United States House of Representatives
Select Committee on the Climate Crisis

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"Confronting Climate Impacts:
Federal Strategies for Equitable Adaptation and Resilience"

Questions for the Record

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The Honorable Kathy Castor

1. **The IPCC report emphasized the importance of connecting climate mitigation, adaptation, and economic development. What are your views on this?**

Climate mitigation and adaptation are actions that we must take because the physical world is requiring it due to our historic greenhouse gas emissions. There is simply no choice given the impacts we are and will continue to experience. In the case of economic development, we can take actions that assist in this response or that exacerbate it further. Global economic development to foster greater equity and sustainability across countries could be made possible by a rapid transition to a system that is based maximizing energy efficiency and generating power through distributed renewable energy. There is also indication, as evidenced by current events, that this would increase political stability.

2. **The IPCC report also emphasized the importance of avoiding maladaptation. What examples have you seen of maladaptation and how can we avoid it in federal programs?**

Maladaptaiton most often occurs when the perspective applied to adaptation planning and implementation is too narrow. Example of this include when:

- **spatial scale is too small** (e.g., only considers one jurisdiction, doesn't not account for the source of a resource or the connectedness of s system),
- **timeframe is too short** (e.g., only considering the impact over the next 10-20 years when the life expectancy of the resource or infrastructure accounts for a much longer investment, such as 100 years for a bridge),
- **only a single climate impact is considered** (e.g., planning for sea level rise but failing to identify the impact of increasing temperature or ocean acidification or changing precipitation patterns),
- **climate change impacts are considered in isolation from other stressors** also affecting the community or ecosystem (e.g., contaminants, lack of affordable housing, energy demand, gentrification), and

- **sectors are considered individually rather than holistically** (e.g., developing adaptation strategies for water and for agriculture separately).

Unfortunately, the piecemeal approach we currently have to adaptation in the United States, predisposes us to developing maladaptation owing to a lack of mandate, funding and technical capacity to undertake holistic adaptation. The science and data exist to guide it, but the will and resources to make it happen do not.

3. **The IPCC report promoted the integration of equity into adaptation measures on a global scale. How might doing so address the longstanding injustices felt in some communities in our country?**

Responding to climate change gives us a unique opportunity to correct myriad past wrongs. It allows us to reconsider how resources have been distributed and past risk unfairly assigned, by requiring explicit reevaluations of these aspects of society in relation to climate change. Things that seemed foregone conclusions of policy and practice, are now themselves vulnerable to climate change, allowing us to develop new strategies that are equitable. But this will only happen if we do the work to fully understand the implications of climate change, then develop solutions that earnestly endeavor to create an equitable circumstance going forward. There are many lessons to be learned from equitable adaptation being undertaken in other countries and the major issues of global North/South equity in the mitigation and adaptation spaces.

4. **Talk us through some of the barriers a local government or community might face trying to develop and implement a climate adaptation plan, and how the federal government can help overcome them?**

There are barriers at each step of the process, but with those are opportunities for improvement.

1) Determining you will undertake climate change adaptation.
   Barrier: Lack of knowledge that this is something a community can undertake. Lack of political will.
   Federal Opportunity: Create requirements for federal support that climate adaptation plans be in place to be a recipient.
2) Determining how you will undertake climate change adaptation.
   Barrier: Lack of clear approach to how this should be undertaken.
   Federal Opportunity: Create standards of practice that are easily accessible, easy to understand, and linked to support. Tools like Climate Smart Conservation[1] are great models.
3) Finding Capacity to undertake climate change adaptation.
   Barrier: Lack of local capacity to undertake a climate adaptation plan. Most communities do not have dedicated staff, nor do they know where to find external support.
   Federal Opportunity: Create climate change adaptation training opportunities in more fields. Currently the National Conservation Training Center does a great job of providing adaptation training for conservation professionals but there are few other sectors for which there are curriculum, tools and training for professionals.
4) Finding information to undertake climate change adaptation
   Barrier: Users don't know where to look and don't have the capacity (see above) to know how to apply it.

Federal Opportunity: Climate Explorer[2] is a great resource supported by federal agencies to get data to users. Systems like Coral Reef Watch[3] are a model for how to pair data with user needs. We need better access by all to Climate Explorer and more pushing of data to users like Coral Reef Watch.

5) Finding funding to undertake climate change adaptation
   Barrier: There are both a perceived and real funding shortfalls for climate change adaptation.
   Federal Opportunity: In addition to making more funds available for adaptation, it is also essential that all funds be spent in a climate smart manner. As mentioned above, making climate change adaptation a requirement for the expenditure of funds will ensure that we are not taking actions (building infrastructure, designing social systems, protecting wildlife) that are not resilient to climate change, which in turn will help us avoid making our problems worse.
6) Implementing climate adaptation
   Barrier: Analysis paralysis and lack of follow through. Currently too much adaptation never advances beyond the development of a vulnerability assessment or an adaptation plan. We are falling short on implementation.
   Federal Opportunity: Require climate change adaptation be inherent parts of any local actions. Just like ensure you have money and staff to undertake a project, it must also take climate change into account (mitigation and adaptation ideally).
7) Monitoring and evaluating your adaptation actions to ensure they work
   Barrier: Very little monitoring and evaluation happens in general.
   Federal Opportunity: We are behind the curve on climate change adaptation. The problems of climate change are increasing and we have not learned enough about what actions confer advantage. We need to learn and we need to do it quickly. This will require monitoring and evaluation of the processes, plans and outcomes to ensure we are making good choices and have information to share with others that follow.
8) Sharing your monitoring and evaluation outcomes
   Barrier: Clear paths of sharing are under-resourced. The largest database of climate change adaptation solutions is run by a non-profit (EcoAdapt where I work) and has a staff of one. We need to expand this.
   Federal Opportunity: Support databases such as the Climate Adaptation Knowledge Exchange (CAKEx.org)[4] and have federal programs share learning through them with interconnectedness of access nodes and content. Additionally, person to person events like the National Adaptation Forum[5] (in person and virtual) offer real time exchange of ideas that can allow for not only sharing of lessons but innovation of new approaches built on collective experience.

5. In your experience, what are the most successful strategies for helping communities adapt that we should include in a national adaptation plan?

When communities have access to a clear mandate (what they are aiming for), understandable climate information, staff with capacity, community champions who support the effort, allocated funds to undertake the work, and a means of monitoring their progress, they can make adaptation happen. None of this is extraordinarily expensive but it does all have to be there. A National

Adaptation Plan could provide the mandate, access to climate information, staff capacity, funds and monitoring. With the increased awareness created by those five elements, the local community champions will likely make themselves known.

The Honorable Mike Levin

1. **In your testimony you highlighted how the U.S. is already experiencing increased wildfire risk due to climate change and how we need to develop climate adaptive strategies to minimize the impacts and severity of wildfires. Over the last four years, California communities have suffered from seven of the largest fires in state history. These fires, including the August Complex fire, Dixie fire, Monument fire, Caldor fire, and Beckwourth complex fire, collectively burned over 2.5 million acres and destroyed or damaged over 30,000 structures. With climate change, we know that we cannot just prepare for a fire season but must now deal with this threat year-round. And we know that wildfire risk will only continue to increase, with the United Nations Environment Program recently finding that the likelihood of extreme wildfires is expected to increase up to 14 percent by 2030 and up to 50 percent by 2100 as a result of climate change and changes in land use. Can you expand on how wildfires can sometimes lead to greater greenhouse emissions?**

Generally when I hear this question I think I'm being asked about emissions from the fire itself. And it is true, fires emit carbon. Fires such as the burning of peatlands in Indonesia can have massive greenhouse gas emissions. Fires in North America emit carbon as well. Although the emissions amount depends on the fuel load and the heat of the fires. However it is important to note that the burning of trees, plants and soils is the release of what is known as biological carbon. It is carbon that is very labile. It moves as the plants photosynthesize, respire, grown, die, and decompose. This is moving quickly in and out of the atmosphere if you think about it on a geological timeframe. Yes, in the near-term it is more carbon in the atmosphere but its part of the baseload of carbon that has been moving in and out of the atmosphere regularly. The real additive concern for climate change is from fossil carbon.

Fossil carbon (from coal, oil, and gas) is largely fixed until we extract it, refine it and burn it. In wildfires there is also a significant fossil carbon source greenhouse gas emissions pattern. When houses burn they contain a good deal of fossil carbon from everything the house contains that is made of synthetic materials derived from fossil materials.
Large amounts of fossil fuel energy are also used to try and prevent fires (e.g., trucks, chainsaws, bulldozers), fight fires (e.g., firetrucks, helicopters, airplanes) and recover from fires (e.g., construction equipment, movement of goods to rebuild)—all of which result in increased emissions. I was struck last summer as sat on the shore of Silver Lake in California as the helicopters came in again and again to get water to deliver to the Tamarack Fire that this was a very energy intensive approach to solving a growing problem. How could we possibly keep up?

2. **How can communities responsibly adapt to increased wildfire risk and address the acute health risks posed by wildfires without compounding our climate challenges?**

This is a considerable challenge. I live in a community where for at least one week each summer (often several) we are relegated to staying indoors with air filters whirring to reduce our exposure to harmful air from wildfires often hundreds of miles away. We are thankful that it is relatively cool where we live but you can see the added complexity of needing to run filters and air conditioning—which is many regions of the west are run on electricity generating by burning goal or gas. Clearly just making the problem worse. What can we do to improve this?

- Only generate electricity in a manner that does not emit greenhouse gases. In other words convert to all renewable, thermally resilient (not vulnerable to elevated temperatures) electricity to power our household, manufacturing, business and transportation needs.
- Update building code to have greater energy efficiency and proper air filtration options.
- Update land use planning to ensure shade and buffer zones.

3. **Can you also share any examples of how communities have successfully built resilience and adapted to the impacts of increased wildfire risk and extreme heat?**

Successful is a hard bar to meet here for two reasons. First, as I mentioned previously, and in my testimony, we have not done enough to monitor and evaluate the effectiveness of our adaptation ideas, processes, actions and outcomes. This is not due to an inability to do this, rather it is due to a lack of funding to support it and requirement to undertake it—both things Congress can address. With fire and heat occurring on an increasing basis there is plenty of opportunity to assess how well an action to reduce vulnerability to these stressors does or does not work. We don't need to wait until fifty years from now to see how we did, we can be learning right now, using those lessons to modify our actions and sharing them with other communities so they can move more quickly to more successful actions. My organization is undertaking a concerted effort to develop monitoring and evaluation guidance, undertake our own efficacy assessment in various sectors and support broader scale adoption. I am happy to share some of those products and tools with you at your request[6]. Second, what success looks like to different communities at different times will vary. Does success mean suppressing fire on the landscape scale as we did for over a century? Does it mean creating a firesafe perimeter so your community does not burn but the landscape around it does? Does it mean moving communities out harm's way? Does it mean reducing the wildland/urban interface by reducing sprawl so communities stay out of harm's way? There are examples of all of these, but for some each of these solutions will not be seen as successful and for others they will. If you would like to see examples of how communities have taken action to address climate change, including wildfire and extreme heat, head on over to the Climate Adaptation Knowledge Exchange's case studies collection (https://www.cakex.org/resources/type/project) and search for "wildfire and heat" in the search box, or use the key word on the right hand side. You will get hundreds of examples from across the country and a few from around the world. I would be happy to explore this data with you more closely if you are interest.

References Page

[1] Stein, B.A., P. Glick, N. Edelson, and A. Staudt (eds.). 2014. Climate-Smart Conservation: Putting Adaptation Principles into Practice. National Wildlife Federation, Washington, D.C. https://www.nwf.org/-/media/PDFs/Global-Warming/2014/Climate-Smart-Conservation-Final_06-06-2014.ashx

[2] Climate Explorer. https://crt-climate-explorer.nemac.org/

[3] Coral Reef Watch. https://coralreefwatch.noaa.gov/

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

[5] National Adaptation Forum. Next event October 2022 in Baltimore, MD. https://nationaladaptationforum.org/

[6] Hoffman, J.R. and L.J. Hansen. 2022. Moving from faith-based to tested adaptation process and approach: How will we know we're adapting? Adaptation Insight and EcoAdapt.