SMITHSONIAN INSTITUTION

Climate Change Action Plan – 2022 Progress Report

July 28, 2022

Presented for Review by the Federal Chief Sustainability Officer and National Climate Task Force

Smithsonian

Introduction

The Smithsonian continues to focus on sustainability efforts and becoming a more climate-resilient institution not only because it is our imperative to steward our invaluable collections and properties, but also because it is part of the Smithsonian's historic mission to research and disseminate knowledge of our changing planet. The Smithsonian has made notable progress since the publication of the Climate Change Action Plan in 2021.

This status report highlights the steps we have taken in terms of protecting our collections and facilities in light of a rapidly changing planet, furthering knowledge of those changes, and educating and empowering people around the globe so that they can be climate aware and take positive action. Our commitment toward increasing the resiliency and sustainability remains strong.

Our Shared Future: Life on a Sustainable Planet, an initiative developed by the Under Secretary for Science and Research, further strengthens our commitment to better understanding Earth's interconnected systems. Through this initiative, the Smithsonian will increase sustainability and focus our research across the Institution and create a new emphasis on environmental justice. In combining the *Our Shared Future: Life on a Sustainable Planet* with the *Climate Change Action Plan*, the Smithsonian is laying out a clear vision for increasing sustainability, improving climate readiness, and educating our visitors and staff about the positive changes they can make.

To better accomplish our goals, we have consolidated oversight of these activities under the Under Secretary for Science and Research. With this change, Pierre Comizzoli, Research Biologist and Senior Program Officer within the Office of the Under Secretary for Science and Research, has been named the Acting Chief Sustainability Officer.

Improving climate-readiness and increasing sustainability requires expertise from across the Smithsonian: facilities and operations professionals, financial personnel, human resources specialists, and others. The Office of the Under Secretary for Administration and leaders from within that organization continue to be involved in the development and execution of Smithsonian's climate-related initiatives.

By utilizing the expertise of our staff and the unique platform we have, we can raise awareness of the risks and challenges of climate change and make strides toward achieving our sustainability goals.

Lonnie G. Bunch III
Secretary
Smithsonian Institution

SECTION 1

Updates on Priority Actions

PRIORITY ACTION PROGRESS			
PRIORITY ACTION #1 Public Programs	**Current Status**	**Estimated Date of Completion**	**Brief Description of Progress**
Perform a Climate Activity Inventory.	Complete		The climate activity inventory has been compiled, documenting current climate work from 23 Smithsonian Units which identified 292 efforts in climate research, education, exhibits, and public engagement activities. The inventory has been shared with unit directors.
Develop plan to improve internal communications, increase visibility, and foster future collaboration related to the Institution's climate change work.	In Progress	Will hold workshops in 2022. The plan will be developed and implemented in 2023 and 2024.	A working group representing 12 Smithsonian units has reviewed available unit inventories to better understand what is being done. The group will begin hosting Drop-In discussion sessions for interested staff to share how units are approaching climate change work for different audiences and purposes. These sessions will serve as the foundation for developing Smithsonian workshops differentiated by audience or strategy. The group is working to host a panel conversation at the Folklife Festival to highlight the work already being done for climate change.
Initiating Life on a Sustainable Planet — SSEC: *Smithsonian STEAM Schools of Distinction: Sustainable Development.*		Pilot program to be ready for 2022–2023 school year.	The Smithsonian Science Education Center (SSEC) in collaboration with other Smithsonian units and the North Carolina Science, Mathematics, and Technology Center, seeks to enhance the teaching and learning of climate change and environmental justice in schools throughout the United States and internationally. SSEC is in the pilot phase of developing a school designation model — Smithsonian STEAM Schools of Distinction: Sustainable Development — that ensures a transdisciplinary action-oriented approach to climate science and sustainability topics.
Initiating Life on a Sustainable Planet — Scaled programming: SSEC: Smithsonian Science for Global Goals.	Complete		SSEC in collaboration with other Smithsonian units and the global InterAcademy Partnership, released three new community research guides for youth ages 11–18 as part of the Smithsonian Science for Global Goals project to help young people discover, understand, and take action on socio-scientific issues on topics such as: "Environmental Justice!", "Biodiversity!" and "Sustainable Communities!" The Embassy of the United States of America in France in collaboration with Smithsonian units, developed a program that allows students, educators, and professionals to explore and discuss new approaches for living, learning, and working more sustainably. Approximately 850 students and educators have participated in the virtual exchange program.

PRIORITY ACTION PROGRESS			
PRIORITY ACTION #2 Research	**Current Status**	**Estimated Date of Completion**	**Brief Description of Progress**
Increase public access to Smithsonian's research collections and long-term data relevant to climate and climate change.	In Progress	No end date. This ongoing activity will continue as new data, samples, and objects are acquired.	Smithsonian scientists and curators added new data and samples to our public-facing data portals such as FigShare. Data sets and samples include legacy collections from decades of past research and new data and samples from experiments and observations. In total, 20 climate and conservation-relevant datasets and 11 climate monitoring datasets were published on FigShare.
Continue Smithsonian participation in national and global research networks led by other partners.	In Progress	The Smithsonian leverages and shares long-term data and samples by leading or participating in synthesis networks that are ongoing. No end date is expected.	The Smithsonian participated in national and global networks including ForestGEO, MarineGEO, Coastal Carbon Network, National Ecological Observatory Network (NEON), Global Autonomous Reefs Monitoring Structure program, Global Coral Biobank Alliance, and Ocean DNA Initiative.
Continue long-term experimental manipulations related to understand how organisms and ecosystems will respond to further climate change.	In Progress	The Smithsonian specializes in long-term experiments and observations. In some cases, these studies have end dates but for most, no end date is expected.	A study on the use of fossil Ginkgo leaves for reconstructing past atmospheric carbon dioxide levels ends in 2022. Other experiments are ongoing such as global warming effects on bamboo growth in giant panda habitats; effects of warming on lowland tropical forests; and potential bird adaptation to climate change. A new experiment began in 2022 on the effects of storm surge and sea level in coastal forests.
Develop partnerships that leverage Smithsonian scholarship to inform natural climate solutions.	In Progress	Developing partnerships for natural climate solutions is ongoing.	Active partnerships that advance natural climate solutions include those with the Pew Charitable Trusts and Conservation International. Progress includes publication of the first "blue carbon report card" that assesses data quality of US coastal wetlands on a state-by-state basis, a country-wide assessment of blue carbon in Belize, and forest carbon data made available to the IPCC.
Develop new sensors and platforms to improve climate change datasets.	In Progress	New sensor and measurement platform development are ongoing activities with no end date.	The TEMPO satellite is set to launch on a SpaceX Falcon 9 in 2022. A new coastal sensor system funded by DOE was deployed in the Chesapeake Bay and Lake Erie.

SECTION 1: UPDATES ON PRIORITY ACTIONS

PRIORITY ACTION PROGRESS			
PRIORITY ACTION #3 Collections	**Current Status**	**Estimated Date of Completion**	**Brief Description of Progress**
Mitigate the risks to collections from extreme weather, including flooding, and reduce energy demand for collections storage by moving collections, or improving storage enclosures and spaces to make them flood safe, energy efficient, and protected from extreme weather events.	In Progress	Storage will continue to improve.	During the COVID-19 pandemic, on-site capacity was limited. With capacity restrictions eased in spring 2022, plans are going forward to acquire high-quality gasketed collections storage cabinetry for some of the most at-risk spaces in 2023, including approximately 50 cabinets for Paleobiology collections at the Natural History Building. From May 2021 through the end of April 2022, approximately 151 high-quality, gasketed collections storage cabinets or enclosures were acquired to protect Smithsonian collections.
Prepare staff for responding to extreme weather events via collections emergency preparedness training.	In Progress	Training will be ongoing.	From May 2021 through the end of April 2022, the Smithsonian's Preparedness and Response in Collections Emergencies (PRICE) team has conducted 14 collections emergency preparedness related trainings with 185 students. These trainings strengthen the ability to mitigate, prepare for, respond to, and recover from both routine and larger-scale incidents resulting from climate change. PRICE is also making several training videos, guides, and other materials available online at the beginning of FY2023 at ncp.si.edu/PRICE.
PRIORITY ACTION #4 Management/Procurement/ Finance/ Human Resources	**Current Status**	**Estimated Date of Completion**	**Brief Description of Progress**
Promote the purchase of environmentally friendly and climate-resilient products by Smithsonian units through the use of Amazon Business Climate Pledge Friendly Products.	In Progress	Smithsonian has always encouraged the purchase of sustainable products and will now include purchasing climate friendly products.	During FY2019, the Smithsonian began encouraging purchases of environment- and climate-friendly products via Amazon Business account holders. As of May 2022, 354 orders have been placed for goods with Sustainability Certification Categories. Purchase card holders are becoming increasingly aware through a variety of forums of the availability of such products and how purchasing such products benefits the Smithsonian, our employees, and the communities where we operate.
Update Smithsonian Directive 314, Contracting policy and its implementing guidance in the Procurement and Contracting Procedures Manual (PCPM).	In Progress	Smithsonian Directive was completed in March 2022. The PCPM will be completed in FY2023.	Smithsonian Directive 314, pertaining to policy, was updated in March 2022. Updates to the appropriate parts of the Procurement and Contracting Procedures Manual to include elements of sustainable and climate-pledge friendly products are underway.

PRIORITY ACTION PROGRESS			
PRIORITY ACTION #5 Facilities & Infrastructure	**Current Status**	**Estimated Date of Completion**	**Brief Description of Progress**
National Museum of American History (NMAH) West Site Drainage Improvements and Temporary Flood Protection Study PN 1803118 — renamed to Site Drainage Improvements and Flood Protection PN 1803118.	In Progress	Concept to be completed in September 2022.	Scope was increased to encompass the east and north sides of the site that are vulnerable to future increased flooding, and to address short, mid- and long-term improvements. Projects will be incorporated into the capital plan and aligned with major renovations.
National Museum of the American Indian — New York (NMAI-NY) Upgrade Electrical & Emergency Power System PN 1595602.	In Progress	Concept design completed May 2022; final design anticipated in 2024, construction planned for 2025.	Design to replace and relocate the emergency generator is ongoing. A related GSA project in coordination with the Smithsonian is proceeding that will address water infiltration remediation at the Alexander Hamilton Custom House in which the museum is housed.
National Museum of Natural History (NMNH) West Wing Basement Drainage PN 1900104.	In Progress	Design completed in June 2022. Construction to start in late 2022.	The project will reduce flood risk by connecting the stormwater line on the west side to the existing 80,000-gallon retention tank on the north with outfall to the DC combined sewer.
Suitland Collections Center (SCC) Pod 6 Addition to Museum Support Center PN 1630102.	In Progress	Design was completed in January 2022. Construction is anticipated to begin in July 2022 and to be completed in 2025.	The new dedicated collections facility will efficiently house collections from the Smithsonian and the National Gallery of Art, acting in partnership, reducing collections vulnerability at existing flood-prone Mall locations. Features include sustainable energy management with roof photo-voltaic and geothermal grid systems.
NZP Upgrade Central Boiler Plant PN 2033112.	In progress	Study completed in 2021, 65% Design to be done by July 2022, final design in 2023; and construction to take place in 2024.	The study recommended near term modifications to maintain boiler plant function while a solution is developed to relocate the plant away from the flood zone. A master plan update is anticipated to begin in FY2023. Replacing one of the existing boilers with two higher efficiency natural gas boilers will provide higher capacity and efficiency. Implementation of reverse osmosis water treatment will improve water treatment efficiency and water quality, reducing chemical use.
SI Explorer Enhancements	Complete	While completed in 2022, future phases are planned for 2023 and 2024.	FEMA flood zones have been added to building information in the Smithsonian's Geospatial Information System viewer (SI Explorer) and Facility Management System (Facility Center) to inform stakeholders and designers about the risk for flooding. There is an effort to develop the ability to identify FEMA zones at the Property, Land, and Exterior Space levels in the future.

SECTION 2

Updates on Other Initial Plan Topics

1. CLIMATE RISK REDUCTION

The Smithsonian uses structured methods for assessing operating risk. An interdisciplinary pan-Institutional task force determined that flooding and sea level rise are Smithsonian's greatest climate-related risks. To address those risks, the Smithsonian prepared a detailed Climate Change Adaptation Plan (CCAP) in 2019 for facilities located on the National Mall and at the National Zoological Park in Washington, D.C., at the National Museum of the American Indian's New York City facility, at the Smithsonian Environmental Research Center in Edgewater, Maryland, and the National Museum of Natural History's Smithsonian Marine Station in Ft. Pierce, Florida. The CCAP guides master plans and contributes to Smithsonian's prioritization of capital projects. For example, the in-progress Museum Support Center Pod 6 project in Suitland, Maryland, includes space to relocate stored collections from the basement of our most vulnerable museum facility, the National Museum of American History.

Given the large footprint of museums on the National Mall and the value of the collections within those museums, the Smithsonian continues to evaluate relocation options for collections at potential risk in flood prone areas. This has been a significant and on-going focus given the need to address both current and future collection needs. Additionally, remedial engineering may be required to maintain building infrastructure in these locations. These projects are included in the annual budget requests to Congress.

The Smithsonian continues to implement and expand its facility condition assessments to incorporate new data for all its locations across the world. This information is used to inform prioritization efforts for capital and operational facility improvements.

2. CLIMATE VULNERABILITY ASSESSMENTS

The Smithsonian has completed vulnerability assessments for risks from flooding and sea level rise for the facilities described above. The pandemic has delayed the completion of the assessment of the Smithsonian Tropical Research Institute in Panama, but there are plans for the assessment to take place in FY2024–25. Heat-related vulnerability studies at the Smithsonian have not yet been scheduled. However, individual projects and master plans are taking them into account. For example, a project at the Smithsonian Astrophysical Observatory's Summit Bowl Dorm in Arizona (currently completing design with construction to begin in FY2025) will replace the existing facility with one built of non-combustible materials and equipped with code-compliant notification systems and an area of refuge to improve its fire resistance and safety in a high wildfire risk area. The National Collections Program's cabinet replacement project recognizes the significant advantages of well-designed cabinets in maintaining resilient environmental controls, to benefit to museums subject to increased temperatures and/or major storms that may result in power outages or flooding.

3. CLIMATE LITERACY

The Smithsonian has not begun developing broad-scale climate training programs geared toward staff. However, the Smithsonian climate working group will be hosting conversations with staff from across the Institution to better understand how units and programs are approaching climate change communication with respect to mechanisms, impacts, and solutions. These discussions will help the Smithsonian ascertain the messaging and strategies being used to connect visitors and the impacts being measured. Through these efforts, the Smithsonian will also be able to identify climate literacy needs of the staff. Additionally, a small group of volunteers at the National Museum of Natural History have participated in the pilot of a climate change communications training course that will be further developed.

Externally, the Smithsonian fosters climate literacy through a range of exhibits, public programs, and education efforts focused on climate literacy. A series of exhibits such as Our Places at the National Museum of Natural History has been developed to connect people to nature through the places where they live, work, and play to inspire action to combat climate change. *Knowing Nature: Stories of the*

Aboreal Forest (SITES) highlights the relationship between people and nature through the lens of climate change and focus on indigenous perspectives, and *Laurie Anderson: The Weather* at the Hirshhorn Museum and Sculpture Garden will address topics including the climate crisis. The Smithsonian offers digital public programs like Story Circle that integrate research and communities around issues of climate change and environmental justice. *Q?rioso's What is climate change and how does it affect us all?* is aimed at children visiting the Smithsonian Tropical Research Institute. Additionally, the online education resource *Native Knowledge 360°* at the National Museum of the American Indian transforms teaching and learning about Native people through modules addressing environmental issues and *Hot Potato: Climate Change, Food Systems, and You* a school program for middle and high school programs are important educational offerings. The Smithsonian Science for Global Goals curriculum aligned with the U.N. Sustainable Development Goals will include two new climate guides currently in development for students, one on Oceans and the other on Humans and the Atmosphere, through the Smithsonian Science Education Center.

4. TRIBAL ENGAGEMENT

The Smithsonian's implementation of its Climate Action Plan considers Tribal Treaty Rights, starting with providing the public with a basic understanding of those rights through the National Museum of the American Indian's (NMAI) exhibition *Nation to Nation: Treaties between the United States and American Indian Nations* which traces the history and impact from colonial times to the present, as one side sought to own the riches of North America and the other struggled to hold on to its homelands and ways of life. NMAI is partnering with Smithsonian Institution Traveling Exhibition Services (SITES)/Museums on Mainstreet to create as many as ten regional versions of the Nation to Nation exhibition called "Know Your Treaty." They will develop local content about treaty rights in collaboration with local tribes.

To engage and showcase youth voices about environmental justice issues effecting their communities, NMAI presents a monthly program, Y*outh in Action: Conversations about Our Future*, where young native activists and changemakers from across the Western Hemisphere share their work towards equity and social justice for Indigenous people. Another public program, *Living Earth*, held annually at NMAI, features Native innovators and practitioners dedicated to using Indigenous knowledge to protect and sustain the environment exploring topics like, seed preservation, indigenous agricultural practices, food sovereignty, water preservation, and healthy communities.

5. ENVIRONMENTAL JUSTICE

Through a new initiative, *Our Shared Future: Life on a Sustainable Planet*, the Smithsonian aims to advance solutions that fill us with optimism for our planet and all species that call our planet home. As part of this initiative, the Smithsonian is launching two new fellowship programs: Smithsonian Climate Change Fellowship and Smithsonian Environmental Justice Fellowship. Climate change, pollution, loss of land rights, and other environmental challenges disproportionately affect people who are currently and who have been historically underserved and marginalized, especially communities of color. Addressing these challenges is complex and requires diverse perspectives from a multitude of stakeholders, especially those closest to and most impacted by the challenges. The Smithsonian will award two 2-year Environmental Justice Fellowships starting in Fall 2022, and will explore one of the following questions:

- How do artists influence and/or serve as catalysts of change for environmental justice?
- How do we identify, remove and reverse barriers faced by minority farmers and landowners and increase participation to improve biodiversity conservation and ecosystem resiliency across working agricultural lands?

Each program (the Smithsonian Climate Change Fellowship as well as the Environmental Justice Fellowship) will support a cohort of 2–5 fellows for a period of two years. Fellows will receive a stipend to conduct independent research that utilizes Smithsonian resources (e.g., data, facilities, expertise). Fellows with research projects that have the potential to produce rapid results and impact are especially encouraged to apply.

The Smithsonian considers environmental justice in many of its programs including research projects that assess

impacts of climate change on indigenous communities as well as educational programs to empower communities. In February of 2022, the Smithsonian's Undersecretary for Education led a panel-style live stream discussion that focused on the roles of Black, Indigenous, women and girls of color in environmental justice, the science of water quality, and space science. And in March 2022, the Smithsonian Science Education Center announced the launch of *Environmental Justice! How can we create environments that are healthy for everyone?* This free guide, developed in collaboration with the InterAcademy Partnership, aims to help young people across the globe to assess and take action to create sustainable, healthy and just environments.

The Anacostia Community Museum (ACM) has included environmental justice in its community engagement, research, and collecting for over a decade. The 2012 exhibition, Reclaiming the Edge: Urban Waterways and Civic Engagement which later emerged as the Urban Waterways program cemented ACM's focus on environmental justice as a core area of interest. In 2023, the Urban Waterways program will be consolidated and re-launched as the Center for Environmental Justice, organizing the museum's environmental justice work under four pathways (1) cultural practice, (2) public policy, (3) faith, (4) inclusive leadership. The center's signature inaugural programs, to begin in 2023, include the Women in Environmental Leadership (WEL) Summit, an Environmental Justice Fellow of Cultural Practice, the Environmental Justice Academy, a training program for girls, and the exhibition To Live Without Harm: Women and Environmental Justice in Greater Washington.

6. PARTNERSHIPS

The Smithsonian has extensive and expanding interagency and private organization partnerships including program and research collaborators as well as financial supporters.

For example, the summer 2022 Folklife Festival on the National Mall will include a new initiative, Earth Optimism × Folklife, that will unite two Smithsonian programs to provide visitors with examples of practical solutions and positive change presented by community leaders, artisans, innovators, scientists, and others working to create a sustainable planet. The program will inform, inspire and, most importantly, leave visitors with hope for the planet and ideas of how to get involved with projects within their own communities and around the world.

SECTION 3

New Topics from Executive Order 14057

POLICY REVIEW

The Smithsonian has not yet initiated a broad and comprehensive review of the Institution's policies to ensure climate-resilient investment or to limit those policies which run counter to the Smithsonian's Climate goals. Work has begun on reviewing and updating the collections, contracting, and facilities climate-related policies. The Smithsonian hopes to begin a full assessment in 2023.

CLIMATE SCENARIO ANALYSIS

The Smithsonian has used climate projections to create scenarios analyzing the impacts of flooding and sea level rise at its most-vulnerable facilities. This has allowed the Institution to identify areas where investment of facilities capital will have the greatest impact and provides the Smithsonian with the ability to align solutions to the expected useful life of particular equipment such as new loading dock ramp flood gates for the current revitalization of the National Air and Space Museum.

The Institution has generally been able to obtain adequate climate data for its decision-making for its facilities, including quality data for Washington, D.C. In anticipation of an upcoming vulnerability assessment for the Smithsonian's Panamanian sites, the State Department's Foreign Buildings Office staff have offered help in obtaining relevant climate data.

Within the Smithsonian, climate information is being widely incorporated into decision-making, including by its Secretary and Deputy Secretary as well as its major operating divisions led by the Under Secretary for Science and Research, the Under Secretary for Museums and Culture, the Under Secretary for Administration, the Under Secretary for Education, and the President of Smithsonian Enterprises.