, all government policies regarding CO₂ pollution and CO₂ sequestration should be aimed at reducing

³⁶ Declaration of Mark Z. Jacobson (Exhibit C); Declaration of James H. Williams (Exhibit J); Exhibit V.

³⁷ Exhibit V.

³⁸ Williams, J. et al. *Assessing the feasibility of 350 PPM CO₂ targets in the United States*. 2019.

global CO₂ concentrations below 350 ppm by 2100. Other greenhouse gases should also be reduced as much as possible and as rapidly as possible. Time is running out. We can no longer afford to base greenhouse gas reduction targets, with tangible consequences for life and death, on politics rather than science.

We are at a critical juncture—never in my life have I seen so much momentum to address the climate challenge. We must not waste this energy, and as such, we must reevaluate our goals and where they are coming from. We can't truly succeed if we're relying on targets based on political compromise instead of the best available science.

We have a fundamental right to a liveable future, and that future requires us to limit global warming to 1°C by the end of the century.

Long-Standing Government Knowledge

My involvement in the Juliana lawsuit has given me insight into the injustices of climate change, and a better understanding of the United States Government's responsibility for it.³⁹ In preparing our case, we uncovered documents that show us that the Government has known about the threats of carbon dioxide for more than half a century. One of my co-plaintiffs, Alex, uncovered a 1961 letter to President Kennedy, where U.S. Senator Clinton Anderson voices the predictions of scientists about catastrophic climate change and sea level rise due to fossil fuel CO₂ emissions.⁴⁰ Just a few years later, President Lyndon B. Johnson received a more pointed warning in a report from noted climate scholar Charles David Keeling, and dozens of university researchers, that "man is unwittingly conducting a vast geophysical experiment," by burning fossil fuels.⁴¹ This 1965 White House report clearly outlined the connection between the burning of fossil fuels and climate change (see Figure 7).

³⁹ Expert Report of James Gustave ("Gus") Speth (Exhibit U).

⁴⁰ Exhibit BB.

⁴¹ Report of the Environmental Pollution Panel President's Science Advisory Committee, *Restoring the Quality of our Environment* (1965); available at: <https://babel.hathitrust.org/cgi/pt?id=uc1.b4116127;view=1up;seq=11>.



Figure 7: Cover of 1965 Restoring the Quality of our Environment report.

Back in September 1969, Daniel Patrick Moynihan, Urban Affairs Adviser to President Nixon, wrote White House counsel John Ehrlichman stating that CO₂ emissions resulting from burning fossil fuels was a problem perhaps on the scale of “apocalyptic change,” threatening the loss of cities like New York and Washington D.C. from sea level rise. The 1969 Moynihan Letter urged the Federal Government to immediately address this threat. Moynihan wrote that it was “pretty clearly agreed” that carbon dioxide content would rise 25 percent by 2000. “This could increase the average temperature near the earth’s surface by 7 degrees Fahrenheit.

This in turn could raise the level of the sea by 10 feet. Goodbye New York. Goodbye Washington, for that matter.”⁴²

Despite these warnings, and the many more that followed, our nation’s leaders actively perpetuated climate change by permitting fossil fuel extraction on public lands and subsidizing fossil fuel extraction (see Figure 8).

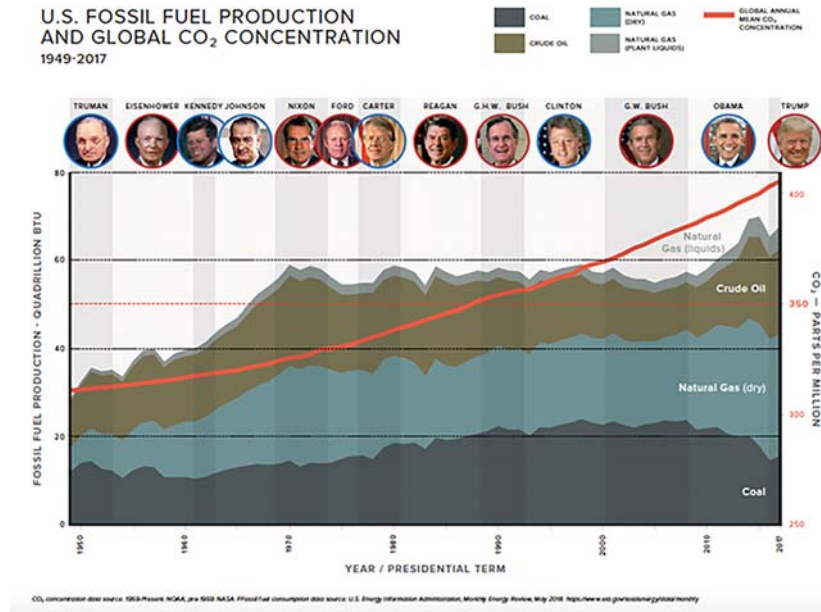


Figure 8: U.S. fossil fuel production and CO₂ concentration for every presidential administration since President Truman.⁴³

Historical Precedent for Our Case and Our Unalienable Rights

The *Juliana v. United States* lawsuit is not without precedent. In fact, it has ample support in the historic record, and even in the words of the Framers of the U.S. Constitution. According to expert historian Andrea Wulf, there are deep roots to the constitutional right to a stable climate. In her expert report, she discusses how the Founders believed that “Nature is the domain of liberty,” linking national “happiness, dignity, and independence” to the quality of the lands. She goes on to discuss how James Madison’s speech of 1818 was “emblematic of how deeply rooted the importance of nature in balance was to the Framers and to the young nation”:

Madison was the first American politician to write that ‘the atmosphere is the breath of life. Deprived of it, they all equally perish,’ referencing animals, man and plants. He spoke of the balanced composition of the atmosphere and the give and take of animals and plants, which allowed the atmosphere the aptitude to function so as to support life and the health of beings, according to nature’s laws.⁴⁴

The Framers adopted John Locke’s philosophy (“laws human must be made according to the general laws of Nature . . . otherwise they are ill made”) that human laws must conform to nature’s laws for the preservation of humankind. As such, Thomas Jefferson wrote extensively about this concept, stating “that our Creator made the earth for the use of the living and not of the dead . . . that one generation men cannot foreclose or burthen its use to another.”⁴⁵

⁴² Exhibit CC.

⁴³ Exhibit U.

⁴⁴ Exhibit AA.

⁴⁵ Thomas Jefferson to Thomas Earle, Sept. 24 1823, *The Writings of Thomas Jefferson* vol. VII, 310–11 (H.A. Washington ed. 1854).

All of these examples clearly demonstrate the fact that, while the Founding Fathers were unable to foresee the grave threat of human-caused climate change hundreds of years ago, they nevertheless intended to enshrine the protection of the public trust into our nation's constitution, and to ensure the fundamental right of present and future generations to access to the natural resources that previous generations benefitted from, and on which human survival depends.

Wulf goes on to reference other American presidents who have voiced the Government's responsibility to preserve the natural world for future generations, such as Theodore Roosevelt, who said:

The function of our Government is to insure to all its citizens, now and hereafter, their rights to life, liberty and the pursuit of happiness. If we of this generation destroy the resources from which our children otherwise derive their livelihood, we reduce the capacity of our land to support a population, and so either degrade the standard of living or deprive the coming generations of their right to life on this continent.⁴⁶

In Conclusion

Growing up with the looming threat of climate change has had lasting impacts on my mental health. Thinking about the future has been a constant source of anxiety and depression for me. I have felt as if there is a pressure cooker boiling over inside of me. I can hardly focus at times because I am overwhelmed with existential horror about the fate of planet.

I am a child of abuse. I know the feel of it on my skin and deep in my psyche. And what my government is doing to perpetuate indefinitely fossil fuel energy, and not take urgent comprehensive action to try to stop climate change, is a form of abuse on young people, who don't have the votes or the lobbying money to stop it. But we cannot just sit back and take it. Not anymore. Government actions that ramp up the danger, hurt our health, destroy our homes, endanger our communities, and scar our emotional wellbeing must stop.

My climate change-induced state of panic is not uncommon amongst my peers. According to Dr. Lise Van Susteren, another expert on our case and an Advisor for the Harvard Medical School Center for Health and the Global Environment, "it is the emotional toll of climate change that is even more catastrophic, especially for our children. It has the capacity to destroy children psychologically."⁴⁷

In Judge Aiken's 2016 opinion, she cites the Supreme Court when it wrote in *Obergefell v. Hodges*:

The nature of injustice is that we may not always see it in our own times. The generations that wrote and ratified the Bill of Rights . . . did not presume to know the extent of freedom in all its dimensions, and so they entrusted to future generations a charter protecting the right of all persons to enjoy liberty as we learn its meaning. When new insight reveals discord between the Constitution's central protections and a received legal stricture, a claim to liberty must be addressed.⁴⁸

Today I am telling you, Judge Aiken was right: "the right to a climate system capable of sustaining human life is fundamental to a free and ordered society."

I didn't become a climate activist because I like shouting outside of Government buildings or because I want to put my body on the line to block a tar sands pipeline.⁴⁹ I became a climate activist because I know that it is my moral responsibility to do everything in my power to stop catastrophic climate change. Your generation and the ones before you, sitting in your seats in positions of power, have decimated our planet. My words stand before you, representing the voices of millions of children, youth and future generations, who are trying to clean up the mess of our forebears. For years, the federal government and the same adults who created the disaster have marginalized us. No more. Climate change is here now. Waiting for the future is already too late.

It is clear: Without youth leadership and a constitutional guidepost, legislative efforts won't save us in time. The Executive Branch won't even fully admit climate change is real, and its leaders do the bidding of the fossil fuel industry. Half measures and incrementalism will only modestly delay the worst impacts of climate

⁴⁶ Exhibit AA.

⁴⁷ Exhibit M, p. 4.

⁴⁸ Exhibit S.

⁴⁹ Today, April 2, 2019, Judge Mary Ann Driscoll of Boston, MA just found that 13 people acting in civil disobedience to protect our climate from more fossil fuel projects were found not responsible in light of their necessity defense that their actions were necessary to protect life. http://www.climatedisobedience.org/raw_audio_westrox_climatetrial_27march2018.

change. If we want a future worth living, all three branches of our federal government must recognize our unalienable rights are at stake and work with the youth at the forefront of this movement, to guarantee that the constitutional right to a stable climate is recognized and protected in the United State of America.

Forget about being on the right side of history. If there even are history books, it will be because of the efforts that we are taking today. Be on the side of young people right now. Act as if our fundamental rights to life, liberty, property and equal protection under the law are as important as yours, those who came before us, and those who will come after us. We are all connected, and the work you do during your terms in this powerful office, should be on the right side of the youth who sit before you and we ask you to stand with us.

That is why I am asking all of you and this entire House to endorse the fundamental rights and the remedy sought in *Juliana v. United States* on the record, and to sign on to amicus curiae briefs in support of me and my co-plaintiffs, as your other colleagues have, including Senators Ron Wyden, Jeff Merkley, and Sheldon Whitehouse, and Representatives Debra Haaland, Peter DeFazio, Earl Blumenauer, and Rashida Tlaib.

We all have a moral imperative. And you have a constitutional one. If not us, then who? If not now, then when? If not for me, do it for your children, and your children's children, and for all life as we know it. Do it because when you took office, you made an oath "to uphold our Constitution" and "secure the blessings of liberty to ourselves and Our Posterity."

I will do my best to address any questions that you may have.

Thank you.

AJI PIPER,
Plaintiff, Juliana v. United States,
Beneficiary of the Public Trust,
and the U.S. Constitution

EXHIBITS

Exhibit A Urgent Motion for Preliminary Injunction
 Exhibit B Declaration of Kevin E. Trenberth in Support of Urgent Motion for Preliminary Injunction
 Exhibit C Declaration of Mark Z. Jacobson in Support of Urgent Motion for Preliminary Injunction
 Exhibit D Declaration of Jerome A. Paulson in Support of Urgent Motion for Preliminary Injunction
 Exhibit E Declaration of Peter A. Erickson in Support of Urgent Motion for Preliminary Injunction
 Exhibit F Declaration of Ove Hoegh-Guldberg in Support of Urgent Motion for Preliminary Injunction
 Exhibit G Declaration of Steven W. Running in Support of Urgent Motion for Preliminary Injunction
 Exhibit H Declaration of Eric Rignot, Ph.D in Support of Urgent Motion for Preliminary Injunction
 Exhibit I Declaration of Joseph E. Stiglitz, Ph.D in Support of Urgent Motion for Preliminary Injunction
 Exhibit J Declaration of James H. Williams in Support of Urgent Motion for Preliminary Injunction
 Exhibit K Declaration of Vice Admiral Lee Gunn, USN (Ret.) in Support of Urgent Motion for Preliminary Injunction
 Exhibit L Declaration of Dr. James E. Hansen in Support of Urgent Motion for Preliminary Injunction
 Exhibit M Expert Report of Lise Van Susteren, M.D.
 Exhibit N Brief of Amici Curiae Public Health Experts, Public Health Organizations, and Doctors
 Exhibit O Brief of Amicus Curiae Law Professors
 Exhibit P Appellants' Opening Brief for Interlocutory Appeal
 Exhibit Q Plaintiffs-Appellees' Answering Brief for Interlocutory Appeal
 Exhibit R Findings & Recommendation, Thomas M. Coffin (May 1, 2017)
 Exhibit S Opinion and Order-MTD, Ann Aiken (November 10, 2016)
 Exhibit T Opinion and Order-MSJ, Ann Aiken (October 15, 2018)
 Exhibit U Corrected Expert Report of James Gustave ("Gus") Speth
 Exhibit V Executive Summary of EER Research
 Exhibit W Declaration of Jayden F. in Support of Plaintiffs' Opposition to Defendants' Motions Dismiss

Exhibit X Declaration of Aji P. in Support of Plaintiffs' Urgent Motion for Preliminary Injunction
 Exhibit Y Declaration of Levi D. in Support of Plaintiffs' Urgent Motion for Preliminary Injunction
 Exhibit Z Expert Report of Dr. Harold R. Wanless
 Exhibit AA Expert Report of Andrea Wulf
 Exhibit BB Clinton P. Anderson letter to President Kennedy (February 14, 1961)
 Exhibit CC Daniel P. Moynihan memo to John Ehrlichman (September 17, 1969)
 Exhibit DD First Amended Complaint for Declaratory and Injunctive Relief
 Exhibit EE Appellants' Reply Brief for Interlocutory Appeal
 Exhibit FF Federal Defendants' Answer to First Amended Complaint for Declaratory and Injunctive Relief

Ms. CASTOR. Thank you, Mr. Piper.

Ms. Zhang, you are now recognized for 5 minutes.

STATEMENT OF MELODY ZHANG

Ms. ZHANG. Good morning. Thank you for the opportunity to testify before you to tell my story about how I came to care about the climate crisis as an essential part of my Christian witness.

My fascination with creation began ever since I started to speak. My first words, which were in Chinese, my heart language, were "chuqu," which means "go outside." There were seasons of my life devoted to poisonous frogs, another to Michigan birds. As a child, I was rapt with wonder, as children often are, with the richness and diversity of wildlife that can be found in God's creation. And when things got overwhelming, I retreated to my neighborhood parks, which served as a sanctuary for myself. I still do.

The practice of the presence of God in creation opens up my imagination and teaches me to listen. "Speak to the earth, and it will teach you, or let the fish in the sea inform you. In His hand is the life of every creature and the breath of all mankind," reads Job.

The scriptures elsewhere erupt with song and mention of God's abiding love for every corner of creation. Genesis 2:15 says that "the Lord God took the man and put him in the Garden of Eden to cultivate it and take care of it." In the Hebrew, these two words are "avad" and "shamar," and they appear often elsewhere in reference to God himself watching over and protecting us.

To me, it is clear that God has entrusted this great gift of creation to us, with the responsibility to steward it with utmost intentionality.

I love people. I can see the imago dei, the image of God, uniquely reflected in each person I meet. I believe that scripture could not be more clear about God's command to love our neighbors as ourselves.

I see that Jesus shows us how much he really means this when he intentionally makes His home among us. He seeks to draw nearest to the overlooked and the underheard, the outcasts in society. He lovingly lays hands on people who have shunned, heals them and spends precious time with them. Then, Jesus goes so far as to sacrifice himself to the point of death to reconcile to himself all things so that we may have new life. I testify that I am moved and changed by the depth of His compassion towards me and all of life on earth.

I learned for the first time that our earth was out of balance in my environmental science class. As I listened to the stories of thou-

sands of species going extinct and how weather patterns were being hijacked by climate change, I was shaken to my core and enraged. The earth is the one home we all have, and it is God's very first and wonderful gift to us. I can barely begin to imagine how much it must hurt God's heart.

I decided to continue exploring environmental issues at university. It was during this time the Flint water crisis unfolded right next to us in Michigan. I listened in utter shock and dismay as my classmates shared about their families having no choice but to drink and bathe in water lined with lead for years until the mainstream media took it up.

We organized daily water bottle drives to be sent to the people in Flint. And I learned that 60 percent of their population was made up of people of color and 40 percent were under the poverty line.

In this period of my life, I began to understand more fully what environmental injustice looked like played out in real-time. I was shaken at the reality of suffering I was witnessing, and my heart broke for these people, my neighbors.

Congress, today, I stand before you as climate justice coordinator for Sojourners, a Christian advocacy organization, and I serve as the co-chair for the steering committee of Young Evangelicals for Climate Action.

After the Flint water crisis, I saw with new eyes that ecological issues are not one-off, siloed problems without consequence to people's lives. I continue to witness the upending of livelihoods that brothers and sisters are already facing both here in our very communities and all over the world as a direct result of the climate crisis.

Just last week, historic flooding after a bomb cyclone in Nebraska killed three people and ravaged homes. Cyclone Idai killed 750 people and displaced 100,000 in South Africa. California wildfires last year were the deadliest, most destructive wildfires ever on record, and they killed 104 people.

I encounter these stories, and I am changed. If I do nothing, I am complicit. More than this, I am disobedient.

The impacts of the climate crisis are hitting our most vulnerable neighbors first, the ones Jesus loved to draw close to. People of color, women, and people living under the poverty line and the young generation are already bearing the brunt of the climate crisis while doing the least to contribute to it. No wonder why young people care.

As a Christian, I believe God calls us to a total and radical re-imagination and transformation of our relationship with others and the earth. As political leaders, especially ones of faith, I implore you to respond faithfully and with full force to love God and neighbor by enacting just, compassionate, and transformative climate policies which rise to the challenge of the climate crisis.

And we don't have a lot of time. So I invite you to dream beyond this deep-rooted partisanship into co-creating a world of wholeness together.

And to my fellow believers in the room, we live in the era of the resurrected Christ. So let us practice resurrection. We can begin to cultivate wholeness in our communities by addressing the climate

crisis faithfully and with full attention. It is a fulfillment of the commandment to love our neighbors as ourselves. And that is my prayer for you.

Thank you.

[The statement of Ms. Zhang follows:]

Testimony of Melody Zhang

Thank you for the opportunity to testify before you, to tell my story about how I came to care about the climate crisis as an essential part of my Christian witness.

My fascination with creation began ever since I started to speak. My very first words—which were in Chinese, my heart language—were 出去, which means, “go outside”. When I learned to read, I had stacks upon stacks of wildlife binders, scrutinizing over every new animal card I received each week. There were seasons of my life devoted to poisonous frogs, another to Michigan birds, and yet another to fish. As a child, I was rapt with wonder and curiosity—as naturally children often are—with the richness and diversity of wildlife, plants, colors, and textures that can be found in God’s creation. And when things got overwhelming, I retreated to my neighborhood parks which served as a sanctuary for me, a place I could communicate with God and be myself. I still do. The practice of the presence of God in creation opens up my imagination, my senses, and teaches me to listen. “But ask the animals, and they will teach you, or the birds in the sky, and they will tell you; or speak to the earth, and it will teach you, or let the fish in the sea inform you. Which of all these does not know that the hand of the LORD has done this? In his hand is the life of every creature and the breath of all mankind,” reads Job 12:7–10.

The Scriptures elsewhere erupt with poetic song in mention of God’s deep and abiding love and connection with every corner of creation. Psalm 19:1 says, “The heavens proclaim the glory of God, the skies display his craftsmanship”. Genesis 2:15 says that “the Lord God took the man and put him in the Garden of Eden to cultivate it and take care of it”. In the original Hebrew, these two words are *avad* and *shamar*, which mean to serve and to protect. They both appear often elsewhere in reference to God Himself watching over and protecting His people. How powerful an image this is! So to me, it is clear that God has entrusted this great gift of creation to us with the responsibility to steward it with utmost intentionality and care. The earth is the very first gift we are bestowed, and in fact our first commandment is to tend it and to take care of it.

I love people. I can see the *imago dei*, the image of God, uniquely reflected in each person I meet. I believe that Scripture could not be more clear about God’s command to love our neighbors as ourselves. When asked what the greatest commandment of all was, Jesus replies, “Love the Lord your God with all your heart, soul, mind, and strength.” The second is this: “Love your neighbor as yourself.” (Mark 12:30–31). I read on and see that Jesus shows us how much he really means this when he intentionally makes his home on earth among us (John 1:14), then seeks to draw nearest to the overlooked and the underheard, the outcasts in society. He lovingly lays hands on people who have been shunned; He heals them and spends precious time with them. He tells provocative parables like that of the Good Samaritan, about a traveler who gives selflessly to lift up and nurture a complete stranger of the “other” race back to life. Then, Jesus goes so far as to sacrifice himself to the point of death to “reconcile to himself all things, whether things on earth or things in heaven, by making peace through his blood, shed on the cross” (Colossians 1:15–20) so that we may have new life. I testify that I am moved and changed by the depth of His compassion towards me and all life on earth. So, I love because I am deeply compelled by this revolutionary, powerful love which He embodied and modeled for me first.

I learned for the first time that our earth was out of balance in my Environmental Science class at school. As I listened to stories about thousands of species going extinct, entire forests being cleared, and how weather patterns were being hijacked by climate change, I was shaken to my core and enraged that we could allow—and even cause—these things to happen. The earth is the one home we all have, and it is God’s very first and very wonderful gift to us. I can barely begin to imagine how much it must hurt God’s heart.

I attended university in Michigan and decided to continue exploring environmental issues. It was during this time that the Flint water crisis unfolded right next door to us. I listened in utter shock and dismay as my classmates shared about their families having no choice but to drink and bathe in water lined with lead for years

until the mainstream media took it up. We organized daily water bottle drives to be sent to the people in Flint, launched campaigns to fundraise for a permanent solution to fixing the corrosive water pipes, and reported on their stories. I learned that 60% of Flint's population was made up of people of color, and 40% were under the poverty line. I had heard about environmental issues affecting people negatively, but in this period of my life I began to understand more fully what environmental injustice looked like played out in real time. It brought urgency to what I was learning in school in a way nothing else did. I was shaken at the reality of suffering I was witnessing and my heart broke for these people, my neighbors. Didn't Jesus call us to love them, to look after their well-being? Didn't he say, "whatever you do for the least of these brothers and sisters of mine, you do for me" (Matthew 25:40)?

Congress, today I stand before you as Climate Justice coordinator at Sojourners and serve as Co-Chair for the Steering Committee of Young Evangelicals for Climate Action. After the Flint water crisis, I saw with new eyes that ecological issues are not one-off, siloed problems without consequence to people's lives. As I grow deeper in my journey of loving God and neighbor as self, I continue to witness the upending of livelihoods that my brothers and sisters are already facing—both here in our very communities and all over the world—as a direct result of the climate crisis. Just last week, historic flooding after a bomb cyclone in Nebraska killed three people and ravaged entire homes. The catastrophic Cyclone Idai killed 750 people and displaced 100,000 in Mozambique, Zimbabwe, and Malawi. California wildfires last year were the deadliest, most destructive wildfires ever on record and they killed 104 people. I encounter these stories, and I cannot help but be changed. If I do nothing, I am complicit. More than this, I am disobedient. Indeed, we are seeing deadly, unprecedented extreme weather events almost on a weekly basis now, all of which are exacerbated and heightened by climate change. The impacts of the climate crisis are hitting our most vulnerable neighbors first, the very ones Jesus loved to draw close to. People of color, women, people living under the poverty line, and the young generation are already bearing the brunt of the climate crisis while doing the least to contribute to it. No wonder why young people care, especially young women of color like me. We are the first generation who will experience the most intense impacts of this humanitarian crisis, and our livelihoods are in jeopardy. Creation and people—both of which God deeply loves—are in peril and it breaks my heart. Romans 8:22–23 says, "The whole creation has been groaning as in the pains of childbirth right up to the present time. Not only so, but we ourselves, who have".

As a Christian, I believe God calls us to a total and radical re-imagination and transformation of our relationship with others and the earth. We yearn toward a future vision of complete reconciliation for all of God's created order. As political leaders, especially ones of faith, I implore you to respond faithfully and with full force to love God and neighbor by enacting just, compassionate and transformative climate policies which rise to the challenge of the climate crisis. And we don't have a lot of time. That is why it takes courage, and the creativity, energy, and moral leadership of young people like us. Congress, I invite you to dream beyond this deep-rooted history of partisanship into co-creating a world of wholeness together. To my fellow believers in the room, we live in the era of the resurrected Christ. So then. Let us practice resurrection. We can begin to practice the cultivation of wholeness in our communities by addressing the climate crisis faithfully and with the full attention it demands of us. It is a tangible fulfillment of the commandment to love our neighbors as ourselves. That is my prayer for you. Thank you.

Ms. CASTOR. Well, thank you all very much for your passionate and insightful testimony.

I recognize myself for 5 minutes for questions.

You all have given voice to the fact that climate change is one of the most urgent, complex challenges humanity has ever faced. We must wrap our heads around it. We have to wrap our heads around the scale of the problem and the potential consequences of failing to rise to the challenge.

As a result, some people react to the crisis with fear and apprehension and even despair. And those are understandable feelings. But in recognizing a crisis, Americans can rise to the occasion. We can come together to see our way to solutions. The witnesses we have just heard from have found resolve in the face of crisis and have taken action to be part of the solution.

So I would like to ask each one of you, where do you find hope and optimism in the face of such a daunting problem?

Mr. SUGGS, will you start?

Mr. SUGGS. Yes, ma'am. Thank you, Chair Castor.

I believe that I find my most hope and my optimism in the faces of people in my community. I have seen how resilient and how responsive we have been to these natural disasters that affect us so extremely.

Hearing the stories of how Hurricane Floyd in 1999, the year before I was born, devastated so much of my community but how people immediately went back and tried try to rebuild. People stayed in Kinston and started businesses and homes elsewhere in the community. They loved our community so much that they did not allow the catastrophic flooding from Floyd to overall destroy them.

And then when Hurricane Matthew hit in 2016, I remember standing on a picnic table right along the banks of the Neuse River. And I and my organization, Kinston Teens, organized a prayer gathering and a volunteer rally to bring our community together. This was the day after the hurricane hit but in the days before the flooding. And I stood on top of a picnic table. There were around 350 people surrounding me—all walks of faith, all walks of life, all races, all political parties, everything. We came together in prayer, and we immediately started volunteering, preparing sandbags placed in front of homes and businesses and doing whatever we could to help our community prepare for the floods.

And that is where I see my optimism coming from, that is where I get my faith from: just from how resilient my community has been in spite of all the challenges.

Ms. CASTOR. Ms. Cooper.

Ms. COOPER. I wholeheartedly agree with what Mr. Suggs said. And I think I am most hopeful when there is a vision.

I was just reading the proverb on the wall that says, "When there is no vision, the people perish." And in Louisiana, that is what we are really learning to embrace.

I work for the Governor's Office of Coastal Activities, and I am so encouraged just to see the plan that we have, the work that we are doing, to go to these sites to see new barrier islands that we are building, new wetlands that we are building, and people who can live in their communities in south Louisiana because of this vision that we have.

And I think a vision for Louisiana and a vision for our whole nation is so important in this way, because without that our people will perish and our people of Louisiana will perish as well.

Ms. CASTOR. Mr. Piper, you expressed a bit more frustration in your remarks, but what do you want to see?

Mr. PIPER. I would say that the hat hasn't dropped, so to speak, on the climate crisis. We still have time to act. And so I will not feel despair, because we haven't failed yet.

Ms. CASTOR. Ms. Zhang.

Ms. ZHANG. I am definitely energized by the creativity and the joy that young people bring to this movement. I was just at the climate march, the youth climate strikes, a few weeks ago, and there was just a palpable joy there. And people—there was color, and there was fun, and there was dancing, part of it.

And I think that is why we are sustained in our movement, is that we know when to have fun and to not make light of the issue but really to be able to sustain us for the long run.

Ms. CASTOR. You know, if you want to be spurred into action, you may want to pick up the new book, "The Uninhabitable Earth: Life After Warming" by David Wallace-Wells. I have been reading it on the airplane going back to Florida.

The author points out in the book that the majority of carbon emissions from fossil fuel combustion have occurred since "Seinfeld" premiered 30 years ago in 1989 and that we have 30 years to turn it around.

But I am not sure that we have that long. The IPCC has concluded that we must reach net-zero carbon emissions by 2050 in order to have a chance to keep warming below the significant level. So for every bit of extra warming, the world will experience more heat waves and heavy precipitation events, sea-level rise, species loss.

2050 is just 31 years from now. All of you will be about our age, the age of us on the dais. And I really appreciate everything that you have said today to help spur us on to action and kick off our first hearing.

With that, I will recognize the ranking member for 5 minutes for questions.

Mr. GRAVES. Thank you, Madam Chair.

And I want to say thanks again to all of you for being here, and I appreciate your testimony.

And, Mr. Suggs, having been through numerous disasters, I really want to commend you for your work. One of the most uplifting things you can do is go to someone who is a disaster victim and offer them a helping hand. And it is the most important thing that you can do, is to just offer folks help, offer them assistance. Folks are often looking around trying to figure out where to even start.

And so I really want to commend you, recognizing that you were impacted by the disaster, but rather than sitting around licking your wounds, you actually lifted those up. And so thank you very much. A huge, huge impact on communities, having been through many disasters myself.

You know, I want to ask each of you a question. One of the challenges we have here in this committee is we have to recommend actions. We have to recommend what actions the Congress should take in changing laws and policies. And there are so many things. We could probably go around this room, and we could probably get hundreds of different recommendations. And so one of the things we need to do is we need to determine which of those actions actually make the most sense, which of them are going to have the biggest impact, looking at tradeoffs.

Do you believe that we should apply some type of criteria to our decisions, looking at which recommendations we are making are actually going to have the biggest impact on temperature or sea rise, and also take into consideration looking at economic impacts, if, for example, one recommendation would have dire economic consequences? If there is another one that can achieve the same objective but not have as dire economic consequences, I mean, don't you

think we should consider—or do you think we should consider things like that before we make recommendations?

Mr. SUGGS.

Mr. SUGGS. Thank you, Ranking Member Graves.

I absolutely do believe in practicality. I believe that, when it comes to policy, when it comes to legislation, when it comes to any type of action items that are taken on behalf of, you know, such a large country as the United States, we do need to think of all the logistics. We need to make sure that we are not making matters worse in any capacity.

So, considering the issues that we faced in Kinston, for example, I do want some ambitious action to be taken, but I don't want anything to happen that may disparage my community even more or disparage another community on the other side of the country. So I definitely believe in practicality.

Mr. GRAVES. Thank you.

Ms. Cooper? Quickly, do you have—

Ms. COOPER. Yes. I agree, I think economic implications can be a large consequence of climate action. And so I think what is most important is working on both sides of the aisle in a nonpartisan, bipartisan manner to implement these policies that we are working towards in this committee and the ideas that we are working towards.

Mr. GRAVES. Thank you.

Mr. Piper.

Mr. PIPER. Yes. Thank you for this question.

I am mostly in agreement that economics definitely must be considered, seeing—

Mr. GRAVES. And let me clarify the question. I am sorry. Economics is one, but also just looking at the efficacy of these recommendations. If we are making a recommendation, should we evaluate, you know, sort of what impact it is going to actually have in terms of the environment, looking at temperature changes, looking at sea rise and things like that? So not just economic, but actually looking at and quantifying the types of, you know, say, benefits that these recommendations would yield.

Does that make sense?

Mr. PIPER. Yeah, that makes—well, I was saying that economics obviously must be considered, but I think, more importantly, recommendations must be made following science and what scientists say is needed to protect the natural resources and to avoid dangerous effects of climate change. And I think that definitely must be considered when making recommendations.

Mr. GRAVES. Thank you.

Mr. Piper, I will actually ask you one other question. I read through all of your testimony. That was long. I want to make sure I understand one thing about your recommendations.

As you know, under Paris, there were targets that were established under the previous administration. Do you believe those targets are appropriate, or do you think that—no, you don't?

Mr. PIPER. No, those—so the targets in Paris, the 1.5-degree Celsius global warming kind of cap that they have will actually lead to catastrophic disaster. And so we cannot hold those as a standard if we are to take any actual action on climate change.

So, while it may seem like they are really radical or positive kind of caps or targets, they are not as——

Mr. GRAVES. Aggressive.

Mr. PIPER [continuing]. Aggressive as they need to be.

Mr. GRAVES. And so, fair to say, your perspective, that you wouldn't support Paris targets because you think they should be more aggressive than Paris?

Mr. PIPER. Yes. But I still recognize that it is a step in the right direction.

Mr. GRAVES. Thank you.

Ms. Zhang, I apologize, but very quickly, if you could respond.

Ms. ZHANG. Absolutely. I believe as Christians we are called to bold and compassionate action, and sometimes, you know, that takes courage.

I know that solar energy already employs more than coal, oil, and natural gas combined. So it is definitely not either/or, but it can be both/and. And so it is a boost for the economy. And 70 percent of the American public are concerned or very concerned about climate change.

Mr. GRAVES. Thank you.

Thank you, Madam Chair.

Ms. CASTOR. Thank you.

Ms. Bonamici, you are recognized for 5 minutes.

Ms. BONAMICI. Thank you, Chair Castor and Ranking Member Graves.

And thank you to all of our witnesses. And I also want to especially welcome the other students and children who are here at this hearing today.

You know, I represent a district in Oregon, and in the Pacific Northwest, we know climate change is not a distant threat; it is reality. We have had smoke from wildfires. We have acidic oceans that are threatening the shellfish industry; decreased snow pack limiting access to skiing and snowboarding, and that is affecting our outdoor recreation industry. Droughts and extreme weather patterns affect our agriculture community. We are concerned about warmer temperatures in the Columbia River further endangering salmon. And rising sea levels, of course, on our coast threaten homeowners and small businesses.

So the science is clear, and the consequences for continued inaction are serious.

And, you know, we have talked a little bit about the Intergovernmental Panel on Climate Change report, and then, of course, the Fourth National Climate Assessment. Some people say those were wake-up calls. They are more than that. They are alarming.

I am glad we are starting this committee's work by highlighting the efforts of young leaders across the country, reaffirming the urgency of taking action.

And, Mr. Piper, thank you for your leadership on the Juliana case to hold the federal government responsible for failing to act on climate change.

I know that one of your advisors is Dr. James Hansen. And when we are talking about—Chair Castor mentioned something about 30 years. Dr. Hansen was one of the first experts to testify in Congress about climate change, and the year was 1988. It could have

been in this room, because this is the Science Committee room, and he was with NASA at the time.

I remember 1988 well, because that is the year my son was born. He is now 30. So when we look at when the first testimony was here in the U.S. House—and 30 years have passed. And so I think it is a lesson for us that we must heed the call.

And so I am inspired by your work and your advocacy especially, Mr. Piper, in my home State of Oregon, where, of course, the case is filed.

You noted that the district court found the right to a climate system capable of sustaining human life is fundamental to a free and ordered society. That is from the opinion, district court opinion. And a stable climate system is quite literally the foundation of society.

So you mention in your testimony that it should be the responsibility of all three branches of government, not just relying on the courts. So can you expand a little bit about that? If the case is pending in the courts, why shouldn't we let the courts decide? Why should we take action in Congress?

Mr. PIPER. So the courts don't make the laws—first, sorry. I want to thank you for the question.

Ms. BONAMICI. That is okay.

Mr. PIPER. But the courts don't make the laws. And, you know, they interpret the laws. But we need laws and policy to be made in order to move forward on this.

And so, while in the courts what we are asking the court to do is recognize our rights and see the Constitution demands that our rights be protected and that laws need to be made, ultimately the laws need to be made by the legislative branch.

Ms. BONAMICI. Of course. Right. Thank you. And I certainly understand that and know that that is our responsibility here on the Select Committee. We are going to be working with several of the committees in making sure that we get the best policy.

Mr. SUGGS, you said that East Kinston is a low-income, predominantly black neighborhood, and the effects of natural disasters exacerbated by climate change are often compounded with limited access to food, hospitals, medical supplies.

So it is really inspiring to hear about your work. What can we do at the federal level to support vulnerable communities like yours to help you prepare and cope with the effects of climate change?

Mr. SUGGS. Thank you so much, Ms. Bonamici.

I believe that there are so many different approaches we can take: one definitely addressing the human impact on the environment, reducing emissions and things of that sort; but, also, doing things on a more local and really immediate level, implementing some flood-mitigation efforts.

Because there are so many communities and neighborhoods like mine that are located in low-lying areas along the banks of rivers and along the Outer Banks of North Carolina that could use some efforts to mitigate the floods, to prevent our rivers and banks from overflowing. So there are so many efforts that could be taken when it comes to that approach as well.

Then, also, investing in economic development and education to help empower the people in those communities to come up with so-

lutions themselves as well. Because it is a multiple way approach that I believe could really make a difference in our community.

Ms. BONAMICI. Thank you so much.

And I want to again thank all the witnesses who are here.

When I think back to that year, 1988, when James Hansen, NASA scientist, was here testifying about climate change, let us not think about the future and looking back and saying they did nothing. Let this be the time that we take action. Let this be the year, let this be the Congress when we heed that call. Because it is about your future; it is about the future of the next generation and the generations to come.

So thank you for your leadership, Chair Castor, and I yield back.

Ms. CASTOR. Thank you very much.

Mrs. Miller, you are recognized for 5 minutes.

Mrs. MILLER. Thank you, Madam Chairman. And thank you all for being here today.

As many of you may be aware, my home State of West Virginia is abundant in natural resources. Coal and natural gas from West Virginia help fuel the world and create good paying jobs for my constituents. I have seen the devastation that a top-down, one-size-fits-all government approach can cause.

We saw this with the war on coal from the Obama administration. The decimation of the coal industry in my State ravished our economy, particularly in the southern part of the state. It created great hopelessness and ultimately led to the rise in our opioid crisis. My district is slowly recovering.

The heavy hand of the federal government has consequences, and it can ruin communities. This is why I want to empower our state and local governments, as well as our communities, as we seek to find solutions and policies for our environment.

Ms. Cooper, given your experience in state government, what are some of the policies and regulations on the federal level that make it difficult to start and complete restoration projects?

Ms. COOPER. Thank you for the question, Mrs. Miller. I think on the state level with our coastal protection and restoration that we are doing in Louisiana, we have a whole agency that just is dedicated to this with state-of-the-art coastal scientists modeling systems and engineers that are working on this issue.

But I think a problem that we face a lot is in permitting on the federal level and with funding. Those would be two of our main problems. Funding in that we don't receive all of the money from offshore oil that we would like to fund our restoration projects.

And then on the permitting side, these processes are long and arduous, and they take years to get through. And when we are trying to restore the environment, it is challenging to wait this long, because you know the wetlands continue to degrade more and more as we wait in these permitting processes and as this takes longer. So if we can get that done faster, then we can restore even more wetlands.

Mrs. MILLER. So removing some of the red tape is what you are saying, in essence?

Ms. COOPER. Yes.

Mrs. MILLER. Okay. What are some of the ways the Federal Government can be a better partner to help our state and local governments?

Ms. COOPER. As I mentioned with the offshore revenue sharing, we are a part of this partnership called GOMESA funding from offshore revenue that happens from the Gulf Coast. And we are responsible for a large portion of the offshore oil and revenues that come to the federal government. And I think if we were allocated our proper amount, in that we would be able to fund more restoration projects that we are working on.

Mrs. MILLER. Okay. Thank you.

And what are some best practices, in your experience, that the State of Louisiana has implemented to preserve the environment without costing jobs in the energy industry?

Ms. COOPER. Right. So as you know, coming from West Virginia, our economy as well is heavily reliant on the industry that surrounds us. So we find it most successful to partner with the industries that we are working with.

We receive a lot of our funding from state mineral revenues, from offshore oil, like I had mentioned, and from oil spill compensations. And so we find this partnership works best for us, because we couldn't do restoration on the scale that we do without receiving the funding that we do through these programs. So I think developing those partnerships and learning to work in a compromising manner is really the only way that we can provide long-term solutions to this problem.

Mrs. MILLER. And you are using innovation in that equation as well?

Ms. COOPER. Yes, yes. Definitely.

Mrs. MILLER. All right. Thank you so much.

Madam Chair, I yield back my time.

Ms. CASTOR. Thank you.

Mr. Huffman, you are recognized for 5 minutes.

Mr. HUFFMAN. Well, thank you, Madam Chair, for bringing these young leaders as our first hearing of the select committee to remind us that we are dealing with a crisis. If you believe that we have the luxury of time, if you believe that we have the luxury of incrementalism, I would submit that you are in the wrong room and probably in the wrong century.

Just last month, I joined students at Casa Grande High School in Petaluma, in my district, in a climate walkout. The first time I have ever encouraged kids who were skipping school. But they were engaging in civil disobedience, or what our colleague Congressman John Lewis might call good trouble. And the reason why is very clear. There comes a time when there is an issue and a cause that is so important that you have to engage in some unconventional tactics. And the climate crisis is that issue.

All over the country, all over the world, young people are finding their voices on climate change. And I thank the witnesses today for offering their voices and calling on those of us in office to heed that call. This level of engagement and activism is one of the best things that I have seen in my many years of beating my head against the wall on this issue. And trust me, I have been at it for a while.

Just as the youth of the 1960s became the fulcrum of change for ending segregation for civil rights, for voting rights, I think the students who led this walkout, and the students who are here and the young people who are here today, are motivated by the need to address climate change and its impacts in a way that is very similar. It reminds me of the 1960s and the civil rights movement.

You are focused on the loss of coral reefs, sea level rise that will endanger coastal communities worldwide, food shortages, and many other catastrophic impacts of climate change. And don't let anyone tell you that your demand to have a livable planet for your lifetime and for your children is unreasonable or extreme or radical. It is really not. It is essential that we hear your voice.

For the many students in my district, this is deeply personal. Their communities are still recovering from wildfires that were the deadliest and most costly in our State's history, a situation that will only get worse with climate change. Last year, California's Fourth Climate Change Assessment found wildfires larger than 25,000 acres could become 50 percent more frequent if we fail to act.

So you are calling for swift action to stop climate change, and that is the right message, and I believe you are the right messengers. But I know that when young people call for change, they are often ridiculed and dismissed as being unreasonable. They are urged to think incrementally. That might have been the right conversation a few decades ago. And it was over four decades ago. In 1981, just down the hall in this very building, one of the first congressional hearings on climate change was held. Ms. Bonamici referenced a 1988 hearing with Dr. James Hansen. Well, in 1981, a Congressman named Al Gore held a hearing on this subject. And don't you wish that we could go back in time and tell the Members of Congress in that room and tell the world that was tuning in to that hearing, listen to this man. He is right. In just a few decades, we are going to start losing our coral reefs. We are going to have several multibillion dollar extreme weather catastrophes a year in this country. This is a real crisis, and you don't have the luxury of time.

So we can't go back in time, unfortunately, and speak to the Congress of 1981 or the people of 1981. As the saying goes, the best time to plant a tree is 10 years ago, right? But the next best time to plant a tree is right now. And we need to plant a lot of trees very quickly.

So the good news is today you are speaking to the United States Congress. And some folks are tuning in, I hope, on C-SPAN, which Al Gore helped to create, by the way.

So do you have a final word or sentence to this moment for the Members of Congress who are listening, for the folks who are tuned in on Al Gore's C-SPAN, that hopefully are listening this time and understand the urgency?

I open it up to any of you to speak to that.

Ms. COOPER. So I appreciate your statement and your question as well. I think in Louisiana, we see the detrimental impacts of a changing climate like none other. And anyone can see that, regardless of what political party you are, regardless of what industry you work in. Everyone can see that. All the communities that we are

working with, all of the people. And even at a Federal level, you can see the coast of Louisiana degrading. And I think what I would emphasize to Congress is compromise, to put aside our partisanship—

Mr. HUFFMAN. Can I followup on that? Would you indulge the shortest of questions? I know I am beyond my time, but, Ms. Cooper, I am very moved by your passion for preventing the impacts and addressing the resiliency needs of the Louisiana coast, to you and Mr. Graves, who is a real champion on this. Please tell the folks back home that he is constantly beating this drum. My answer is, yes, let's do it. Let's act boldly to preserve your coastline and to build your coastal resiliency.

But wouldn't you agree that at the same time as we do those things, if we are making the climate warmer by failing to address emissions, we are not really helping you? Would you agree with me on that?

Ms. COOPER. I would, but I believe that it is all about compromise. I don't think it has to be zero percent oil and gas or 100 percent oil and gas. I think we need—what we need is a gradual transition. We need technological innovation that keeps pace with our transition away from oil and natural gas. I don't think it can happen overnight.

In Louisiana, too much of our jobs and our livelihood and economy is dependent on this. And so I stand firmly behind that.

Mr. HUFFMAN. I appreciate that. Thank you, Madam Chair.

Ms. CASTOR. And I would like to welcome Congresswoman Mary Gay Scanlon of Pennsylvania for joining us today and sitting in. So welcome.

Now, Mr. Armstrong, you are recognized for 5 minutes.

Mr. ARMSTRONG. Thank you, Madam Chair. And thanks to everyone sitting here.

We have a big closeup group, program in North Dakota, and our high school kids are out here over the course of the last 3 weeks. And my favorite thing in the entire time I am in this town is when I see young people becoming engaged in things, whether I agree with them, disagree with them, or anything. I think it is fantastic. I think you bring perspective that we oftentimes lack hearing from when we are in this town.

And so as we go through this—I am from North Dakota. We have kind of—we produce the world's food, we produce the world's energy. So trying to figure out how you want to make sure that we keep these competing interests at play is sometimes interesting.

So I called the smartest kid I know who I used to coach as a 12-year-old in baseball, and he submitted a letter which, when I am done, I am going to ask for unanimous consent to put in the record. But I know I don't always read those, so I am going to read—we will get you one.

So I am just going to read the letter from my good friend, Tanner Hopfauf.

Dear Congressman Armstrong, I am writing to share my input in response to the Select Committee on the Climate Crisis announced hearing entitled Generation Climate: Young Leaders Urge Climate Action Now.

The hearing is described as a contrast to a typical congressional hearing. The committee will hear from young leaders who are urging policy leaders to take climate action now and finally address climate crisis.

I work in the oil and gas industry in North Dakota, and I consider myself a young leader who would be directly impacted by climate action being discussed in Congress. This is a complex issue, so I hope the committee will consider my perspective, which is shared by many young leaders throughout the country who may not be represented at the hearing today.

I grew up in southwestern North Dakota in the rural town of Dickinson. I attended K–12 here and graduated from Dickinson High School in May of 2014.

While in high school, I decided I wanted to pursue a degree in engineering. And with the increase in activity and opportunities presented by the oil and gas industry, I knew petroleum engineering was my goal. Once I learned that the University of North Dakota offered a bachelor's degree in petroleum engineering, I applied and was accepted.

While attending UND, I was fortunate enough to have an internship during each of the three summers, two of which were in western North Dakota. Upon graduating in 2018, I accepted a position with an exploration and production company and have been there since. My career thus far in educational decisions would have been drastically different were it not for the oil and gas industry in my community.

My story is not unique. Before the oil and gas industry became established, many young adults from rural North Dakota were forced to look for jobs and career opportunities out of State after graduating. Simply put, the jobs that offered long-term career advancement that would appeal to young adults entering the workforce did not exist in North Dakota. As a result, our rural communities were shrinking, and we are losing our small town culture and way of life so many had enjoyed for generations.

The oil and gas industry has completely changed this outlook. Local citizens now have the opportunity to go to work and have careers in the areas they have always called home. This industry has provided a spark to our communities and has given a breath of life back to them.

Communities that have been shrinking for many years have now begun to grow and prosper. People are choosing to move and live in rural North Dakota because of the careers that are now available. Additionally, local residents now have the ability to remain in their hometown while having successful and meaningful careers. The boom in the economy has provided so much for the individuals that are working directly in the industry, but it has also positively influenced the way of life for all citizens living in the area and even the entire State.

Rural citizens have benefited from increased infrastructure, advancing education systems, and additional sources of entertainment. So many things that rural North Dakotans would have never thought possible or to be available in their communities now are available because of this industry.

The oil and gas industry is reshaping North Dakota and the economy at the local and the State level. The industry has put North Dakota on the map and continues to provide many opportunities for rural North Dakotans. Without this industry, our economies would cease to grow, job opportunities would no longer be abundant, and, once again, local citizens would be forced to look out of State for career opportunities.

I stand behind the oil and gas industry and will continue to support its involvement in the rural North Dakota communities. I am proud to have grown up in Western North Dakota. I am proud to have graduated from college in eastern North Dakota. And I am proud to be an active member of the workforce that the industry has established in North Dakota.

The oil and gas industry in North Dakota has revolutionized the way we extract oil and gas from the land and has an incredible record of post-production reclamation. We live where we work and we take our environmental stewardship very seriously.

And there is another paragraph, but in the interest of time, I would just ask for unanimous consent to enter this letter into the record.

Ms. CASTOR. Without objection.
[The information follows:]

**Letter for the Record from Tanner Hopfauf to Representative Kelly
Armstrong**

Dear Congressman Armstrong,

I am writing so share my input in response to the Select Committee on the Climate Crisis' announced hearing, entitled "Generation Climate: Young Leaders Urge Climate Action Now." The hearing is described as "in contrast to a typical Congressional hearing, the committee will hear from young leaders who are urging policymakers to take climate action now and finally address the climate crisis." I work in the oil and gas industry in North Dakota and I consider myself a young leader who would be directly impacted by the "climate action" being discussed in Congress right now. This is a complex issue so I hope the Committee will consider my perspective, which is shared by many young leaders throughout the country who may not be represented at this hearing today.

My name is Tanner Hopfauf, I grew up in southwestern North Dakota in the rural town of Dickinson. I attended K-12 here and graduated from Dickinson High School in May of 2014. While in high school, I decided I wanted to pursue a degree in engineering and with the increase in activity and opportunities presented by the oil and gas industry I knew petroleum engineering was my goal. Once I learned the University of North Dakota (UND) offered a bachelor's degree in Petroleum Engineering, I applied and was accepted. While attending UND, I was fortunate enough to have an internship during each of the three summers, two of which were in western ND. Upon graduating in May of 2018, I accepted a full-time position with an exploration and production company and have been there since. My career thus far and educational decisions would have been drastically different were it not for the oil and gas industry in my community.

My story is not unique. Before the oil and gas industry really became established, many young adults from rural North Dakota were forced to look for jobs and long term career opportunities out of state after graduating high school and college. Simply put, the jobs that offered long term career advancement that would appeal to young adults entering the workforce didn't exist in ND. As a result, our rural communities were shrinking and we were losing our small town culture and a way of life so many had enjoyed for generations before. The oil and gas industry has completely changed this outlook, local citizens now have the opportunity to go to work and have fulltime careers in the area they have always called home. This industry has provided a spark to our rural communities and has given a breath of life back into them. Communities that had been shrinking for many years before have begun to grow and prosper. People are choosing to move to and live in rural ND because of the jobs that are now available. Additionally, local residents now have the ability

to remain in their home town communities while having successful and meaningful careers. The boom in the economy has provided so much for the individuals that are working directly in the industry, but it has also positively influenced the way of life for all citizens living in the area and even the entire state. Rural citizens have benefited from increased infrastructure, advancing education systems, and additional sources of entertainment; so many things that rural North Dakotans would have never thought possible or to be available in their communities now are because of the oil and gas industry.

The oil and gas industry is reshaping North Dakota and the economy at the local and state level. This industry has put North Dakota on the map, and continues to provide many opportunities for rural North Dakotans. Without this industry our economies would cease to grow, job opportunities would no longer be abundant, and once again local citizens would be forced to look out of state for career opportunities. I stand behind the oil and gas industry and will continue to support its involvement in rural North Dakota communities. I am proud to have grown up in Western North Dakota, I am proud to have graduated from college in Eastern North Dakota, and I am proud to be an active member of the workforce the oil and gas industry has established in North Dakota communities.

The oil and gas industry in North Dakota has revolutionized the way we extract oil and gas from the land and has an incredible record of post-production reclamation. We live where we work so we take environmental stewardship very seriously. As this committee moves forward, I hope they will acknowledge the excellent stewardship of our resources that is happening in North Dakota right now, and all the economic opportunities and prosperity it has created for our residents. Ours is a young, vibrant industry that I hope can gain more respect and understanding rather than be used as a scape goat to win political points. I am a young leader and I want my voice to be heard. Climate change and the policies being discussed pose a direct threat to my industry, and I don't want to be collateral damage in this political debate.

Thank you for your work on this committee and for representing my voice and the voices of so many others working and thriving in western North Dakota.

Sincerely,

TANNER HOPFAUF.

Mr. ARMSTRONG. Thank you.

Ms. CASTOR. Thank you, Mr. Armstrong.

Mr. Casten, you are recognized for 5 minutes.

Mr. CASTEN. Thank you, Madam Chair, for putting this hearing together.

And thank you to all our witnesses. You know, we always start off these things by thanking witnesses. And there is sort of a pro forma to that, and somehow it seems insufficient for you guys today. You deserve more than just thanks.

You know, as a lot of people have said up here, over the last four decades, we have had a bipartisan consensus to do nothing. And that is shameful. That is bipartisan agreement, but it is an agreement for inaction, at least on the scale that is required.

Now, some of that action may be driven by corruption, some is driven by denial, some is driven by cowardice. But I think in all cases, there are far too many in this town who are content to sit and wait for public opinion to force them to act. And acting in response to polls may make you an effective politician, but it is the opposite of leadership.

What you all have done in getting to this point is leadership. You are shaping public opinion. You are forcing people to mobilize for the greater good, even if that is contrary to their own individual interests. And that is worth more than just a pro forma thing. So thank you. Thank you for being here and for driving that conversation. What you have done is leadership distilled, and what we have done so far is shameful.

Now, as Mr. Piper noted, this is a first step. It is a small first step. But all of us on both sides of this dais is—you know, as Robert Frost said, “We have promises to keep and miles to go before we sleep.”

So let’s hold us accountable to those promises, let’s hold you accountable to those promises, and start thinking about what the next steps are. As we all think about those, I want to start just with a little bit of advice for you all.

I have spent my entire career trying to do something about climate change. First as a scientist, then as an engineer, then as an entrepreneur. I built a couple companies. Everything I ever did was built on profitably reducing greenhouse gas emissions.

I used to think that dealing with climate change was a technology problem. Laws of thermodynamics were somehow holding us back. Then I thought it was an economic problem, that the laws of economics were somehow holding us back. And I am in this job now because I have come to the conclusion that it is the laws of the United States that are holding us back.

Now, the good news is that is the only one of those laws that can be changed. So that is a cause for some optimism. But it took me about 20 years to come to that realization. And if you will humor me with some advice, it is only to hope that you can be smarter than I have been.

My first piece of advice for you is do not waste your energy preaching to the converted. It is good for your ego. It will make you feel good. It is not necessary. Number two, do not waste your energy celebrating those who agree that climate change is real. They deserve no more praise than people who will acknowledge that their tin foil hat does not prevent the aliens from reading their thoughts.

So what do you do? Lead not by persuading people who already are there, lead not by telling people they are immoral, but lead by getting people to understand that their self interests are aligned with your larger purpose.

People who are motivated solely by economics like the not pay for fuel. People who are motivated solely by national security like the idea that we could have a military that doesn’t depend on sending money to people we don’t feel very good about. People who are motivated—they feel macho by getting behind the wheel of a really fast muscle car, love the acceleration of an electric vehicle. Meet people where they are and get them to go.

And so my question for you all who have done a better job of leadership than we have is to maybe share in the few minutes we have left how you have persuaded people who disagree with you to act for the greater good and what we can learn from your experience.

Mr. Suggs.

Mr. SUGGS. I will start. Thank you, Mr. Casten. I will share that I believe sharing stories is one way to really build bridges. And when I have opportunities to share the stories that are from my community and how people’s lives have been just totally changed by these catastrophic events, I believe that is the way to build rapport among each other, and we see where we are coming from.

And when I can hear the stories of—like the gentleman from North Dakota just shared about the young man who works in the oil and gas industry, and when we can hear those stories and we—I believe that is the path that we use to find compromise, so—but when we can share stories, I believe that is the way to really persuade people to hear the other perspective.

Ms. COOPER. I appreciate your advice, Congressman Casten. And I find that it is important in this instance to have shared experiences. In Louisiana, I get to see this on a personal level, which I am very privileged by. But to see individuals and communities, as I had briefly noted before, that are losing their cultures, that are losing their environments every day already to these climate crises. And we can all see the impacts of intense weather events in our communities. And if not in our communities, then we can see this on national television. It is everywhere. We have disasters happening all the time. And I think relating to one another in that shared experience manner is the best way to move forward, because you can't deny that those things are happening.

Mr. CASTEN. I think out of respect to my colleagues, I think we are out the time. But I appreciate your responses. And sorry to not leave time for all of you.

Ms. BONAMICI. [Presiding.] Thank you.

And I want to explain. Chair Castor and Representative Lujan had to run to another committee where they are having votes on amendments and bills, so they will return.

And at present, I would like to recognize Representative Levin for 5 minutes for your questions.

Mr. LEVIN. Well, thank you so much. So grateful for, finally, the first hearing of this select committee. Grateful to serve and really grateful to all of you. I think my friend Mr. Casten said it well; you give us hope, and we are grateful that you are here.

I think the work of this committee is significantly overdue. This is a scientific, health, political, economic, national security, environmental, and moral issue. My constituents in Southern California feel the impact of climate change every day in many different ways. Increased coastal erosion that has caused infrastructure to collapse, sea level rise, longer and more extreme droughts, and unprecedented wildfires.

These examples are underpinned by clear and compelling evidence, including from institutions in my district, like the Scripps Institute of Oceanography. And they reinforce the stories that we have heard from you, both in your written testimony and here this morning.

I have no doubt that what we continue to highlight here will just add to the overwhelming evidence that we better transition away to a more sustainable future, but we better do so in an economically productive way. And what I mean by that, like Mr. Casten, I had been in the clean energy industry for about 15 years, and it is an incredible economic opportunity, and we cannot lose sight of that. And it should be shared by all regions of this country, especially those that have been dependent on fossil fuels.

As far as the heavy hand of the federal government, I would like to remind my colleagues of the tens of billions of dollars that we subsidize fossil fuels with each year. The real question, in my

mind, is whether Americans will be using clean energy technologies that are developed here, that are researched, developed, deployed here, with American jobs and American ingenuity, or whether we are going to be using technologies that are developed and deployed first in Asia and Europe, and whether we are going to lead or whether we are going to cede our global leadership.

So I commend you all for your leadership. It was a similar belief in the need to act on climate that prompted my own campaign for Congress after working as an environmental activist and lawyer for about 15 years, as I mentioned. And I actually began my campaign by sending my opponent a copy of the book, "Climate Change for Beginners," which is written at about a third grade reading level. Everybody here should check it out. If you have a family member that doesn't believe in basic science, hand it to them.

But the reality is that our President also denies the scientific consensus on climate. When he visited my home State of California last year in the wake of our devastating wildfires, he suggested we rake our forests, that would solve the problem.

So, Mr. Piper, I wanted to turn to you. How would you respond to this current administration's omissions and outright denial of science?

Mr. PIPER. Thank you for the question. And I sued them.

Mr. LEVIN. Well, that is—care to opine on that, sir?

Mr. GRAVES. I would like to clarify for the record, you actually sued the Obama administration.

Mr. PIPER. That is true. That is true.

Mr. LEVIN. Please do clarify for the record, Mr. Piper.

Don't worry about that. They are voting down the way.

Mr. PIPER. Okay. Yeah. Sorry.

On a less humorous note, on a more serious note, I think it is hard to honestly hold a response to such strong illogical climate denial, because there is not much you can say. Something as ridiculous as telling somebody to rake a forest in order to reduce the effects of a wildfire season that is out of our control, it blows my mind.

But I guess in, like, honestly, when I think about how I respond to that, it would have to be that I place my faith in the proceedings of the court, in the hope that the court can disregard the disbelief, recognize the science and the constitutional obligation and the constitutional rights of the youth, not only my, you know co-witnesses here, but also all the youth across America to a livable climate and a stable future.

Mr. LEVIN. And I was very interested, Mr. Piper, to see that your case highlights some of the federal subsidies for fossil fuels. Can you briefly expand on the role that these fossil fuel subsidies play in your case?

Mr. PIPER. You know, at the moment, like, right now, I don't have that off the top of my head, but I am actually happy to get back to you with that.

Mr. LEVIN. That would be great.

Finally, and if I could just run just a second or two longer.

Mr. Suggs, can you talk about how the repeated flooding has affected Kinston's economy, small businesses, the workers who rely on wages from those businesses?

Mr. SUGGS. Thank you, Congressman Levin. I will say I mentioned it earlier in my testimony how U.S. Highway 70 runs right through town. It is our main business corridor. It also runs almost parallel with the Neuse River. So many of our businesses are located along that highway. If you want to get from our State capital to Raleigh to North Carolina's beautiful beaches, you have to go down Highway 70 in Kinston.

And when hurricanes and floods hit, that entire highway is flooded. So millions of businesses along that highway, and grocery stores, restaurants, clothing stores, are under water and submerged. People are out of work for weeks or months while these businesses have to rebuild.

Kinston in east North Carolina is also big on agriculture. And you have farms and migrant farmworkers and their families and the farmers' families who are out of work for months while their farmland is under water.

So I mean, it definitely is a huge—takes a huge toll on our economy. People sometimes leave our community because of the constant flooding. So that also affects population loss, and that has a trickle-down effect on the economy. So there are so many ways that—

Mr. LEVIN. Thank you, Mr. Suggs.

To the extent that we consider the economic impacts of climate change, let's be fair and evenhanded about those impacts.

And I yield back. Thank you.

Ms. CASTOR [presiding]. Let's see. Ms. Brownley, you are recognized for 5 minutes.

Ms. BROWNLEY. Thank you, Madam Chairwoman. And thank you for having this hearing, our first major hearing today. I can think of no better group of witnesses to kick off this committee than the young leaders sitting before us today. You represent, as many of us have already expressed, but you represent the generation that will bear the full brunt of the failures of our generation and previous generations to prevent this crisis if we do not act.

I must say I am heartened that even and despite of the federal government's inaction, that all of you have expressed hope and still believe that the government can, in a nonpolitical way, truly and boldly address this climate crisis. So there is no question that the time to act is now.

And I am proud to represent a district in California. And I believe this committee has a historic opportunity to learn from California's example and many other solutions that we can find nationwide and, quite frankly, worldwide.

There are so many questions that I would like to ask all of you, but I know my time is limited. But, Mr. Piper, I am just so extraordinarily impressed. As you said, you sued the government, and I am very impressed that you were able to pull that together. And I understand that in your lawsuit, there were 21 plaintiffs that were 21 years or younger. I can't imagine your joy and your feeling of success when the judge held that—your argument that you have a due process right to a climate system capable of sustaining human life. It must have been an extraordinary moment. And the disappointment still continues that the case has not been fully resolved.

But you talk about this issue. We talk a lot about the climate crisis with regards to its economic impact, to its health impact, to its national security impact. But you are really describing this, quite frankly, as a civil rights—fundamentally, a civil rights issue.

And so I wanted to ask you first if you were intentional in terms of having 21 plaintiffs that were 21 years or younger. And, if so, why? But I also wanted to ask you, if you could, talk a little bit more about your belief and why the climate crisis is so much a civil rights issue to our time.

Mr. PIPER. Thank you, Ms. Brownley, for this question. In regards to the ages and number of the plaintiffs, I believe it is just coincidence of fate, not necessarily something that is specific and intentional.

And then with it being—oh, my. I honestly forgot the second part of your question. Could you please.

Ms. BROWNLEY. You have talked about the climate crisis being a civil rights issue. And, you know, if you could just talk a little bit more about that. I would like to hear the other panelists sort of weigh in on what their feelings are that this climate crisis is indeed a civil rights issue of our time.

Mr. PIPER. Yeah. So I think it is the—so the easiest way to say this is the Public Trust Doctrine, which is, in common law, states that the government holds a responsibility to protect the natural resources of the air, land, and the water for posterity. And when we recognize that no life on this planet can be held without those three natural resources, without having clean air, clean water, and land that is capable of sustaining life and growing life.

And then specifically in regards to our Constitution, I believe it is the Fifth Amendment that says that the federal government cannot deprive its citizens of the right to life, liberty, and the pursuit of happiness or property without due process of law. And in that way, we have to recognize that the federal government's destruction of the environment through its conscious building of a fossil fuel infrastructure is a violation of the Constitution.

Ms. BROWNLEY. Thank you. Five minutes goes by quickly. Thank you very much, and I yield back.

Ms. CASTOR. Votes have been called on the floor, but we are going to try to—oh, excuse me. We are in recess. Okay. Good.

I was going to counsel everyone to be concise. But now I think we are okay.

So, Mr. Palmer, you are recognized for 5 minutes.

Mr. PALMER. Thank you, Madam Chairwoman.

Ms. Cooper, you talked about some of the issues involving Louisiana. And I know the focus is entirely on human activity and what the government ought to do in regard to human activity. Louisiana has been involved in some major floods, one a couple of years ago that caused tremendous damage. And there is a lot of discussion about what the federal government's responsibility is in that.

Isn't it true that the Army Corps of Engineers had a study that lasted 20-something years, maybe 30 years, looking at building a diversion canal from the Comite River over to the Lilly basin that would largely have mitigated any problems from that flood or at least made the problem much more minimal than they were?

Are you aware of that? Can you talk about it a little bit?

Ms. COOPER. Yes. Thank you for the question, Mr. Palmer. I am not familiar specifically with that project. I can get back with you on the information needed afterwards.

But I can speak to how our restoration projects and the projects that we are doing are all aimed at reducing flood risk for our communities. And I am sure, as you might have seen, we have flood maps for our entire coast. And we are trying to figure out where the biggest flood risks are now and in the next 50 years. We set up like a low and a high scenario of what could be the lowest expectations and the highest. And so we are trying to plan our projects around that information. And so we are putting projects in areas that need it the most and making our investments worth the most.

But in regard to that specific project, I would be glad to get back with you on that.

Mr. PALMER. Well, you don't need to, because I know a good bit about it. I wanted to know what you know about it.

And the issue here is, is that I know the climate is changing. Climate has a history. It has always been changing. And there are some serious consequences from climate change that we need to be prepared for.

I worked for two international engineering companies. I worked in environmental systems. I ran a think tank for 25 years. And there is a fundamental principle in addressing issues, and that is you first have to properly define the problem. If you don't properly define the problem, then the solutions you come up with generally are going to be off the mark. And there are very serious consequences when dealing with climate change if we don't properly define the problem. If you put all the emphasis on anthropomorphic impact and you don't take into account natural variation and other issues, then we are going to suffer.

For instance, there is an ice shelf in the Antarctic. Are you all familiar with the ice shelf, that there is some concerns about it? I see Mr. Piper is nodding his head.

The last time that ice shelf broke off was 125,000 years ago. Okay? Any idea why it broke off?

Some folks think it was climate change. And there is a high probability that that was part of it, because we have gone through cooling periods and warming periods. But it is also highly probable that it is basic physics. Because an ice shelf is not an iceberg. It is not displacing its mass in water. It is not an ice sheet on land. It extends out over the surface of the water. In this particular case, it is probably 5 or 6 feet above the water.

And at some point, just basic physics are going to come into play where the weight on the end will cause it to break off, and it will—if it doesn't freeze back in place, whatever it does, once it hits the water, it is going to cause sea levels to rise.

If we don't take into account the natural variations and that climate is changing and take action to mitigate for those probabilities, as they failed to do Louisiana with the Comite River Canal, then you are going to have some serious problems. If we had built that canal 30 years ago, and Mr. Graves and I have talked about this quite a bit, I think you wouldn't have had the billions

and billions of dollars in damage. You probably wouldn't have had the loss of life and the destruction that you had.

So my encouragement is for you to stay involved, but look at the total picture. Don't focus on just one thing.

And with that, Madam Chairman, I will yield back.

Ms. CASTOR. Thank you, Mr. Palmer.

Mr. Luján, you are recognized for 5 minutes.

Mr. LUJÁN. Well, good morning, everyone. And, again, thank you to all of our witnesses today for your testimony, for the courage to be here today and what you are doing with your lives to make a positive difference, not just in our communities, but really having a positive impact around the world. Each of you has made the case that it is past time for Congress to act to protect the health and safety of our young people and our Earth. And I applaud your efforts. We agree with you, most of us agree with you.

I am going to start off my remarks today by sharing a little data and a little bit about my age.

In 1990, I was 18 years old. In the 29 years since, we have seen the impacts of climate change. To begin in the nearly three decades since I was the age of some of our guests here today, nearly half the industrial emissions that have ever been emitted into the atmosphere for the entirety of human history have been released. It has had a dramatic impact on our world.

The polar caps then were 40 percent larger. Our seas were about 3 inches lower. Our entire planet has warmed, and we have seen a new wave of biological extinctions. Famine, natural disasters, negative human health. That is how I define the problem.

I would say that this requires immediate action. Our changing planet affects our health, our food, our ecosystems, and our way of life, and we cannot wait for another generation to act.

Ms. Zhang, I appreciate how your testimony ties environmental issues with issues of injustice. In Pope Francis' encyclical *Laudato Si*, he stressed the importance of protecting our most vulnerable from the impacts of climate change. He says, I quote, "We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental."

The Pope goes on to recognize that we have a moral obligation to act on climate change for future generations and to protect the poor, marginalized, and those most at risk.

So my question for you is, can you speak to why the religious community believes we need to reduce emissions, reduce pollution, and address climate change?

Ms. ZHANG. Absolutely. Thank you so much, Mr. Luján, for your question. I believe that—the Bible says a good man leaves an inheritance for his children and his children's children. And I think this inheritance in terms of both abundance of natural and fiscal resources, I think that I—I believe that God is speaking word through our generation. And I think that the religious community cares a lot about this because it is directly tied to our love of God and neighbor. And we see that this is a humanitarian crisis that is not something hypothetical and is happening in the future but is already impacting people, people who Jesus called us to draw closest to, and he himself modeled that for us.

And so that is some of the work that my organization, Young Evangelicals for Climate Action, and Sojourners, a Christian advocacy organization, focus on transformation through a biblical call to social justice. That is the work that we do.

And, you know, we are called to steward the very first gift that we are given by God. And this is something that God cares a lot about. And if we take the time to know the creatures on Earth and to spend time in it, I think that that is—in the knowing, really, is where loving begins. And I think we are so disconnected as a society now to that original calling that it really—it starts from a practice of stewardship and a practice of a personal experience with Earth. And so that is what we hope to do.

And I am in the room with Interfaith Power and Light, and there are numerous interreligious organizations that are working for this. So thank you.

Mr. LUJÁN. And based on some of the earlier line of questioning, I have a simple question to each of you, which is really yes or no. Do you think that we should be doing everything we can to reduce pollution?

Mr. SUGGS.

Mr. SUGGS. Yes, sir.

Mr. LUJÁN. Ms. Cooper?

Ms. COOPER. Yes. I agree.

Mr. LUJÁN. Mr. Piper?

Mr. PIPER. Definitely.

Mr. LUJÁN. Ms. Zhang?

Ms. ZHANG. Absolutely.

Mr. LUJÁN. And I hope that we don't lose sight of our responsibilities here as we look to find common ground to get this done. But we need to act. And I think that Mr. Huffman has highlighted the cost of inaction. And I hope that you all take to heart the importance of highlighting what happens if we don't do anything. This Congress needs to act.

And I know the call for bipartisanship, you are not saying sit idly by and wait another 10 years to do something. I think, Ms. Cooper, you would even say, it is time to act, come together, find some common ground, and get to work. Would that be correct?

Ms. COOPER. That is absolutely correct.

Mr. LUJÁN. I appreciate that.

I have to run down to a vote, and I will see you all a little bit later. Thanks for being here.

Ms. BONAMICI [presiding]. Thank you, Mr. Luján.

I now recognize Mr. Neguse for 5 minutes for your questions.

Mr. NEGUSE. Thank you, Madam Chairwoman. And I also want to thank Chairwoman Castor who I know had to step out, but for her leadership and, in particular, for setting the agenda of this committee to have the young folks that have joined us today be our very first witnesses with respect to our first substantive meeting. I certainly appreciate her leadership.

And I want to thank each and every one of you, as my colleague Mr. Casten mentioned, not in a pro forma way. I mean, I know that you all have traveled a great expense to Washington, D.C., to come visit with us today. And just know that your testimony is in-

credibly powerful, and it certainly is inspiring to us and to the country.

Climate change is the existential threat of our time that we must begin addressing immediately. And it shouldn't be a partisan issue. As Congress discusses the threat of climate change, we cannot lose sight of what is truly at stake. The conversations we have now, the decisions that we make today will decide the quality of life for the witnesses that are gathered here today in front of this committee. We must choose to protect their access to clean air, clean water, and a stable climate. And this is not an abstract issue as has clearly been demonstrated today during the hearing. Climate change is staring us right in the face.

In my home State of Colorado, I represent Colorado's Second Congressional District—Boulder, Fort Collins, northern Colorado. Over 50 percent of the district I represent consists of public lands. And so my constituents are already beginning to experience firsthand the impacts of this crisis. Increased flooding, erosion, rising temperatures, and faster snowmelt all have real-life consequences to my constituents.

But addressing these impacts starts with an acceptance of science. And with great respect to my colleague on the other side of the aisle, with respect to his comment regarding defining the problem, I don't know that this committee needs to necessarily define the problem. The scientists, the experts have defined the problem for us. The IPCC determined that we have 12 years to ensure that the increase in global temperature remains below the threshold required to avoid the most severe impacts of climate change.

Let me just give you a sense of some of the key findings in the IPCC report, that carbon dioxide is at an unprecedented level not seen for at least the last 800,000 years; that sea level is set to continue to rise at a faster rate than over the past 40 years. And that, yes, over the last two decades, the Greenland and Antarctic ice sheets have been melting, and glaciers have receded in most parts of the world.

That is the science. And there are a variety of important recommendations from the top minds in the country on this issue. And despite the clear and unified voice from the scientific community on this issue, the administration has continued to propose drastic cuts to climate research funding and to make remarks that are blatantly false. Just this week, the President claimed that the noise of wind turbines causes cancer. And while, you know, that may be funny to some, these kind of claims are dangerous. When we ignore facts, when we ignore science, we ignore the duty that we have to future generations.

And the good news is that this generation is paying attention. Almost every meeting I have had with young people since taking office 3 months ago has been about the environment. Last month, like my colleague, Representative Huffman, I joined young people in my State, in Boulder, in the youth climate strike, including folks from the Climate Reality Campus Corps at CU Boulder, Defend our Future, many other groups. And it was incredibly encouraging to see so many young people demanding action.

And on that note, I would be remiss if I didn't also recognize that, as one of the original cosponsors on the Green New Deal,

there is a group of young people that really have inspired the country, and certainly have inspired many of my colleagues, the Sunrise Movement, that have pushed for significant action to move the needle against climate change by pushing for the Green New Deal.

At the end of the day, like many of my colleagues here, I am a parent. My wife and I have a 7-month-old daughter, Natalie. And as we think about the future that she is going to inherit—you know, so much of the work we do here in Congress I see through the prism of being a young father and making sure that she inherits a world that is perhaps better than the one that I inherited. And the good news again is that when my daughter is my age, you all will be the leaders running for office, serving in Congress, sitting in these chairs, making these decisions. And I have no doubt that, given that reality, we will truly make progress on this important issue.

So, with that, I will ask a question of Ms. Zhang similar to the question Assistant Speaker Luján mentioned.

I was struck by your testimony, your written testimony, accounting your work helping out folks in the Flint water crisis in Michigan. And I am wondering if you could share with the committee how that experience changed the way you thought about the moral implications of how environmental justice issues impact communities and, in particular, communities of color.

Ms. ZHANG. Thank you for your question. I think that before the Flint water crisis happened, when I was in university, I was studying environmental issues, but studying them from an ecological perspective and caring about creation. But I did not realize that climate change was already impacting what Jesus calls the least of these, people who are being impacted. And not only in the Flint water crisis, but there is a zip code in my district, 48217, in Detroit, where people are living within 10 miles of toxic pollution plants, and they are—60 percent of them are people of color, and most of them are in poverty.

And I think of the, you know, recent EPA rollback of the MATS rule. And I think that 100 percent of their livelihoods are in danger because of this. And this happens often all over the country. And this is a deep issue of environmental justice very much so. And we care both about creation and about people, and this climate change issue affects both drastically.

So thank you.

Mr. NEGUSE. Thank you. Madam Chair, I yield back.

Ms. CASTOR [presiding]. Thank you.

Mr. Carter, you are recognized for 5 minutes.

Mr. CARTER. Thank you, Madam Chair. I appreciate the opportunity to be recognized. And if I may, could I yield time to my colleague, Mr. Palmer?

Ms. CASTOR. The gentleman is recognized.

Mr. PALMER. I thank the gentleman.

I want to ask unanimous consent to enter a couple of things into the record. One is the IPCC's climate change Physical Science Basis. And just want to point out that what they found in this report, there is no robust trends in annual numbers, tropical storms, hurricanes, major hurricanes accounts that have been identified over the last 100 years in the North Atlantic basin. A couple other

points that I think will be relevant to some of the comments from my colleagues.

And the other is from the Climate Science Special Report from the Fourth National Climate Assessment that says that the IPCC AR5, the annual report, fifth annual report, did not attribute changes in flooding to anthropomorphic influence, nor report the technical changes in flooding, magnitude, duration, or frequency. And would like unanimous consent to enter that into the record.

And, with that, I yield back to the gentleman from Georgia.

Mr. HUFFMAN. And, Madam Chair, just for clarification, we are entering the entire reports into the record, right, not select schedules that may tell partial stories?

Mr. PALMER. I am entering the pages from the annual report. If the gentleman would like to read the entire report.

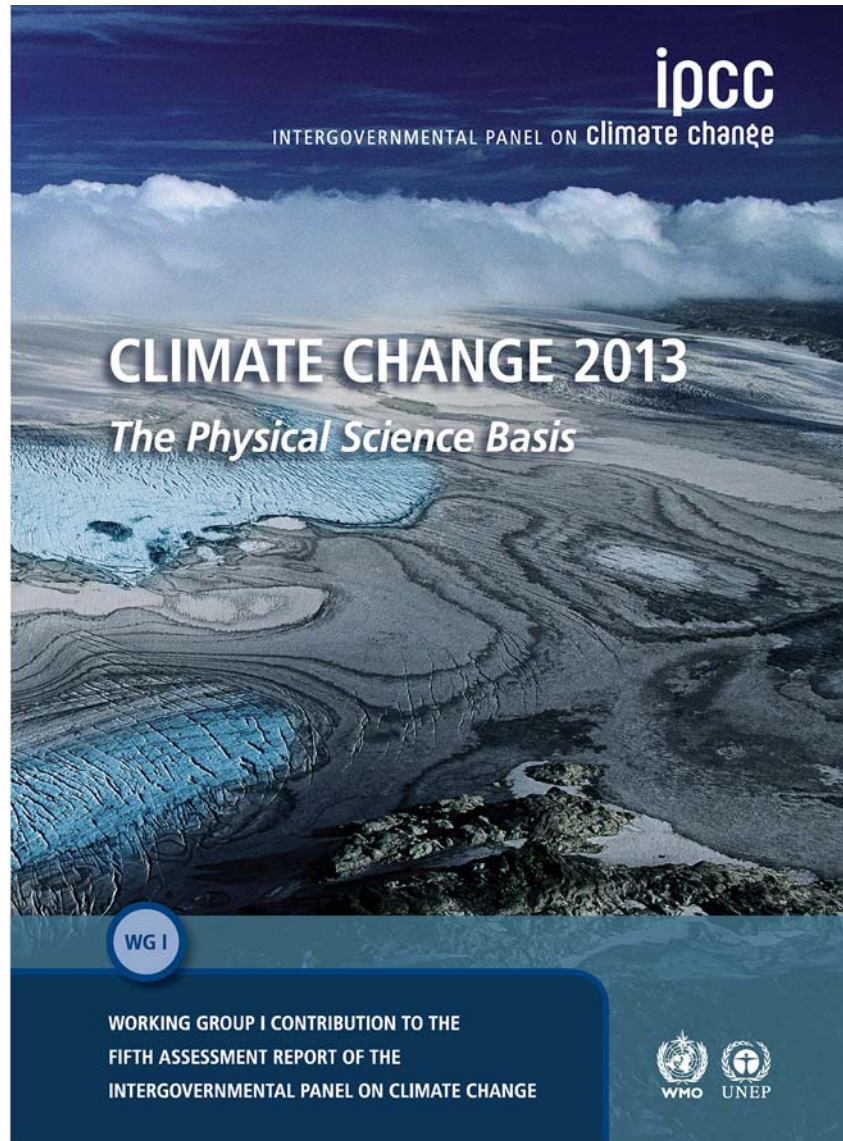
Mr. HUFFMAN. I would just suggest we enter the whole report. I mean, I certainly wouldn't want any misleading partial sections. I wouldn't want Bob Barr redacting it. I would like to see the whole report.

Mr. PALMER. Well, you certainly have the—you can object to unanimous consent, if you want to, or you can enter the entire report on your behalf, but I am entering those.

Mr. HUFFMAN. Either way. I will defer to my colleague, whichever way he wants to go. If he would like to enter the partial sections of the report, I would propose we additionally enter the entire report.

Ms. CASTOR. So, without objection, we will accept Mr. Palmer's unanimous consent request and recognize—we will go ahead to Mr. Carter and then come back to Mr. Huffman.

[The information follows:]



Technical Summary

TFE.9 (continued)

will at least double in frequency but in many regions will become an annual or a 1-in-2-year event by the end of the 21st century. The magnitude of both high and low temperature extremes is expected to increase at least at the same rate as the mean, but with 20-year return values for low temperature events projected to increase at a rate greater than winter mean temperatures in most regions. {10.6.1, 11.3.2, 12.4.3}

Precipitation Extremes

It is *likely* that the number of heavy precipitation events over land has increased in more regions than it has decreased in since the mid-20th century, and there is *medium confidence* that anthropogenic forcing has contributed to this increase. {2.6.2, 10.6.1}

There has been substantial progress between CMIP3 and CMIP5 in the ability of models to simulate more realistic precipitation extremes. However, evidence suggests that the majority of models underestimate the sensitivity of extreme precipitation to temperature variability or trends especially in the tropics, which implies that models may underestimate the projected increase in extreme precipitation in the future. While progress has been made in understanding the processes that drive extreme precipitation, challenges remain in quantifying cloud and convective effects in models for example. The complexity of land surface and atmospheric processes limits confidence in regional projections of precipitation change, especially over land, although there is a component of a 'wet-get-wetter' and 'dry-get-drier' response over oceans at the large scale. Even so, there is *high confidence* that, as the climate warms, extreme precipitation rates (e.g., on daily time scales) will increase faster than the time average. Changes in local extremes on daily and sub-daily time scales are expected to increase by roughly 5 to 10% per °C of warming (*medium confidence*). {7.6, 9.5.4}

For the near and long term, CMIP5 projections confirm a clear tendency for increases in heavy precipitation events in the global mean seen in the AR4, but there are substantial variations across regions (TFE.9, Figure 1). Over most of the mid-latitude land masses and over wet tropical regions, extreme precipitation will *very likely* be more intense and more frequent in a warmer world. {11.3.2, 12.4.5}

Floods and Droughts

There continues to be a lack of evidence and thus *low confidence* regarding the sign of trend in the magnitude and/or frequency of floods on a global scale over the instrumental record. There is *high confidence* that past floods larger than those recorded since 1900 have occurred during the past five centuries in northern and central Europe, western Mediterranean region, and eastern Asia. There is *medium confidence* that modern large floods are comparable to or surpass historical floods in magnitude and/or frequency in the Near East, India and central North America. {2.6.2, 5.5.5}

Compelling arguments both for and against significant increases in the land area affected by drought and/or dryness since the mid-20th century have resulted in a *low confidence* assessment of observed and attributable large-scale trends. This is due primarily to a lack and quality of direct observations, dependencies of inferred trends on the index choice, geographical inconsistencies in the trends and difficulties in distinguishing decadal scale variability from long term trends. On millennial time scales, there is *high confidence* that proxy information provides evidence of droughts of greater magnitude and longer duration than observed during the 20th century in many regions. There is *medium confidence* that more megadroughts occurred in monsoon Asia and wetter conditions prevailed in arid Central Asia and the South American monsoon region during the Little Ice Age (1450 to 1850) compared to the Medieval Climate Anomaly (950 to 1250). {2.6.2, 5.5.4, 5.5.5, 10.6.1}

Under the Representative Concentration Pathway RCP8.5, projections by the end of the century indicate an increased risk of drought is *likely* (*medium confidence*) in presently dry regions linked to regional to global-scale projected decreases in soil moisture. Soil moisture drying is most prominent in the Mediterranean, Southwest USA, and southern Africa, consistent with projected changes in the Hadley Circulation and increased surface temperatures, and surface drying in these regions is *likely* (*high confidence*) by the end of the century under RCP8.5. {12.4.5}

Extreme Sea Level

It is *likely* that the magnitude of extreme high sea level events has increased since 1970 and that most of this rise can be explained by increases in mean sea level. When mean sea level changes is taken into account, changes in extreme high sea levels are reduced to less than 5 mm y⁻¹ at 94% of tide gauges. In the future it is *very likely* that there will be a significant increase in the occurrence of sea level extremes and similarly to past observations, this increase will primarily be the result of an increase in mean sea level. {3.7.5, 13.7.2}

(continued on next page)

2.6.2.4 Severe Local Weather Events

Another extreme aspect of the hydrological cycle is severe local weather phenomena such as hail or thunder storms. These are not well observed in many parts of the world because the density of surface meteorological observing stations is too coarse to measure all such events. Moreover, homogeneity of existing reporting is questionable (Verbout et al., 2006; Doswell et al., 2009). Alternatively, measures of severe thunderstorms or hailstorms can be derived by assessing the environmental conditions that are favourable for their formation but this method is very uncertain (Seneviratne et al., 2012). SREX highlighted studies such as those of Brooks and Dotzek (2008), who found significant variability but no clear trend in the past 50 years in severe thunderstorms in a region east of the Rocky Mountains in the USA, Cao (2008), who found an increasing frequency of severe hail events in Ontario, Canada during the period 1979–2002 and Kunz et al. (2009), who found that hail days significantly increased during the period 1974–2003 in southwest Germany. Hailpad studies from Italy (Eccel et al., 2012) and France (Berthet et al., 2011) suggest slight increases in larger hail sizes and a correlation between the fraction of precipitation falling as hail with average summer temperature while in Argentina between 1960 and 2008 the annual number of hail events was found to be increasing in some regions and decreasing in others (Mezher et al., 2012). In China between 1961 and 2005, the number of hail days has been found to generally decrease, with the highest occurrence between 1960 and 1980 but with a sharp drop since the mid-1980s (CMA, 2007; Xie et al., 2008). However, there is little consistency in hail size changes in different regions of China since 1980 (Xie et al., 2010). Remote sensing offers a potential alternative to surface-based meteorological networks for detecting changes in small scale severe weather phenomenon such as proxy measurements of lightning from satellites (Zipser et al., 2006) but there remains little convincing evidence that changes in severe thunderstorms or hail have occurred since the middle of the 20th century (Brooks, 2012).

In summary, there is *low confidence* in observed trends in small-scale severe weather phenomena such as hail and thunderstorms because of historical data inhomogeneities and inadequacies in monitoring systems.

2.6.3 Tropical Storms

AR4 concluded that it was *likely* that an increasing trend had occurred in intense tropical cyclone activity since 1970 in some regions but that there was no clear trend in the annual numbers of tropical cyclones. Subsequent assessments, including SREX and more recent literature indicate that it is difficult to draw firm conclusions with respect to the confidence levels associated with observed trends prior to the satellite era and in ocean basins outside of the North Atlantic.

Section 14.6.1 discusses changes in tropical storms in detail. Current data sets indicate no significant observed trends in global tropical cyclone frequency over the past century and it remains uncertain whether any reported long-term increases in tropical cyclone frequency are robust, after accounting for past changes in observing capabilities (Knutson et al., 2010). Regional trends in tropical cyclone frequency and the frequency of very intense tropical cyclones have been identified in the

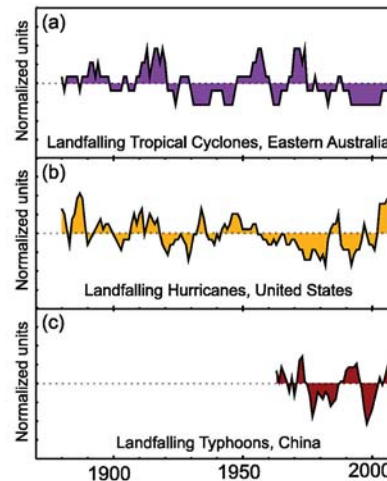
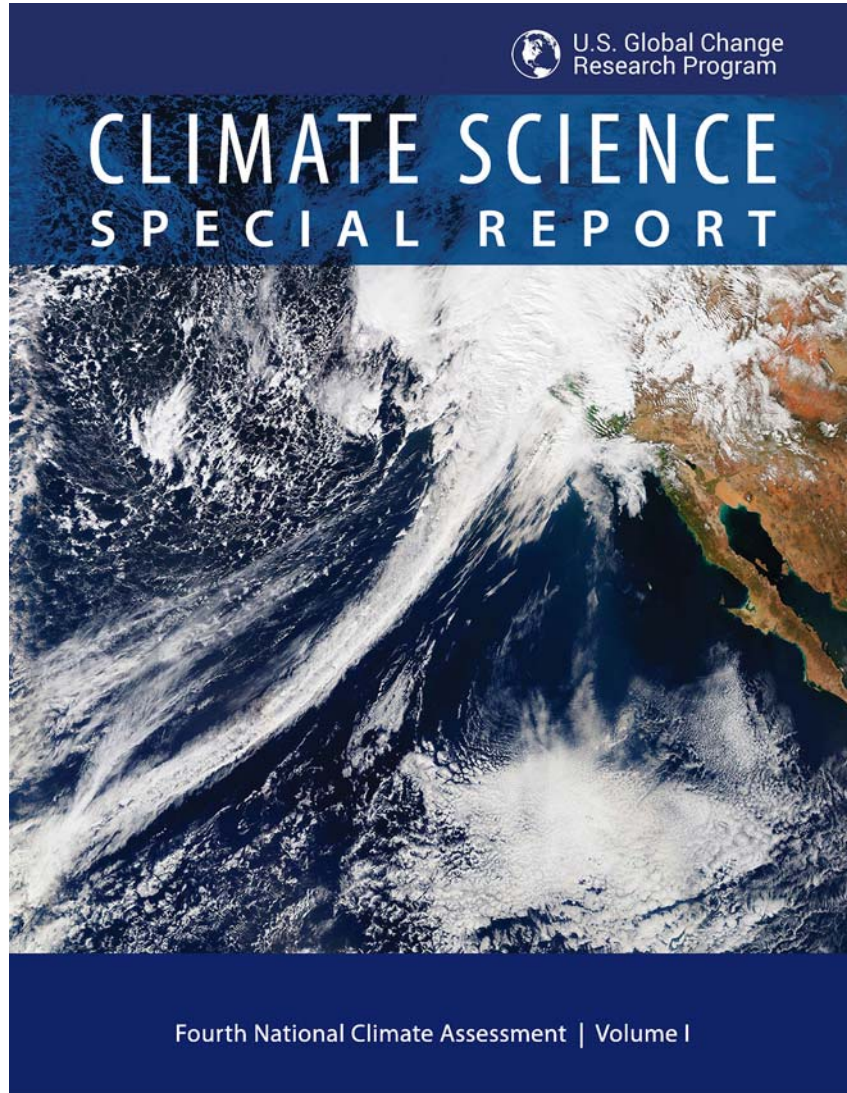


Figure 2.34 | Normalized 5-year running means of the number of (a) adjusted land falling eastern Australian tropical cyclones (adapted from Callaghan and Power (2011) and updated to include 2010/2011 season) and (b) unadjusted land falling U.S. hurricanes (adapted from Vecchi and Knutson (2011)) and (c) land-falling typhoons in China (adapted from CMA, 2011). Vertical axis ticks represent one standard deviation, with all series normalized to unit standard deviation after a 5-year running mean was applied.

North Atlantic and these appear robust since the 1970s (Kossin et al. 2007) (*very high confidence*). However, argument reigns over the cause of the increase and on longer time scales the fidelity of these trends is debated (Landsea et al., 2006; Holland and Webster, 2007; Landsea, 2007; Mann et al., 2007b) with different methods for estimating undercounts in the earlier part of the record providing mixed conclusions (Chang and Guo, 2007; Mann et al., 2007a; Kunkel et al., 2008; Vecchi and Knutson, 2008, 2011). No robust trends in annual numbers of tropical storms, hurricanes and major hurricanes counts have been identified over the past 100 years in the North Atlantic basin. Measures of land-falling tropical cyclone frequency (Figure 2.34) are generally considered to be more reliable than counts of all storms which tend to be strongly influenced by those that are weak and/or short lived. Callaghan and Power (2011) find a statistically significant decrease in Eastern Australia land-falling tropical cyclones since the late 19th century although including 2010/2011 season data this trend becomes non-significant (i.e., a trend of zero lies just inside the 90% confidence interval). Significant trends are not found in other oceans on shorter time scales (Chan and Xu, 2009; Kubota and Chan, 2009; Mohapatra et al., 2011; Weinkle et al., 2012), although Grinsted et al. (2012) find a significant positive trend in eastern USA using tide-gauge data from 1923–2008 as a proxy for storm surges associated with land-falling hurricanes. Differences between tropical cyclone studies highlight the challenges that still lie ahead in assessing long-term trends.



sensitivity at depth-to-surface air temperature increases than at near-surface levels.^{15, 38} Berg et al.³⁹ adjust for the differences in land component model vertical treatments, finding projected change in vertically integrated soil moisture down to 3 meters depth is mixed, with projected decreases in the Southwest and in the south-central United States, but increases over the northern plains. Nonetheless, the warming trend has led to declines in a number of indicators, including Sierra snow water equivalent, that are relevant to hydrological drought.³⁰ Attribution of the California drought and heat wave remains an interesting and controversial research topic.

In summary, there has not yet been a formal identification of a human influence on past changes in United States meteorological drought through the analysis of precipitation trends. Some, but not all, U.S. meteorological drought event attribution studies, largely in the “without detection” class, exhibit a human influence. Attribution of a human influence on past changes in U.S. agricultural drought are limited both by availability of soil moisture observations and a lack of subsurface modeling studies. While a human influence on surface soil moisture trends has been identified with *medium confidence*, its relevance to agriculture may be exaggerated.

Runoff And Hydrological Drought

Several studies focused on the Colorado River basin in the United States that used more sophisticated runoff models driven by the CMIP3 models^{40, 41, 42, 43, 44} showed that annual runoff reductions in a warmer western United States climate occur through a combination of evapotranspiration increases and precipitation decreases, with the overall reduction in river flow exacerbated by human water demands on the basin’s supply. Reduced U.S. snowfall accumulations in much warmer

future climates are virtually certain as frozen precipitation is replaced by rain regardless of the projected changes in total precipitation amounts discussed in Chapter 7: Precipitation Change (Figure 7.6). The profound change in the hydrology of snowmelt-driven flows in the western United States is well documented. Earlier spring runoff⁴⁵ reduced the fraction of precipitation falling as snow⁴⁶ and the snowpack water content at the end of winter,^{47, 48} consistent with warmer temperatures. Formal detection and attribution (Ch. 3: Detection and Attribution) of the observed shift towards earlier snowmelt-driven flows in the western United States reveals that the shift is detectably different from natural variability and attributable to anthropogenic climate change.⁴⁹ Similarly, observed declines in the snow water equivalent in the region have been formally attributed to anthropogenic climate change⁵⁰ as have temperature, river flow, and snowpack.^{41, 51} As a harbinger, the unusually low western U.S. snowpack of 2015 may become the norm.³¹

In the northwestern United States, long-term trends in streamflow have seen declines, with the strongest trends in drought years⁵² that are attributed to a decline in winter precipitation.⁵³ These reductions in precipitation are linked to decreased westerly wind speeds in winter over the region. Furthermore, the trends in westerlies are consistent with CMIP5-projected wind speed changes due to a decreasing meridional temperature and pressure gradients rather than low-frequency climate variability modes. Such precipitation changes have been a primary source of change in hydrological drought in the Northwest over the last 60 years⁵⁴ and are in addition to changes in snowpack properties.

We conclude with *high confidence* that these observed changes in temperature controlled



Table 8.2. Projected changes in western U.S. mountain range winter (DJF) snow-related hydrology variables at the middle and end of this century. Projections are for the higher scenario (RCP8.5) from a high-resolution version of the Community Atmospheric Model, CAM5.⁶⁶

Mountain Range	Snow Water Equivalent (% Change)		Snow Cover (% Change)		Snowfall (% Change)		Surface Temperature (change in K)	
	2050	2100	2050	2100	2050	2100	2050	2100
Cascades	-41.5	-89.9	-21.6	-72.9	-10.7	-50.0	0.9	4.1
Klamath	-50.75	-95.8	-38.6	-89.0	-23.1	-78.7	0.8	3.5
Rockies	-17.3	-65.1	-8.2	-43.1	1.7	-8.2	1.4	5.5
Sierra Nevada	-21.8	-89.0	-21.9	-77.7	-4.7	-66.6	1.1	4.5
Wasatch and Uinta	-18.9	-78.7	-14.2	-61.4	4.1	-34.6	1.8	6.1
Western USA	-22.3	-70.1	-12.7	-51.5	-1.6	-21.4	1.3	5.2

As earlier spring melt and reduced snow water equivalent have been formally attributed to human-induced warming, substantial reductions in western U.S. winter and spring snowpack are projected (with attribution) to be *very likely* as the climate continues to warm (*very high confidence*). Under higher scenarios and assuming no change to current water-resources management, chronic, long-duration hydrological drought is increasingly possible by the end of this century (*very high confidence*).

8.2 Floods

Flooding damage in the United States can come from flash floods of smaller rivers and creeks, prolonged flooding along major rivers, urban flooding unassociated with proximity to a riverway, coastal flooding from storm surge which may be exacerbated by sea level rise, and the confluence of coastal storms and inland riverine flooding from the same precipitation event (Ch. 12: Sea Level Rise). Flash flooding is associated with extreme precipitation somewhere along the river which may occur upstream of the regions at risk. Flooding of major rivers in the United States with substantial winter snow accumulations usually occurs in the late winter or spring and can result from an unusually heavy seasonal snowfall followed by a “rain on snow” event or from a rapid onset of higher temperatures

that leads to rapid snow melting within the river basin. In the western coastal states, most flooding occurs in conjunction with extreme precipitation events referred to as “atmospheric rivers” (see Ch. 9: Extreme Storms),⁷² with mountain snowpack being vulnerable to these typically warmer-than-normal storms and their potential for rain on existing snow cover.⁷⁴ Hurricanes and tropical storms are an important driver of flooding events in the eastern United States. Changes in streamflow rates depend on many factors, both human and natural, in addition to climate change. Deforestation, urbanization, dams, floodwater management activities, and changes in agricultural practices can all play a role in past and future changes in flood statistics. Projection of future changes is thus a complex multivariate problem.³⁴

The IPCC AR5⁷ did not attribute changes in flooding to anthropogenic influence nor report detectable changes in flooding magnitude, duration, or frequency. Trends in extreme high values of streamflow are mixed across the United States.^{34,75,76} Analysis of 200 U.S. stream gauges indicates areas of both increasing and decreasing flooding magnitude⁷⁷ but does not provide robust evidence that these trends are attributable to human influences. Significant increases in flood frequency have

Mr. CARTER. Okay. Well, thank you.

And reclaiming my time. First of all, let me thank all of you for being here. And I mean that sincerely. We appreciate your interest in this. This is encouraging to have all of you here and testifying on such an important subject. It is important. Climate change is real. Our climate has been changing since day one. And protecting our environment is real. We understand that. And that is what we want to do here.

I am going to start with you, Ms. Cooper, and ask you, for a number of reasons, not the least of which is because I have a grandchild that lives right near Tulane, and I notice that is where you went to school. So obviously, very important to me. I just wanted to ask you: You are a recent college graduate, from what I understand?

Ms. COOPER. Yes, sir, I am.

Mr. CARTER. And you graduated from Tulane?

Ms. COOPER. Yes.

Mr. CARTER. I am just interested in knowing what spurred your interest in climate change? Was it your studies at the university or was it the impact that, perhaps, the climate has had in Louisiana? Or just what exactly was the impetus there?

Ms. COOPER. So I have always been very interested in the outdoors. I grew up with two brothers, and our lives were digging holes and mud fights. And that kind of was my background. And then when Hurricane Katrina hit, I wasn't entirely sure of what the implications were, because I was at such a young age in just fourth or fifth grade. But just seeing how that affected my community and members around me I think has had a lasting impression on me far beyond that time when I was that age.

And so when I went to Tulane University, I got invested in the Tulane Green Club and I got invested in the local nonprofit. And that really opened my eyes to the issues that we were facing in just that one city. And I knew that if New Orleans was having such strong implications of climate change, how much more our coast and then how much more our Nation and world aside from that.

Mr. CARTER. Well, certainly, New Orleans is an interesting situation. Thirty percent of all the wetlands combined with the offshore production, energy production that they have. So I think it is an interesting example, if you will, of what is happening out there and what we could be doing and what we are doing right, what we could do better.

I just wanted to ask you about some of the work the governor's office has done to partner with the private sector and the energy companies to help improve our climate. Are you aware of anything like that?

Ms. COOPER. So a lot of our partnership, as I mentioned before, a lot of our revenue comes from the offshore as well as onshore drilling endeavors in Louisiana. And I see this as a perfect partnership, because we cannot do the restoration at the scale we do without this.

We have completed 111 projects already. We have 76 more on the way on our coast. And this could not be possible without utilizing the resources that are already there and knowing the impact that it is having on our area.

Mr. CARTER. Right. Okay. Well, thank you, Ms. Cooper.

And thank all of you again for being here and for your input and for your participation. It is so encouraging to see youth participating in the process. And I want you to know how much we appreciate this.

And thank you, Madam Chair. And I yield back.

Ms. CASTOR. Thank you. I would like to recognize Mr. Huffman for—

Mr. HUFFMAN. Thanks, Madam Chair.

I would just like to request unanimous consent to enter three reports in their entirety into the record. The first would be the entire IPCC report, including its very explicit conclusions about anthropomorphic climate change. The second would be the recent National Climate Assessment, the Fourth National Climate Assessment, including its conclusions, that by the end of the century, we are likely to experience literally hundreds of billions of dollars in economic damage per year if we don't make major changes. And finally, a March 28, 2019, report by the World Meteorological Organization, that also makes clear the impacts of anthropomorphic climate change, including the impacts of extreme weather.

Ms. CASTOR. Without objection, those are entered into the record. [The information follows:]

ATTACHMENT: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

The report is retained in the committee files and available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

ATTACHMENT: Fourth National Climate Assessment

The report is retained in the committee files and available at: https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf

ATTACHMENT: WMO Statement on the State of the Global Climate in 2018

The report is retained in the committee files and available at: https://library.wmo.int/doc_num.php?explnum_id=5789

Ms. CASTOR. I would also like to note I did have an opportunity to glance at Mr. Palmer's request here. And while it talks about the trends in the number of tropical storms, hurricanes, major hurricane counts, I can tell you, as a Floridian that has lived through the past few years, that, yes, the number may not be impacted, but the intensity, the size, the amount of moisture in the atmosphere when you are talking about flooding, those are at issue. And those are going to be some of the issues that we address here going forward.

I want to thank you all for being here, for being the voice of this generation. We hear you. It is now our obligation, our moral responsibility to take action. That is the charge of this select committee. From this point forward, we will be focused on solutions. This will be a solutions-oriented committee. And that includes a just transition, creating the—making sure we are on track to create the clean energy jobs of the future.

We need everyone's help, all Americans, to develop the patriotic solutions for this country, for our planet going forward. So thank you all.

Mr. Ranking Member, did you have one?

Mr. GRAVES. I do.

Madam Chair, I ask unanimous consent that we include for the record a statement by Mr. Benji Backer, president of the ACC, in the record hearing.

And just to ensure that nothing is left out in the lines of Mr. Huffman's wishes, I want to ask if you could insert the Encyclopedia Britannica, 2019 version, into the record as well.

So that is my last request.

[The information follows:]

**Statement for the Record by Mr. Benji Backer, President, ACC,
Submitted by Ranking Member Garrett Graves**

"To whom it may concern,

When you examine the issue of climate change in this country, we are told that young liberals are invested and young conservatives don't care. However, as a college student and lifelong conservative political activist, I know firsthand this isn't true.

In 2017, alongside my Millennial peers, I founded the American Conservation Coalition, an organization dedicated to conservative environmental solutions, including climate change. In just over a year since our founding, we've expanded to 120+ college campuses with enthusiastic conservative leaders representing us on each respective campus. Why have we succeeded? Because young conservatives are concerned about climate change—and it's a priority for them. Young conservatives feel left behind by the opposing party, as well as their own, on the issue of climate. They care about it and want to see solutions, but they first want the status quo to change. In fact, *59% of Millennial conservatives believe climate change is having an effect on the United States*, according to last year's Pew poll. The percentage has been rising each year, and over 90% of independents and liberals see it as a problem as well. Additionally, *recent polling shows that 66% of all conservatives believe in man-made climate change*.

Young people, specifically young conservatives, are discouraged by the partisan bickering that the climate movement has embraced. Unnecessary partisan quarreling on climate change has alienated important voices and prevented meaningful results. Whether it's the Democratic Party proposing unrealistic resolutions such as the Green New Deal and perpetuating false doomsday scenarios, or the Republican Party's stagnant inaction and frequent use of climate denial language, both political parties have failed us on climate change thus far. To young people, the issue of climate change transcends party lines. Our environment is not a partisan issue, and it shouldn't be treated as such to promote political agendas. This is an issue that has massive implications for our children's futures, as well as our own.

In terms of solutions, we urge Congress to explore policies that mitigate climate change without an increase in taxes and big government. Through a smart policy proposal that includes the right incentives, public-private partnerships, an all-of-the-above energy approach, and technological advancements, the United States can continue to take the lead on climate change.

While other countries must act on climate change, and the United States has taken many steps in the right direction, I join my young conservative peers in calling for even greater action. We're tired of big-government and anti-economic policies that consistently fail. We're tired of the false alarmism and doomsday scenarios. We're also tired of conservative inaction and denial. We're ready for climate change to be a priority through bipartisan reforms that include important sources of energy (including nuclear, natural gas, and hydropower), technological advancements, smart market incentives, and corporate leadership. It's time for a new wave of climate action in this country that acknowledges and engages with a growing, improving economy to foster an improved climate."

Ms. CASTOR. Thank you.

Thank you all for joining our kickoff hearing for the Select Committee on the Climate Crisis. We will look forward to seeing you at the next hearing.

The committee is adjourned.

[Whereupon, at 10:52 a.m., the committee was adjourned.]

