

Statement of Dr. John P. Holdren
Director, Office of Science and Technology Policy
Executive Office of the President of the United States
to the
Oversight Subcommittee
of the
Committee on Environment and Public Works
United States Senate
on
February 25, 2014

Chairman Whitehouse, Ranking Member Inhofe, and Members of the Subcommittee, I am pleased to be here with you today to discuss the efforts of the Federal Government to inform and support climate preparedness and resilience across the Nation.

Few environmental factors affect our economy, livelihoods, and ecosystems more than weather and climate. Severe weather, climatic extremes, and climate change pose risks to human health, safety, and property. In 2012, the National Oceanic and Atmospheric Administration (NOAA)'s National Climatic Data Center identified eleven weather or climate events that each resulted in losses exceeding \$1 billion in the U.S., totaling \$110 billion in damages and 377 deaths across the entire year. The damage caused by Hurricane/Post-tropical Cyclone Sandy (Sandy) alone was estimated at over \$65 billion, and damages from drought in 2012 totaled approximately \$30 billion. The severe drought currently affecting California and other areas of the Southwest is impacting critical economic sectors, such as agriculture, ranching, and water resource management.

People and property have always been vulnerable to extreme events, but recent trends are making many of those vulnerabilities worse. Sea-level rise is increasing the height of storm surge that hits coastal communities during hurricanes. More frequent episodes of extreme heat are leading to increased vulnerability to heat stroke and deaths; the very young, the very old, the sick, and the poor are particularly vulnerable. Disruption and failure of critical transportation, energy, and telecommunications infrastructure is occurring due to extreme heat and severe storms. Wildfires in the American West, while subject to much year-to-year variability, are on a long-term upward trend, imperiling homes, businesses, and forests already weakened by drought and outbreaks of pine bark beetles that also are related to climate.

Scientifically, one cannot say that any single episode of extreme weather—no storm, no flood, no drought—was caused by climate change; but the global climate has been so extensively impacted by the human-caused buildup of greenhouse gases that many such events are being influenced by climate change. Effective climate-preparedness efforts will require anticipating and planning for changes in the frequency, intensity, and locations of some kinds of extreme events, as well as for more gradual changes such as the continuing rise of sea level and movement of the geographic ranges of pests and pathogens.

The health of the U.S. economy rests on many pillars, and one of those pillars—of particular relevance to the jurisdiction of the Committee—is the health of our natural environment and the resources it provides. Ecosystems provide many benefits to people, including coastal protection, clean water, and opportunities for commerce, tourism, and recreation. Resilient ecosystems have the ability to enhance resilience of communities to extreme weather and climate. For example, salt marshes, sand dunes, and barrier islands can serve as “nature’s defenses,” helping to shield adjacent homes and businesses from storm surge and coastal flooding. Many ecosystems have already been depleted or degraded due to non-climatic factors,

such as pollution, overharvesting, and changes in land use, reducing the ability of these systems to provide benefits to people.

These benefits are further threatened by the impacts of climate change, which are leading to widespread changes in the nation's habitats and ecosystems. Certain commercial fish species are moving northward along the East Coast as waters warm. Acidifying ocean waters threaten the viability of shellfish aquaculture operations in the Pacific Northwest. The timing of biological events, such as flowering and migration, is shifting in regions across the country. Warming spring seasons in Alaska have affected the location and availability of plant species that caribou feed on. Decreases in rainfall and snowpack in the West are reducing the health and productivity of forests and agricultural systems and threatening the survival of endangered salmon runs. Climate change presents an additional challenge that natural resource managers must address to ensure the health of ecosystems for centuries to come.

Climate Preparedness and Resilience Efforts

Responding to climate change is an urgent public health, safety, national security, and environmental imperative. The President's Climate Action Plan, released in June 2013, provides a roadmap for Federal action to meet the pressing challenges of a changing climate through cutting carbon pollution, preparing the United States for the impacts of climate change, and leading international efforts to address global climate change. The Plan acknowledges the reality that even as we work to avoid dangerous climate change, we must strengthen America's resilience to the climate impacts we are already experiencing – and those that can no longer be avoided. Today, I will focus primarily on the Federal Government's efforts to advance climate preparedness and resilience across the nation.

In November 2013, the President signed Executive Order 13653, *Preparing the United States for the Impacts of Climate Change*, directing agencies to help American communities strengthen their resilience to extreme weather and prepare for other impacts. Specifically, this Executive Order directs agencies to: modernize Federal programs to better support local preparedness for climate change impacts; enhance the resilience of the Nation's valuable infrastructure and natural resources; and develop information, data, and tools to help decision makers on the ground. The Executive Order established a new interagency Council on Climate Preparedness and Resilience, chaired by the Office of Science & Technology Policy, the Council of Environmental Quality, and the National Security Council. Executive Order 13653 also created a State, Local and Tribal Leaders Task Force, composed of 26 elected officials from across the country. The Council and Task Force have already begun working to identify how the Federal Government can: remove barriers to climate-resilient investments; modernize Federal programs, grant, and loans to better support local efforts; and develop the tools necessary to help communities prepare for climate change and to sustain healthy ecosystems.

Federal agencies are examining how a changing climate will impact their missions and operations. In February 2013, some agencies released their first-ever climate change adaptation plans, outlining strategies to reduce their vulnerability to the impacts of climate change. Agencies are being asked to continue advancing development and implementation of their adaptation planning efforts, as well as to identify existing barriers to enhancing preparedness. We are already beginning to see leadership and action emerging across the agencies – and these efforts are making a difference on the ground. For example, the Department of Transportation (DOT), in partnership with states and communities, is advancing integration of climate information to minimize the effects of extreme weather and climate change on critical transportation infrastructure. In 2010 and 2011, DOT's Federal Highway Administration (FHWA) supported state Departments of Transportation and Metropolitan Planning Organizations' efforts to pilot approaches for conducting climate change vulnerability and risk assessments. FHWA helped to support projects in San Francisco Bay, coastal and central New Jersey, Hampton Roads, Virginia, the State of Washington, and the Island of Oahu, Hawaii. Informed by these

pilot efforts, DOT is now supporting 19 Climate Resilience Pilots across the country. These on-the-ground projects will advance understanding of current and future vulnerabilities – and will inform actions to improve transportation safety and minimize the disruptions that affect communities on a daily basis. Similarly, FHWA is conducting a study of climate vulnerability for transportation facilities in Mobile, AL, and developing tools to help transportation authorities across the nation identify risks and develop adaptation strategies.

The Administration is focused on ensuring the nation’s infrastructure is resilient to the increased impacts of climate change and extreme weather. For example, the Department of Health and Human Services is working to create sustainable and resilient hospitals in the face of climate change. Through a public-private partnership with the healthcare industry, it will identify best practices and provide guidance on affordable measures to ensure that our medical system is resilient to climate impacts. It will also collaborate with partner agencies to share best practices among Federal health facilities.

Agencies are analyzing the impacts of climate change on key sectors of our economy and are developing strategies to address them. Last summer, the Department of Energy (DOE) released a report outlining the impacts of climate change on the energy sector, including power-plant disruptions due to drought and the disruption of fuel supplies during severe storms. The report also pinpoints potential opportunities that would make our energy infrastructure more resilient to these risks. In September 2013, sixty-three experts from Federal, academic, and nongovernmental organizations released a report documenting the effects of climate change on oceans and marine resources. This study reviewed how climate variability and change are affecting ocean physical, chemical, and biological systems – and how these changes are already having societal impacts by affecting fisheries and other ocean industries. Additional reports on climate impacts on critical economic sectors will be released within the next year.

In November 2013, the Administration launched the National Drought Resilience Partnership (NDRP) to help communities better prepare for droughts and to reduce impacts on families and businesses. The NDRP is coordinating Federal efforts across the country and working closely with State and local governments and other partners to improve community preparedness and resilience to drought. With the severe drought in California, the NDRP is also playing a critical role in response, helping to connect communities to the Federal assistance they need. For example, in California, NOAA, the Environmental Protection Agency (EPA), the Bureau of Reclamation (BOR), and the U.S. Fish and Wildlife Service (USFWS) are working daily with their State counterparts to maximize operational flexibilities related to water delivery, while maintaining important environmental safeguards.

The Climate Action Plan and Executive Order 13653 are also advancing actions to increase the climate resilience of natural resources. The Executive order charged the Department of the Interior (DOI), the U.S. Department of Agriculture (USDA), NOAA, the EPA, the Federal Emergency Management Agency (FEMA), and the U.S. Army Corps of Engineers (USACE), among others, to identify additional opportunities for enhancing the resilience of the Nation’s watersheds, natural resources, and ecosystems in the face of climate change through potential changes to their land- and water-related policies and programs. Agencies are building on efforts already completed or underway, as outlined in agencies’ climate change adaptation plans, as well as recent interagency climate adaptation strategies, such as the National Action Plan: Priorities for Managing Freshwater Resources in a Changing Climate; the National Fish, Wildlife, and Plants Climate Adaptation Strategy; and the resilience efforts outlined in the National Ocean Policy Implementation Plan. Collectively, these efforts will help to safeguard the nation’s valuable natural resources in a changing climate.

The President’s Climate Action plan directs Federal agencies to “update their flood-risk reduction standards for federally funded projects.” This effort builds on the work done by the Hurricane Sandy Rebuilding Task Force which announced in April 2013 that all federally funded Sandy-related building

projects must meet a consistent flood risk management standard. We are actively working to create a flood risk management standard for major Federal investment that will provide a minimum level of risk reduction against flood hazards and rely on the best available, actionable science on both current and future risk.

Improving integration of science into preparedness decisions

Climate preparedness efforts depend on access to timely and relevant scientific information. The Office of Science and Technology Policy (OSTP) is responsible for ensuring that the best science, research, data, tools, and technologies are brought to bear in implementing U.S. climate preparedness and resilience efforts. The Climate Action Plan and Executive Order 13653 provide an opportunity to advance understanding of climate impacts and to inform preparedness and response options. One of the themes of the Climate Action Plan is “using sound science to manage climate impacts,” through developing actionable climate science, assessing climate change impacts in the United States, launching a Climate Data Initiative, and providing a toolkit for climate resilience.

Many leaders around the country have requested scientific and technical support from the Federal Government to inform the development and prioritization of preparedness efforts. The Administration has learned, through conversations with decision makers, including the State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience, that simply providing scientific information is often not enough to support decision making. Science needs to be made accessible, understandable, and usable. We are working across the Federal family and in close communication with non-Federal partners to meet the growing demand for this “actionable” information. The U.S. Global Change Research Program (USGCRP), which coordinates and integrates global change research across 13 agencies, has a new strategic focus on “informing decisions.” Efforts to advance science in support of climate preparedness are emerging across agency initiatives and programs. Federal agencies are working to respond to the planning needs of communities on the ground. For example, in the immediate aftermath of Sandy, NOAA, in partnership with FEMA, the USACE, and the USGCRP, created a set of map services to help communities, residents, and other stakeholders consider risks from future sea-level rise in planning for reconstruction. These map services integrate the best-available FEMA flood-hazard data for each location with information on future sea-level rise, highlighting areas that will be at risk in the future.

Later this year, the Administration will release the Third National Climate Assessment (NCA). The NCA, required by the Global Change Research Act of 1990, is an important resource for understanding and communicating climate science and impacts in the United States. The NCA informs the nation about already-observed changes, the current status of the climate, and anticipated trends for the future. The Third NCA, written by over 240 authors from universities, local, state, tribal, and Federal governments, non-governmental organizations, and the private sector, will present a comprehensive picture of climate impacts on U.S. regions and sectors. The information in the NCA will help decision makers and citizens throughout the country prepare for climate change. The NCA includes climate impacts and projections and assesses progress in the nation’s responses to climate change. The NCA has built partnerships inside and outside of the government to support this effort – and has engaged thousands of individuals in the development and review of the report. To improve accessibility of information and findings for citizens and scientists, the Third NCA will be deployed as an interactive, online report, including access to underlying data and resources.

As part of the Climate Action Plan, and consistent with President Obama's May 2013 Executive Order on open data, the Administration is also launching a new Climate Data Initiative and the creation of an open-source Climate Resilience Toolkit. These resources will enhance the availability of government data and information to fuel entrepreneurship, innovation, scientific discovery, and public benefits. The

Climate Data Initiative will leverage Federal, state, and local datasets to stimulate private-sector innovation around preparedness for, and resilience to, climate change. In the coming months, the Administration will launch a pilot of the Climate Data Initiative initially focused on sea-level rise and other coastal hazards. Additional pilots (*e.g.*, food security, human health) will be launched over the coming months. The Climate Resilience Toolkit will complement the Climate Data Initiative by providing science-based and data-driven tools to help local, state, tribal, and regional planners better understand the impacts of climate change in their own communities.

We look forward to working with leaders from the public and private sectors to ensure that scientific information developed by the Federal Government is available and useful for informing actions that make communities, economies, infrastructure, and natural resources more resilient to extreme weather and climate change.

The President believes that the Federal Government must do more to help communities across the country become more resilient to the effects of climate change. Recent events have reinforced our knowledge that our communities and economy remain vulnerable to extreme weather, natural hazards, and climate change. For that reason, two weeks ago in Fresno, the President announced that the 2015 Budget will include a new \$1 billion Climate Resilience Fund. The President proposes to use this Fund to: invest in research and unlock data and information to improve understanding and projections of the impacts of climate change; help communities plan and prepare for the impacts of climate change and encourage local measures to reduce future risk; and fund breakthrough technologies and infrastructure that will make us more resilient in the face of changing climate.

I thank the Committee for its support and interest in this issue, and I look forward to continuing to work with you. I will be pleased to take any questions Members may have.