Testimony for the House Select Committee on the Climate Crisis
on
Confronting Climate Impacts: Federal Strategies for Equitable Adaptation and Resilience

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Planning for and responding to the effects of climate change are essential to our nation, and the world's, long-term stability and sustainability. The recent *Intergovernmental Panel on Climate Change Sixth Assessment Report Working Group 2 Climate Change 2022: Impacts Adaptation and Vulnerability*[1] is not the first we are hearing about the current, promised and potential impacts of climate change on our communities and the ecosystems that surround and support us. For decades we have turned a blind eye to the scientific literature and first-hand accounts of the need to take action on climate change as the harm grows and the risk increase for those communities and ecosystems. In my testimony I will introduce you to the ways we can increase the resilience of our nation to the damaging effects of climate change and what is needed to make this happen.

I would like to begin by providing some context. I am the head of a small non-profit organization that is filling a very large gap—creating a climate-savvy society by innovating, facilitating and training practitioners in adaptation solutions. EcoAdapt's[2] sole focus is to "meet the challenges of climate change." That means helping everyone from foresters and marine protected area managers to city planners and public health officials apply a climate lens through which to evaluate their work and develop solutions that will allow success in meeting their mandate even as the world is changing around us. We do this through four programs. Our **State of Adaptation** program takes a research approach to assessing what activities people are undertaking, what is working and what is preventing success. Our **Climate Adaptation Knowledge Exchange**[3] is the largest adaptation resource database. It is available via an online, open access portal (CAKEx.org) that is accessed by thousands of people from around the world each month. **Awareness to Action** is our workshop methodology that has provided hands-on training in climate change adaptation to over 6,000 individuals representing hundreds of organizations and agencies across the country (and a few around the world). Finally, our **National Adaptation Forum**[4] is a biennial convening of adaptation professionals that affords the opportunity for the exchange of ideas and the innovation of the next generation of climate solutions. The next Forum will be held in Baltimore this October. I hope you can join us.

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[1] IPCC, 2022: *Climate Change 2022: Impacts, Adaptation, and Vulnerability.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg2/

[2] EcoAdapt: http://ecoadapt.org/

[3] Climate Adaptation Knowledge Exchange: https://www.cakex.org/

[4] National Adaptation Forum: https://www.nationaladaptationforum.org/

In the past two decades, I have learned a lot about good adaptation practice—on the ground and through government support. I'd like to share some of that with you today. My hope is that you will see the importance of championing this type of work in your own Districts and through the federal mechanisms that can help to make all of our lands and communities climate savvy. The effects of climate change that are being felt today will continue and intensify for decades and centuries to come, yet every day we are afforded the opportunity to make management and planning decisions that either help us prepare for these changes or leave us more and more vulnerable. I urge you to lead us onto a path toward a better future. A path on which we take both mitigation (reducing the greenhouse gases that cause climate change) and adaptation (preparing for and responding to the climate change impacts that are unavoidable due to past emissions) seriously. These are not choices to be played against each other—both are necessary responses to climate change. Doing one without the other will lead us to our own peril.

Ignoring climate change is not an option. It was not an option the first time I testified before a Congressional committee (Senate Committee on Commerce, Science and Transportation) in March of 2004, almost exactly 18 years ago, when atmospheric CO_2 was 378 ppm and global temperature had increased 0.6 degrees Celsius. Yet we did not take action. It was not an option when I testified in 2007 to the Senate Committee on Commerce, Science and Transportation's Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard, when atmospheric CO_2 was 386 ppm. And still we did not change our trajectory. It was not an option when I testified in 2019 and atmospheric CO_2 was 410 ppm and global temperature has risen one degree Celsius. And it is still not an option today when atmospheric CO_2 has reached 418 ppm and global temperatures have risen 1.1 degrees Celsius. I am back today hoping that we are ready to fully address this unprecedented problem with the level of action it requires. The best place to start is somewhere, so let's see what we can do today.

How can we create a durable nation in the face of climate change?

There are clear actions we can be taking to increase our national resilience. To understand why they are needed we can look to how the impacts we are already experiencing and are projected to experience are affecting communities and resources across the country. In this same hearing there will be two speakers from the Gulf Coast, so I will share examples from other regions of the country—not only the impacts that are being felt, but some responses to those impacts.

Fire. Perhaps the most far-reaching effects of climate change have been those of wildfire. Not only have the size, heat and speed of these fires been terrifying, and the damage to life, property, economies and ecosystems been felt deeply where fires occur, but the smoke is having impact at the continental and often global scale. In summer 2020 a colleague and I were collaborating on a project—me on Bainbridge Island in Washington, him in rural Maine—yet we were both inside our houses with windows closed and air filters running to reduce the effects of the smoke-filled air that surrounded our homes. Over the past several years, millions of Americans have experienced these impacts for often weeks at a time—risking serious health impacts with extended outdoor smoke exposure. Many communities are developing plans for how to ensure healthy air in schools when late summer fire season and back to school intersect. Many schools have not historically had air conditioning systems but such equipment is now becoming necessary as windows cannot be left open to cool classrooms on hot late summer days. Obviously adding air conditioning and air

filtration systems to schools costs money, as does powering and maintaining them. Money that most school districts, especially those already underfunded, do not have. Additionally, how do we ensure the energy used to power these cooling and air filtration systems does not result in emissions that further compound the problems these actions are working to ameliorate?

Those hot late summer days are also becoming more common as the number of days above 95 degrees Fahrenheit is increasing, meaning more of them occur beyond what is traditionally thought of as peak summer. **Heat** is often described as the invisible aspect of climate change and may be among its most deadly with more constant stress to people and ecosystems then episodic events such as storms or floods. In our daily lives, hearing that global temperatures have increased a bit over 1.1 degrees Celsius does not sound like much. Difference in temperature from day to night is often much more than that. However, that's not what this increase is all about. This is the global average temperature. That means the temperature that makes life possible on our planet. Even small increases in global temperature dramatically change the way our earth systems work. An increase in temperature of 1 degree Celsius can cause coral reefs to bleach, glaciers and ice shelves to melt, ocean currents to change, and evapotranspiration to change. This affects things as basic as our food and water supply. Dealing with heat is an opportunity for knowledge exchange, with examples from warmer climates being of great use to those in warming locations.

Drought. Much of the country has seen long-term or new seasonal drought over the past two decades. From Atlanta to Seattle, the Great Lakes to Los Angeles, there have been droughts that have upended local planning. These have implications of delivery of drinking water, meeting agricultural needs and supporting ecosystems—with lake levels and soil moisture dropping. Communities are taking action to increase water efficiency in building code, encouraging drought tolerant landscaping to reduce the need for irrigation, and increasing local storage capacity. In agriculture, crops are changing, and in forestry, new tolerant species are being planted for restoration and harvest. To make these modifications effective, local planners need information, such as what drought projections looks like more than one year out, and what species will be most appropriate for landscaping and restoration efforts when combining multiple future climate impacts (temperature, drought, seasonal flooding).

Sea level rise and inland flooding. While discussed by other speakers at this hearing, these are not just issues of the Gulf Coast of the United States. Increasing frequency and magnitude of flooding have been seen around the country in recent years as changing precipitation patterns overwhelm often channelized freshwater systems. Sea level rise is being felt as direct encroachment of water, saltwater intrusion to aquifers, and increasing rates of erosion along all coastlines. Sea level rise is a train wreck in slow motion. Why do we continue to develop our coastlines when we know the projections of sea level rise will be a meter or more in many places? On the island where I live, just like most communities across the country, we have not changed our zoning to recognize the reality of climate change and new structures continue to be constructed in harm's way by public and private interests. Federal dollars allocated for local transportation, water treatment and any other activity are not required to consider the impacts of climate change before they are distributed, creating countless bad investments.

Ocean Acidification. While we can't see it, ocean acidification is another aspect of climate change that is complicating our lives. The damage done to ecosystems and fisheries by changing ocean pH

will have knock on effects to society. Ocean acidification is expected to diminish coral reef growth, systems already being adversely affected by increasing ocean temperatures. This combination will diminish reefs further reducing the protection they provide to coastlines in Florida and Hawaii, as well as U.S. territories and associated states. Ocean acidification will affect fisheries, including many that are important to tribal, indigenous and other subsistence cultures. There is also the potential for ocean acidification to affect coastal water quality in a manner that will complicate our ability to meet desired standards associated with wastewater treatment and contaminated site remediation. While we need better information about what works as effective adaptation in all sectors, ocean acidification is an area where much exploration, innovation and evaluation are needed.

Interactive effects. Climate change is not occurring in a vacuum. Rather it is another suite of stressors on top of an array of stressors already affecting our people, communities, industries and ecosystems. As a result it will exacerbate the impacts of those stressors, and often also be exacerbated by those stressors. An example of such a multiple stress that was mentioned above is contaminated lands, such as brownfield sites, which when flooded (due to freshwater flooding or sea level rise) can lead to remobilization of contaminants or damage to remediation efforts[5]. Invasive species can also interact with climate change. Similarly, invasive grasses, for example, alter the availability and continuity of fire fuels, contributing to more severe wildfires. There are resilience opportunities in taking action to substantially reduce the presence of these other stressors (e.g., cleaning-up contaminated sites, removing invasive species) in order to decrease the potential adverse impacts of climate change, but only if these actions are taken at a level that genuinely reduces the harm caused when climate change is added.[6]

It is also essential to understand that climate change affects us all, but some people and places will be more deeply impacted than others based on where they are and the resources available to them. In fact for these people the disproportionate burden of other stressors will make the impact of climate change even more devastating. There is great opportunity for federal action to ensure that the needed resources are readily available and that potential harm is limited to the degree possible.

Planning for the future, not the past. Those who work in climate change often point out what may sound obvious—the past is not an option. However when you realize that most planning and management decisions are made based on past patterns of development, economic trends and local preferences, you also realize that we are rarely planning for the future. A simple example of this can be seen in natural resource management where a vital tool for habitat protection is habitat restoration. The very premise of restoration is to restore the site with the flora and fauna that previously inhabited the location prior to some injury (e.g., fire, oil spill). Yet in many cases the species that used to live there will no longer find it hospitable given changes in temperature and precipitation patterns, or sea level rise. Similarly designing stormwater infrastructure for past run-off levels in areas likely to see dramatic increases in large precipitation events would not be a prudent investment. An example of progress in this area was the course correction by FEMA to

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[5]Mielbrecht, E. and K. Tarrio. 2019. Massachusetts Climate Change & Hazardous Waste Site Screening. EcoAdapt. ,https://www.cakex.org/sites/default/files/documents/MA%20Climate%20%26%20Contaminants%20Screening%20Report%20FINAL%206Dec2019.pdf

[6] Hansen, L.J. and J.R. Hoffman. 2011. Climate Savvy: Adapting Conservation and Resource Management to a Changing World. Island Press, Washington DC.

no longer require rebuilding damaged structures just as they had been which would have made them just as vulnerable as they were, increasing the likelihood of repeated damage.

The need for regional coordination. Improving coordination helps increase the resilience of people and landscapes by providing opportunities for leveraging resources (e.g., funding, data, people time), building buy-in and support for plans and on-the-ground projects, improving communication about planned and ongoing activities, and providing a shared understanding of threats, solutions, and priorities. For example, the Flagstaff Watershed Protection Project is a partnership effort between the State of Arizona, City of Flagstaff, and Coconino National Forest to help reduce the risk of devastating wildfire and post-fire flooding in neighboring watersheds.[7] In 2010, the Schultz Fire in Coconino National Forest severely burned thousands of acres of steep terrain; over 20 major flash flooding events occurred after the fire, destroying community drinking water sources and costing over $130 million in damages. Increased fire severity and extreme precipitation events are projected to continue with climate change, requiring targeted forest restoration work and collaboration to reduce the risk of fire and flooding and subsequent impacts on the community. This project is one of only a handful of examples where restoration work on a national forest is being funded primarily by a municipality.

In coastal systems, sea level rise is causing saltwater intrusion into freshwater ecosystems and aquifers resulting in habitat conversion, infrastructure loss, and in some cases, forced relocation of coastal communities, such as in Alaska (e.g., Native Alaska Villages of Kivalina and Newtok) and Washington State (e.g., Hoh Tribe). The primary adaptation approaches employed to address sea level rise, flooding, and erosion issues include: engineered structures (rip rap, bulkheads, tide gates), natural and nature-based approaches (natural habitats such as wetlands or engineered natural features such as living shorelines), and policy and regulatory techniques (tools that either prevent infrastructure in at-risk areas, such as conservation easements, managed retreat; or modify how activities are implemented to reduce risk such as rolling easements, minimum development buffers, real estate disclosures).[8] Natural and nature-based approaches are increasingly used in the United States, especially in lieu of structural approaches that are experiencing limited and declining use, largely due to their cost, lifetime, and the potential for negative ecological consequences.[8] New and novel approaches, including prioritizing, protecting and restoring coastal wetlands with room to migrate inland as sea levels rise, as well as purchasing the land to create new opportunities for coastal habitat migration, are also important.

What do we need to make adaptation possible for all?

Adaptation is necessary not only for our cities, counties and states, but it is also needed for the management and protection of the natural systems upon which we rely. Our rivers, lakes, aquifers, oceans, estuaries, forests, grasslands, deserts and even our agricultural lands give us clean water, raw materials, clean air, and food, as well as also being home to our nation's biodiversity of which we are the stewards. We cannot protect our communities from the impacts of climate change if we are not protecting the very resources we rely upon.

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[7] Flagstaff Watershed Protection Project: http://flagstaffwatershedprotection.org

[8] Gregg R.M., W. Reynier, L.J. Gaines, and J. Behan. 2018. Available Science Assessment Process: Sea Level Rise in the Pacific Northwest and Northern California. Report to the Northwest Climate Adaptation Science Center. EcoAdapt (Bainbridge Island, WA) and the Institute for Natural Resources (Corvallis, OR).

As I was sharing examples of the impacts and actions above, I was outlining the categories of actions that are needed to make adaptation happen. These include:

1) Capacity building
2) Mandate
3) Access to data
4) Access to funding
5) Assessing adaptation effectiveness
6) Ways to share adaptation knowledge
7) Holistic action

Capacity building: While climate change is a ubiquitous challenge to every facet of our lives, society and nature, most people have no idea how it affects their ability to do their jobs or how to make decisions in a climate savvy manner. This will require basic applied education that reaches broadly, as well as in depth educational modification for how everyone from engineers to game wardens to factory supply managers apply adaptation in their trade. Not to be left out of this educational need is congressional and agency staff in our state and federal governments. We need to make consideration of climate change as common place as consideration of funding or staffing. To do this we need to actively provide training across the country. Perhaps akin to public health or emergency preparedness campaigns wherein general awareness as well as local technical expertise are both strengthened. A **National Climate Service**, which could be created from many existing pieces both within and outside of the federal government, is desperately needed. One the greatest resources we have to address climate change is the collective capacity of scientists, planners and managers in our federal, tribal, and state agencies and nongovernmental institutions. The knowledge, experience, and ingenuity brought by our federal partners cannot be undervalued as a key part of the solution to climate change. To capitalize on this asset, we need increased capacity, coordination, and collaboration among and between federal agencies and their non-federal partners, including tribal nations, nonprofits, businesses, community groups, and academic institutions.

Mandate: Everyday decisions are made that are vulnerable to climate change when there are virtually no requirements to consider climate change. Federal dollars are spent to build new infrastructure but there is no climate lens to ensure these projects can endure for their projected lifetime without succumbing to damage from climate change. For example, development in flood plains, ill-suited for extreme weather events, on eroding coastlines, reliant on aquifers which are being infiltrated by rising seas, in areas prone to wildfires and mega-droughts should be disincentivized. In our State of Adaptation Program interviews, we have found that leading motivations of adaptation action are clear mandates, laws and policies. Therefore it would be advised to create a mandate requiring the avoidance or reduction of climate change vulnerabilities in any and all federal funding mechanisms. These mandates and policies should require agencies to work across jurisdictions to increase the likelihood of success. An essential requirement will be to incorporate climate change into all governmental or governmentally-funded planning efforts. This can take the form of discrete "climate action or adaptation plans" or the direct integration of climate change into existing planning processes. For example, EcoAdapt, in collaboration with numerous other partners, worked with the Greater Farallones National Marine Sanctuary (located along the north-central California coast and ocean) to

evaluate vulnerability of their species, habitats, and ecosystem services to climate change and create a Climate Adaptation Plan.[1] The region's natural resources and the services they provide are vulnerable to increasing ocean temperatures, sea level rise, and extreme weather events (winds, waves, storms). The plan integrates climate adaptation into existing management frameworks and recommends over 75 adaptation strategies for regional management agencies to take to enhance coastal resilience, including implementing living shorelines, protecting and restoring habitat, limiting human disturbance, addressing invasive species, promoting education, and investing in science needs.

Access to data: Good decisions can be made when good data are available. Fortunately, good data for climate change exist. We must ensure that these data are accessible, understandable, applicable and used by everyone. Great strides have been made to ensure ease of access. Tools such as Climate Explorer[9], Sea Level Rise Viewer[10], CoralReef Watch[11] all make data easily accessible to and for any interested user. There are still often gaps that prevent users from knowing these data exist or how to apply them. These gaps could be addressed with improved capacity (as described above), data tools to cover more issues (e.g., drought, wildfire, interactive impacts such as contaminant remobilization), and more centralized access points to the full range of data and tools available for making climate savvy decisions. Currently each federal agency has their own lists of tools and data, often not easily navigated by users. Interfaces such as the Climate Resilience Toolkit[12], ARC-X[13], and the Climate Adaptation Knowledge Exchange[14] all are a great start but are all wildly underfunded to meet the need and not broadly discoverable. Of course the ability of these interfaces to deliver good data is incumbent on our continued commitment to data—monitoring the effects of climate change (in the field and remotely from space), updating and maintaining state-of-the-science models and projections, and interpreting these data for the broad array of uses that required them.

Access to funding: There is no avoiding it, climate change will cost us money. And inaction will only cost us more. Making funding available for climate action (mitigation and adaptation) is insurance to prevent more costly expenses due to damage in the future. It should also be noted that by requiring a climate lens to evaluate the comparative vulnerability of different actions (e.g., where to site a road to avoid flooding, how to build houses to reduce energy costs in a warming world, when to undertake habitat restoration projects to avoid extreme weather damage, who to include in planning processes to ensure all vulnerabilities are identified, what land use practices can best reduce wildfire hazards for people and wildlands) we can ensure that all tax dollars spent are adaptation dollars. This will avoid funds being spent for no long-term gain, while increasing benefit through avoided climate change impacts and cost saving when fewer subsequent expenditures are needed to correct for short-sighted misallocations.

Adaptation is a multi-phased process that includes scientific assessments, planning, implementation, and monitoring and evaluation. Funding directed to just one of these phases will

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[9] Climate Explorer: https://crt-climate-explorer.nemac.org/
[10] NOAA Sea Level Rise Viewer: https://coast.noaa.gov/digitalcoast/tools/slr.html
[11] NOAA Coral Reef Watch: https://coralreefwatch.noaa.gov/
[12] Climate Resilience Toolkit: https://toolkit.climate.gov/
[13] Environmental Protection Agency Climate Change Adaptation Resource Center: https://www.epa.gov/arc-x
[14] Climate Adaptation Knowledge Exchange: https://www.cakex.org/

not deliver the results needed to comprehensively address climate change. Therefore, it is imperative that the federal government increase its capacity to provide sustained funding to all stages of the adaptation process, particularly to implementation where upfront costs tend to be higher. Emphasis must also focus on increasing the capacity of state and local governments, as well as boundary organizations, such as nongovernmental partners, to execute climate adaptation work. These organizations are sources of highly specialized and locally relevant expertise, and execute on-the-ground work from technical decision support to facilitating community discourse through workshops. Additional funding sources include foundations and local and state governments. However, many of these initiatives have resulted in piecemeal, fragmented, and disparate approaches, as well as a lack of movement beyond assessment and planning. Federal finance plays a key role in funding all phases of the climate adaptation process. In fact federal funding that is used to support projects that are not inherently taking climate change into account is likely to be money misspent—unable to create the benefits it was intended to achieve when the effects of climate change erode the target efforts.

Assessing adaptation effectiveness: It is clear that inaction is no longer an option, which makes it even more essential that we know which actions will offer the greatest likelihood for positive outcomes. With limited money, staff, resources and time, the more we can learn about what works the better. To do this we need to actively monitor the effectiveness of the implementation of processes, tools and actions to decrease our national vulnerability. This means being willing to learn what doesn't work as well as what does. It requires providing funds to not only create data infrastructure, train the workforce and implement the adaptation actions, but also to track and test each of those steps to ensure they are delivering on their promise. There is often an assumption that with climate change adaptation we will not know what is working until decades from now. While there certainly will be greater clarity on the effectiveness of our actions in the future, we are not without methods to learn early and modify in the short-term to increase our chances for success in the long-term. We need a national database that monitors and tracks adaptation efforts, with researchers dedicated to analyzing the findings to inform our next iterations of what is good adaptation.

The importance of making informed decisions to alleviate the environmental, social, financial, and emotional costs of climate change cannot be overstated. Climate change presents a variety of impacts to which we must respond. Several adaptation case studies and guidebooks have been released in recent years with recommendations of suitable adaptation actions to address different climate impact concerns. However, determining when, where and how a particular action may be best implemented is more difficult to discern. Synthesizing what has worked and what has not worked, as well as why, can help identify potential modifications to current practices and facilitate understanding of the consequences of decisions. Further, science- and evidence-based decision-making supports better outcomes, while reducing costs and lowering the risk of implementing policies that may be based on well-intentioned but insufficient research. In addition to improving overall practice, a better understanding of which actions can be most effectively applied in different settings helps identify and leverage funding opportunities and create new or enhance existing partnerships to advance climate adaptation. EcoAdapt has embarked on an effort to evaluate the body of scientific knowledge supporting specific climate adaptation actions to determine the conditions under which particular actions may be most effective for achieving management goals. Since 2014, we have assessed wildfire, sea level rise,

and drought adaptation options. This work needs to expand beyond these three topics, not to mention being better funded.

Sharing adaptation knowledge: Learning from the past and ongoing efforts of others, as well as from research is fundamental to ensuring effective, successful adaptation outcomes can happen in a timely manner. Federal (Climate Resilience Toolkit[15]) and nongovernmental (EcoAdapt, Climate Adaptation Knowledge Exchange[16], Georgetown Adaptation Clearinghouse[17]) knowledge brokers play central roles in gathering, synthesizing, and contextualizing science into digestible and actionable information sources. Since 2009, EcoAdapt has engaged in a sustained research initiative to identify, evaluate, and assess climate adaptation activities in planning and underway. This includes identification and synthesis of best available science on historic, observed, and projected future climatic changes and impacts, extensive reviews of federal, tribal, state, and local climate change planning documents, over 4,000 interviews with practitioners in order to identify trends and barriers to climate adaptation action, and over 400 case studies now housed on the Climate Adaptation Knowledge Exchange. As with other aspects of climate data, we need to improve access and discoverability of these repositories and their holdings.

Holistic action. Woven through all of the above must be approaches that think holistically and act equitably. Climate change affects everyone everywhere, but the impacts are not felt equally. The ability of historically disenfranchised and underserved communities to adapt to climate change will be stymied by underperforming infrastructure, underfunded institutions, absent services, fewer safety nets such as insurance, and numerous other existing stressors that will be exacerbated by or exacerbate climate change. At the same time, protecting our public lands is a critical part of an adaptation strategy that not only safeguards these areas and the ecosystems that inhabit them, but also the ecosystem services upon which our citizens rely. Investment in the protection of public lands may be our best path to enduring access to clean air, clean and plentiful water, flood control, wildlife habitat, improved mental health, spiritual heritage, and recreational enjoyment. Finally, collaboration across jurisdiction and between sectors will help avoid solutions that work at cross-purposes while maximizing efficiency of limited resources. All of abovementioned elements could be part of a **National Adaptation Plan** or a **National Climate Strategy**. Completed under the auspices of a coordinated approach there is certainly a greater likelihood for success in ensuring the many facets of society and ecosystems are supported, that resources are applied equitably, that training is consistent, goals can be established, and progress can be tracked. Currently climate change adaptation is unfunded, uncoordinated and largely wishful thinking. Without clear adaptation goals and the tools to achieve them we cannot expect good long-term outcomes for our country or our planet.

To meet the needs of your constituents, we need Congress to become well-versed in understanding the full range of issues inherent in effective adaptation, to fund adaptation, to require adaptation within all federal action, and to ensure that the enabling conditions required for adaptation to happen are in place (e.g., data collection and dissemination, training, removing barriers to local action, research). This can be undertaken in a piecemeal approach but to meet

[15] Climate Resilience Toolkit: https://toolkit.climate.gov/
[16] Climate Adaptation Knowledge Exchange: http://www.CAKEx.org
[17] Georgetown Adaptation Clearinghouse: https://www.adaptationclearinghouse.org/

the challenge of climate change with the timeliness that is required, a better approach would be a coordinated federal approach funded and staffed at the scale befitting the consequences for everyone in every one of your districts.

Concluding Thoughts

The problems presented by climate change are vast and the solutions are innumerable and long overdue. With a challenge as urgent and pervasive as climate change, any delay in action is harmful. We have been underachieving for decades. Further prevention of progress will result in backsliding with irreversible and in some cases deadly consequences. What we need is for leadership to step forward. This Congress has the ability to right the ship and advance climate action like never before—at a rate appropriate for the scale and speed of this problem. Key items for prioritization include:

- Increase investments in science- and evidence-based approaches to climate adaptation while allowing for flexibility to identify, develop, and test promising, novel approaches. This includes not just funding for modeling and data collection, but also increased funding for implementation of adaptation actions which include evaluation of effectiveness, and capturing and sharing those lessons learned.
- Increase coordination and collaboration between federal entities and non-federal partners (including international partners) to advance climate adaptation objectives. For example, the majority of federal dollars goes towards fire suppression rather than prevention activities. Getting fire back onto the landscape (both natural and prescribed burns) to support ecological functions is critical, especially as a means to reduce wildfire risk. This includes supporting tribal cultural burning practices across the landscape.
- Reduce the rate and extent of climate change by reducing our reliance on fossil fuels that are polluting our air and water, damaging habitat, harming our health, decreasing our national security, preventing our development into growing job sectors and causing climate change, which is threatening our survival.

Congress' power to appropriate funds can be wielded as one of the most effective tools to ensure the prioritization of climate adaptation overall[18]. Appropriations should be viewed through a climate lens to ensure that the agencies, departments, and research programs most qualified and poised to meet the climate challenge are adequately funded, and that any investments of tax payer dollars are not mis-spent on efforts that are likely to be undermined by the effects of climate change. We need simultaneous action at the scale required to solve the problem on climate change mitigation and adaptation. Approaches like the recent Infrastructure Bill and Build Back Better present the types of opportunities we need to seize to take action at a sufficient scale to integrate investments in climate adaptation across all agencies to address the effects of climate change we are and will experience due to the past emissions we did not curb.

I invite the current Congress to have the fortitude your predecessors have lacked. The time to take meaningful action on climate change to protect our nation and our neighbors around the planet is upon us. It is your job as elected officials to recognize the scope of this crisis and make the changes that are needed. Be brave. Be bold. Take action today for a better tomorrow for all.

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[18] For an additional list of opportunities to promote adaptation through Congressional action, see the Climate Policy Menu: http://climatepolicymenu.org/adapt/