U.S. General Services Administration

FY 2014 Climate Change Risk Management Plan

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List of Acronyms

CEQ	Council on Environmental Quality
COP	community of practice
DHS	Department of Homeland Security
EO	Executive Order
ESF	Emergency Support Function
EV	electric vehicle
FAS	Federal Acquisition Service
FCDDI	Federal Data Center Consolidation Initiative
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
GIS	Geographic Information Systems
GSA	U.S. General Services Administration
HEV	hybrid electric vehicle
IEQ	indoor environmental quality
IRS	Internal Revenue Service
IT	Information Technology
MWCOG	Metropolitan Washington Council of Governments
NASA	National Aeronautic and Space Administration
NCPC	National Capital Planning Commission
NOAA	National Oceanic and Atmospheric Administration
OMA	Office of Mission Assurance
PBS	Public Buildings Service
USDA	U.S. Department of Agriculture
USGCRP	U.S. Global Change Research Program

Executive Summary

The U.S. General Services Administration (GSA) understands that climate change could affect our ability to fulfill the agency's mission, operate our facilities, provide products and services, and meet policy and program objectives. As part of our responsibilities under Section 8(i) of Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* and Executive Order 13653, *Preparing the United States for the Impacts of Climate Change*, GSA is committed to securing Federal property and supply chain investments, which are critical to meeting our objectives in supporting the delivery of government services to the public.

GSA's adaptive capacity is defined by its ability to include climate factors in its management processes. By implementing the actions described in this Climate Change Risk Management Plan (hereafter referred to as the "Plan"), GSA will enhance its capacity by laying essential groundwork to incorporate climate change adaptation planning into the agency's strategic approach to enterprise risk management. The results of the planned activities will position GSA to provide customer agencies with innovative, expert solutions to the myriad of challenges posed by climate change risks in a dynamic policy and fiscal environment. GSA's national service lines, the Public Buildings Service and the Federal Acquisition Service, offer a unique network to facilitate an integrated national strategy for climate change adaptation planning, as well as to coordinate the Federal effort with state, local, and regional officials. This network, combined with the lessons and data gained from prior fiscal year priority actions and future planned actions, will be invaluable to GSA's success in building a robust capacity to manage risk from climate change. Because it is not possible to predict the precise timing, frequency, or severity of future risks, positioning GSA with robust, resilient capacity is imperative to successfully manage risks from climate change.

This plan summarizes GSA's approach, accomplishments, plans, actions and coordination activities to evaluate the agency's climate change risks and vulnerabilities to manage both the short and long-term effects of climate change on the agency's mission and operations. In FY14 and FY15, GSA will focus on these four action items that continue to build better understanding and address the risks and opportunities brought on by climate change:

1. Update the agency Climate Change Risk Management Plan, per the requirements of Executive Order 13653, *Preparing the United States for the Impacts of Climate Change*.
2. Initiate an update to agency and service-level vulnerability assessments based on the Third National Climate Assessment. This will lead to a subsequent update of the agency Climate Change Risk Management Plan in FY15.
3. Evaluate responses to GSA's 2013 Request for Information to assess the marketplace for climate change adaptation services and determine any next steps GSA should take to support Federal agencies in acquiring these services.
4. Deliver climate change adaptation training to GSA organizations based on a combination

of agency priority and organizational capacity.

A summary of GSA's current understanding of the challenges and opportunities posed by climate change to GSA's mission, program and operations is provided in Section 3.1. For more information on the agency's FY12-13 activities, please refer to GSA's FY13 Plan.

This Plan is a living document that will be updated within one year of the publication of each quadrennial National Climate Assessment report, or more frequently, as necessary. GSA's Climate Adaptation and Resiliency Team (Adaptation Team) and senior leadership will review and update the Plan in coordination with the Strategic Sustainability Performance Plan Team. GSA will post a copy of this Plan on InSite (the employee intranet) and make it available to the public as directed by the White House Council on Environmental Quality and the Office of Management and Budget.

1. Introduction

We know that our climate is changing. While it is essential to try to mitigate this change by reducing greenhouse gas (GHG) emissions[1], inertia in the climate system due to past GHG emissions means that some further climate change is unavoidable, and we must assess the climate risks that we face so we can plan to adapt.

This Plan focuses on adapting to a changing climate. Executive Order (EO) 13653, *Preparing the United States for the Impacts of Climate Change,* defines adaptation as an "adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects."

Climate change adaptation is a qualitative, iterative process that addresses risk vulnerability, adaptive capacity, preparedness[2], and resiliency[3]. It involves not only coping with immediate problems more efficiently, but also establishing and maintaining a reserve sufficient to cope with multiple (or more severe) stressors in anticipation of future changes. In essence, climate change adaptation requires building a robust capacity to manage risk.

GSA owns or leases 9,011 assets, maintains an inventory of more than 378 million square feet of workspace for 1.1 million Federal employees, preserves more than 647 historic properties, and provides 11 million different products and services totaling more than $54 billion in annual sales. Although predicting the precise occurrence of future climate risks is impossible, climate change could affect GSA's ability to fulfill our mission, operate our facilities, provide products and services, and meet policy and program objectives. GSA needs to develop robust, resilient capacity to manage climate change risks and secure the Federal real property and supply chain investment, particularly during this era of heightened environmental and fiscal challenges.

Adaptive Management Approach

As noted in CEQ's October 2010 *Progress Report of the Interagency Climate Change Adaptation Task Force*, "adaptation plans must allow for a 'feedback' mechanism, whereby new knowledge and information, lessons learned (including costs of implementation), and modified priorities can be accounted for and incorporated into the ongoing adaptation process." This feedback-based process is often referred to as adaptive management.

GSA is taking an adaptive management approach to its planning by instituting an incremental, iterative, and integrated process that builds capacity through climate literacy and incorporates

[1] Part of the U.S. General Services Administration (GSA) mitigation strategy, for example, focuses on making federal buildings more energy-efficient and procuring energy-efficient products (e.g. ENERGY STAR qualified) as methods to reduce energy consumption, and therefore reduce GHG emissions.
[2] "Preparedness" means actions taken to plan, organize, equip, train, and exercise to build, apply, and sustain the capabilities necessary to prevent, protect against, ameliorate the effects of, respond to, and recover from climate change related damages to life, health, property, livelihoods, ecosystems, and national security (EO 13653).
[3] "Resilience'' means the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions (EO 13653).

organizational learning into our business model. The intent is to make the agency robust and to operationalize adaptation immediately into existing processes. GSA uses an adaptive management process to gather, review and analyze information and respond in ways that promote flexible agency decision-making.

This approach is particularly appropriate for the agency because addressing climate risks is currently a non-routine problem set and yet these risks will impact complex systems over an extended period of time. Using a risk management approach, GSA is: considering all the threats and opportunities of incremental climate change and variability; piloting tailored organizational adaptation and collaboration methods; sharing lessons learned inside and outside GSA; fostering an internal community of practice (COP) that has moved from familiarity to understanding; and refining our adaptation based on experience and new information.

2. Policy

GSA recently updated its Climate Change Adaptation Policy Statement, reaffirming the agency's commitment to adaptation planning and the requirements outlined in EO 13653. See Appendix A to read the updated statement.

3. Federal Agency Planning for Climate Change Related Risk

3.1. Climate Change Related Risks for GSA

The impact of gradual, incremental climate change on GSA's statutory mission is characterized differently from acute extreme weather incidents, which are handled reactively. Demand planning for changing climate risk factors supports the changing mission of the Federal customers. If GSA is not able provide supplies, services, or spaces that are climate-resilient over time so that Federal customers can operate at full capability, much more is at risk than simply GSA's mission. GSA must work with its customers to understand how a changing climate, in conjunction with other socio-economic and demographic trends, will affect customer agency missions. This understanding can inform an assessment of mission criticality, and will help GSA to prioritize customers' risk management needs.

Sites and facilities with specialized functions that are challenging to replace, relocate or interrupt such as form processing, data centers, labs, courthouses, and land ports of entry (LPOE's), will need additional care in design and maintenance over time to maintain services and supplies for the Federal customer. In addition to designing new facilities for climate resilience over their lifetime, Federal customers should also take account of the potential impacts of climate change on operating budgets if, for example, energy costs increase as the temperature rises.

In FY13, GSA's Adaptation Team broadly assessed the agency's vulnerability to chronic, incremental climate impacts using a method tailored to our mission, which identified key threats, prioritized activities that reduce vulnerabilities, set strategic priorities for ensuring resilience, and

built preparedness capabilities. The assessment looked at impacts GSA-wide, at the Public Buildings Service (PBS)-level, and at the Federal Acquisition Service (FAS)-level. Below are identified impacts on the climate change-related impacts on the risks to the agency's ability to accomplish its missions, operations, and programs.

GSA-Wide

As part of the Federal climate change adaptation strategy, GSA is committed to securing Federal property and investments, which are critical infrastructure supporting the delivery of government services to the public. Therefore, much of the priority climate risks and opportunities are within the FAS and PBS organizations, but some vulnerabilities impact the agency as a whole.

Health and Safety

Indoor environmental quality (IEQ) and site access are the biggest health and safety risks to the GSA workforce that occupies agency office space. All GSA regions are impacted by this risk. Monitoring known vulnerable sites, better understanding the sources of indoor environmental contaminants, and controlling them as risks emerge are all opportunities to address IEQ issues.

Infrastructure and Support Systems

As agency workplaces become increasingly flexible and mobile, their dependency on GSA information technology infrastructure, building systems, and workplace strategies and design that support mobility are becoming more mission-critical. Currently, GSA has 15 data centers located in regional office buildings and other locations. Through the Federal Data Center Consolidation Initiative (FDCCI), we established a goal to consolidate these 15 into three major data centers located in Chantilly, VA, Fort Worth, TX, and Kansas City, MO. All three locations are particularly vulnerable to heat waves in terms of the infrastructure that supports real property, such as transit, utilities (electric, gas, and telecommunications), water and wastewater, and business and commerce. All have a medium to high sensitivity in their ability to accommodate projected climate impacts through 2100 with minimal disruption or costs. GSA has opportunities to ensure the major data centers are not in particularly vulnerable locations or the facilities are equipped to accommodate projected climate impacts with minimal consequences.

Social Resiliency

All people, including Federal employees, will be vulnerable to the effects of climate change, including heat waves, droughts, precipitation extremes, intense storms, and sea level rise. These changes are already having an impact on workplace health and safety, and disrupting access to Federal sites or systems. The Federal workforce will need to build capacity to cope with, and adapt to, climate change impacts within the workplace. This will be challenging, as climate risk management is often complex and requires a coordinated effort. By enhancing capacity to deal with climate change impacts in the workplace, GSA's climate change adaptation planning can build and foster social resilience among the Federal workforce, bolstering the critical resource of human capital.

Environmental Justice

GSA must respond to environmental justice issues that impact both our federal customers and the vulnerable communities (specifically low income and minority) that are affected by our activities. This responsibility is mandated by EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. As our customers identify vulnerable mission critical sites and supply chain components, GSA will partner with them to identify and avoid maladaptation, actions that increase vulnerability to climate risks rather than reducing them, to vulnerable communities. Real property adaptation actions may vary across a spectrum of protection, accommodation, or retreat. Supply chain adaptation actions may vary across a spectrum of planning for disruption, minimizing damage, or damage control. Preparing agency staff to have the capability, confidence, and capacity to successfully implement this emergent aspect of risk management requires ongoing attention.

GSA recognizes that minority communities and low-income communities may be disproportionately impacted by the effects of climate change. Extreme heat, severe storms, reduced air quality, severe droughts, and sea-level rise may exacerbate environmental and public health challenges facing minority communities and low-income communities. In addition to addressing GSA's responsibilities to these vulnerable communities, GSA's Office of Civil Rights will also ensure that future training of and educational outreach to recipients of Federal financial assistance will incorporate the need to include consideration of EJ communities in planning for and responding to climate-related events.

Public Buildings Service

The PBS mission is to provide effective, mobile, sustainable workplace solutions for Federal agencies at the best value for the American Taxpayer. Climate impacts may increase the costs of maintaining excellent conditions of real property. Mission delivery for PBS is affected by Federal policy, variable funding levels, increasing temperatures, changing precipitation patterns, more intense storms, and rising sea levels. PBS can expect higher summer temperatures and a subsequent need to minimize cooling loads. Additionally, buildings may also need to withstand lower and longer-lasting winter temperatures and higher flood elevations. Depending on the customer mission, GSA may need to provide buildings that maintain livable conditions in the event of extended power outages, interruptions in heating fuel, and shortages of water to ensure resilience and survivability.

Federal Acquisition Service

FAS's mission is to make Federal agencies more effective at what they do by providing expertise, management, and optimal acquisition solutions. FAS is a key stakeholder in providing innovative acquisition solutions to Federal agencies, including products and services to support the implementation of agency climate change adaptation plans. FAS operates on a fee-for-service model and recovers all of its operating costs through fees assessed on the goods and services provided to customers, so alignment with Federal needs is critical in supporting its

customers and sustaining the organization in the future. This poses risks (the inability to meet customer demand) and opportunities (the ability to prepare hand in hand with Federal customers). For example, the proportion of the U.S. Forest Service budget allocated to firefighting has increased from 15 percent to nearly 50 percent. FAS will need to monitor increasing demand for supplies and services that assist agencies in managing their climate risks. This will ensure FAS has the ability to scale up and provide the appropriate type and amount of climate risk management offerings.

GSA Global Supply

GSA Global Supply supports military base supply stores in Asia, Europe, the Middle East, and the United States. In these stores, GSA manages the inventory for the customer, while base personnel oversee daily store operations. More information on climate impacts faced by international sites is discussed later in this section.

GSA Fleet

GSA Fleet leases vehicles to Federal agencies located across the United States, as well as to agencies operating overseas. Vehicle assets are particularly vulnerable to extreme temperatures, extreme weather events, and flooding. Extreme heat can cause a number of operational problems, including overheating, changes in the stability of certain fuels (algae blooms in biodiesel), and increased incidents of tire failures, such as blowouts. Extreme heat and precipitation changes can also damage crops used in the formulation of biofuels like ethanol and virgin oil biodiesel, leading to an increase in fuel costs for the Federal fleet. Hybrid and dedicated electric vehicles (HEVs and EVs) can suffer from poor performance in cold or hot environments. HEVs may suffer from reduced fuel efficiency, and EV battery life is shortened in extreme cold and heat, leading to reduced vehicle range. Vehicle damage and loss could also increase due to changes in the intensity, timing, and location of extreme events, such as hail and flooding. However, GSA Fleet has the opportunity to reduce these risks by coordinating closely with its customer agencies to ensure proper geographical placement of vehicles and operation and maintenance procedures.

Operations

Since it operates on a fee-for-service model and is not a mandatory source in a majority of the markets it serves, FAS must work closely with customer agencies and industry partners to ensure the appropriate products and services are available to sustain mission-critical Federal operations. The Office of Customer Accounts and Research—which enables FAS's understanding of customer requirements for the range of acquisition solutions and becoming a strategic partner in helping customers select the best value solution for their needs—will be a critical source of this information. Working closely with customers provides insight to the prospective adaptation needs of the customer agencies and enables FAS to ensure these needs are met through its offerings.

Economic Activities and Federal Supply Chain

As a source of Federal supply for products and services, FAS is a key component of the Federal product and service supply chain and depends on the larger global supply chain. Generally,

FAS is vulnerable to fluctuations in demand that exceed our contractors' ability to deliver in a timely manner, as well as supply chain disruptions in manufacturing, transportation, or other capacities. Climate change could substantially increase these vulnerabilities, posing risks to the FAS mission, with cascading impacts to customer agencies. For example, flooding in Thailand in fall 2011 cost a Western Digital plant that produced one-fourth of the hard-disk disk sliders distributed worldwide nearly $200 million. As a result, consumers experienced elevated pricing by at least 10 percent due to supply deficits, Western Digital's recoup of losses and risk mitigation, and industry consolidations. Other potential risks include heat waves, drought, intense storms, sea level rise, and high fluctuations in temperature and precipitation.

3.2. Coordination with Continuity of Operations

GSA, along with all Federal agencies, is required to conduct business analysis for the Federal Continuity Directive-2 of Department of Homeland Security (DHS). This document provides the Mission Essential Functions for continuity of government due to incidents. Extreme weather incidents are one type of impact to these mission essential functions, which include Logistics Management and Resource Support Emergency Support Function (ESF) #7 – Logistics Management and Resource Support Annex.[4]

GSA's Office of Mission Assurance (OMA) serves as the agency-wide lead for continuity of operations and special security programs, as well as disaster policy, planning, support, and operational coordination. In this role, OMA integrates the full suite of agency authorities, capabilities and equities to enact and guide the development of structured programs ensuring the resiliency of GSA's mission essential functions. GSA supports Federal agencies and state, tribal, and local governments that need resource support prior to, during, and/or after incidents requiring a coordinated Federal response. ESF #7 operates under the following authorities:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93- 288) as amended
- Homeland Security Act of 2002
- Homeland Security Presidential Directive 5
- Homeland Security Presidential Directive 8
- Post-Katrina Emergency Management Reform Act of 2006

As such, OMA is responsible for handling any extreme weather events, such as tornadoes or climate-related risks deemed so significant that it impairs GSA's statutory mission or operation. However, GSA's key logistics and resource role in support of ESF#7 could be challenged by an increase in the frequency and severity of extreme weather events, if supply chains are disturbed. Examples of such risks include increased frequency or intensity of storms (such as hurricanes), increased storm surge, inland or shoreline inundation, sea level rise, or increased incidence and spread of wildfires.

[4] Available online at: http://www.fema.gov/pdf/emergency/nrf/nrf-esf-07.pdf

3.3. GSA Actions to Manage Climate Risks

In FY12 and FY13, GSA committed resources to addressing climate change in accordance with EO 13514, primarily through information dissemination and action training through workshops. A discussion of these activities, below, is followed by proposed plans to continue and build on these activities in FY14 and FY15.

Ongoing Activities

Effective integration of climate risk management measures in operational planning and service delivery is dependent on a solid awareness of constraints and incentives. Even when climate risk management is helped by new information and technological solutions, the positive effects can sometimes be limited by lack of speed or institutional capacity to effectively mainstream adaptation. The development of an enabling environment for change, both at the level of individual decisions and at the organizational level, can act as a big incentive for adaptation. For example, GSA has collaborated with other agencies on long-term climate change scenario planning exercises, which have worked to improve understanding of climate change impacts on operations and will be used in adaptation planning. GSA focused efforts to make an enabling environment for change with its partners who are more directly engaged with State, Local and Tribes than GSA.

Efforts to Support and Encourage Adaptation: Building a Climate Resilient National Capital Region Workshop Series

Rationale
Starting in fall 2013, NCPC (National Capital Planning Commission), GSA, NASA (National Aeronautic and Space Administration), MWCOG (Metropolitan Washington Council of Governments), U.S. Global Change Research Program (USGCRP), and the Smithsonian Institution sponsored free invitation-only webinars and workshops to assist Federal and local agency's climate adaptation planning and improve regional coordination. The workshops provide Federal, regional, and local organizations with an opportunity to work together, share technical information, and collaborate on climate adaptation strategies tailored to the National Capital Region. Stewardship of the region's resources requires coordinating policy, tools, information, and expertise with others. Many Federal, regional, and local agencies are individually exploring climate adaptation strategies for their buildings, infrastructure, workforce, and landscapes. However, no single entity can address all of its climate change risks without working with other area organizations.

Actions to Ensure Success
The workshop structure was based on a process for assessing and planning for vulnerabilities to climate impacts. This process has been tested and followed for several years by NASA managers.

In the interim between workshop events, participants were encouraged to complete 'homework assignments' to identify the built systems most vulnerable to climate change. In discussion groups, participants shared and synthesized the results of this homework, characterizing the primary threats common among participating organizations. At some of the workshops, participants broke into sector-based groups to identify strategies for a climate resilient DC area. The groups at the December workshop were:

- Transportation,
- Water/wastewater/stormwater,
- Governance,
- Geographically and historically significant areas,
- IT/telecomm, and
- Energy (electrical supply)

Workshop participants also honed elevator speeches and headlines to communicate climate preparedness messages within their organizations.

Timeframe: The workshop series began in 2013 and is continuing through 2014.

Efforts to Encourage Adaptation: GSA Regional Climate Scenario Sessions

Rationale

Superstorm Sandy, persistent drought conditions covering more than half of the United States, extended heat waves, and projections for more of the same through the end of the century. Climate change will impact organizations around the globe, and those that prepare today will be ready to swiftly navigate the challenges ahead. GSA recognizes the need to prepare today so it can maintain its mission and support its customers well into the future.

Actions to Ensure Success

GSA's PBS and FAS teamed with several Federal partners in January 2013 to conduct climate scenario sessions that build capacity, capability, and confidence within the Federal government to address incremental climate risks. The sessions were held in two regions: the National Capital Region (Region 11) and the Heartland Region (Region 6).

The sessions were designed to help the participants meet the requirements of Section 8(i) of EO 13514, which requires Federal agencies to evaluate climate change risks and vulnerabilities and to manage the effects of climate change on agency operations in the short and long term. Climate change adaptation is an emergent problem set that requires PBS and FAS to develop innovative integrated service offerings that are tailored to support mission continuity for each Federal customer.

The two scenario sessions brought together a set of Federal stakeholders to sift through

information on mission critical assets and climate projections and create strategies to address climate risks. Participants in each region focused on one customer and evaluated a select set of climate risks to two of the customer's mission critical assets: a facility and the information technology and telecommunication services that support the facility. GSA regional staff selected a willing customer with a need for better understanding climate risks to their assets. Region 6 identified its U.S. Department of Agriculture (USDA) customer, who is concerned about the future reliability of a mission critical data center and its information technology (IT) support given extreme heat and persistent drought conditions that are projected for Kansas City, Missouri, through the end of the century. Region 11 staff wanted to leverage lessons learned from a major flooding event in 2006 at Internal Revenue Service (IRS) headquarters to assess how projected extreme heat and rising sea levels will impact the facility and the telecommunications services that support it.

The sessions leveraged the combined capabilities of PBS, FAS, and the participating agencies. Several science agencies, including NASA, NOAA (National Oceanic and Atmospheric Administration), and USGCRP, participated and provided climate projection information. The outcomes from both threshing sessions included a list of climate risks to the assets, strategies to address the risks, and the identification of partners and funding needed to effectively mitigate the risks, all of which will assist GSA and its customers in meeting their EO 13514 climate change adaptation goals. GSA worked together with EPA, IRS, NCPC, USGCRP, NOAA, and NASA to support the National Capital Region Climate Risks Preparation and Adaptation Pilot. GSA focused on the IRS headquarters building located in Washington, DC. The IRS identified this building as both mission-critical and vulnerable to the impacts of climate change. In January 2013, an all-day scenario session brought participants together to consider the impacts of long-term extreme temperature, sea level rise, and extreme precipitation projections. NASA supplied downscaled climate data, IRS brought experience from a flooding event at their facility in 2006, and NCPC provided expertise in comprehensive planning. The scenario tackled impacts to specific systems, facility and supply chain assets, and considered how to identify partners and funding needs.

GSA was awarded a GreenGov Presidential Award in the 'Climate Champion' category for these efforts. Recipients are recognized for exemplifying President Obama's charge to lead by example and demonstrating extraordinary achievement in the pursuit of EO 13514. Additionally, the Washington, DC, climate scenario session was recognized by CEQ's GreenGov Spotlight Community. CEQ selected six projects from across the Nation that exemplified the ability to leverage regional resources and help achieve the goals of EO 13514, *Federal Leadership in Environmental, Energy and Economic Performance*. A Spotlight Community demonstrates the benefit of a Federal entity working with its neighbors, including local governments, area businesses, and non-profit organizations, to improve fleet management, increase renewable energy production and use, or enhance water conservation. The DC team is now moving forward with establishing priorities for creating a climate preparation and adaptation plan for the IRS building and the surrounding Federal Triangle area. The plan is expected to be adaptable to many Federal building in the National Capital Region.

Timeframe: Sessions were held in 2012 and 2013. GSA is considering advancing existing efforts and expanding into additional regions if resources allow.

Necessary Resources: Dedicated representatives from the Washington, DC, and Kansas City, MO, sites to develop a site-specific adaptation plan and coordinate on activities. Additional GSA staff will be needed to expand efforts into additional regions.

For more information on the agency's FY12-13 activities, please refer to GSA's FY13 plan.

FY14-15 Climate Risk Management Actions

In FY14 and FY15, GSA will focus on four action items that continue to build better understanding and address the risks and opportunities brought on by climate change.

1. Update the agency Climate Change Risk Management Plan, per the requirements of Executive Order 13653, Preparing the United States for the Impacts of Climate Change.
2. Initiate update to agency and service-level vulnerability assessments based on the Third National Climate Assessment. This will lead to a subsequent update of the agency Climate Change Risk Management Plan in FY15.
3. Evaluate responses to the Request for Information to assess the marketplace for climate change adaptation services.
4. Deliver climate change adaptation training to GSA organizations by request.

FY14-15 Climate Risk Management Actions in Detail

Action #1	Update the agency Climate Change Risk Management Plan, per the requirements of Executive Order 13653, Preparing the United States for the Impacts of Climate Change
Action Goal	Update the agency Climate Change Risk Management Plan and associated documents (e.g., GSA Climate Change Adaptation Policy Statement) to address the new requirements of EO 13653.
Climate Risk(s) Addressed by Action	All climate risks (sea level rise, extremes of temperature and precipitation, and increasing frequency and magnitude of intense storms)
Responsible Organization(s)	GSA's Climate Adaptation Team and relevant partners in FAS, OGP, and PBS
Agency Lead	Office of Federal High Performance Green Buildings
New, Continuing, On-going, or Future	Continuing

Effort	
Potential Opportunities	This plan will help to build awareness of climate risks and strategic implications for GSA business lines. Updating GSA's Climate Change Risk Management Plan can lead to a number of potential opportunities, including: • Set the framework for identifying, evaluating, and addressing climate risks within GSA and in partnership with our customers. • Document prior actions, successes, and challenges, as well as define and make the agency accountable for future planned actions. • Build a better understanding among GSA staff regarding how climate change can impact the agency's ability to deliver its mission and how they can begin to prepare to manage these risks today. • Define barriers that the agency and others must address to ensure GSA is effectively preparing for climate change. • Ensure GSA's plans are coordinated with the most up-to-date National Climate Assessment projections.
Scale	National
Timeframe	FY14 – FY15; plan will be then be updated within one year of each National Climate Assessment release.
Implementation Methods & Key Milestones	This activity utilizes the methods and requirements of the GSA business processes overlaid with climate impacts. Implementation methods include non-routine strategic process assessments for resilient investment and mission impacts and maturity, requiring extensive advisement, coordination, and collaboration with partners across the agency. Based on these agency processes, some of which have evolved drastically in the last three years and are no longer routine to staff, the following are key past and future milestones: • FY11: Developed first agency wide adaptation action plan and was included in Agency Directives. • FY12: Implemented planned actions, which were used to inform the second-agency wide adaptation action plan. • FY13: Implemented planned actions, which were used to inform the third agency-wide adaptation action plan. • FY14: Implementing planned actions, which are used to inform the fourth-agency wide adaptation action plan with new criteria. • FY15-16: Implement planned actions including updated vulnerability assessment and used to inform fifth agency wide adaptation action plan.
Performance	GSA will track performance through its Self-Assessment. All actions beyond the self-assessment are dependent on agency stakeholder

	participation, continuity and agency issuance process.
Inter-governmental Coordination	GSA will coordinate with relevant customer and partner agencies to leverage and optimize adaptation activities and plans, such as coordination on technical studies and sharing outcomes to inform risk management efforts.
Resource Implications	To date, GSA has completed previous adaptation plans using in-house expertise with some contract support. Going forward, GSA is using more contract support to assist, given the high demand on agency staff to work on other non-technical endeavors such as collaboration efforts internally and with partner agencies to operationalize adaptation into existing processes. To plan and implement given the long-term challenges of climate change, the GSA climate team has found that non-routine problem solving skills and ex ante decision making are not typical components of GSA business processes, and thus agency staff have little experience with them. Staff must either be trained or hired in order to develop these skills within the agency.
Challenges/Further Considerations	This activity touches all GSA business processes, many of which have evolved drastically in the last three years and are no longer routine to staff. Due to these changes, it requires more time and resources to update GSA's Climate Change Risk Management Plan. Climate change adaptation planning efforts, which translate into future cost avoidance, seemingly align with GSA's actions over the past three year to reduce agency costs. However, the adaptation aspect of agency risk management is new and unfamiliar, the scope is extremely broad, and the return on investment is often uncertain and realized in the long term. This issue is relevant across the entire Federal government.
Highlights of Accomplishments to Date	Since FY11, GSA has successfully implemented all planned actions spanning from agency-wide climate literacy, to the development of process-based metrics, and to advising projects on climate protection levels. More information on these accomplishments can be found in GSA's FY2013 Climate Change Adaptation Action Plan. Additionally, GSA has received several awards for one of its planned adaptation activities, the climate adaptation pilots it held with staff and customers in its Kansas City, MO, and Washington, DC, regions. These awards include: 2013 Presidential GreenGov Climate Champion Award; selection as one of six nationwide projects for CEQ's GreenGov Spotlight Communities program; and GSA's Real Property Innovation Special Achievement Award for Asset Management.

Action #2	Initiate update to agency and service-level vulnerability assessments based on the Third National Climate Assessment
Action Goal	Incorporate new science from the Third National Climate Assessment into GSA's agency and service-level vulnerability assessments. This will inform subsequent update of the agency FY15 Climate Change Risk Management Plan, and most importantly, inform GSA's prioritization of adaptation activities.
Climate Risk(s) Addressed by Action	All climate risks
Responsible Organization(s)	Climate team and relevant partners in FAS, OGP, and PBS
Agency Lead	Office of Federal High Performance Green Buildings
New, Continuing, On-going, or Future Effort	Continuing
Potential Opportunities	This activity will incorporate new science from the Third National Climate Assessment (NCA) regarding behavioral, social and economic impacts. The vulnerability assessments will include particular emphasis on the overlay of impacts to a) locations with concentrations of Federal real property; b) mission-critical operations which cannot readily be relocated, such as data centers, Land Ports of Entry, etc.; c) the information technology/telecommunications sector; and d) emergency and disaster response products and services. GSA will provide specific vulnerability assessment content for Federal Triangle, Washington, DC; Kansas City, MO; and Boston, MA. Additionally, the agency will identify and include references to existing locality adaptation plans which dovetail with concentrations of GSA real estate. In addition, using information from the Third NCA, GSA will evaluate climate risks to data center and telecommunications supply chains to better inform its climate change adaptation planning and risk management activities. GSA will create short fact sheets for each of the eight NCA regions describing the climate vulnerabilities of data center and telecommunications equipment and services supply chains for each region. The information gathered will be shared with GSA acquisition staff and customer agencies and will serve as an opportunity to assist them in understanding climate risks and exploring ways to minimize the interruption of data center and telecommunications services. GSA also intends to share the outputs of this work with Federal climate change adaptation, resilience, and preparedness working groups.

Scale	National
Timeframe	FY14 – FY15

Implementation Methods & Key Milestones	This activity will analyze the methods and requirements of GSA business processes overlaid with climate impacts. The following are key milestones:
	• FY11: Conducted first vulnerability assessment (VA) based on the 2009 NCA.
	• FY12-13: Used VA in Region 6 and Region 11 pilots as well as agency-wide climate literacy training sessions.
	• FY13-16: Ongoing advisement with relevant agency business lines to incorporate VA findings into projects, including:
	  ○ PBS Office of Design and Construction statement of work templates;
	  ○ Support for a Region 1 Land Port of Entry project;
	  ○ Regional Office and Central Office Project Reviews;
	  ○ PBS Portfolio Capital Investment and Leasing FY16 call, and
	  ○ Telecommunications and data center services.
	• FY16-17: Implement climate factors into relevant projects.

Performance	GSA will track performance through its Self-Assessment. All actions beyond the technical assessment are dependent on agency stakeholder participation, continuity and agency issuance process.
Inter-governmental Coordination	GSA will coordinate as relevant with customer agencies to optimize resources already deployed in technical studies and/or to share outcomes to inform their risk management efforts. GSA will also share any future climate assessment needs with the US Global Change Research Program for consideration in the next NCA.
Resource Implications	To date, GSA has completed previous vulnerability assessments using in-house expertise. Going forward, GSA is using contract support to assist these efforts, given the high demand on agency staff to work on other non-technical endeavors such as collaboration to operationalize.
Challenges/Further Considerations	Federal agency budgets have been reduced, but requirements for Federal climate change adaptation planning activities have increased, posing a resource challenge to GSA. GSA recognizes that outsourcing the vulnerability assessment update process does not build agency capacity to execute this work. GSA also planned to use FRPP Mission criticality data element to assist in the effort to prioritize the results of the VA. However, this data element was removed in 2013 because the criteria were deemed subjective. All agencies need a way to communicate this factor, and GSA has conveyed this need to CEQ. GSA prefers use of a modified

	existing method, such as DHS's Federal Continuity Directive 2 (FCD-2), that focuses on gradual or chronic effects on mission and not incidents disrupting continuity. It is currently unknown whether agencies will receive sufficient funding to be able to manage the risks identified through the vulnerability assessments. This factor requires a greater judgment of methods to prioritize limited funding based on vulnerability, mission criticality, and the value of agency mission continuity or diminished capacity. It will be challenging for GSA to partner with its customers on managing climate risks identified if they are not appropriately funded to do so.
Highlights of Accomplishments to Date	All actions beyond the vulnerability assessment are dependent on stakeholder participation, continuity and agency policy issuance process. • FY11-Present: Used the Interagency Climate Change Adaptation Task Force's Guiding Principles to prioritize the most vulnerable assets relevant to the most critical. Planned to use the FRRP mission criticality data element. • FY13: Built capacity with agency staff and customers through more detailed use of the NCA for pilots in Region 6 and Region 11. • FY13: Assisted USGCRP with two-pager summaries for the NCA. • FY14: In partnership with PBS Portfolio, the Adaptation Team included in the FY16 Capital Investment and Leasing Plan call a Climate Risks section to guide project prioritization and assistance. • FY14: Under advisement with GSA's Office of Government-wide Policy, discussed options to report Federal liabilities regarding GSA assets in flood plains and also anticipate an OMB data call for such information based on the President's Climate Action Plan. • FY14: Under advisement with GSA's new enterprise-wide Geographic Information Systems (GIS), discussed options to respond to customer inquiries regarding GSA assets in flood plains and anticipate more inquiries. Developing adaptation requirements in May 2014. • FY14: Under advisement with GSA's Fire, Safety and Environmental Program, discussed options regarding GSA assets in flood plains and anticipate more inquiries. • FY14: Under advisement with GSA's Operations and Maintenance Program, discussed options regarding recording the causes of building component failures based on climate impacts. Confirmed again that GSA only records such failures when a facility was in a FEMA disaster location. Currently under advisement and collaboration with other agencies that track real time temperature or wind loads effecting equipment or systems performance or failure. • FY14: Under advisement with GSA's Office of Mission Assurance

	to determine methodology based on existing methods from DHS-Federal Continuity Directive -2 (FCD-2) . Additionally sought assistance from CEQ.

Action #3	Define demand and supply for Climate Change Adaptation Support Services
Action Goal	Assess the marketplace for climate change adaptation services (Applying and Interpreting Climate Models, Applied Climate Science, Climate Risk Management, and Climate Risk Communications and Training) and determine any next steps GSA should take to support Federal agencies in acquiring these services.
Climate Risk(s) Addressed by Action	This action will assist other agencies in identifying and addressing their climate risks, which will vary depending on the location of operations.
Responsible Organization(s)	FAS
Agency Lead	Office of Acquisition Management
New, Continuing, On-going, or Future Effort	Continuing
Potential Opportunities	GSA is dedicated to procuring goods and services for the Federal government. As an integral part of GSA, the Federal Acquisition Service (FAS) possesses unrivaled capability to deliver comprehensive products and services across government at the best value possible. GSA is in the unique role to ensure climate change adaptation support services the Federal agencies need to achieve their adaptation plan goals are available in a timely and cost-effective manner.
Scale	These services can provide support to a wide variety of Federal agency functions, whether they are local, regional, national, or international in scale.
Timeframe	FY12 – FY17
Implementation Methods & Key Milestones	This activity uses the methods and requirements of the Federal procurement process to assess the marketplace for an emerging industry. Based on this method, the following milestones were created: • FY12: Coordinated with the White House Council on Environmental Quality (CEQ) to discuss issuing a Request for Information (RFI) to assess the marketplace for climate change adaptation support

	services and received their thoughts, comments, and buy-in. • FY13: Hosted customer meeting to determine Federal need for climate change adaptation support services. Developed and issued RFI. • FY14: Evaluated RFI responses and formulated final market assessment. • FY15: Develop options for next steps, including but not limited to revisions to the current Schedule 899 or other schedules, a different acquisition strategy, and a future solicitation. Present options and recommendations for next steps to FAS management for review and approval. • FY16-17: Implement selected and approved next steps.
Performance	Beyond the listed milestones above, GSA will create a performance tracking plan once the market assessment is completed and an implementation strategy is selected and approved by FAS management.
Inter-governmental Coordination	GSA has coordinated the entire RFI effort with Federal climate science and procurement subject matter experts, including staff from the National Parks Service, National Oceanic and Atmospheric Administration, Army Corps of Engineers, US Global Change Research Program, NASA, and GSA.
Resource Implications	To date, GSA has completed the required steps by accessing the expertise that exists in the Federal climate change adaptation and acquisition communities. GSA expects future milestones will also be completed using existing Federal staff.
Challenges/Further Considerations	Since GSA's initial discussion with its customers in October 2012, Federal agency budgets have been reduced, but requirements for Federal climate change adaptation planning activities have increased. It is currently unknown whether agencies will receive sufficient funding to purchase needed climate adaptation support services. The marketplace for climate change adaptation support services is also growing at a rapid pace. GSA will need to consider this if it decides to issue a solicitation for these services, as the marketplace may significantly change between the time GSA completes its market assessment and when a solicitation is issued.
Highlights of Accomplishments to Date	FY13: In early FY13, GSA hosted a meeting with 10 customer agencies to discuss the types of climate change adaptation support services are needed by the Federal community. Based on this discussion, GSA coordinated with Federal climate science and procurement experts to develop and issue an RFI on September 26, 2013. FY14: The RFI closed for responses in December 2013. GSA reached out to the Federal climate science community and successfully found a

	team of volunteers to assist in assessing the RFI responses. The team is providing GSA with substantial support in reviewing the responses received and providing subject matter expertise in the areas of climate science, risk management, and communications.

Action #4	Deliver climate change adaptation training to GSA organizations by request
Action Goal	Build climate risk literacy, capability, and confidence in specific business lines and agency processes
Climate Risk(s) Addressed by Action	All climate risks
Responsible Organization(s)	Climate team and relevant partners in FAS and PBS
Agency Lead	Office of Federal High Performance Green Buildings
New, Continuing, On-going, or Future Effort	Continuing
Potential Opportunities	GSA has the opportunity to expand and enhance the use of geographic information systems (GIS) throughout agency operations. This method can help GSA track assets and operations in order to understand and plan for potential impacts from climate risks.
Scale	National
Timeframe	FY14 – FY17
Implementation Methods & Key Milestones	This activity is utilizing methods and requirements of GSA business processes with consideration of climate risks and potential impacts. Adaptive management is the primary implementation method, using a flexible yet structured and systematic process for continually improving decisions, management policies, and practices by learning from the outcomes of decisions previously taken. Based on existing processes, the following are key milestones : • FY11: Conducted first vulnerability assessment based on 2009 NCA. • FY12- 13: Conducted pilots in Region 6 and Region 11 as well as agency-wide climate literacy training sessions, briefings to senior leadership, and regional leadership and account management community.

	• FY13-16: Ongoing advisement with relevant agency business lines to incorporate findings into projects, such as multiple statement of work templates for the PBS Office of Design and Construction, support for a Region 1 Land Port of Entry project, Regional and Central Office Project Reviews, PBS Portfolio Capital Investment and Leasing FY16 call, and the SSA-focused Client Portfolio Planning team. • FY16-17: Implement climate factors into relevant projects.
Performance	All actions beyond the technical assessment are dependent on agency stakeholder participation, continuity, and agency issuance process. Effectiveness of GSA trainings can be measured based on future planning actions of trainees. For example, GSA work may be deemed successful if future projects incorporate climate risk management into the planning and management phases.
Inter-governmental Coordination	Coordinate as relevant with customer agencies to optimize resources already deployed in technical studies or to share outcomes to inform their climate risk management efforts.
Resource Implications	To date, GSA has completed training and technical support using in-house expertise. Going forward GSA is seeking to add staff given the demand on existing CCA agency staff directed to other non-technical endeavors.
Challenges/Further Considerations	Topics ranging from historic properties to maladaptation in vulnerable communities (specifically low income and minority communities) will require developing criteria, guidance, and implementation methods in issues largely unfamiliar to the agency. Preparing agency staff to have the confidence and capacity to successfully implement this emergent aspect of risk management requires ongoing effort and resources. GSA and other Federal agency staff struggle to understand how climate change presents risks to their supply chains. This is a challenge not only for adaptation staff, but also for agency leadership and management. While GSA strives to build awareness of climate risks in the supply chain through its training and pilot activities, staff still struggle to understand the risks and what they can, or should, do to manage the risks. Since Federal agency budgets have been reduced, but requirements for Federal climate change adaptation planning activities have increased, it is currently unknown whether agencies will receive sufficient funding to be able to manage risks identified in vulnerability assessments. This factor requires improved judgment in prioritizing the use of limited funding based on vulnerability, mission criticality, and the value of the agency mission continuity or diminished capacity.

Highlights of Accomplishments to Date	All actions beyond the technical assessment are dependent on stakeholder participation, continuity, and agency issuance process. • FY13: Built capacity through more detailed use of NCA for pilots in Region 6 and Region 11. GSA received several awards for the climate adaptation pilots it held with staff and customers. These awards include: 2013 Presidential GreenGov Climate Champion Award; selection as one of six nationwide projects for CEQ's GreenGov Spotlight Communities program; and GSA's Real Property Innovation Special Achievement Award for Asset Management. • Assisted USGCRP with two-pager summaries for NCA. • FY13: Data element removed from FRPP because of the subjective nature of content. • FY14: Developed a Capital Investment and Leasing Plan call section for Climate Risks. Under advisement with PBS Portfolio to broadcast to regions and support teams in prospectus development. • FY14: Under advisement with GSA's Office of Government-wide Policy, discussed options to report Federal liabilities regarding GSA assets in flood plains and anticipate OMB data call for such information based on the President's Climate Action Plan. • FY14: Under advisement with GSA's new enterprise-wide GIS, discussed options to respond to customer inquiries regarding GSA assets in flood plains and anticipate more inquiries. Developing adaptation requirements in May 2014. • FY14: Under advisement with GSA's Fire, Safety, and Environmental Program, discussed options regarding GSA assets in flood plains and anticipate more inquiries. • FY14: Under advisement with GSA's Operations and Maintenance Program, discussed options regarding recording building component failure causality based on climate impacts. Confirmed again that GSA only records such failures when a facility is in a disaster location. This work is under advisement and collaboration with other agencies that track real time temperature or wind loads effecting equipment or systems performance or failure. • FY14: Under advisement with GSA's Office of Mission Assurance to determine methodology based on existing methods from DHS-Federal Continuity Directive -2 (FCD-2) . Sought assistance from CEQ. • FY14: Coordinated with USGCRP and the US Army Corps of Engineers in the creation of two adaptation planning resources available on GSA's Sustainable Facilities Tool (SFTool). This includes the following SFTool modules: ○ Hot Annotated EO 13653, which contain links to Federal external resources that help agencies better understand and implement EO 13653, definitions of new terminology, and strategies and best practices on how Federal agencies

	are taking steps to prepare for climate change. ○ Climate Change Risk Preparation and Adaptation Planning module, which provides detailed steps and tips to assist Federal agencies in hosting climate risk workshops similar to the ones GSA held with its staff in Kansas City, MO, and Washington, DC.

3.4. Climate Risk Management within Supply Chains, Property Investments, and Capital Equipment Purchases

Supply Chains and Suppliers

GSA establishes long-term government-wide contracts, called Schedules, with commercial companies to provide Federal agencies access to millions of commercial products and services at volume discount pricing. The Schedules represent a portion of the Federal supply chain, and more than 18,000 commercial companies hold a GSA Schedule. With such a large scope, GSA will prioritize climate risks in its supply chain by first targeting the products and services that Federal agencies identify as mission critical.

As a first step, GSA has identified telecommunications and data center services as both mission-critical to its customers and vulnerable to climate change risks. This determination is based on climate scenario sessions GSA held in 2013, additional discussions with its customers, and published reports. The results of the Business Continuity Institute's November 2013 Supply Chain Resilience Survey, which covered 519 respondents from 71 countries, noted "the primary sources of disruption were unplanned IT or telecom outages, with 55% stating they experienced high or some impact from this type of disruption." These outages were ranked as the top cause of supply chain disruption for the financial and insurance services, professional services, public administration and defense, and information technology and communication services sectors. In addition, recent extreme weather events have caused significant costs to the telecommunications sector. For example, Superstorm Sandy in 2012 cost Verizon $1 billion and was the single largest impact to its wire line infrastructure in its 100-year history.[5] While GSA does not yet have the information to calculate the costs and benefits of such risks, the agency expects the costs suppliers incur to recover from events like these and future climate-related events will be passed along to its customers, so any proactive steps that can be taken today can help in managing the rise of future costs.

To mitigate these risks and potential increased costs, GSA will collect, review, and summarize published information on climate risks to data center and telecommunications supply chains to better inform its climate change adaptation planning and risk management activities. Based on the findings of this study and the results of the most recent finalized National Climate

[5] Source: http://www.pbs.org/newshour/bb/science-july-dec13-sandy_10-28/

Assessment (NCA), GSA will create short fact sheets for each of the eight NCA regions describing the data center and telecommunications equipment and services supply chains climate vulnerabilities for each region. The information gathered will be shared with GSA acquisition staff and customer agencies to assist them in understanding climate risks and exploring ways to utilize the procurement process to minimize the interruption of data center and telecommunications services. GSA also intends to share the outputs of this work with Federal climate change adaptation, resilience, and preparedness working groups.

Real Property

PBS seeks to provide robust, climate-ready workplaces for its Federal customer agencies and to secure the Federal real property investment. It does this by first addressing existing assets in GSA's real property portfolio (owned and leased). These assets are the Federal investment to be secured—real property and the customer's mission executed from a mission-critical, climate-vulnerable site. Going forward, as new capital becomes available or significant reimbursable work is received from customers that need new mission-critical sites, GSA will conduct technical and feasibility studies, including climate risk factors in the pre-project formulation phase. In addition, climate risk factors should also inform decisions of any forthcoming civilian property space consolidation actions.

Currently, PBS's adaptive capacity is determined by its ability to organizationally factor climate readiness into its management and business processes, on the basis of its understanding of climate projections and existing site-specific climate impacts. This capacity contributes to GSA's interagency effort to plan for climate change adaptation because climate-ready real property will be essential to ensure continuous support of all customer missions, however they may evolve to adapt to climate changes. Mission delivery is affected by Federal policy, variable funding levels, increasing temperatures, changing precipitation patterns, devastating storms, and rising sea levels. In ensuring customer resiliency to climate change and other challenges, PBS will draw on analysis of many sectors and scales of infrastructure connected to real property, including transit/transportation, utilities (power, gas, electric, water, and wastewater), telecommunications, business and commerce to support operations, food, and material supply.

PBS will partner with customer agencies to determine Climate Protection Levels (CPLs) at the specific site and facility scale for mission-critical sites. CPLs are climate-based, expert-determined benchmarks achieved through the implementation of design and performance standards with the express purpose of limiting the climate change risk exposure. PBS will adopt CPLs to address factors such as higher summer design temperatures (and the associated need to minimize cooling loads), lower and longer-lasting winter design temperatures, and higher flood elevations. Building operating plans, alternative workplaces, and mobility strategies must follow through to support the CPLs. In addition, contingency plans for funding resources must address building enclosure maintenance, including requirements to retune, calibrate, or repair complex building control systems.

Depending on the customer mission, GSA may need to provide buildings that maintain livable conditions in the event of extended power outages, interruptions in heating fuel, and shortages of water to ensure resilience and survivability. Widespread adoption of CPLs may require GSA to further interface with pertinent code-making bodies to develop new standards, codes, and regulations to better equip sites and facilities to adapt to extreme climate conditions, comply with rigorous storm standards (such as those required by the Miami Dade County hurricane code), and incorporate resiliency as a life-safety issue. For mission-dependent sites where the mission will be impeded but not fail or currently non-vulnerable sites, PBS will build climate factor monitoring into existing asset management methods, such as building evaluation reports and physical condition surveys, at the specific site and facility scale.

Capital Equipment

GSA has reached out to and researched the insurance, accounting, and actuary communities connected to real estate and supply chains. Across the board, these organizations—from the United Nations Environmental Program Financial Initiatives Global Roundtable to entities in U.S. corporate real estate and those working on building codes and standards—are carefully considering the upward trending costs and frequency of extreme events. Interestingly, the costs of incremental climate change and variability (e.g. persistent drought, insect infestation, human health impacts, etc.) are not readily available, perhaps due to the short time frames the investment community addresses and the adoption gap of a robust methodology for the valuation of externalities.

This is a challenge for GSA because the development of accounting standards and insurance or valuation methods are not a part of GSA's core mission. GSA, and the Federal Government as a whole, needs information on how to monetize costs avoided (not cost savings) by investing up-front in risk management to avoid the large costs of a risk's negative effect. For example, because the Federal Government is not insured, setting a value on the avoided costs of ensuring mission continuity and securing Federal investments in a changing climate is difficult. Gathering such information is critical to measure the long-term benefits of mainstreaming climate change adaptation to GSA and the nation by reducing risk to life and property, enhancing economic vitality, promoting environmental and infrastructure sustainability, and reducing vulnerability to dynamic processes. GSA has informed CEQ and the U.S. Government Accountability Office (GAO) that an open-source risk model and approach to monetizing the cost and payoff of risk management is needed.

4. Modernizing Federal Programs to Support Climate Resilient Investment

4.1. Overcoming Barriers to Adaptation

Internal Preventable Barriers

GSA recognizes that current and future impacts of a changing climate present one of the most serious barriers to the Federal government's ability to effectively carry out its mission. The main internal barriers to adaptation within GSA include: limited understanding of climate risks and how to prepare for them, perceived lack of immediacy and relevance about climate risks, unclear scope and responsibilities, lack of integration across functional organizations, slow process change, and limited budgets and budget processes.

The solution for many of the human resource-related issues outlined above is a concerted, determined process of education and change management. Significant time and effort will be necessary to expand the knowledge base needed to provide relevant knowledge and skills, and to manage change over a large organization. Climate risk assessment is new to most staff, and adding this complex new requirement to existing workloads will be a challenge. Many agencies, including GSA, will need to dedicate staff full time to leverage change and help other staff to include this scope in their work.

The number of people in GSA currently capable of providing the educational and training component is quite small, and this is not a topic that lends itself to simple "train the trainer" programs. We show this as a barrier principally because the time needed to accomplish the change is longer than this plan envisions. Many of these aspects of risk management are new and unfamiliar; the scope is extremely broad; and, our predictive ability is imprecise regarding resources. We are working on possible solutions, and these are described in Section 3.3 of this Plan.

1. Limited understanding of climate risks

Rationale

This barrier is characterized by both lack of understanding about climate risks, and a lack of information and guidance on how to manage these risks.

Momentum is lacking to make climate risk management a priority, both in terms of leadership at GSA and in our customer agencies. While there is increased engagement from the White House with agency leadership in this area, many agencies are struggling to understand the value or urgency of directing already limited resources towards identifying and addressing climate risks. Until customers request support to address climate risks

associated with GSA-supplied facilities, products, or services, GSA is not able to prioritize these efforts within its business model.

Credible, readily available, and practical information about climate risks is critical for effective climate risk management decision-making. The scientific effort that underpins this information is complex, and people often lack the tools and capacity to transform knowledge of direct climate impacts into decisions and actions. There is a strong demand for guidance that translates the science of climate change into information that is useful for decision-making (e.g. for evaluating the cost, benefit, and most effective timing of adaptation options).

Actions to Reduce Vulnerability

While GSA will continue to engage and coordinate with the staff-level climate change adaptation community to identify opportunities and manage climate risks, GSA needs continued support from the White House to make climate risk management a priority within the Federal community in order to incorporate climate risk factors into our existing processes. GSA also needs agency leadership to communicate the importance of climate adaptation planning and provide visibility on this topic to develop a culture of prevention and preparedness.

Timeframe

Short term – 18 months: To counteract the lack of understanding about climate risks, agency staff needs to hear from senior leadership that climate risk management is a priority in the short term. It is an emergent and complex topic that is understood over time, and the agency must begin to build capacity today. GSA needs to carefully develop an internal consultancy to support business lines. To counteract the dearth of practical information and guidance, GSA should continue engagement with science agencies to build internal consultancy.

Long term – 5 years: GSA should work toward building a robust internal consultancy on a cooperative extension model.[6] This would foster a network of staff educated in climate risk management principles and methods, who can share information and best practices with others.

Necessary Resources

- Climate change translators who can effectively communicate with and train agency leadership and staff in climate risk management issues.
- GSA's internal consultancy should consist of dedicated staff to cultivate risk

[6] A cooperative extension model is based on the Cooperative Extension System, a non-formal program implemented originally by the US Department of Agriculture and designed to help people use research-based knowledge. As a resource to overcome barriers to adaptation, a cooperative extension model could serve to translate scientific research into actionable information for decision-making, as well as to inform the research community about gaps in existing knowledge.

management skills, and to establish methodologies and standard operating procedures relevant to agency business processes. This resource requires a budget for regional travel to pilot locations. It should also be designated as a priority in interface with agency geographic information system (GIS) team.

2. **Perceived lack of immediacy and relevance about climate risks**

Rationale

This barrier is associated with both the timing and the relevance of climate risks. Agency staff assume that climate change will not begin to impact GSA for many decades, and therefore do not feel there is a need to develop strategies to address these risks today. It is also difficult for people across all organizations within GSA, and at all levels, to make the connection between their key business priorities (such as growth in sales, budgetary and time constraints, and cost savings), and the long-term need to prepare the business to adapt to the effects of climate change.

Long-term vs. short-term priorities: Long-term problems involving varying levels of uncertainty, non-routine problem solving skills and ex-ante decision making are not typical components of GSA business processes. GSA staff has little experience dealing with these types of issues. Additionally, agency leadership tends to be focused on making big wins during the timeframe of their appointment, and climate risks are generally more long-term in nature. GSA's business model is geared towards addressing the needs of its customers today. Without demand today from its customer agencies to address climate risks in its offerings, such as facilities, products, or services, GSA will struggle to incorporate climate risk factors into its existing processes.

Compliance vs. proactive planning: There is a broad perception by agency staff that climate adaptation is a compliance process with a definitive endpoint, rather than an iterative risk management process that evolves over time.

Actions to Reduce Vulnerability

GSA already collects information regarding damage and mission impacts after a disaster is declared. GSA and other agencies should develop methods to identify and document causality between incremental climatic change and business disruption/downtime to make the issue of climate risk management more real and relevant. This is particularly useful if it can be demonstrated that proactive planning is more effective and less costly than reacting after the fact.

Timeframe

Short term – 18 months: Continue engagement through pilots to build internal consultancy.
Long term – 5 years: GSA should work toward building a robust internal consultancy on a cooperative extension model. This would foster a network of staff educated in climate risk

management principles and methods, who can share information and best practices with others.

Necessary Resources

- Climate change translators who can effectively communicate with and train agency leadership and staff in climate risk management issues.
- Risk management process training for applicable agency staff focused on incremental climate impacts.

3. Scope and responsibilities are unclear

Rationale

The extent to which responsibility for adaptation lies within existing obligations in other areas is unclear. Because adaptation is, at its simplest level, an effort to prepare for and respond to a changing climate, it is similar to other actions that governments take every day to manage the risks presented by external stressors and shocks. It is difficult, for example, to draw a definitive boundary between emergency response/recovery and adaptation planning. Similarly, there are overlaps between climate risk management and provisions of national security, and intersections between asset maintenance programs and adaptation. Ideally, some degree of planning for climate risks can be 'mainstreamed' into other forward planning exercises, like emergency response or Continuation of Operations (COOP) Plans, however this integration needs to be deliberate and intentional.

Actions to Reduce Vulnerability

GSA should continue to coordinate with the Office of Mission Assurance to avoid duplication, optimize resources, and address the fact that acute and chronic climate impacts require different skill sets. GSA needs staff with climate, technical, economic, and/or risk management skills to help the agency effectively prepare for climate risks.

GSA can continue to advance existing adaptation pilots, and expand them to additional GSA regional offices to build an internal consultancy. The pilots help to build adaptation capacity by immersing FAS and PBS staff in one-day climate scenario sessions that walk participants through a potential future climate change scenario, identifying and evaluating the risks associated with the scenario, and developing strategies to reduce the identified climate risks. Staff in GSA's Kansas City, MO, and Washington, DC, offices have participated in these sessions, and GSA can expand to other vulnerable locations, like Boston, MA. Over time, these pilots will help to build the necessary climate risk management skill sets with applicable staff. However, additional external training may be necessary to ensure staff have the appropriate breadth, depth, and mix of climate, economics, and risk management skills.

Timeframe

Short term – 18 months: Continue engagement through pilots to build internal consultancy. **Long term** – 5-10 years: Build a robust internal consultancy by utilizing a cooperative extension model, resulting in a network of staff educated in climate risk management principles and methods, who can share information and best practices with others.

Necessary Resources

- Climate change translators who can effectively communicate with and train agency leadership and staff in climate risk management issues.
- In the absence of such training provided internally by the Federal government, agencies will need adequately funded budgets to purchase external climate, economics, and risk management training resources.

4. Confusion about mitigation and adaptation

Rationale

Coordination between adaptation and sustainability/mitigation staff must be carefully navigated, particularly when assigning climate risk duties to sustainability/mitigation specialists. Adaptation is a related but different problem set that requires understanding and application of very different skills. Most GSA staff are not familiar with and do not have experience applying the skill sets necessary for climate risk management work, and the skill sets of the sustainability/mitigation team members are not easily transferred to climate risk management work. To be successful, GSA will need to expand the existing small matrixed team to become an integrated cross-agency team with climate, economics, and risk management skills to ensure that the agency is able to effectively adapt to climate change. GSA will investigate the costs of training or hiring employees with these skills sets over the next year.

Actions to Reduce Vulnerability

By continuing and expanding adaptation pilots for regional offices, GSA can build the internal consultancy resource necessary to support climate risk management within the agency.

Timeframe

Short term – 18 months: Continue engagement through pilots to build internal consultancy. **Long term** – 5-10 years: Build a robust internal consultancy by utilizing a cooperative extension model, resulting in a network of staff educated in climate risk management principles and methods, who can share information and best practices with others.

Necessary Resources

- Climate change translators who can effectively communicate with and train agency

leadership and staff in climate risk management issues.

- In the absence of such training provided internally by the Federal government, agencies will need adequately funded budgets to purchase external climate, economics, and risk management training resources.

5. Climate change risks need a different management model

Rationale

The climate change adaptation problem set requires a different management model – adaptive management. This is emergent and iterative, over multiple time and spatial scales and highly non routine. GSA has little experience with such a management model. The required changes in decision making methods, the combination of business models and practices, and the extra resources necessary for these changes to take place are the essence of this barrier. Confounding this barrier are organizational divisions which may follow different policy objectives and sometimes work towards very different time horizons. For example, facility managers are focused on day-to-day operations and asset maintenance, usually in the near term. Our asset repair evaluations use a 5-year horizon for planning. Adaptation planning requires a much longer view, and the ability to assess physical infrastructure changes over a much expanded period requires skills and tools that GSA does not currently have. However, the risks that climate change presents are often complex, and require an integrated approach if they are to be managed successfully. An uncertain and challenging budgetary landscape also impedes the climate risk management progress.

GSA has consolidated many operations to reduce redundancy and streamline operations. We have developed some consolidated offerings, such as Total Workplace, yet this is a new way of working, and is not sufficiently common to be second nature.

Actions to Reduce Vulnerability

This barrier can be addressed through improved communication and coordinating networks on specific cross-cutting issues, like adaptation. In order to be successful, these networks must set out broad aims and objectives about working together to achieve common goals. They should also encompass an implementation framework for how objectives will be achieved, with agreement on joint actions, budgets, and timescales.

Timeframe: 5-10 years

Necessary Resources

- Requires significant support from GSA senior management, especially the FAS and PBS Commissioners.
- Small core team from FAS and PBS to help develop communications and training across organizational divisions.

6. Process change and business line funding boundaries

Rationale

Developing new (or modifying existing) guidance or processes regarding human resources, budget development, internal controls and governance to effectively manage any new challenge is difficult for any organization. In GSA's particular case, the very different business models of PBS and FAS add a level of difficulty, since the decisions made regarding physical infrastructure are affected by those involving the supply chain, and vice-versa. In addition, projects and programs that require funding across GSA's business lines (OGP/PBS/FAS), such as climate risk management, are difficult to coordinate and manage due to the different funding methods for each organization.

Actions to Reduce Vulnerability

Clear performance indicators that describe how to measure, communicate, and benchmark progress on adaptation would encourage action.

Timeframe: 5-10 years: Build a robust internal consultancy by utilizing a cooperative extension model. This would foster a network of staff educated in climate risk management principles and methods, who can share information and best practices with others.

Necessary Resources

- Climate change communications specialists, also commonly referred to as climate change translators, who can effectively communicate with and train agency leadership and staff in climate risk management issues. These specialists can assist GSA will utilizing a cooperative extension model, as well as developing performance indicators.
- In the absence of such training provided internally by the Federal government, agencies will need adequately funded budgets to purchase external climate, economics, and risk management training resources. GSA will investigate the costs of training or hiring employees with these skills sets over the next year.

7. Limited budgets and budget process

Rationale

Adaptation actions and strategies can be perceived as expensive, and it is unclear who should pay for them. For example, a survey of Federal agencies showed vulnerability assessments can range in cost from $350,000 to $2.1 million. However, the cost of inaction can be much greater (see Verizon example in Section 3.4, Suppliers and Supply Chain). Sometimes the benefits of investing in adaptation are outside the scope and timeframe of

investment and budget decisions.

Actions to Reduce Vulnerability

Efforts to understand the costs of inaction, and to make the economic case for different adaptation options, should be communicated widely to demonstrate the value of investing scarce resources at an early stage.

Timeframe: Currently not known and will be developed as more information becomes available over the next several years. However, this is not GSA's core mission, and we must we rely on others to inform some of these macro financial decisions, such as the recent *A Climate Risk Assessment for the United States* and *American Climate Prospectus* documents released by Risky Business in June 2014.

Necessary Resources

- Budget increases to develop plans and then take appropriate actions to strengthen physical or supply chain infrastructure. Scope to be developed over the next year.

8. Limited understanding of GIS

Rationale

Agency proficiency and strategic use of Geographic Information Systems (GIS) in the assessment and management of climate risks is limited.

Actions to Reduce Vulnerability

The Adaptation team is currently developing requirements with the GIS team to support adaptation.

Timeframe: 5-10 years

Necessary Resources: Expansion and use of enterprise-wide GIS.

Strategy Execution Barriers

GSA is engaged in managing acute and chronic climate risks for two primary strategic objectives - securing Federal investments in real property and supply chains for products and services, and supporting the long-term mission continuity of our customers. This is GSA's value proposition. GSA has relied on scenario planning for strategic development to generate risk management options. Implementation has revealed strategy execution barriers which, in their current form, hinder and frustrate progress to incorporate climate and adaptation factors across GSA. These are among the processes which we will need to improve in order to achieve the goals of this Plan.

1. **Lack of awareness and understanding of the imperative for adaptation**

   Rationale

   Confusion persists between *adapting to* climate change (i.e., preparing for some degree of inevitable change), and *mitigating* (i.e., preventing future change). In contrast to emissions reductions, which are easily quantified, progress on adaptation is difficult to measure and report. There is also a lingering impression that adaptation implies a cavalier attitude towards emissions reductions and mitigation. In fact, the two responses are vital.

   Actions to Reduce Vulnerability

   There is a need for awareness-raising within GSA to demonstrate the importance of understanding and responding to climate change impacts.

   Timeframe: 5-10 years

   Necessary Resources: Climate change translators who can effectively communicate with and train agency leadership and staff in climate risk management issues.

2. **Customer barriers**

   Rationale

   Customer agency leadership and staff face the same challenges as GSA, which makes demand planning and implementation more challenging. This is particularly true because GSA must make different adaptation plans and decisions depending upon the mission criticality of a facility, supply, or service as determined by the occupying or procuring agency. A concern is that there is no common methodology or understanding for agency officials to determine whether a facility, supply or service is 'mission critical' regarding interruptability, relocateability, and replaceability in the context of incremental climate impacts. This is an essential step in determining where to prioritize adaptation activities. If agencies over-state the number of facilities, supply or services that require the extra measure of adaptation planning, the sites, supply or services most at risk to climate change may not be addressed in a timely manner.

Actions to Reduce Vulnerability

The lack of a common methodology to determine climate change impacts on mission criticality has been identified and conveyed to CEQ, DHS, the Agency Adaptation Planning Working Group, and the Federal Adaptation Community of Practice.

Overcoming this barrier will require development of criteria, guidance and implementation methods in subject matter that is primarily unfamiliar to agency staff. Developing the capability, confidence and capacity of agency staff to successfully implement this emergent aspect of risk management requires ongoing resources of staff and training.

Timeframe: To be developed, based on external input.

Necessary Resources: Assistance from OMB and CEQ leadership in coordinating the development of a common methodology across the Federal government to determine mission criticality in the context of climate change.

3. Changes in management methods

Rationale

Changing management methods for people, processes and resources can present barriers to agency-wide adoption of climate risk management strategies. For example, agency staff are still contending with new management methods introduced following the return to central control of guidance and functions (away from regional control), and this has created inconsistencies in the use and application of core agency transactions. For mission and business continuity planning purposes, GSA would benefit from a concerted effort to develop skills for managing across large time and spatial scales, as well as an increased emphasis on proactive, preventative management (rather than reactive responses to address extreme incidents).

Actions to Reduce Vulnerability

GSA is adopting an adaptive management approach by engaging in incremental tasks to pilot, evaluate and learn from outcomes and make adjustments in the next implementation cycle. GSA also seeks to overcome organizational tendencies to rely on decision tools which assume predictability, including customer mission assumptions which may be affected by a changing climate.

GSA needs to incorporate consideration of climate change impacts on customer mission in demand planning. Our experience with this process is limited; to date, climate risk management within agency transactions is very preliminary, and we do not yet have a complete view of either the scope or the effort that will be required to effectively manage climate risks in demand planning.

Timeframe: 5-10 years: Build a robust internal consultancy by utilizing a cooperative extension model.

Necessary Resources

- Climate change translators who can effectively communicate with and train agency leadership and staff in climate risk management issues.
- In the absence of such training provided internally by the Federal government, agencies will need adequately funded budgets to purchase external climate, economics, and risk management training resources.

Policy and Funding Barriers

Existing policy and funding programs, especially if they were developed before there was widespread acknowledgement and understanding of the importance of responding to climate change, can act as a barrier to adaptation. These policy and funding barriers can be considered *adaptation constraining* policies:[7]

> "Climate adaptation constraining decisions lead to actions that limit or constrain the ability of other decision-makers to manage, reduce or otherwise adapt to the consequences of climate change. Such outcomes are called climate mal-adaptations (IPCC, 2001). Climate adaptation constraining decisions may be implemented in order to achieve perfectly proper and well-intentioned objectives. However, they have negative consequences for others in terms of the future level of climate risk and its effective management. In order to avoid climate adaptation constraining decisions, decision-makers need to consider the impact that their decisions may have on the ability of their successors, or the ability of other decision-makers with other areas of responsibility, to adapt to future climate change. Hence, climate adaptation constraining decisions include the consequences of decisions taken today that restrict the freedom of future decision-makers to manage future climate risks."

Adaptation constraining policies and funding programs make it more challenging for individuals, systems, physical infrastructure, or natural environments to manage climate risks appropriately. They include policies and funding programs that increase vulnerability or reduce adaptive capacity to climate risks.

The following section presents examples of policy and funding barriers that limit or constrain options for adaptation.

1. **Policy or Funding Barrier:** Federal Acquisition Regulation (FAR)

   Rationale

[7] Willows, R.I. and Connell, R.K. (Eds.). (2003). Climate adaptation: Risk, uncertainty and decision-making. UKCIP Technical Report. UKCIP, Oxford.

The FAR drives acquisition requirements and policies for the Federal government and does not currently include requirements for agencies to address climate risks that could impact the delivery and availability of mission critical facilities, products and services. In the absence of such requirements, Federal agencies leave themselves potentially at risk of not having access to the products and services they need to successfully execute their missions. This could include vulnerability to climate change-related disruptions in the supply chain, such as flooded manufacturing facilities that cause shipment delays and increased prices or lack of telecommunications services due to severe wind events.

Actions to Address Vulnerability

Through climate scenario planning sessions, GSA is assessing the vulnerabilities and risks associated with the procurement of telecommunications and information technology (IT) products and services. As Federal agencies depend more and more on computers, data centers, telework technologies, and the infrastructure that support these items (e.g., electricity grid and adequate cooling systems) to execute their missions, it becomes increasingly important to identify and mitigate climate risks that could disrupt the supply chains for these products and services. Since climate change acts as a threat multiplier, this effort is being coordinated with GSA's cybersecurity initiative, which is also investigating risks to telecommunications and IT supply chains.

GSA is also working to include climate adaptation, resilience, and preparedness factors in relevant facility, product, and service contracts. GSA suggested the Federal Adaptation Community of Practice establish a Federal working group to identify and prioritize sectors that face climate risks in the Federal supply chain. This working group, which would include several other Federal partners, could provide additional guidance to agencies. As part of this initiative, GSA would coordinate with other agencies to suggest the development of a FAR clause to advance climate adaptation and resilience. This clause would apply to all mission critical procurements of products, services, real property, and capital equipment, and would require bidding suppliers to evaluate climate risks to their supply chains and create climate risk mitigation plans to address any identified risks. Incorporating adaptation into the FAR could have a widespread and positive cascading influence on industry's efforts to prepare for climate change and reduce the Federal government's risk to climate-related supply chain disruptions.

Timeframe: FY13 - FY20

Necessary Resources: Federal working group focused specifically on identifying climate risks in the Federal supply chain.

2. **Policy or Funding Barrier:** OMB Circular A-11

Rationale

Without specific inclusion of climate factors in civilian agency management guidance and

regulations, agencies are prevented from appropriately addressing climate risk in a timely or meaningful way. OMB Circular A-11 addresses agency management objectives, strategic plans and scoring impacts for construction, leases of capital assets and acquisition of real property. In 2011 GSA suggested the inclusion of climate factors within the agency strategic plan during OMB review, but this suggestion was not accepted. Below are A-11 items regarding transparency, disclosure and reporting:

- Agency Material Weakness: In some locations, climate risks will jeopardize GSA's statutory mission and operation. This currently is not an "Agency Material Weakness" disclosed in the annual financial report to Congress. Other climate risks that do not rise to the level of an Agency Material Weakness currently are not afforded a monitoring or management mechanism in the internal control processes.
- Federal Real Property Profile (FRPP): The FRPP does not enable GSA's Senior Real Property Officer (SRPO) to populate and discern real property portfolio data elements associated with climate risks, vulnerabilities, or costs. For example, it is not possible to record or track real property replacement costs following a 100-year or 500-year flood, or life-cycle costs associated with an increase in energy demand due to hotter temperatures. Changes in cooling degree days (CDD) will affect operational budgets for energy. Section 31.9(f) of A-11 states "if you plan to acquire real property, you must include estimates consistent with the policies of Executive Orders 13327, and 13514 in your budget submission, and make sure that estimates for acquisition of real property under contract are consistent with obligations reported in object class 32 (see section 83.7)." However, there is no requirement for ensuring consistency with Executive Order 13653 for site acquisition.
- Without direct appropriation, adaptation will not be achieved. Budget prioritization, if continued without change in direction, is highly unlikely to address long-term gradual changes. For acute climate impacts, the increase in intensity, duration and frequency of extreme weather incidents will require more funding and refresh of trained response and recovery staff. It has been noted in multiple forums that the cultural tendency is to reactively respond to extreme climate events, while preventative steps to manage threats and opportunities from gradual climate impacts tend to be overlooked. These chronic, incremental risks are a relatively new area of concern; the experience of planning for and managing the impacts is slight; the scope is extremely broad; and our predictive ability is imprecise. Without funds prioritized to address the most vulnerable or critical assets and operations to climate impacts (including locations adjacent or within low income and minority communities), GSA will be unable to meet its full potential to serve its clients.

Actions to Reduce Vulnerability

GSA has sought assistance from CEQ. OMB's next update should include Executive Order 13653 and specifically provide content to address factors regarding budget development. In the meantime, GSA is incorporating climate factors incrementally into transactions that it controls or influences. Though this work has begun, GSA does not yet have a complete scope of its extent or the effort that will be needed to accomplish it. GSA is working to make

adaptation operational through the inclusion of criteria in the processes of procurement-related and infrastructure planning, requirements development and through their execution, both at the project and the portfolio scales. However, external guidance is essential for overcoming this barrier.

Timeframe: Unknown

Necessary Resources: External guidance is essential for overcoming this barrier.

3. **Policy or Funding Barrier:** Lack of emphasis on cost avoidance and mission valuation

Rationale
The current Federal focus on cost savings tends to hinder efforts to avoid future costs. The lack of emphasis on cost avoidance limits efforts to co-fund adaptation projects between agencies that are co-located at the same site. It greatly impedes implementation and capacity building by limiting travel and reducing program funds and contract support for climate risk management.

As a specific example, per Executive Order 11988 on Floodplain Management, the Interagency Floodplain Management Task Force is updating guidance on decision-making for projects that have potential impacts to (or within) the floodplain. However, to date this guidance does not include a mechanism for estimating flood-related losses, nor does it take account of how flood risks may be exacerbated as the climate changes.

Federal efforts to adapt to a changing climate are a public good from which private entities will also benefit. Monetizing the total value of Federal mission continuity and assets (facilities and supply chain) and costs avoided by implementing up-front climate risk management strategies will help to build the business case for comprehensive climate risk management.

Actions to Reduce Vulnerability
GSA is working with its customers and through the Agency Adaptation Planning Working Group and the Federal Adaptation Community of Practice to find ways to share resources, particularly for co-located sites.

Timeframe: Unknown

Necessary Resources: External guidance is essential for overcoming this barrier. As in the previous section, which outlined internal GSA barriers, part of the solution is a concerted, determined process of education and change management. Significant time and effort will be necessary to expand the knowledge base needed to provide relevant knowledge and skills, and to manage change across large organizations.

4. **Policy or Funding Barrier:** Lack of climate resistant model building codes and licensed design professionals to design climate resistant sites and facilities

Rationale
Model codes used in the design, build and compliance process of structures and sites are

based on historical climate, and do not reflect the future climate over their service life. Model codes are developed and maintained by standards organizations independent of the jurisdictions or entities (such as a Federal agency) that adopt the code. It is unlikely that model codes will meet the needs for site-specific climate resistant design in a timely way due to the rapidly changing climate and the divergent motivations and beliefs of stakeholders that participate in the code development process. In addition, architectural and engineering design practitioners are not familiar with how to use climate projections to inform design decisions. A changing climate could increase operating costs for facilities, for example if future energy use does not take account of hotter temperatures. In addition, professionals licensed to protect the public health, safety and welfare of building occupants could be deemed negligent if they do not take foreseeable climate change impacts into consideration. Finally, designing for climate resilience may conflict with and frustrate legacy priorities in historic preservation and aesthetics as the choices to resist, accommodate or retreat may be costly.

Actions to Reduce Vulnerability
Pilot development of climate protection levels on mission critical projects to develop capacity in design profession and agency project management staff.

Timeframe: 5- 20 years
Necessary Resources: Technical staff familiar with climate change who can effectively communicate with and train agency leadership and staff developing or implementing projects.

5. **Policy or Funding Barrier:** Lack of climate resilient building codes and licensed design professionals to design climate resilient sites and facilities.

Rationale
As the owner of multiple renewable energy sites and systems, GSA has encountered significant regulatory complexity and restrictions on interconnected systems which make the installation timing and return on investment suboptimal. (For the array of issues see www.nrel.gov/electricity/transmission/issues.html). For energy assurance, GSA is keen to minimize the regulation and interconnection barriers that hinder financing, installation and operation of distributed energy and storage systems. All agencies would benefit from overcoming these barriers.

Actions to Reduce Vulnerability
Pilot development of climate protection levels on mission critical projects using distributed energy generation and storage to develop capacity in design profession and agency project management staff.

Timeframe: 5- 20 years

Necessary Resources: Leadership in the Federal interface (Federal Energy Regulatory Commission (FERC)) with the utility sector to develop decentralized energy generation and storage. Some states are moving forward in the efforts already.

5. Providing Information, Data, and Tools for Climate Change Preparedness and Resilience

Climate risk management is a challenging problem for which there is no single, easy solution. Although information, data and tools can assist in the analysis of the problem and can support decision-making, effective management of climate risks will also require professional judgment, leadership, and consideration of costs and benefits.

In order to provide quality and timely services to the American public, GSA coordinates with U.S. agencies to plan for climate change impacts that could affect their ability to fulfill their mission. This collaboration involves sharing of information of both climate- and non-climate related information across multiple Federal agencies. Information includes historical and projected climate data, sea level rise projections, and climate risk management processes, as well as information on agencies' facility, supply and service usage, planning, and information technology infrastructure.

GSA participates in the White House Climate Preparedness and Resiliency Council and supports three of its four working groups. These groups are the Agency Adaptation Planning Working Group (EPA and CEQ), the Climate Date Working Group (NASA, NOAA, OSTP), and the Infrastructure Resiliency Working Group (DHS, DOE, National Security Council). To support the launch of these working groups, OFHPGB, OMA and FAS have provided staff to attend sessions, review and comment on documents and work flow.

Through the Agency Adaptation Planning Working Group and its Federal Adaptation Community of Practice, GSA has provided compelling interagency coordination and adaptation advocacy. Working with their customers provides significant opportunities for interagency coordination in an environment of limited funds and different levels of understanding. Through its work, GSA has helped EPA, the Department of Treasury, DOJ, HHS, SSA, and other agencies to address climate change issues and impacts.

GSA participates as a stakeholder in the Council's Data and Tools working group and the USGCRP Interagency Adaptation Science Working Group. GSA provides comments seeking actionable science and uses information provided through these forums to inform or incorporate into GSA processes and business.

Internally, GSA established an enterprise-wide GIS program with an anticipated roll-out date in early FY2015 that will assist the agency in better serving its customers. The Adaptation Team is coordinating with the GIS team to identify data sets and discuss requirements for climate change adaptation planning. The teams together already discovered data accuracy and data sourcing issues and are investigating ways to address them so GSA is able to respond to customer inquiries for climate-related GIS products, such as maps identifying facilities located in floodplains or along the coast.

Since GSA largely operates at the Federal level, its experience with state, local, and tribal interests is limited. Although these entities are not their core business, GSA does seek opportunities to work with them whenever possible. For example, GSA uses information it receives from other Federal agencies to internally plan for climate impacts and also to serve as a model for other Federal, state, local, and tribal agencies seeking to increase the resilience of their supply chains and assets in order to ensure continuity of services to citizens and potentially reduce long-term climate risk costs.

5.1. Interagency Efforts to Support Climate Preparedness and Resilience

Coordination of research efforts in understanding climate change and evolving risks, as well as of end-user engagement, can benefit both the research and can enhance the practical reach and application of research results. GSA is committed to collaboration with other decision-makers to grow an informed and engaged community of climate risk management practitioners. We are actively engaged in the following interagency efforts to support climate preparedness and resilience.

Agency Adaptation Planning Work Group
GSA is a regular, vocal participant in this group, which focuses on developing the Climate Change Adaptation Community of Practice (described below) and assisting agencies in the climate adaptation planning process. Through relationships built within this workgroup, we have advanced adaptation methods and approaches and gained insight into customer needs.

Adaptation and Mitigation Nexus Affinity Group
The purpose of the Adaptation and Mitigation Nexus (AMNex) Affinity Group, part of the National Climate Assessment Network, is to conduct research on, provide guidance for, and encourage implementation of integrative adaptation and mitigation practices. This work will inform the National Climate Assessment's focus on evaluating progress on adaptation and mitigation. Membership spans across Federal, state, and local government agencies, non-profits, private sector organizations, and university institutions. We are a member of this affinity group and provide a perspective on finding integrative adaptation and mitigation practices in the Federal supply chain.

Building a Climate Resilient National Capital Region
We participated in MWCOG adaptation events, including a climate impact symposium in May 2012. For threshing sessions in R11, we used portions of MWCOG's climate projection analysis of the capital region.

Climate Change Adaptation Community Of Practice (COP)

We are a regular participant in the Federal Climate Change Adaptation COP, assisted in planning and hosting the first meetings of the group, convened the first meetings of the Sites and Facilities Subgroup, and co-chaired the Grants and Contracts Subgroup.

Council on Climate Preparedness and Resilience
GSA participates in the White House Climate Preparedness and Resiliency Council and supports three of its four working groups: the Agency Adaptation Planning Working Group, Climate Date Working Group, and the Infrastructure Resiliency Working Group. To support the launch of these working groups, GSA has provided staff to attend sessions and review and comment on documents and work flow.

Industry
We have reached out to the insurance, actuary, and real-estate industries to discuss their approaches on adaptation. The Services to Support Federal Climate Change Adaptation Activities RFI engaged a large number of industry stakeholders in helping GSA to assess the marketplace for these services. In addition, we have held brainstorming sessions with the U.S. Environmental Protection Agency regarding next steps with the insurance industry, sustainable supply chain, and disclosures of climate risks in accounting standards. We have also investigated how Geographic Information Systems can assist with adaptation projects and the effort required.

Interagency Forum on Climate Change Impacts and Adaptation
We are an engaged participant at this forum of industry and government. With the U.S. Department of Energy, we presented a white paper on the Sites and Facilities Subgroup's efforts. We also presented on the Services to Support Federal Climate Change Adaptation Activities RFI.

NASA
We have a close relationship with the NASA adaptation planning staff, a pioneer in its approach for mission-critical sites. NASA is working on the challenges of incorporating climate projections into building codes and standards, including American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) climate zones for energy modeling and building enclosure analysis.

USGCRP / NOAA
We are piloting with USGCRP and NOAA to integrate climate science into adaptation planning. (See FY13 action 3 for additional information on this important collaboration).

USGCRP Adaptation Science Workgroup
We are a member of the USGCRP Adaptation Science Workgroup, which advances foundational science for adaptation decisions. As a non-science agency representative, we articulate science needs to secure investments in real property and supply chain and support mission continuity.

5.2. GSA's Interagency Work to Support Climate Preparedness and Resilience

To date, GSA has collaborated with agencies to share climate and asset information to inform trainings and internal operations. Due to the breadth of its assets and operations and its recent partnerships with agencies in FY2013, GSA has a unique opportunity to continue working with agencies such as USGCRP, NASA, and NOAA in order synthesize climate information into information useful for planning at the national, regional, and local scales.

For example, GSA has provided input into the development of USGCRP's Global Climate Information System (GCIS) initiative, which seeks to provide audiences access to a range of global change data and information from across agencies. As a stakeholder, GSA highlighted their departmental needs with regards to climate data. While the GCIS is still being developed, the climate.data.gov website was launched. GSA understands that these two initiatives will be merged at some future time and that it is important to develop climate data to aid decision making. Therefore, GSA will continue to support these efforts and provide its unique input as a stakeholder wherever possible and appropriate.

GSA can continue to work with other Federal agencies to incorporate climate information into facility and supply chain planning in order to increase the resilience of its operations. It thereby continues to serve as an example for other agencies to follow. Below are existing inter-agency efforts in which GSA has participated to accomplish these goals:

Regional Two-Pagers Advance Federal Climate Scenario Sessions

GSA's Public Building Service (PBS) and Federal Acquisition Service (FAS) partnered with other Federal agencies in January 2013 to conduct climate scenario sessions intended to build capacity, capability, and confidence within the Federal government to address incremental climate risks. Sessions were held at regional offices in Washington, DC, and Kansas City, MO. GSA developed a detailed storyline using climate trends and scenarios from the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Global Change Research Program (USGCRP) along with information on the selected assets in each regional office. Additional information and expertise was provided by the National Capital Planning Commission (NCPC), U.S. Department of Agriculture (USDA), and the Internal Revenue Service (IRS). The storyline described what the region might experience 50 years from 2013, using the more extreme end of the climate projections in order to minimize risk when managing assets with long anticipated life cycles.

Conducting climate scenario sessions with GSA staff and its customers and developing and implementing strategies in the near term to reduce climate risks can ensure continuity of services to citizens, and potentially also reduce long-term climate risk costs. The DC and MO sessions advanced organizational readiness for climate risks and advanced customer satisfaction and confidence that GSA can support their mission continuity in a changing climate.

The sessions also informed priorities to be addressed in the PBS and FAS delivery cycles, including asset business plans, budget scoring, and the development of specific contract clauses to mitigate climate risks.

Enhancing Federal Agencies' Understanding of Executive Order 13653

GSA and the U.S. Global Change Research Program (USGCRP) partnered to developed a "hot annotated" version of Executive Order 13653, intended to enhance the understanding of the new requirements and Federal adaptation planning efforts. The "hot annotated," or clickable terms, version of EO 13653 is housed on GSA's Sustainable Facilities Tool (SFTool, sftool.gov[8]), which helps identify and prioritize cost-effective strategies to make office buildings and workplaces more sustainable. Over time, the SFTool has expanded to include other related sustainability information, such as Federal green purchasing requirements. The annotations contain links to Federal external resources that help agencies better understand and implement EO 13653, definitions of new terminology, and strategies and best practices on how Federal agencies are taking steps to prepare for climate change. By partnering with USGCRP, GSA was able to access reputable content and expertise for the hot annotated EO.

In early 2014, information on the new tool was shared with applicable Federal working groups and announced in the White House Council on Environmental Quality's GreenGov Leader, an edition of the Environmental Protection Agency's Climate Change and Water News bi-weekly newsletter, and was a lead item in a FedCenter Daily Newsletter. During the first month of its release, the hot annotated EO webpage posted strong website analytics figures, with 706 unique viewers spending an average of five minutes visiting the webpage.

The website will continue to be a resource for Federal, state, local, and tribal entities interested in becoming familiar with the EO and supporting information. As the hot annotated EO is used by more members of the climate adaptation community, it can potentially enhance collaboration and infuse best practices into Federal, state, local, and tribal climate adaptation, resilience, and preparedness efforts. Therefore, GSA views the hot annotated EO as a living tool and will continue to expand on the annotations as new information and best practices become available for interested agencies and organizations.

Climate Change Adaptation Self-Assessment

In addition to these efforts, GSA developed process-based metrics to monitor and evaluate the implementation and success of climate adaptation actions. Combining lessons learned from experts in the United Kingdom and the U.S. Forest Service, GSA crafted a Climate Change Adaptation Self-Assessment, a brief survey that allows GSA to track each region, service, and business line's ongoing climate change adaptation management process.

[8] Direct URL: http://sftool.gov/learn/annotation/427/executive-order-13653-preparing-united-states-impacts-climate-change

This Self-Assessment is important for GSA because it creates a balanced approach to climate change adaptation that includes building internal and external partnerships and preparing our agency staff to respond to climate change related issues. It will prompt representatives in each region, service, and business line to recognize their accomplishments and define what they want or need to accomplish in the following year. The Self-Assessment's process-based metrics ensure that each region, service, and business line works toward a balanced response to climate change adaptation.

Results will be used to measure and assess GSA's progress in adapting to a changing climate and will help us identify needs and share lessons learned. This will help GSA's Climate Change Adaptation and Resiliency Team assess strengths and identify areas for greater investment to accomplish particular elements at the region, service, or business line level. Results will also help us communicate GSA's progress, successes, and plans to key stakeholders. Depending on outcomes of the vulnerability assessment once it is updated with the new NCA information, GSA will revisit the Self-Assessment and determine the timeline for launching the assessment.

Appendix A: GSA Climate Change Adaptation Policy Statement

GENERAL SERVICES ADMINISTRATION
Washington, DC 20405

ADM P 1095.8

GSA POLICY AND PROCEDURE

SUBJECT: FY 2014 Climate Change Adaptation Policy Statement

1. Purpose. This directive establishes an agency-wide policy statement for the U.S. General Services Administration (GSA) to integrate climate change adaptation planning and actions into its decision-making processes, programs, and operations. GSA's policy assigns responsibility for implementing the climate change adaptation planning requirements in accordance with Executive Order (EO) 13653, *Preparing the United States for the Impacts of Climate Change*, EO 13514*, Federal Leadership in Environmental, Energy, and Economic Performance*, and their associated implementing instructions and guidance. By integrating climate change adaptation strategies into its programs, operations, and business model, GSA ensures that it executes its mission and operations securely, effectively, and efficiently in current and future climate conditions while contributing to the Federal Government's leadership role in sustainability and pursuing the vision of a resilient, healthy, financially stable and prosperous nation.

2. Background. GSA plays a significant role in procuring space, products, and services for the Federal Government. GSA provides space for over one million Federal employees in over 9,600 buildings and has an annual business volume of more than $50 billion, representing about 14 percent of the Government's procurement spending. While the scope, severity, and pace of future climate change impacts are difficult to predict, it is clear climate change could have important impacts on GSA's ability to effectively fulfill its mission, operate its facilities, and meet its policy and program objectives. GSA already has disaster response and recovery systems for extreme weather events. However, these systems do not focus on the impacts and risks associated with gradual climate change. This planning effort addresses projected incremental climate changes, such as sea level rise and changing temperature and precipitation patterns. Through climate change adaptation planning, GSA will continue to develop, prioritize, implement, and evaluate actions to mitigate climate change risks. Integrating climate change risk management and adaptation strategies into programs, operations, and business models ensures GSA executes its mission and operations securely, effectively, and efficiently in current and future climate conditions while ensuring GSA's ability to execute its mission effectively and efficiently during climate changes.

3. Policy. All GSA organizations will continue climate change adaptation planning, in consultation with GSA's Senior Climate Change Adaptation Official (Director, Office of Federal High-Performance Green Buildings, Office of Government-wide Policy) and implement the results of that planning using best available science and information. GSA will consider potential climate change impacts when undertaking long-term planning, setting priorities for research and investigations, and informing decisions affecting GSA resources, programs, policies, and operations. Responsiveness, awareness, and collaboration with Federal customers and industry will drive GSA's climate change adaptation planning toward innovation and value.

   To properly manage climate change risks and plan for climate change adaptation, GSA will update and publish its agency-wide Climate Change Adaptation Action Plan 1 year following the release of the National Climate Assessment. The Plan will include each of GSA's Service and Staff Offices as appropriate, and incorporate the findings and directives of this policy statement. The Plan will identify how climate change may impact GSA's ability to achieve its mission, programs, policies, and operations. It will also identify and prioritize climate risk management actions, establish a mechanism to evaluate progress, and continue to improve GSA's capacity to effectively adapt to current and future changes in the climate.

   Each GSA Service and Staff Office will review existing programs, operations, policies, and authorities to: identify potential long term impacts of climate change on the organization's areas of responsibility; prioritize and implement response actions that promote operational resiliency in response to potential climate changes; and continually assess and improve capacity to adapt to current and future climate change impacts and threats. This review will be coordinated with GSA's Climate Change Adaptation and Resiliency Team, the Office of General Counsel and other pertinent GSA organizations.

   GSA will fully implement E.O. 13653, *Preparing the United States for the Impacts of Climate Change,* issued by President Obama on November 1, 2013.

   GSA will fully implement the climate change adaptation implementing instructions issued by the White House Council on Environmental Quality (CEQ) under Section 16 of E.O. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* and other applicable authorities.

   GSA will continue to apply the guiding principles and the flexible framework for agency adaptation planning found in the March 2011 *Federal Agency Climate*

Change Adaptation Planning Implementation Instructions and Support Document issued by CEQ.

GSA will coordinate with other agencies and interagency efforts, including the Climate Preparedness and Resiliency Council (the Council) and its work groups on climate change adaptation issues that cut across agency jurisdictions, including areas where national adaptation plans are being or have been developed, and will identify a process for sharing climate change adaptation planning information within GSA, other Federal Government departments and agencies, and the general public.

4. Responsibilities. The GSA Administrator, through the Senior Climate Change Adaptation Official (The Director of the Office of Federal High-Performance Green Buildings), has established a Climate Change Adaptation and Resiliency Team to research, draft, and implement the agency's Climate Change Adaptation Action Plan. The Climate Change Adaptation and Resiliency Team will include representation from various GSA offices, as appropriate.

   The GSA Senior Climate Change Adaptation Official is responsible for ensuring implementation of all aspects of this policy. This policy does not alter or affect any existing duty or authority of individual components or offices.

   The Heads of Service and Staff Offices (HSSO) and Regional Administrators (RA), in consultation with GSA's Senior Climate Change Adaptation Official and the Office of Federal High-Performance Green Buildings, will continue to review their existing programs, operations, policies, and authorities to identify potential impacts of climate change on the organization's areas of responsibility. In doing so, they shall: prioritize and implement response actions; identify risk management measures and integrate them with climate change mitigation activities; and continuously assess and improve GSA's capacity to adapt to current and future changes in the climate. In addition, HSSOs and RAs will ensure agency, service, and office plans are updated annually and fully coordinated with GSA's Climate Change Adaptation and Resiliency Team, the Office of General Counsel and other pertinent GSA organizations. HSSOs and RAs will also ensure organizational plans are closely coordinated with appropriate partner agencies, stakeholders and integrated with overall interagency efforts, including the Council and its work groups for those issues that cut across agency jurisdictions, including areas where national adaptation plans are being or have been developed.

5. Applicability. This directive applies to all GSA program actions, including but not limited to:

- Real property acquisition through Federal construction, purchase, or lease, including lease extensions;
- Acquisition of supplies and services for Federal customers
- Public buildings design and construction;
- Public buildings alteration;
- Public buildings operation;
- Real Property Disposal;
- Continuity of Operations and disaster support policy, planning, and operational coordination; and
- Emergency Support Function-7 co-lead responsibilities under the National Response Framework.

6. Effective Date. This directive is effective immediately and will remain in effect until it is revised or cancelled.

7. Cancellation. The following order is cancelled: GSA Order 1095.7 ADM, FY 2011 Climate Change Adaptation Policy Statement.

8. Signature.

DAN TANGHERLINI
Administrator

June 12, 2014
Date