

November 19, 2021

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Re: Federal Agency Climate Adaptation and Resilience Plans
Docket ID: CEQ-2021-0003

Submitted via Regulations.gov.

Dear Chair Mallory:

The Natural Resources Defense Council (NRDC) appreciates the opportunity to comment on the 26 federal agency Climate Adaptation and Resilience Plans (CAPs) released in October 2021 in response to Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*.

The Biden-Harris administration deserves a great deal of credit for reinvigorating the critical adaptation work that languished under President Trump. The catastrophic wildfires, hurricanes, floods, and heatwaves in just the last year—let alone in the seven-plus years since agencies last updated their adaptation plans—illustrate the urgent need for an ambitious approach to protecting people and nature from the deadly and costly impacts of climate change.

We are also pleased to see multiple advancements from the prior generation of adaptation plans, despite the short timeframe agencies had to complete the 2021 CAPs. For instance:

- The priority adaptation actions identified for each agency are more specific and focused than found in previous plan iterations. Each CAP includes specific implementation mechanisms that should make the 2021 plans more actionable and measurable.
- Several agencies are working to mainstream climate adaptation into agency missions and operations, even if they do not use that term. For instance, USACE Priority Action 5 is to “mainstream climate adaptation and mitigation as applicable into operations,

planning, and acquisition” for existing projects.¹ DOT’s CAP is designed to integrate into the agency’s enterprise risk management, which will help ensure that climate risk oversight is a part of the agency’s established processes. And DOD’s plan states that “every element in the Department should consider appropriate ways to align their work to the initiatives and activities contained within this document.”

- Every CAP contains action items to increase the climate literacy of the federal workforce. For instance, DHS’s plan clearly recognizes the importance of climate literacy, noting “Without adequate climate literacy training for employees and stakeholders, the Department risks developing infrastructure, management decisions, and project designs that do not sufficiently integrate climate resilience, environmental justice, and gender and racial equity considerations” (p. 18).

However, the CAPs need a stronger emphasis on core topics such as delivering more equitable outcomes for disadvantaged communities through agency policies and programs, as well as more clarity about implementation timelines and resource and capacity gaps. NRDC offers the following cross-cutting observations and examples based on in-depth reviews of 13 CAPs and keyword searches of the remainder. Additional agency-specific recommendations are in the Appendix.

Note that throughout this document, we use “mitigation” in the sense of reducing climate-changing pollution, not in the sense of hazard mitigation unless otherwise specified.

I. Comprehensiveness of the CAPs

a. Agencies should devote more attention to protecting their most important asset: their employees.

The COVID-19 pandemic has put immense strain on the federal workforce and, as such, provides a preview of how agencies will be challenged to integrate climate resilience into their operations and missions. When asked about the pandemic in 2020, substantial proportions of agency employees reported unmet physical and mental health needs, increased workloads, and reduced effectiveness² even as the total federal workforce grew.³

¹ This stated commitment to mainstreaming is notable given that USACE’s 2020 Sustainability Report and Implementation Plan does not address adaptation or resilience. <https://www.sustainability.gov/pdfs/usace-2020-sustainability-plan.pdf>

² OPM, “2020 Office of Personnel Management Federal Employee Viewpoint Survey: Covid-19 Report by Agency,” April 2021, <https://www.opm.gov/fevs/reports/data-reports/data-reports/report-by-agency/2020/2020-agency-report-for-covid-items.pdf>.

³ Partnership for Public Service, “Fed Figures: COVID-19 and the Federal Workforce,” <https://ourpublicservice.org/fed-figures-covid-19-and-the-federal-workforce/> (accessed November 11, 2021).

Climate change is, of course, a fundamentally different kind of health and safety threat to agency workers than COVID-19.⁴ It arguably is even more complex and much longer-term, posing myriad challenges to agency missions. Climate change will also challenge the ability of agency heads to meet their legal responsibility to provide healthy and safe working conditions for their employees and contractors.⁵

We found that just five agencies (DOJ, EPA, State, USAID, VA) consider the health and safety of their workforce among their top agency vulnerabilities or one of their top adaptation goals or actions. The plans of an additional six agencies have moderate (GSA, NCPC, and OPM) to relatively strong (DOD, DOE, DOL, HHS) statements about workforce health and safety. The remaining 14 agencies have either minimal (DHS, DOI, DOT, ED, MCC, NASA, USACE, USDT) or no obvious commitments (DFC, DOC, HUD, Smithsonian, SSA, USDA) to workforce health and safety. Every agency should model its efforts to protect the physical and mental health of their workers after the USAID CAP, which recognized that “USAID’s workforce, including contractors, is fundamental to successfully delivering on USAID’s mission,” and committed to “always prioritize the health and safety of its workforce despite competing priorities and limited resources” (p. 25).

One important adaptation measure to protect the health and well-being of the federal workforce is to ensure agencies have sufficient qualified staff. This is particularly important as extreme events increase the demand for certain agency services, such as wildland fire response, disaster recovery and rebuilding efforts, expanded international humanitarian missions, replacing or retrofitting existing federal assets, or replacing public housing with more climate-resilient units. OPM specifically addresses this concern in their CAP, noting that, “the Federal government is struggling to recruit and retrain staff in certain occupational series, including those critical to Federal climate resilience efforts” (p. 5).

Another near-term effort is to ensure that employees and contractors in high-heat environments are getting the training and other protections they need to minimize the risk of heat-related illnesses, injuries, or death. OSHA has initiated a formal rulemaking for an occupational heat safety standard,⁶ but agencies should not wait for that rulemaking to assess and improve their high-heat procedures. Please see below for more detail on the health threat of heat.

⁴ Juanita Constible et al., *On the Front Lines: Climate Change Threatens the Health of America’s Workers*, NRDC, July 2020, <https://www.nrdc.org/resources/frontlines-climate-change-threatens-health-americas-workers>.

⁵ U.S. Department of Labor, “All About OSHA,” June 2015, https://www.osha.gov/sites/default/files/publications/all_about_OSHA.pdf.

⁶ OSHA, “Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings Rulemaking,” October 2021, <https://www.osha.gov/heat-exposure/rulemaking> (accessed November 17, 2021).

Finally, only HHS, VA, and the State Department mention workforce mental health in their CAPs. Agencies must also be ready to address the potential for climate-related mental health stresses on federal workers, including PTSD, depression, strains on social relationships, and more. This could be addressed, in part, through training resources in each agency’s climate literacy efforts.

b. Agencies should more thoroughly address the threat of rising average temperatures and increasingly frequent, severe, and longer heat extremes.

The aggregated nature of these agency-level CAPs means they cannot cover every climate hazard, agency vulnerability, or adaptation need in detail. However, CEQ should instruct agencies to address the direct effects of heat more thoroughly in amended CAPs.

Heat requires a different approach than most other climate hazards because:

- It is so far reaching. Every resource and system that humans depend on—from our own bodies, to our crops, to our built environment, to our technological devices—has an upper temperature limit.
- The ecosystems and wildlife overlapping with the land, water, and ocean areas for which many agencies are responsible also have upper temperature limits for healthy functioning.
- It manifests on multiple time scales, from the chronic effects of gradually rising temperatures to the episodic perils of severe heat waves.
- Heat waves are increasingly co-occurring with flood, wildfire, and hurricane disasters, which frequently disrupt the very life-support systems needed to stay safe in heat.⁷
- There are fewer governance systems responsible for preparing for and responding to heat emergencies and disasters than for other hazard such as floods.⁸

Only 12 of 26 agencies recognize the *direct* health and safety threat of heat to their workforce in their CAPs. That gap is particularly notable in the DOC, DOI, and USDA plans, given the significant contingent of outdoor workers in those agencies.⁹ Furthermore, 15 agencies recognize

⁷ T. Matthews, R. L. Wilby, and C. Murphy, “An Emerging Tropical Cyclone–Deadly Heat Compound Hazard,” *Nature Climate Change* 9, no. 8 (August 2019): 602–6, <https://doi.org/10.1038/s41558-019-0525-6>. Wei Zhang and Gabriele Villarini, “Deadly Compound Heat Stress-Flooding Hazard Across the Central United States,” *Geophysical Research Letters* 47, no. 15 (August 16, 2020), <https://doi.org/10.1029/2020GL089185>.

⁸ Ladd Keith et al., “Deploy Heat Officers, Policies and Metrics,” *Nature* 598, no. 7879 (October 7, 2021): 29–31, <https://doi.org/10.1038/d41586-021-02677-2>.

⁹ Transforming Youth Outdoors, “Federal Government Agencies: Outdoor Career Opportunities,” November 2020, https://www.americantrails.org/images/documents/004_-GUIDE-Federal-Government-Agencies-Outdoor-Career-Opportunities_v1.pdf.

the threat of heat to energy infrastructure and cooling systems, but only four mention its effect on transportation infrastructure. Specific examples of gaps include:

- HUD, which mostly focuses on flood hazards in its CAP. HUD’s efforts to address heat-health risks should include using its influence on housing and local community development patterns to mitigate the urban heat island effect in historically disadvantaged communities. HUD’s adaptation strategy must also address the legacy of federal support for housing redlining, which has created disparities in heat exposure due in part to inequities in tree cover and other green space.^{10,11,12}
- DHS, whose plan should reflect the risks of extreme heat not only to its own workforce (e.g., FEMA staff responding to disasters) but also to migrants and others affected by the agency’s border policies and operations.¹³

Several agencies treat heat less thoroughly in their 2021 CAPs than in their Obama-era plans. For instance, DHS mentions heat as a direct threat to the health of staff in its 2013 plan, but only as an indirect threat through changing patterns of disease in its 2021 plan. USDA repeatedly points to heat as a direct threat to its workforce, operations, and mission in its 2014 plan, but largely ignores it in its 2021 plan.

Agencies also do a poor job of accounting for heat impacts to the natural areas and wildlife they manage. There are few to no plans for adapting to the effects that higher temperatures and especially the increasing frequency of heat waves will have on biodiversity, like mass fish die offs, coral bleaching, and disrupted reproduction of plants. Higher temperatures will exacerbate the rate of biodiversity loss, especially for species and ecosystems already under pressure from human activities. Agencies charged with managing natural areas and wildlife should include strategies to reduce non-climate stressors caused by human activities, such as industrial exploitation of natural resources, to increase the ability of ecosystems and species to adapt to higher temperatures and recover from heat waves.

c. Agencies would benefit from additional guidance, direction, tools, and funding for more granular and up-to-date vulnerability assessments across all hazards.

¹⁰ Angel Hsu et al., “Disproportionate Exposure to Urban Heat Island Intensity across Major US Cities,” *Nature Communications* 12, no. 1 (May 25, 2021): 2721, <https://doi.org/10.1038/s41467-021-22799-5>.

¹¹ Susanne Amelie Benz and Jennifer Anne Burney, “Widespread Race and Class Disparities in Surface Urban Heat Extremes Across the United States,” *Earth’s Future* 9, no. 7 (July 2021), <https://doi.org/10.1029/2021EF002016>.

¹² Jeremy S. Hoffman, Vivek Shandas, and Nicholas Pendleton, “The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas,” *Climate* 8, no. 1 (January 2020): 12, <https://doi.org/10.3390/cli8010012>.

¹³ Human Rights Watch, “US: Extreme Heat Should Prompt New Border Approach,” September 2021, <https://www.hrw.org/news/2021/09/15/us-extreme-heat-should-prompt-new-border-approach>.

Some agencies have performed site-specific vulnerability assessments for their critical assets. Our review suggests, however, that most agencies have not prepared comprehensive, quantitative assessments of the vulnerabilities they face to projected future conditions. For example:

- DOT needs to prioritize site-specific adaptation investments given the many threats of climate change to its transportation infrastructure and assets nationwide. To date, it appears that detailed vulnerability assessments have been performed for only some of DOT's modal Operating Administrations.
- HUD's CAP includes some actions to help protect HUD-assisted assets and their occupants (although please see below for additional comments on renters), but not HUD-owned and operated assets. The agency should ensure it is identifying and acting on threats to its ability to continue service delivery. It also should consider identifying and evaluating the climate vulnerability of its most mission-critical buildings and operational assets and including this type of information in its plans.

We also found that in some cases, the 2021 plans went into considerably less detail on specific climate hazards and vulnerabilities than the Obama-era plans. Other 2021 plans seemed to still rely on vulnerability assessments conducted more than seven years ago, meaning they do not reflect the most recent advances in scientific data and understanding.

For example, HUD's 2012 plan included distinct risk and vulnerability analyses for extreme heat, changes in precipitation, climate-related extreme events, and sea level rise. HUD updated that plan in 2014 with a "crosswalk of vulnerabilities" that provides information on the primary impacts expected from each major climate hazard. Both documents provide a more detailed assessment than the 2021 plan on how climate change could affect the agency's programs, structures, people, and administration.

CEQ should help coordinate more specific guidance, direction, and tools (such as DOD's Climate Assessment Tool¹⁴) for federal agencies to conduct vulnerability assessments. More granular and standardized vulnerability assessments are particularly important with respect to decision-making support for mission-critical facilities and assets. Congress should also ensure agencies have the funding they need to update their vulnerability assessments. For example, GSA's 2021 plan relies on an outdated vulnerability assessment completed in 2015 but indicates that future assessments will be contingent on funding.

CEQ should also work closely with the National Security Council and other relevant bodies to conduct a regular series of scenario-based strategic planning exercises for multiple levels of global warming, including a 4°C world. These exercises would serve as valuable learning

¹⁴ Department of Defense, "DoD Climate Assessment Tool," April 2021, <https://media.defense.gov/2021/Apr/05/2002614579/-1/-1/0/DOD-CLIMATE-ASSESSMENT-TOOL.PDF>.

experiences for agency leadership and personnel and help elevate understanding of the need for more ambitious and expeditious climate adaptation. These strategic planning exercises would encompass a wide array of potential scenarios such as:

- Rapid-onset climate hazards and disasters (e.g., widespread heat waves, wildfires, or flooding events);
 - Compound or simultaneous climate hazards and disasters (two or more hazards happening at the same time in the same place or multiple catastrophic events taking place in different parts of the country in the same approximate time frame);
 - Slow-onset climate hazards (e.g., sea level rise);
 - Cascading failures of interconnected infrastructure systems in major metropolitan areas or across broader geographic regions; and
 - Specific climate hazards, or a chain of climate hazards, that lead to long-term or permanent displacement or migration of population within the United States and the influx of migrants into the nation.
- d. Agencies should put more emphasis on preventative measures to limit the consequences of foreseeable extreme events, rather than just improving their ability to manage the events when they happen.**

Some of the plans we reviewed relied too much on better managing emergencies and disasters after they happen, rather than emphasizing proactive actions to reduce the likelihood or severity of an emergency or disaster before it happens. Even outside the scope of traditional hazard mitigation work, planning and proactive approaches are essential to avoid harm and to catalyze the large-scale efforts needed to adapt to climate change. As the nation did with anti-terrorism activities, we need to adopt a far more proactive stance. Nobody would suggest that we wait for terrorist attacks to occur and then focus on rebuilding in the aftermath. Yet that is often the approach the nation is effectively taking with regards to the present and future impacts of climate change.

For example, EPA appears to recognize that more extreme weather can cause unplanned releases of dangerous chemicals at actively operating industrial facilities, not just contaminated sites like Superfund sites and brownfields. The implication is that EPA should require facilities to take steps to prevent these ‘unplanned’ releases from occurring, for example, in its Risk Management Plan rulemaking or by shifting permit requirements to accommodate for higher flood conditions. Similar examples include EPA’s stormwater program, activities supported under its Clean Water and Drinking Water State Revolving Funds, and other grants and permitting programs overseen by EPA.

Agencies should develop benchmarks for observed climate impacts to assets that newly trained field staff could monitor and use to inform and update operations, maintenance, inspections, and routine processes.

e. Agencies should endeavor to “multi-solve” wherever possible, maximizing both adaptation and emission-reduction goals.

Given inevitable resource constraints and the urgency to drastically cut emissions and increase climate resilience, agencies should be alert to opportunities to achieve both goals. For example, DOE’s Priority Action 2 stands out for its recognition that:

- Climate mitigation and adaptation are interdependent;
- Adaptation actions can have mitigation co-benefits; and
- Mitigation measures should include resilience objectives.

HHS likewise aims to reduce greenhouse gas emissions, reduce costs, and address social determinants of health in its Priority Action 3. However, as HHS grant development teams are working to develop requirements for grantees to “address the impacts of the climate crisis,” we urge them to ensure that explicit climate adaptation requirements stand alongside more general or multi-purpose “sustainability” ones.

As another example, USDA can build more incentives for soil health into the Federal Crop Insurance Program as adaptation to a changing climate while sequestering carbon in the soil to mitigate greenhouse gas emissions.

f. Agencies should incorporate more nature-based solutions in their adaptation and mitigation strategies.

Our review suggests that agencies are not giving enough consideration to green infrastructure and other nature-based solutions for building long-term climate resilience. This is surprising, given the potential mitigation and adaptation co-benefits from nature-based solutions and the fact that several of the CAPs we reviewed were by members of EPA’s Green Infrastructure Collaborative.¹⁵

It is also surprising given the scientific consensus that humanity must tackle the climate and biodiversity crises together if we want to effectively address either. Protecting natural systems and adjusting agricultural and forestry practices must be an integral part of an equitable climate

¹⁵ EPA, “Green Infrastructure Federal Collaborative.” updated November 2021, <https://www.epa.gov/green-infrastructure/green-infrastructure-federal-collaborative#Collaborative%20Members> (accessed November 16, 2021).

strategy. Doing so will provide benefits to communities including the following, all of which support adaptation:

- Buffers against floods, droughts, extreme heat and storm surges;
- Property damage prevention and erosion control;
- Improved water quality and food security;
- Preservation of people's cultural relationships with nature; and
- Empowerment of Indigenous sovereignty.

As we consider the contribution certain agriculture, forestry, and land management practices have made to the climate crisis and how such practices have made adaptation and resiliency more difficult, relevant agencies should consider how nature-based solutions can empower farmers and other resource users to be part of the solution. Further, with the right investments, protecting and restoring carbon-dense ecosystems and adjusting resource-use practices can also help people transition to new sustainable, safe, long-term careers, especially in rural and Indigenous communities who have historically been dependent on extractive industries that often have devastating health impacts.

In short, better managing working lands and safeguarding critical natural areas and ensuring that they are connected, effectively and equitably managed, and ecologically representative will help stabilize the climate, protect biodiversity, and give plants and wildlife a chance to adapt to already unavoidable climate change impacts.

While many agencies generically identify the value of conserving natural areas in their CAPs, they do not identify concrete plans for promoting and advancing nature-based solutions as a tool for adaptation. For instance, although the DOT CAP identifies the preservation of ecosystems as a guiding principle, it mentions nothing about the co-benefits of incorporating nature-based solutions into transportation projects. DOT should identify priority actions to create incentives and requirements for transportation projects to incorporate low impact development, green infrastructure, and other nature-based solutions for climate resilience.

Within USDA, numerous programs present opportunities to advance natural climate solutions as a cornerstone for adaptation. Programs like the Conservation Stewardship Program (CSP) and Environmental Quality Incentives Program (EQIP) should be framed as natural climate solutions because they have the potential to convert their land into a resource for adaptation, and to help farmers stabilize the carbon sink.

All federal agencies should do more to explain how they are embedding the use of green infrastructure and nature-based solutions into their adaptation and resilience planning, grant funding programs, and other efforts to reduce climate risks and vulnerabilities. This includes

identifying agency funds that can support nature-based solutions, with clear goals for how much financial support the agency will provide and over what time frame.

g. Agencies should incorporate implementation of the reinstated Federal Flood Risk Management Standard (FFRMS) into their CAPs.

In May 2021, the Biden administration officially reinstated the FFRMS, which requires the siting and design of all federally funded projects to account for the increasing risk from flooding and sea level rise. This important standard protects federal assets and financial investments. It also represents a critical safeguard for the people and communities who rely on buildings and infrastructure that are built, at least in part, using federal funds and must comply with the FFRMS.¹⁶

Despite the requirement that all executive agencies comply with the FFRMS, only the DHS and HUD plans mention it by name, and DHS states only that it will “Ensure DHS investments incorporate the FFRMS where appropriate” (p. 12). While we recognize that formal reinstatement of the FFRMS may have taken place too late for some agencies to fully incorporate it into their CAP, CEQ and OMB should ensure that agencies are rapidly moving towards implementation. This includes issuing a deadline by which agencies must implement the FFRMS and adopt all necessary regulations, guidance, or grant criteria. CEQ and OMB should also immediately request of all agencies a plan for FFRMS implementation, including necessary changes to agency policies and practices. Each agency’s FFRMS implementation plan should then be appended to the CAP.

We do recognize that CEQ is chairing an FFRMS Working Group, which we understand is assisting and supporting agency efforts towards implementation. That is important. But given the \$1 trillion in federal infrastructure funding that was recently approved and the potential for much more in the weeks ahead, it is imperative that these dollars comply with the FFRMS.

II. Equity

a. Agencies must devote additional resources and capacity to developing and implementing equitable and just adaptation policies, programs, and practices.

NRDC is encouraged by the stated intent of federal agencies to identify and remedy the inequitable harms of climate change—and the inequitable distribution of benefits of programs and policies intended to address climate impacts. The plans we reviewed at least briefly discuss

¹⁶ Joel Scata, “FEMA Restores Potentially Lifesaving Flood Standard,” NRDC, September 2, 2021, <https://www.nrdc.org/experts/joel-scata/fema-restores-potentially-lifesaving-flood-protection-standa>.

how certain populations are disproportionately affected by climate hazards and make high-level statements about the need for more equitable outcomes.

However, the CAPs typically lack specifics on how equity will be incorporated into adaptation programs, projects, or other interventions. For example:

- DOD identifies Environmental Justice under Challenges/Further Considerations under Line of Effort 1 (Climate-Informed Decision-Making). The CAP notes that the department’s programs, policies, and activities must address disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts on disadvantaged communities. However, there is only a vague reference to how DOD will accomplish this, with the plan stating that “DOD business intelligence and metrics across financial and management information systems should include climate-related Environmental Justice and social vulnerability analyses where appropriate” (p. 8).
- DOE’s CAP includes little discussion on how the agency will help address climate vulnerable populations aside from the agency’s broader environmental justice initiatives. The CAP indicates that as DOE conducts site-specific vulnerability assessments and resilience planning (Priority Action 1), it will evaluate the potential costs and consequences of inaction, including to environmental justice communities. DOE sites should directly engage affected communities in these site-specific assessments and implementation of resilience plans.
- HUD should devote additional attention to adaptation measures that protect renters and unhoused people, who are more likely to be exposed to climate hazards than homeowners and often have less capacity to respond.¹⁷
- HHS offers a relatively strong initial list of actions to protect the health and safety of its workforce from climate hazards. Future phases of adaptation planning should incorporate targeted protections for lower wage and manual labor workers, who across the federal workforce¹⁸ and within at least some HHS component agencies are disproportionately people of color.¹⁹ Lower wage and manual labor workers are more likely to be exposed to climate hazards and may have less capacity to respond.
- DHS states that it will “Identify strategies to expand outreach to and access for communities with environmental justice concerns to financial assistance programs that build climate adaptation capacities,” (p. 12) but this urgent and essential work requires

¹⁷ Khalil Shahyd, “How HUD Can Address the Crisis of Housing & Climate Change,” NRDC, January 22, 2021, <https://www.nrdc.org/experts/khalil-shahyd/how-hud-can-address-crisis-housing-climate-change>.

¹⁸ OPM, “Federal Executive Branch Characteristics (FEBC): Fiscal Year 2010 to Fiscal Year 2018,” n.d., <https://www.opm.gov/policy-data-oversight/data-analysis-documentation/federal-employment-reports/reports-publications/federal-executive-branch-characteristics-2010-2018.pdf>.

¹⁹ National Institutes of Health, “NIH Workforce Profile Fiscal Year 2020, Fourth Quarter,” October 2020, <https://www.edi.nih.gov/people/resources/advancing-racial-equity/nih-workforce-profile-fy20q04> (accessed November 17, 2021).

more than just identifying strategies. DHS should also commit to specific steps to meet this goal, such as creating a dedicated capacity building set-aside within the Building Resilient Infrastructure and Communities (BRIC) grant program that provides funding to low-income communities, communities of color, and tribal communities.

- DHS’s performance metrics are largely non-specific and, with few exceptions, do not capture the equity implications of the agency’s actions. One of the more specific metrics tracks dollars spent through the BRIC grant program. While one component of this metric includes benefits to disadvantaged communities, the overall strategy of measuring money invested for “reducing both risks posed by natural hazards and future losses” (p. 13) could continue to drive BRIC funding toward large infrastructure projects in areas with expensive real estate, rather than to build adaptive capacity in vulnerable communities.²⁰
- USDA’s CAP is missing strategies to identify and address specific climate vulnerabilities of farmworkers, who increasingly are being exposed to extreme heat, wildfire smoke, and potentially more pesticides. The plan should prioritize protections for the people who keep our food supply consistent and secure, often at great cost to their own health. This would start by including them in the list of USDA’s stakeholders who have been underserved by agricultural policy (p. 18).
- USDA likewise should address the health threats from industrial agriculture, which likely will increase as the climate changes, as part of its approach to help underserved stakeholders. This should include explicitly acknowledging the risks of increased pesticide use in response to climate-fueled increases in pest populations and setting pesticide use reduction targets.

Much work is needed to ensure that overburdened communities can leverage data, tools and funding streams to advance adaptation and resilience priorities effectively. A long-term strategy to direct resources to overburdened and under-resourced communities, typically through sustained outreach and engagement and transparent development of policies and programs, is needed to produce measurable and positive results. NRDC recommends that agencies:

- Develop and offer webinars and trainings for a diverse range of audiences;
- Assign staff or expand staffing capacity to work with communities to provide information transparency; and
- Eliminate barriers to accessing funding opportunities or technical assistance.

Future phases of the CAPs should also address:

²⁰ Anna Weber, “Building Resilience, BRIC by BRIC,” NRDC, September 1, 2021, <https://www.nrdc.org/experts/anna-weber/building-resilience-bric-bric>.

- How much agency funding is going to disadvantaged communities in support of climate resilience and adaptation efforts and how agencies intend to increase that share of funding in the future; and
 - How agencies will implement the Justice40 Initiative, the government-wide effort to deliver 40 percent of the overall benefits of relevant federal investments to disadvantaged communities.
- b. Agencies should more deliberately and robustly address the threat of maladaptation, especially in vulnerable communities.**

Research and practice have shown that even well-intended adaptation strategies can have a range of negative consequences for populations that already experience the disproportionate harm of climate hazards. This threat of “maladaptation” should be an integral consideration for agencies as they identify the potential challenges or risks associated with the design and implementation of adaptation measures. Specific examples are below.

- NRDC supports the concept of adding climate-related requirements to federal grants as found in HHS Priority Action 3. However, additional requirements have the potential to increase the funding equity gap for marginalized and under-resourced communities and state, local, and tribal governments that already lack capacity or expertise to write competitive grants. The HHS plan alludes to ensuring that subject matter teams tasked with developing grant language have “proper representation.” Equity among grantee communities should be a core consideration for HHS and other agencies working to embed new requirements in federal grants.
- Similarly, DHS states that it will evaluate grant and loan programs “to ensure that, where DHS has authority, climate adaptation-integrated projects receive priority” (p. 13). DHS should ensure that this includes capacity-building activities in frontline communities, communities of color, and other marginalized and under-resourced communities. While these activities may not involve a tangible “project,” investing in community capacity is a critical component of climate adaptation.
- HUD must consider potential harm to climate-vulnerable populations as it continues to explore approaches to better integrate climate-related financial risk into its asset management and servicing procedures and its underwriting standards, loan terms and conditions. This and other actions under Objective 2 (Enhance Mortgage Financing) could lead to unintended and maladaptive consequences, such as further limiting Federal Housing Administration loan approvals or restricting low-cost financing for climate resilience measures for those who are most in need of such assistance.

Federal agencies also need to identify the policies, practices, guidance, and other decision-making criteria they employ that are already leading to maladaptive outcomes or, at the very least, that are

failing to account for future climate conditions. Every day, federal agency rules, regulations, and guidance criteria influence decisions made about where to build, how to build, and what to build. The federal government's policies usually set the floor for what states adopt as their own policies, which in turn influence what projects ultimately get permitted and built in local government jurisdictions.

It is presently the exception, rather than the norm, for those decisions to account for the future impacts of climate change or to contemplate a future that looks different than the past. For instance, the National Flood Insurance Program (NFIP) is responsible for providing insurance as well as establishing minimum land-use standards, mapping flood risks, and providing assistance to reduce flood damage—all of which should account for the impacts of climate change. However, the program utterly fails to recognize climate change, which is one of the biggest long-term drivers of flood risk. FEMA currently has a Request for Information open for public comment which seeks input on how to begin correcting these inherent problems.

Other examples abound. Under the Clean Water Act, temperature-dependent water quality standards and water quality-based effluent limits may not be protective if they are calculated based on decades-old data. Similarly, the conditions of various stormwater permits typically require retention of stormwater from a 25-year, 24-hour storm event (or some other interval). Most states are calculating those permit conditions using out-of-date precipitation data. As a result, stormwater systems are being permitted that are already under-sized and under-capacity for the present and have no hope of handling the volumes of rainfall for the more intense storms of the future.

CEQ should direct agencies to conduct a comprehensive review of existing statutes, regulations, authorities, grant making programs, and other agency decisions that currently *do not* account for future climate impacts. Agencies also need to prioritize communities for targeted adaptive capacity building support according to the drivers of social vulnerability *and* exposure to climate hazards. This may need new evaluation methods and additional funding for increasing local adaptive capacity.

III. Implementation and Evaluation of the CAPs

a. Future CAPs need more specific and urgent implementation timelines.

Many of the priority adaptation actions in the CAPs are identified as ongoing activities or noted as a beginning or incremental phase for additional actions that are not so clearly defined. Agencies have typically provided more specificity on when work will begin than when it will be completed.

For example, for DHS’s Priority Action 2 (Ensure Climate Resilient Facilities and Infrastructure), the CAP states, “DHS will continue to execute many of these actions in FY 2021-2025. As adaptation is an iterative process, these actions will be ongoing” (p. 8). While it is important to acknowledge the continually evolving nature of climate adaptation work, the CAP should provide more concrete timelines for the specific actions identified in the plan.

Far-off implementation deadlines for many of the priority actions also leave agency facilities, operations, and workforce under- or unprotected for too long. For instance, the DOL CAP indicates that implementation will not *start* until the end of FY2023 for Priority Action: Ensuring Worker Safety (p. 7) and the start of FY2024 for Priority Action 2: Facilities and Mission Readiness (p. 10).

b. Every agency needs more capacity devoted to the essential work of climate adaptation.

Even without the challenge of climate change, the Government Accountability Office (GAO) has long been concerned that “mission critical skill gaps are undermining the ability of federal agencies to carry out their missions.”²¹ These skill gaps will only widen as the challenges of climate change intensify and become more complex. Furthermore, as noted above, climate change will increase demand for many of the federal government’s basic services. Federal agencies and Congress will need to ensure that agencies have appropriate staffing levels and skill sets to deliver on more ambitious and urgent adaptation efforts. Some specific examples of staffing needs are below.

Priority Action 2 in the HHS CAP appears to be about mainstreaming climate adaptation into the missions and programs of every HHS division. For example, each operating division of HHS (e.g., Agency for Healthcare Research and Quality, CDC, Centers for Medicare and Medicaid Services), will create its own climate action plan that will eventually be integrated into the overall HHS plan. According to the CAP, this effort will be supported by the new Office of Climate Change and Health Equity (OCCHE) and the HHS Sustainability Team (p. 7). This seems like an unusually large task for OCCHE, which is a brand-new office with a small staff and a reported budget of about \$3 million per year.²² It is unclear how OCCHE can deliver on this Priority Action without additional staff and funding, especially given all their other critical roles.

The DHS CAP states that no further resources are needed to implement its Priority Actions; at most, DHS will “need to reallocate employees and funding” (p. 9) and provide additional

²¹ GAO, *Science and Technology: Strengthening and Sustaining the Federal Science and Technology Workforce*, GAO-21-461T, March 2021, <https://www.gao.gov/products/gao-21-461t>.

²² Ariel Wittenberg, “U.S. Climate Equity Office Debuts, But With a Tiny Budget,” E&E News, September 13, 2021, <https://www.scientificamerican.com/article/u-s-climate-equity-office-debuts-but-with-a-tiny-budget/>.

guidance and training. However, it is well known inside and outside of DHS that FEMA, the agency perhaps most directly responsible for addressing the impacts of climate change, already faces serious capacity issues. Both a May 2020 GAO evaluation and FEMA’s own after-action report for the 2017 hurricane season found that FEMA has struggled to staff its disaster response activities in recent years, and that many personnel deployed to disaster sites lacked adequate training.^{23, 24} As climate-driven disasters increase in frequency and intensity, FEMA will likely need to increase staffing for deployable personnel while also ensuring adequate capacity for the planning, training, grant-making, and other activities needed to implement the CAP. FEMA and DHS, in consultation with state and local emergency management officials, should assess future staffing and capacity needs at FEMA, as well as state and local governments that partner with the agency.²⁵ The assessment should identify the needs for responding to multiple simultaneous disasters, expanding hazard mitigation programs, and advancing climate adaptation efforts.

c. Agencies should more clearly and consistently identify the individuals or offices responsible for CAP implementation.

Adaptation plans at all levels of government often fail to indicate who is responsible for implementation.²⁶ We were pleased to see that all but one of the 26 agencies designated specific, senior-level individuals to oversee implementation.²⁷ The CAPs from GSA and DHS stood out for clearly outlining the responsible individuals and groups within their respective agencies for implementing actions within the plans.

The HHS CAP, in contrast, identifies a Chief Climate Action Officer who will be responsible for overall implementation (p. 2), but does not consistently identify who is responsible for individual actions within the plan. Specific operational or staff divisions (e.g., CDC) or categories of staff (Subject Matter Experts) are occasionally designated, but in many other instances the use of passive voice makes it impossible to tell who will be in charge (e.g., “Timelines will be developed” and “Meetings will be held” on p. 15 of the plan).

CEQ should also provide additional information about how it plans to coordinate implementation of the adaptation plans across agencies. For instance, one of the implementation barriers

²³ GAO, *FEMA Disaster Workforce: Actions Needed to Address Deployment and Staff Development Challenges*, GAO-20-360, May 2020, <https://www.gao.gov/assets/gao-20-360.pdf> (hereinafter “GAO, Disaster Workforce”).

²⁴ FEMA, *2017 Hurricane Season FEMA After-Action Report*, July 2018, https://www.fema.gov/sites/default/files/2020-08/fema_hurricane-season-after-action-report_2017.pdf.

²⁵ GAO, Disaster Workforce. GAO recommended a somewhat similar assessment, although restricted just to FEMA disaster response capabilities (see p. 43). But a wider scale assessment is needed that includes state and local governments and the mutual support they provide through Emergency Management Assistance Compact.

²⁶ See, for example, Marta Olazabal and Maria Ruiz De Gopegui, “Adaptation Planning in Large Cities is Unlikely to Be Effective,” *Landscape and Urban Planning* 206 (February 2021): 103974, <https://doi.org/10.1016/j.landurbplan.2020.103974>.

²⁷ Instead of one or two individual officials, HUD assigns responsibility to its recently established Climate and Environmental Justice Council (p. 3).

mentioned in the CAPs is potential delays at collaborating agencies (p. 16 of the DOL CAP). CEQ has a valuable role to play in interagency coordination and high-level sequencing of action. Roles and responsibilities for cross-agency action should be clearly defined, and both federal and non-federal stakeholders should be able to easily find the point of contact for specific adaptation-related needs. Formally naming a federal Chief Adaptation Officer or Chief Resilience Officer would help ensure a coordinated all-of-government approach and signal that the administration is treating this critical issue with the importance it deserves.²⁸

d. More collaboration is needed within and across agencies to provide stakeholders with centralized, actionable climate data and adaptation tools.

Many of the CAPs we reviewed prioritized the development and dissemination of climate risk data, adaptation tools, and other resources for their workforce or other stakeholders. However, local, state, and tribal climate practitioners already report that the plethora of climate-related guidance and resources from various federal agencies is overwhelming, insufficiently actionable, and at times may even conflict. For instance, one collaborative effort by NRDC and academic researchers to describe one year's climate-sensitive health impacts and associated costs required us to compile data from over a dozen agency sources.²⁹ The lack of a centralized source for climate change-relevant environmental, health, and cost data, integrated across various federal agencies at consistent geographic and time scales, hampers stakeholders' development of local knowledge to describe climate impacts and associated costs, and to develop actionable adaptation tools.

Agencies should collaborate closely on investments in adaptation research and tools to minimize duplication, improve consistency, and provide more centralized, user-friendly datasets and knowledge resources for a wide range of stakeholders. Individual agencies should also ensure that the research and data they are producing are relevant and useful, which in some cases will require additional or reallocated funding. For example:

- USDA should provide the data and tools needed (e.g., information, measurement/monitoring strategies, and best practices tailored for complex and diversified farms; outcomes data from the Soil Health Demonstration Trial) to ensure that public investments in climate-smart practices emphasize low-cost, accessible strategies that will benefit a wide range of producers across the country.
- One of the priority actions in the HHS plan is to expand CDC's existing surveillance and monitoring programs and data integration. NRDC strongly supports this expansion, and particularly appreciates the intent to integrate residential data, work history data, and

²⁸ Rob Moore, "Climate Change Demands New Paradigm for Disaster Management," NRDC, September 7, 2021, <https://www.nrdc.org/experts/rob-moore/climate-change-demands-new-paradigm-disaster-management>.

²⁹ Vijay Limaye, et al., "Estimating the Health-Related Costs of 10 Climate-Sensitive U.S. Events During 2012," *GeoHealth* 3:245-265 (September 2019), <https://doi.org/10.1029/2019GH000202>.

community science approaches (p. 4). It will, however, require a substantial additional and sustained investment to build a 21st-century system that links climate change, environmental disruptions, and associated health harms and costs.³⁰

e. Agencies should regularly and consistently track and report their implementation progress in a central location.

We found few direct connections between the priority actions identified in the 2021 CAPs and each agency’s previous adaptation plan. Based on a cursory review of plans published during the Obama administration, some agencies did draw from earlier planning efforts—including by reusing entire sections of text. However, there is no obvious continuity between the plans, especially as it relates to any implementation progress the agency has made through its climate adaptation planning efforts. For example, there is no reference to DOE’s previous iterations of its Climate Change Adaptation Plan in the 2021 report, which is surprising given the amount of information and previous work that was likely leveraged in its creation. The 2016 plan provides a good summary of past studies and documents that were used in its development and includes a useful appendix of additional resources.

We also found insufficient and often inconsistent levels of detail on how success will be measured *within* agencies, and inconsistent methods for tracking plan implementation *between* agencies. This is particularly true with respect to equity metrics. For example, the Performance sections in each of the Priority Actions in the HHS CAP are a mix of specific metrics (e.g., “number of people served by remote IT access platforms”) and general aspirations (“ensuring there is a focus on environmental justice”).

The more specific metrics offered in the CAPs also tend to measure broader sustainability/efficiency goals, versus climate resilience per se. For instance, DHS’s performance metric for Priority Action (Ensure Climate Resilient Facilities and Infrastructure) is “Report annually on progress toward measuring and reducing DHS greenhouse gas emissions and sustainability practices in the Sustainability Report and Implementation Plan” (p. 7).

It is notoriously difficult to measure and communicate the success of climate adaptation plans,³¹ so CEQ should consider providing specific guidance and tools for agencies to do it more effectively and consistently. We also recommend linking all agencies to a common, centralized reporting dashboard with a public-facing element for greater transparency and to drive increased

³⁰ Vijay Limaye and Kim Knowlton, “Now’s the Time To Strengthen and Modernize Health Data,” NRDC, July 23, 2020, <https://www.nrdc.org/experts/vijay-limaye/nows-time-strengthen-modernize-public-health-data>.

³¹ See, for example, Lars Christiansen, Gerardo Martinez, and Prakriti Naswa, *Adaptation Metrics: Perspectives on Measuring, Aggregating and Comparing Adaptation Results* (Copenhagen: UNEP DTU Partnership, 2018), <https://unepdtu.org/publications/adaptation-metrics-perspectives-on-measuring-aggregating-and-comparing-adaptation-results/>.

accountability across the federal government. Members of Congress and the public should not have to search for implementation progress in potentially hundreds of annual reports or other documents from component agencies.

IV. National Climate Adaptation and Resilience Strategy

- a. The White House and federal agencies should use the CAPs to spur a sustained national conversation about the urgency of climate adaptation, jobs created through adaptation initiatives, and the resources still needed to build a resilient, climate-smart United States.**

The White House and senior agency leaders appropriately appear to be the main audiences for the CAPs. However, the CAPs also should be better leveraged for a sustained national conversation about the urgency of climate adaptation, the scale of the investment needed, how adaptation will improve the delivery of essential government services, and the kinds of federal support communities need for their own local adaptation initiatives.

CEQ and OMB should consider developing for lay audiences a short, jargon-free summary of key themes across the 26 plans, as well as the challenges—and opportunities—that lie ahead. This summary should define and use key terms in a consistent way, for example by using the definitions in the National Climate Assessment. Agencies should also take every possible opportunity to make climate adaptation visible for the public and key stakeholders, including by communicating significant planning and implementation projects and milestones and tying those successes back to the CAPs.

Another, more targeted “summary for policymakers” would help Congress identify major funding gaps, legislative remedies for barriers to agency actions or maladaptive policies, and other action items.

- b. The United States needs an overarching strategic vision for climate adaptation.**

NRDC recommends that future CAPs be guided by an overarching strategic vision, preferably in the form of a National Climate Adaptation Strategy. That should include the following:

- National goals that serve to guide climate resilience and adaptation efforts;
- Direction to agencies to incorporate climate-informed decision making into all relevant national programs, operations, and strategies;
- An emphasis on future-oriented adaptation strategies and decision-making that considers the impacts of climate change, including those that are likely or possible decades from now;

- Prioritization of climate resilience and adaptation efforts to support the most vulnerable human communities and the most urgent national challenges;
- Recognition of the vulnerability of natural systems to climate change; and
- An emphasis on the necessity of ecosystem integrity and restoration as cornerstones of our national climate resilience and adaptation vision and the need to preserve the intrinsic value of nature and support ecosystem services.

Efforts to increase the nation's climate resilience have never been more critical and the new CAPs represent an important milestone in the administration's efforts to deal with the climate crisis. We look forward to working with CEQ, OMB, and the federal agencies named in this letter to build a safer, healthier future *and* present for people, communities, and natural systems. Please contact Juanita Constible (jconstible@nrdc.org) if you have questions or wish to discuss aspects of the letter with one of the many experts who contributed to it.

Respectfully,

NATURAL RESOURCES DEFENSE COUNCIL

Appendix: Additional Agency-Specific Recommendations

DHS

- The DHS CAP provides clear descriptions of the agency's key climate vulnerabilities, associated adaptation goals, and existing adaptation-related work. DHS has a head start on adaptation compared to many agencies, as the nature of its portfolio means it is already grappling with a wide range of climate-driven hazards and uncertainties. As such, the DHS CAP focuses on continuing existing work and incorporating adaptation principles into areas where that has not yet been done. As noted above, the DHS CAP provides a strong organizational plan for these efforts, with the Climate Change Action Group overseeing work and providing updates on implementation.
- DHS, particularly through FEMA programs and policies, has a lot of power to advance adaptation goals across the United States. The agency's CAP discusses how its grant and loan programs can incorporate adaptation principles, and the integration plan described on p. 12 seems like an excellent step. However, grant and loan programs are not the only opportunity to promote adaptation in state and local jurisdictions.
- For example, FEMA sets requirements for state and local hazard mitigation plans, which could be strengthened to better incorporate the effects of climate change. FEMA

guidance currently directs states to consider future climate impacts as part of an approvable State Hazard Mitigation Plan: “State risk assessments must be current, relevant, and include new hazard data, such as recent events, current probability data, loss estimation models, or new flood studies as well as information from local and tribal mitigation plans, as applicable, and *consideration of changing environmental or climate conditions that may affect and influence the long-term vulnerability from hazards in the state* [emphasis added].”³² But those plans vary widely in how climate impacts are considered and few states are truly incorporating climate data into either their vulnerability assessments or their proposed hazard mitigation actions. In 2020 FEMA solicited feedback on updates that could be made to the state and local hazard mitigation planning guidance.³³ One clear recommendation is to retain and strengthen the climate and future conditions requirements and expand them to local hazard mitigation plans.³⁴

- Similarly, FEMA is beginning the process to update the minimum codes and standards required for participation in the NFIP, as well as many other aspects of the program.³⁵ While the DHS CAP mentions the NFIP and other non-grant programs in passing, the plan should include actions and metrics for how these efforts will be used to reach adaptation and equity goals and proposed timelines for implementation.
- DHS relies heavily on BRIC to achieve its goals under Priority Action 2. Even with the additional funding allocated by Congress in the coming years, BRIC still represents a relatively small share of the resources needed to address climate adaptation. BRIC funding is also effectively out of reach for many communities, such as those are located in states without mandatory building codes, that lack the capacity to apply, or that have needs that are difficult to quantify in a benefit-cost analysis.³⁶ NRDC urges DHS not just to “support the continuation” of BRIC as it states on p. 12 of its CAP, but to commit to continuing improvement of the program make it more equitable, accessible, and effective.
- DHS’s plan appropriately identifies human migration/climate-related relocation as an important consideration in its adaptation activities. However, the CAP should go beyond the commitment to “re-examine and build upon past efforts to understand the impacts of climate change on mass migration” and outline more specific actions to achieve the desired “balanced, equitable outcomes” (p. 23). In addition to increasing coordination among DHS Operational and Support Components, DHS should also coordinate closely with other agencies (e.g., HUD, USDA) whose policies and programs interact with or are affected by climate-related relocation.

³² FEMA, *State Mitigation Plan Review Guide*, March 2015, https://www.fema.gov/sites/default/files/2020-06/fema-state-mitigation-plan-review-guide_03-09-2015.pdf.

³³ FEMA, *Mitigation Planning Policy Update-Summary of Feedback*, October 2020, https://www.fema.gov/sites/default/files/2020-10/fema_mitigation-planning-policy-update-summary-feedback.pdf.

³⁴ *Ibid*, p. 17.

³⁵ Scata 2021.

³⁶ Weber 2021.

DOT

- The most significant action proposed by DOT is to address transportation projects that do not incorporate resilience to climate change impacts into their design, construction, and siting. DOT's recommended action is to evaluate existing and new projects to ensure that climate resilience measures are adopted across the life cycle of the project. Given the enormous federal investments made in the nation's transportation infrastructure, this is an action that should be implemented in close partnership with State-level transportation agencies, regional and metropolitan transportation authorities, and others which are involved in allocating and managing the use of DOT funding. This action is linked to DOT's priority action to enhance resilience throughout the project planning and development process by updating current regulations and guidance for internal and external stakeholders.
- Given the influence DOT-funded projects have on local community growth and development patterns, we recommend that the agency identify opportunities to help states and local jurisdictions reach their own climate adaptation and resilience goals (e.g., preventing transportation projects from increasing downstream flood risk and incorporating new mobility opportunities for vulnerable populations).

HUD

- While the CDBG-DR and CDBG-MIT grant programs are addressed throughout the CAP, we recommend that HUD put more emphasis on how the agency help improve the nation's resilience to climate hazards through the permanently authorized and more extensive CDBG grant program. As noted in the plan, CDBG is a flexible and widespread program, reaching over 1,200 local governments in all states and territories, and a powerful tool for building climate resilience. HUD should identify some specific actions for how they will do this with CDBG grantees beyond a required discussion topic in the Consolidated Planning Process. For example, promoting the integration of a jurisdiction's Consolidated Plan with their FEMA-approved Hazard Mitigation Plan (and/or other resilience/adaptation plans) would be beneficial to both local planning processes and eliminate potential conflicts in community planning and development decisions.

USDA

- USDA identifies many of the significant risks that climate change poses to agriculture, forests, grasslands, and the communities that support and depend on them, and appropriately recognizes that adaptation actions by USDA and stakeholders can reduce impacts of climate change while creating opportunities and co-benefits, including in sustainable agriculture, conservation, economic development, infrastructure, and equity (p. 2).

- USDA’s plan should include more attention to the vulnerabilities created and exacerbated by emissions and health threats from industrial agriculture, and it should emphasize the need for a transition organic and regenerative farming systems as a key climate resilience strategy.
- NRDC appreciates that USDA recognizes the Federal Crop Insurance Program as a key vulnerability, that crop insurance is part of adaptation action, and support the proposed action to help producers manage climate-related production risks. We recommend that the vulnerabilities and actions related to crop insurance from Section II are also included in the proposed adaptation actions in section III.
- After the success of last spring’s Pandemic Cover Crop Program, we encourage USDA to make the state crop insurance incentives mentioned on p. 6 available federally, because some states will have less resources than others to fund programs.
- Regarding the Soil Health Demonstration Trial, mentioned on p. 16 of the report, USDA has yet to provide Congress with an outcomes report about this program as required by legislation. We urge USDA to provide the public with information on the progress of this program in early 2022 at the latest.
- USDA oversimplifies the threat to agriculture as being about just decreased productivity (starting p. 3), versus decreased resilience or stability. The actions in this section could be improved as follows:
 - Responsive on-farm adaptation actions (p. 4-5) should explicitly include:
 - Diversification of farms (monocultures are more vulnerable; polycultures are less likely to have a total loss in extreme weather)
 - Building healthy soil (helps crops withstand extreme weather)
 - Vector and disease spread action (p. 5) should explicitly include monitoring and mitigating the spread of human infections that animal populations may carry (zoonotic pathogens), not just animal disease; it should also include a OneHealth approach to tracking levels of antibiotic resistance in animals, including farmed animals, in and around the farm environment – in soil, water, air – as well as in people on in close contact with the animals, to ensure that USDA has sufficient information to effectively respond to early warnings of spreading antibiotic resistance
 - The phrase in the research action about “adapted cultivars and crops” should specifically state that they should be publicly available and regionally adapted, and breeds should also be included.
- Throughout the plan, expanding organic agriculture through USDA’s existing, successful National Organic Program should be explicitly identified as an action that supports building soil health and improves resilience in a changing climate (pp. 4-5, 7, 15)

- The plan should specifically recognize that adding compost to soil benefits the climate in several ways; these benefits could be better emphasized as an adaptation action throughout the plan. Compost helps prevent erosion during extreme storm events and with water retention when there are droughts. It also reduces greenhouse gas emissions at landfills and promotes the uptake of carbon dioxide by vegetation. We recommend it be added to the following sections:
 - P. 5 under *Increase implementation of on-farm adaptation strategies and practices*
 - P. 5 under *Continue research into climate impacts on agriculture productivity*
 - P. 7 under *Build resilience by enhancing soil health*
 - P. 15 in third paragraph under *Build resilience to climate change across landscapes...*
 - P. 27: compost application and food waste reduction would be good topics to include in a new climate seminar series