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Chairperson Lofgren, Ranking Member Davis, and Members of the Committee, thank you for the opportunity to testify before the committee today on the issue of climate change and the threat it poses to the Smithsonian, our facilities, and our collections.

Climate change has long been a focus of the Institution, from conducting research on the topic for over 160 years to using that knowledge to take steps to adapt to a changing world. Our 2014 Climate Change Statement notes that the Smithsonian responds to climate change by “increasing knowledge of the human and natural environment through research; by making our findings available to the public; by protecting the Institution’s core asset, the national collections; and by operating our facilities and programs in a sustainable manner.” These topics remain our priority today.

The Smithsonian recently completed and published the 2021 Climate Change Action Plan in line with the principles established in Executive Order 14008. Focusing on the priority areas of public programs, research, collections, management, and facilities and infrastructure, the document also gives special focus to the topic of climate vulnerability. Because the Smithsonian is such a multi-faceted organization, these topics and action items are not siloed, but instead are shared One-Smithsonian responsibilities.

While each of those topics is closely related to the others, today my focus will be on the known risk to our collections and facilities posed by climate change. These risks, as well as our plans to limit the impact of those risks, have been clearly laid out in the *Climate Change Action Plan* as well as previous documents including the 2015-2019 *Climate Change Adaptation Plan*, the 2013 *Roadmap for the Development of a Climate Change Adaptation Plan*, and the *Smithsonian Collections Space Framework Plan*.

As you saw, the recent New York Times article, *Saving History with Sandbags: Climate Change Threatens the Smithsonian*, has drawn attention to the risks, especially the flooding risks, we currently face – risks we have all been aware of and a common concern shared by this Committee and the Smithsonian. While media coverage of flooding is not the publicity we would normally like, we are grateful that more people are aware of and care about this problem.

What the New York Times article did not reveal in depth is that there are two separate but related problems that climate change has handed us – the risk of rising sea levels and other flooding plus the increasing challenge of safely maintaining our collections and facilities.

As the planet warms, flooding, both from increased frequency and intensity of storms – causing interior drainage and storm surge flooding – and sea level rise, is a growing risk not only in the National Mall area, but also at the National Zoological Park, in New York City, and at our facilities in Florida and Panama. Other weather extremes, including temperature swings, tornados, high winds, fire, and hurricanes necessitate adaptation, mitigation, and robust emergency response preparedness for all our buildings and collections.

The Smithsonian last updated its vulnerability assessment in 2017 using the higher ranges of the then-available data from the National Climate Assessment. It showed that our properties most vulnerable to flooding were the National Museum of American History and the neighboring National Museum of Natural History. They are highly exposed to flooding from both the Potomac and precipitation runoff and have extensive critical spaces that house invaluable collections and building systems on lower levels. The National Museum of the American Indian and the National Air and Space Museum, while still at risk of flooding, are not as vulnerable and have fewer critical spaces and no collections on their lower levels. The National Museum of African American History and Culture's location and the fact that most of the important spaces are below grade would make it appear high risk, but as our newest museum, flood protection measures were integral to its design. That said, as the risk of Potomac River flooding grows, so does the risk to that museum.

The Smithsonian's museums are not the only structures on the National Mall, nor is the Smithsonian the only agency downtown facing these challenges. The existing, and aging, stormwater and sewer systems in our city can only handle the capacity of a 15-year rain event. Storms like this, or even stronger, are happening more frequently. The stormwater management system is becoming less able to handle the load. An interagency study is being conducted by the DC Silver Jackets (of which Smithsonian is a participating member) to assess the cost and benefits of making major investments in a National Mall pumping station to increase capacity to pump excess water to the Potomac River. Such a facility would be expensive and would require interagency cooperation and management.

The Smithsonian has collaborated with the National Capital Planning Commission and the US Army Corps of Engineers to identify a comprehensive flood protection solution for the Federal Triangle area and the National Mall. Further feasibility and environmental studies may be undertaken as an interagency collaborative effort. More studies are needed on this topic and the potential mitigations to address the rising risk.

Until flooding mitigations are addressed and put in place, we must take other steps to ensure our collections are protected. The threat of flooding goes beyond water damage. Higher humidity in the case of a water event or temperature fluctuations that might occur should flooding damage our climate control systems, power systems, or generators, could also greatly damage the millions of objects in our care.

And it is not just water that poses a risk. As the planet warms, it is becoming more challenging and more expensive to carefully control the temperature and humidity in our spaces – especially in historic buildings with antiquated systems and building envelopes. Even minor fluctuations can negatively impact delicate items. But the challenge does not make this task impossible, in fact it highlights how important it is that we take steps to ensure our collections are protected in a sustainable manner.

The Smithsonian-wide Collections Space Database includes collections space condition assessments of the quality of collections storage equipment, space envelope integrity, and the capacity to maintain the appropriate temperature and relative humidity requirements for collections stored in such spaces. With this understanding of the risk our collections face, we are mitigating the threat by moving items from areas prone to flooding and improving storage enclosures and spaces to make them flood safe, energy efficient, and to protect them from extreme weather fluctuations.

Each year the Smithsonian National Collections Program supports the purchase and installation of high quality, gasketed storage cabinetry to replace open shelving and substandard cabinetry. These new cabinets better buffer the collections from environmental change – allowing a wider range of indoor conditions – and offer waterproof features while reducing the need for energy-intense environmental controls.

The Smithsonian is also designing, developing, and building flood safe spaces to house at-risk collections. At the Suitland Collections Center in Maryland, the Smithsonian has designed POD 6, a sustainable facility that will be used, in part, to store collections now housed in flood-prone basements on the National Mall and at the National Gallery of Art. Construction is slated to begin in FY2022. Another future collections support facility includes the Dulles Collections Center Module 2 to house artifacts from the National Air and Space Museum. Other ongoing and planned renovation projects on the National Mall will provide relocation space for at-risk items within the facility from where they are currently stored to a safer place within that building. Collections facilities for the National Museum of the American Latino and the Smithsonian American Women's History Museum have been included in the Dulles Collections Center Master Plan.

Your bipartisan support of current and ongoing collections space expansion has made this possible. The recently completed Module 1 at the Dulles Collections Center is proof of what a difference quality collections storage can make. It has been safely and efficiently housing National Air and Space Museum artifacts during the ongoing revitalization project and will protect collections relocated from the inadequate Garber facility in Suitland, Maryland.

Providing better storage or relocating the collections under our care is not the only way we can protect them. Where possible, revitalization projects will renovate building envelope insulation and add more efficient and reliable mechanical systems necessary for indoor climate control to create more resilient facilities.

Individual flood-resilient projects have been identified in our master planning and will be implemented over the next twenty years (the time period of a typical master plan). The current National Air and Space Museum revitalization project includes two large underground cisterns to better manage stormwater and the addition of a higher flood gate to the loading dock. The archival and library collections have been relocated from the museum basement to the LEED Gold Dulles Collections Center.

At the National Museum of American History, the FY2022 Budget provides \$500,000 in Facilities Planning and Design for Master Plan follow-on studies and design. A West Side Drainage Improvements and Temporary Flood Protection Study will consider Master Plan recommendations for flood protection measures to improve resiliency.

The work to improve collections storage and to make our facilities more climate ready and resilient has been incremental. The work will be prioritized and phased in over time to optimize Smithsonian's existing funding. The timeframe for this work is reasonable under the current assumptions of climate change impacts and with the funding requested to stay on plan.

Our deferred maintenance backlog, currently estimated at over \$1 billion, further jeopardizes the safety of our facilities and collections. Extreme weather events already pose a major risk but could further exacerbate maintenance vulnerabilities. Nearly half of this deferred maintenance backlog will be

addressed in the Revitalization of the Historic Core project as well as the current National Air and Space Museum Revitalization project. The \$35 million Congress provided in both 2020 and 2021 to jump start our other deferred maintenance tasks has been put to good use. We are thankful for the bipartisan letter of support from this Committee to our Appropriators in support of our maintenance backlog. 456 unique maintenance and repair projects were quickly identified and started. Your support has improved the safety and security of our buildings that house our irreplaceable collections. Going forward, we will continue to similarly identify synergies between our capital funding and maintenance budget to find ways to further increase the safety and security of our facilities and collections as we are doing to improve our Historic Core and the National Air and Space Museum.

Many people, including your Congressional colleagues and members of the public are focused on the development of our two new museums. While we are excited for that challenge and opportunity, we need and deeply appreciate your commitment to our existing properties and collections. By addressing these current issues concerning the unparalleled items in our care and the buildings that house them, you are ensuring future generations of visitors and researchers and learn from and be inspired by our vast collections. The future success of the Institution depends on the responsible stewardship of what we already have and ongoing investment to meet industry maintenance standards

The Smithsonian has been entrusted with the nation's scientific and cultural heritage. This is a responsibility we do not take lightly. Climate change is posing one of the greatest challenges we have faced, but we remain committed to facing that challenge head on. The steps we take today and in the future will increase the resiliency not just of our Institution and its impressive, historic buildings, but the collections we manage. With your continued support, we know this is a challenge we can meet.

Thank you again for giving us the opportunity to discuss the current and planned actions we are taking to protect the nation's irreplaceable treasures in light of a changing planet, aging infrastructure, and growing collections under our care. I am happy to answer any questions you may have at this time.