DEPARTMENT OF THE INTERIOR

CLIMATE ADAPTATION PLAN

2024

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EXECUTIVE SUMMARY

The Department of the Interior (Interior, Department) has significant responsibilities, including managing 20 percent of the Nation's lands; supplying water and hydropower in the 17 Western States; conserving plants, fish and wildlife, and their habitats; preserving historic and cultural resources; providing geological, hydrological, and biological science; fulfilling trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated island communities; providing recreational opportunities to the public; and responsibly managing renewable and nonrenewable energy and mineral development on public lands and the Outer Continental Shelf (OCS).

This Climate Adaptation Plan (Plan) was prepared in accordance with guidance for Federal climate adaptation planning from the White House Council on Environmental Quality (CEQ). The information presented here aligns with adaptation and resilience requirements in section 211 of Executive Order (EO) 14008, entitled "Tackling the Climate Crisis at Home and Abroad"; section 5(d) of EO 14030, entitled "Climate-Related Financial Risk"; and section 503 of EO 14057, entitled "Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability." This work also describes how the Department is contributing to the objectives and opportunities for action identified in the Biden-Harris administration's National Climate Resilience Framework.

The Plan builds on the Department's 2021 Climate Action Plan by quantifying, at a high level, exposure to climate hazards—including extreme heat, extreme precipitation, flooding, wildfire, and sea level rise—that can affect the Department's ability to meet its mission in the coming years. The impact of the projections is significant—nearly every building and employee will face hotter temperatures and more extreme precipitation events. Sea level rise will affect hundreds of Interior-managed sites, from national parks and wildlife refuges to historic sites. Uncharacteristically severe wildfire already affects millions of acres of lands managed by the Department. In addition, other climate change-influenced drivers of change, such as drought and invasive species, will also affect the natural and cultural resources the Department stewards in the years to come.

The Plan also provides updates on important progress made since publication of the 2021 Climate Action Plan, including the following:

- Significant investments in the stewardship of lands, waters, and facilities, including through funding from the Bipartisan Infrastructure Law (BIL), Inflation Reduction Act (IRA), and Great American Outdoors Act (GAOA), and the establishment of a restoration and resilience framework to advance the impacts of the Department's work.
- Funding for American Indian, Alaska Native, Native Hawaiian, and insular area communities to increase their resilience in the face of climate change.
- Updates to Departmental policy to better factor climate change into its work.

As the Department plans for the next several years, it will build on this foundation to address the hazards presented by climate change. This plan outlines steps for the Department to take through 2027, organized under three overarching themes, that will strengthen its adaptive capacity and resilience:

- **Understand and assess current and future impacts of climate change on Department assets, mission, operations, and services**. This includes improving understanding of key vulnerabilities, pursuing research on climate hazards and stressors, and integrating findings into decision support tools and enterprise-wide planning.
- **Prioritize and scale adaptation and resilience efforts.** This includes implementation of new Department policies, targeted investments in conservation and resilience, wider adoption of NBS, and enhancement of equitable funding opportunities for communities and partners to adapt to climate change.
- **Build capacity for adaptation within the Department's workforce and through partnerships.** This includes developing new guidance, training, and performance expectations for the Department's workforce, and continued meaningful engagement and collaboration with communities, including American Indians, Alaska Natives, Native Hawaiians, and affiliated island communities.

The Plan identifies potential opportunities that will help to inform the Federal budget development process, but it is not a budget document and does not imply approval of any specific action or investment. All activities and recommendations included in the report are subject to resource constraints and weighing of priorities as part of the annual budget formulation process, as well as the availability of appropriations provided by Congress.

Through its Plan, the Department is also able to advance environmental justice as part of its mission, consistent with EO 14008 and with EO 14096, entitled "Revitalizing Our Nation's Commitment to Environmental Justice for All." As the Department implements its Plan to increase the resilience of its facilities and operations, the agency shall, as appropriate and consistent with applicable law (1) address disproportionate and adverse environmental and health effects (including risks) and hazards, including those related to climate change and cumulative impacts of environmental and other burdens on communities with environmental justice concerns, and (2) provide opportunities for the meaningful engagement of persons and communities with environmental justice concerns.

In addition, as a member of the White House Environmental Justice Interagency Council (WHEJAC), the Department received recommendations on climate planning, preparedness, response, recovery and impacts. The Department is reviewing the recommendations and, as appropriate and to the maximum extent permitted by law, is taking steps to address the WHEJAC's recommendations.

KEY TERMS

Adaptive Capacity: The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Climate Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects. Human intervention may facilitate adjustment to expected climate and its effects.

Climate Mitigation: Measures to reduce the amount and rate of future climate change by reducing emissions of heat-trapping gases or removing carbon dioxide from the atmosphere.

Climate Resilience: The capacity of interconnected social, economic, and ecological systems to cope with a climate change event, trend, or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure. Climate resilience is a subset of resilience against climate-induced or climate-related impacts.

Environmental Justice: The just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision making and other Federal activities that affect human health and the environment so that people:

> (i) are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
>
> (ii) have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices. (Source: EO 14096, section 2(b), 88 FR 25251 (Apr. 26, 2023)).

Exposure: The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards. (U.S. Climate Resilience Toolkit).

Hazard mitigation: Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Nature-based Solutions: Actions to protect, sustainably manage, or restore natural or modified ecosystems as solutions to address societal challenges, simultaneously providing benefits for people and the environment. (Nature Based Solutions: Guidance and Examples).

Risk: Threats to life, health and safety, the environment, economic well-being, and other things of value. Risks are evaluated in terms of how likely they are to occur (probability) and the damages that would result if they did happen (consequences).

**Definitions used are from the Fifth National Climate Assessment, unless noted otherwise.

SECTION 1: AGENCY PROFILE

Agency Mission	The Department protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated island communities.
All Agency Bureaus Included in Climate Adaptation Plan	▪ Bureau of Indian Affairs ▪ Bureau of Indian Education ▪ Bureau of Land Management ▪ Bureau of Ocean Energy Management ▪ Bureau of Reclamation ▪ Bureau of Safety and Environmental Enforcement ▪ Bureau of Trust Funds Administration ▪ National Park Service ▪ Office of Surface Mining Reclamation and Enforcement ▪ U.S. Fish and Wildlife Service ▪ U.S. Geological Survey ▪ Office of the Assistant Secretary – Insular and International Affairs ▪ Departmental Offices
Agency Climate Adaptation Official	Joan Mooney, Principal Deputy Assistant Secretary for Policy, Management and Budget
Agency Risk Officer	Patricia Currier, Director of Planning and Performance Management
Point of Public Contact for Environmental Justice	Eric Werwa, Ph.D., Acting Director, Office of Congressional and Legislative Affairs Environmental Justice Contact: environmental_justice@ios.doi.gov

Owned Buildings	41,800 owned buildings/ more than 99,000,000 square feet (Fiscal Year (FY) 2023 Federal Real Property Profile)
Leased Buildings	310 commercial leases accounting for nearly 2,800,000 Rentable Square Feet (RSF) (FY 2023 Federal Real Property Profile). Approximately 775 U.S. General Services Administration (GSA) Occupancy Agreements accounting for nearly 12,900,000 RSF (FY 2023 Occupancy Agreement Data from GSA).
Employees	77,070 full-time employees (Interior Office of Human Capital FY23 data)
Federal Lands and Waters	• 480 million acres of public lands • 700 million acres of subsurface mineral responsibilities • 3.2 billion acres of the OCS[1]
Budget:[2] ***($000s)***	**FY22 Enacted:** $16,208,272 **FY23 Enacted:** $17,334,379 **FY24 Enacted:** $16,865,543 **FY25 President's Budget:** $17,999,149 **Does not include supplemental or permanent appropriations*
Key Areas for Climate Adaptation Efforts	• Fulfilling trust and special responsibilities to American Indians, Alaska Natives, Native Hawaiians, and insular communities. • Conserving, protecting, managing, and restoring natural and cultural resources. • Providing recreational opportunities to the public • Managing water resources. • Responsibly managing energy development on public lands and in offshore environments. • Maintaining facilities and services that support fulfillment of the Department's mission. • Training the Department's workforce and ensuring a safe working environment.

SECTION 2: ASSESSING CLIMATE RISKS

A key first step to achieving resiliency is to understand where hazards are likely to occur and how different assets are exposed to them. This provides a foundation for evaluating how that exposure translates into risk—for buildings, employees, or other resources of interest.

The Department used the Federal Climate Mapping for Resilience and Adaptation Application (Federal Mapping App), which was developed for Federal agencies by CEQ and the National Oceanic and Atmospheric Administration (NOAA), to conduct a high-level screening of climate hazard exposure for Federal facilities and personnel. The Department also used the Strategic Hazard Identification and Risk Assessment (SHIRA) project, developed by the U.S. Geological Survey (USGS) and Interior's Office of Emergency Management. The SHIRA is available to Interior employees and includes numerous data layers (including risk data that is both climate and non-climate-related). These data were used to complement results from the Federal Mapping App and provide additional context about what climate exposure means to assets and operations.

The Department assessed the exposure of its buildings and employees to five climate hazards: extreme heat, extreme precipitation, sea level rise, flooding, and wildfire risk. These five hazards represent key vulnerabilities to Department assets and sufficient data coverage exists for their assessment for many geographies. However, hazards not included in this study (e.g., drought, invasive pests, etc.) may pose additional risk to staff, facilities, and operations. The Plan also presents a summary of climate hazards that affect the lands, waters, and cultural and natural resources the Department manages. Additional information about the data used in this exposure assessment can be found in appendix A.

Table 1. Climate Data Used in Agency Risk Assessment

Hazard	Description	Scenario	Geographic Coverage
Extreme Heat	Measured as whether an asset is projected to be exposed to an increased number of days with temperatures exceeding the 99th percentile of daily maximum temperatures (calculated annually), calculated with reference to 1976-2005. Data are from high-resolution, downscaled climate model projections based on the Localized Constructed Analogs (LOCA) dataset prepared for the 4th National Climate Assessment.	RCP 4.5	CONUS
		RCP 8.5	CONUS
Extreme Precipitation	Measured as whether an asset is projected to be exposed to an increased number of days with precipitation amounts exceeding the 99th percentile of daily maximum precipitation amounts (calculated annually), with reference to 1976-2005. Data are from high-resolution, downscaled climate model projections based on the LOCA dataset prepared for the 4th National Climate Assessment.	RCP 4.5	CONUS
		RCP 8.5	CONUS and AK
Sea Level Rise	Measured as whether an asset is within the inundation extents from NOAA Coastal Digital Elevation Models and the 2022 Interagency Sea Level Rise Technical Report. Intermediate and Intermediate-High sea level rise scenarios are used as proxies for RCP 4.5 and 8.5, respectively. Projections of inundation extents from the 2017 NOAA report, "Global and Regional Sea Level Rise Scenarios for the United States," available through the SHIRA hazard exposure dashboard, were used for areas outside the 48 contiguous States and Puerto Rico.	RCP 4.5	CONUS, HI, and territories
		RCP 8.5	CONUS, HI, and territories
Wildfire Risk	Measured as whether an asset is in a location is rated as high, very high, or extreme risk based on the U.S. Forest Service (USFS) Wildfire Risk to Potential Structures (a data product of Wildfire Risk to Communities), which estimates the likelihood of structures being lost to wildfire based on the probability of a fire occurring in a location and likely fire intensity. Data reflects wildfires and other major disturbances as of 2014.	Historical	All 50 States
Flooding	Measured as whether an asset is located within a 100-year floodplain (1 percent annual chance of flooding) or 500-year floodplain (0.2 percent annual chance of flooding). Data from the Federal Emergency Management Agency National Flood Hazard Layer and First Street Foundation's Flood Model were used.	Historical and 2052 (First Street only)	All 50 States and PR

Exposure to extreme heat, extreme precipitation, and sea level rise were evaluated at mid- (2050) and late-century (2080) under two emissions scenarios, Representative Concentration Pathway (RCP) 4.5 and RCP 8.5.[3] Exposure to flooding and wildfire risk were only evaluated for the present day due to data constraints.

Table 2. Climate Scenarios Considered in Agency Risk Assessment

Scenario Descriptor		Summary Description from the 5th National Climate Assessment
RCP 8.5	Very High Scenario	This scenario reflects the highest range of carbon dioxide (CO_2) emissions and no mitigation. Total annual global CO_2 emissions in 2100 are quadruple emissions in 2000. Population growth in 2100 doubles from 2000. This scenario includes fossil fuel development.
RCP 4.5	Intermediate Scenario	This scenario reflects reductions in CO_2 emissions from current levels. Total annual CO_2 emissions in 2100 are 46 percent less than the year 2000. Mitigation efforts include expanded renewable energy compared to 2000.

Additional details about the data used in this assessment are provided in appendix A.

GEOGRAPHIC LIMITATIONS TO ASSESSING EXPOSURE

Relative to the contiguous United States, other regions of the United States, including Alaska, the Hawaiian Islands and U.S.-affiliated Pacific islands (USAPI), Puerto Rico, and the U.S. Virgin Islands are lacking data to inform climate risk projections. This has implications for portfolio-wide assessments of Department-managed assets, and for assessment of region-specific hazards.

At the national level, these data gaps limit our ability to fully assess the impact of hazards. Sea level rise in the Pacific provides an example of the importance of closing these gaps. Studies are in progress to assess sea level rise impacts on U.S. Fish and Wildlife Service (FWS) refuges and national parks in Hawaii and the USAPI. In Hawaii, local vulnerability assessments project a sea level increase of 3.2 to 3.9 feet above year 2000 levels by 2100 in the intermediate sea level rise scenario, or as soon as 2070 under the high scenario. Approximately 3 feet of sea level rise is projected in Guam, affecting at least 58 percent of its built environment. The combination of sea level rise and storm surge or king tides is currently impacting buildings and infrastructure, including National Park Service (NPS) sites such as the Pearl Harbor National Memorial. The SHIRA project uses sea level rise data created by NOAA that map the extent of sea level rise in 1-foot increments, which can serve as a proxy for different emissions scenarios where data gaps occur, but no similar data are available for hazards like extreme heat or extreme precipitation.

Regional hazards—like tropical storms and permafrost changes—have important implications for decision making. For example, in Alaska, 80 percent of the State is underlain by permafrost. Buildings and other infrastructure are at risk due to temperature increases and resulting permafrost degradation, but precise information of projected impacts is lacking. Impacts of thawing permafrost in Interior-managed lands have already been observed; for example, in 2021, a landslide from a thawing rock glacier in Denali National Park cut off a section of the Denali Park Road, with further slumping occurring through summer in 2022. The cost estimates for addressing the damage to restore visitor access is at least $102 million.[4] The SHIRA project includes data on permafrost extent, and the USGS Alaska Climate Adaptation Science Center is supporting region-specific research to understand how permafrost and other important features of Alaska are changing and developing platforms to share the resulting data.[5]

2A. Climate Risks Affecting Mission, Operations and Services

The work of the Bureaus and Offices that comprise the Department is varied, including the provision of services such as stewarding resources; facilitating energy development; and supporting outdoor recreation; and delivering water, power, and other services to communities. While each of the Bureaus within the Department has its own distinct mission, the impacts of climate change will be felt across the agency. The following section includes a table of crosscutting areas of impact (table 3) followed by a description of each Interior Bureau's mission and examples of Bureau-specific climate impacts.

Table 3. Summary of Key Current and Projected Climate Hazard Exposures and Impacts

Area of Impact	*Description*	*Identified Climate Hazard*[6,7,8]	*Potential Impacts*
Biodiversity	*The Department is charged with conservation and management of millions of acres of public lands and waters. Maintaining healthy ecosystems, protecting native species, and safeguarding biodiversity are some of the main goals of natural resource conservation.*	• Increased severity of wildfires • Ocean acidification • Sea level rise • Changing precipitation patterns • Increased temperatures • Increased severity of drought	• Habitat loss and range shifts • Biodiversity loss • Changes in invasive species abundance, density, and range
Cultural Resources	*Interior protects and manages a wide range of cultural resources, such as archeological sites, historic structures, collections of museum objects, and cultural landscapes.*	• Increased flood risk • Increased temperatures • Increased severity of wildfires • Melting permafrost • Sea level rise	• Flooded/destroyed historic resources including landscapes, structures, and archeological sites • Loss of/damage to archaeological resources • Changes to/loss of natural processes, flora, fauna, etc. that have cultural significance to specific peoples • Stress on, or loss of, historic structures
Freshwater Resources	*The Department, through the Bureau of Reclamation (BOR), plays an integral role in managing water in the Western United States, and BOR's facilities provide much of the infrastructure critical to storing and distributing water in the West. The Department, through NPS and FWS, works to conserve, protect, and restore water resources.*	• Changing precipitation and runoff patterns • Increasing severity of drought • Decreased water availability • Increased temperatures • Loss of snowpack • Sea level rise • Increased flooding • Increased severity of wildfire	• Changes to water supply and demand • Decreased water quality • Degraded infrastructure • Degraded habitat • Impacts to aquatic species and waterfowl • Impacts to recreation
Infrastructure	*Interior manages a wide variety of infrastructure, including buildings, roads, dams, scientific labs, water delivery systems, fences, tunnels, and other equipment. This infrastructure allows millions of visitors to enjoy public lands, provides water to the West, and powers Tribal communities.*	• Changing precipitation patterns • Higher storm surges • Increased flood risk • Increased temperatures • Sea level rise • Increased severity of wildfire	• Damage to/decreased access/loss of access to infrastructure • Altered functionality (operations, efficiency, and safety) of existing infrastructure • Visitor safety concerns

Area of Impact	*Description*	*Identified Climate Hazard*[6,7,8]	*Potential Impacts*
Island Communities	*The Department has responsibilities to effectuate and implement the special political and legal relationship between the United States and the Native Hawaiian Community and continue the process of reconciliation with the Native Hawaiian people. It is also responsible for coordinating Federal policy with respect to the territories of American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands, and administering and overseeing U.S. Federal assistance provided to the freely associated states of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau.*	• Changing precipitation patterns • Increasing severity of drought • Higher storm surges • Increased flood risk • Increased temperatures • Sea level rise • Increased severity of wildfire	• Damage to/decreased access/loss of access to infrastructure and other critical components of a community, resulting in community-managed retreat and/or relocation • Decreased access to clean freshwater • Decreased reliability of electricity due to severe storms • Decline of culturally significant endemic species • Increasing technical and financial assistance needs • Increased fire risk to communities
Energy and Mineral Development	*Interior, through the Bureau of Land Management (BLM), manages about 245 million surface acres and 700 million subsurface acres, located primarily in 12 Western States, including Alaska, many of which are open to energy and mineral development. In addition, the Department manages energy and mineral development on the 3.2-billion-acre OCS, through the Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement, and regulates coal mines and assures that land is restored to beneficial use post-mining (Office of Surface Mining Reclamation and Enforcement).*	• Changing precipitation patterns • Decreased water availability • Increased flood risk • Increased temperatures • Increased severity of wildfires • Storm intensity/extreme events • Melting permafrost • Sea level rise • Changes in sediment demand, supply, and availability	• Changes in access to energy and minerals (melting permafrost, shrinking sea ice opening potential for new resources) • Changes to water supply and demand • Damage or decreased access to, or loss of infrastructure • Damage to closed or abandoned well-heads and other energy infrastructure • Changes in energy production
Livestock Grazing	*Interior, through BLM, manages livestock grazing on approximately 155 million acres of public lands, administering nearly 18,000 permits and leases held by ranchers who graze their livestock on more than 21,000 allotments.*	• Changing precipitation patterns • Increasing severity of drought • Increased temperatures • Increased severity of wildfires	• Invasive species encroachment • Changes in forage availability

Area of Impact	*Description*	*Identified Climate Hazard*[6,7,8]	*Potential Impacts*
Coastal/ Marine Resources	*The Department manages, protects, and provides access to significant ocean, coastal, and Great Lakes resources, including 34 million acres in over 100 marine and coastal national parks, more than 35,000 miles of coastline, over 180 marine and coastal national wildlife refuges (NWR), and more than a million square miles of marine national monuments. In addition, the Department manages energy and mineral development on the 3.2-billion-acre OCS.*	• Changing precipitation patterns • Storm intensity/extreme events • Higher storm surges • Coastal erosion and soil erosion from wildfires • Increased flood risk • Increased temperatures • Ocean acidification • Sea level rise • Changes in sediment demand, supply, and availability	• Biodiversity loss • Damage to/decreased access/loss of coastal infrastructure • Habitat loss • Decline of coral ecosystems • Damage to cultural resources and culturally significant resources • Impacts to fisheries • Loss of coastal groundwater resources due to sea level rise
Recreation	*Each year, more than 400 million people visit Interior-managed areas to participate in recreational activities such as camping, hunting, fishing, hiking, boating, mountain biking, birding and wildlife viewing, photography, climbing, winter sports, and visiting natural and cultural heritage sites. The Department's recreation resources and visitor services support strong local economies and public land conservation.*	• Changing precipitation patterns • Increasing severity of drought • Coastal erosion • Increased flood risk • Increased temperatures • Melting glaciers • Sea level rise • Increased severity of wildfire (including wildfire smoke)	• Changing recreational opportunities (types, quality, quantity available) • Changing visitation patterns (timing, location, amounts of visitors) • Increased health and safety risks • Decreased access to potable water • Decreased access to trails, other infrastructure
American Indian and Alaska Native Communities	*The Department is the primary Federal agency charged with carrying out the United States' trust responsibility to American Indians and Alaska Natives, maintaining the government-to-government relationship with federally recognized Tribes, and promoting and supporting Tribal self-determination. It provides services to nearly 2 million American Indians and Alaska Natives, including education, social services, economic development, law enforcement, Tribal court administration, housing improvement, disaster relief, road maintenance, and resource management.*	• Changing precipitation patterns • Increased severity of drought • Coastal erosion • Increased flood risk • Increased temperatures • Increased severity of wildfires • Melting permafrost • Sea level rise • Shrinking sea ice extent and timing	• Damage to/decreased access/loss of access to infrastructure and other critical components of a community, resulting in community-managed retreat and/or relocation • Decreased access to clean freshwater • Loss of traditional ways of life (hunting, fishing, gathering) • Loss of cultural resources • Reduced food security (declining subsistence resources; drought, invasive species, etc. affecting agriculture; access to water; access to clean, affordable energy; loss of subsistence way of life)

Interior Bureaus and Offices

Bureau of Land Management (BLM) manages public lands for a variety of uses such as energy development, livestock grazing, recreation, conservation, and timber harvesting while ensuring natural, cultural, and historic resources are maintained for present and future use. The BLM National Conservation Lands System is a subset (approximately 15 percent) of the overall system of public lands that are managed to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations. The BLM wildlife habitat, aquatic ecosystems, recreation opportunities, forest and woodlands resources, air quality, water rights, and wildland fire management efforts (including preparedness, suppression, and post-fire restoration) are often impacted directly by changing climate conditions. Drought conditions are particularly relevant to BLM management of several programs within the agency, including livestock grazing, wild horses and burros, and the management of wildland fire.[9]

Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE) have closely intertwined missions in support of offshore resource conservation and development. The BOEM manages development of U.S. OCS energy, mineral, and geological resources in an environmentally and economically responsible way, while BSEE provides regulatory oversight and enforcement to promote safety, protect the environment, and conserve resources offshore. Climate change impacts such as sea level rise, more intense and frequent storms, and ocean acidification and hypoxia can negatively affect ecosystems, leading to declines in fishery productivity and biodiversity, changes in wildlife behavior and migratory patterns, as well as increases in flooding and shoreline erosion.[10] In addition, changes in temperature, precipitation, sea level rise, storm intensity and wave regime can also affect coastal and offshore energy exploration, production, and transportation.[11,12]

Bureau of Reclamation (BOR) manages, develops, and protects water and related resources in an environmentally and economically sound manner in the interest of the American public. The BOR constructed many dams, powerplants, and canals in the 17 Western States and is currently the largest wholesaler of water[13] and the second-largest producer of hydroelectric power in the United States. Climate change affects BOR's ability to deliver water and generate power in an economically and environmentally sound manner.[14] Drought fueled by climate change impacts the quantity and quality of water available to meet competing objectives. Below-average inflows and depleted reservoir levels reduce allocations and deliveries to customers, degrade production of clean energy via hydropower facilities, and make it difficult to meet flow and temperature targets for threatened and endangered species. Similarly, the changing dynamics of wildfire create acute and long-term challenges for water management. Fire has the potential to damage water and power infrastructure, and burned watersheds can experience radical changes that impact water quality and runoff characteristics.

Indian Affairs (IA) supports federally recognized Tribal Nations and American Indian/Alaska Native trust beneficiaries nationally, regionally, and locally. IA contains four related components:

- Office of the Assistant Secretary – Indian Affairs (OAS-IA)
- Bureau of Indian Affairs (BIA)
- Bureau of Indian Education (BIE)

- Bureau of Trust Funds Administration (BTFA)

Each IA component supports federally recognized American Indian/Alaska Native Tribal governments by directly administering or funding tribally administered programs. Indigenous people face harms and risks from climate change that negatively affect their health and well-being, economic sustenance, and cultural integrity and continuity.[15] IA supports climate preparedness and resilience for all federally recognized Tribal Nations and Alaska Native villages through technical and financial assistance, access to scientific resources, and educational opportunities.

U.S. Fish and Wildlife Service (FWS) works with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. Climate change presents a growing threat to America's fish, wildlife, plants, and their habitats; because of climate change, some species populations may decline, many will shift their ranges substantially, and others will face increased risk of extinction.[16] The FWS also manages the National Wildlife Refuge System (NWRS), which is comprised of 571 NWRs and 38 wetland management districts that make up 95 million acres of land and 760 million acres of submerged lands and waters.

National Park Service (NPS) preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. Rising temperatures, droughts, wildfires, sea-level rise, and extreme weather are transforming national park sites, resulting in habitat and biodiversity loss, declining freshwater availability, outbreaks of pests and diseases, damage to—or loss of—cultural resources, deteriorating infrastructure, and visitor safety concerns, among others.[17]

Office of Surface Mining Reclamation and Enforcement (OSMRE) works in cooperation with States and Tribes to ensure that coal mines are operated in a manner that protects citizens and the environment during mining, assure that land is restored to beneficial use following mining, and mitigate effects of past mining by pursuing reclamation of abandoned coal mines. Changes in climate may have an impact on the effectiveness of reclamation efforts—successful recovery of disturbed lands will require that reclamation efforts consider changing climatic conditions and environmental variables and engineer ecosystems capable of adapting in step with the changing climate (rather than habitats suited only to the pre-disturbance climate).[18]

U.S. Geological Survey (USGS) monitors, analyzes, and predicts current and evolving Earth-system interactions and delivers actionable information at scales and timeframes relevant to decision makers. This includes providing science about the natural hazards that threaten lives and livelihoods; the water, energy, minerals, and other natural resources humans rely on; the health of ecosystems and environment; and the impacts of climate and land-use change. As the science arm of the Department, USGS plays an important role in investigating the causes and consequences of climate change and helping decision makers to develop more informed adaptation and mitigation strategies.[19]

2B. Climate Risks Affecting Interior Buildings

Table 4. Climate Hazard Exposure to Interior Buildings

Indicators of Exposure of Buildings to Climate Hazards	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Extreme Heat: Percent of buildings projected to be exposed to more days with temperatures exceeding the 99th percentile of daily maximum temperatures (calculated annually) from 1976-2005	>99%	>99%	>99%	>99%
Extreme Precipitation: Percent of buildings projected to be exposed to more days with precipitation amounts exceeding the 99th percentile of daily maximum precipitation amount (calculated annually) from 1976-2005	98%	>99%	99%	99%
Sea Level Rise: Percent of buildings projected to be inundated by sea level rise*	<1%	1%	<1%	>2%

	High Risk	Very High Risk	Extreme Risk
Wildfire: Percent of buildings at highest risk to wildfire	17%	4%	2%

	100- or 500- year floodplain
Flooding: Percent of buildings located within floodplains	34%

Note: Interior buildings are geographically dispersed across the Contiguous United States (CONUS) and exposure to climate hazards varies across regions. This has operational implications for asset management, asset risks, and health impacts on asset users. Please see appendix B for more information on:

- The distribution of extreme heat exposure to Interior buildings across regions
- Projected distribution of extreme precipitation events impacting Interior buildings across regions
- Regional exposure to inundation due to sea level rise
- Distribution of exposure to wildfire risk across regions
- Flood risk exposure of Interior buildings, including 100-year flood plain (1% annual exceedance probability)) and the 500-year flood plain (0.2% annual exceedance probability) exposures

* Buildings are reported as inundated if the centroid that marked their location was within projected sea level rise inundation extents—considered here as at or below the elevation of the mean higher high water mark—for a scenario. Note that this is an underestimate of the exposure to climate hazards associated with sea level rise, which extend beyond inundation and include, for example, storm surge, tidal flooding, and saltwater intrusion.

The Department owns or manages more than 41,800 buildings across the country that serve a wide range of functions, including the following:

- visitor centers
- school buildings

- offices
- museums
- housing units
- restaurants
- warehouses

Climate change will generally disrupt the services the Department provides and affect the safety and comfort of visitors, students, and staff who rely on Interior buildings. In addition, many of the buildings the Department owns or manages have special historical significance—climate change impacts on those buildings affect connections with the country's heritage. The climate hazards described in table 4 will affect Department buildings in a number of ways.

Extreme Heat

An increase in days with maximum temperature exceeding the current 99th percentile maximum is expected for nearly every building under every emissions scenario (see appendix B for more information on the scale of increased temperatures across regions). Depending on location and scenario, many places could experience high temperatures for weeks or months each year that meet or exceed the hottest three to four days of a year in the past.

While these changes may not necessarily influence building lifespans, they affect operations—with extreme heat, heating, ventilation, and air conditioning (HVAC) systems may be overused or inadequate, which may result in increased cooling costs or elevated indoor temperatures. For the Department's buildings across the contiguous United States, the number of cooling degree days (a measure of demand for climate control in buildings) are projected to increase 48-65 percent by mid-century, and 65-129 percent by late century.[20] Heating degree days (a measure of demand for building heat) are projected to decrease 16-20 percent by mid-century, and 21-35 percent by late century.[21]

The Department owns approximately 600 visitor centers, 340 school buildings, 2300 offices, and more than 8000 housing units, and these increases in severe heat will affect their operation and the services they provide. In addition, many of the Department's buildings house museum collections or other important cultural items, and extreme heat would affect their preservation.

The buildings data used for this assessment did not include information on whether individual buildings are equipped to handle these changes. Some buildings with HVAC systems may need to operate those systems more frequently—a change that may affect energy consumption, sustainability goals, and equipment lifespans— while others without these systems may need to be replaced with units more suitable for future climate.

Extreme Precipitation and Flooding

As with extreme heat, nearly all Interior-owned or managed buildings are projected to experience increases in single-day precipitation under both scenarios at mid- and late-century, although the magnitude of that change is not as great, and variability is higher. SHIRA tools include projected

changes in precipitation events greater than 2 inches, which is useful for considering engineering and site design vulnerabilities and flash flood potential. Across the full suite of Interior-owned or managed buildings, there is a projected increase in the frequency of this type of precipitation event of 20-29 percent by mid-century and 30-51 percent by late century.

Approximately 27 percent of Interior-owned or managed buildings in the contiguous United States are currently located in an area with a 1 percent annual exceedance probability (AEP) of flood, with an additional 6 percent in an area with a 0.2 percent AEP flood.[22] The SHIRA tools also include a floodplain data layer, created by the First Street Foundation, that projects floodplain changes at mid-century. This projection is not included in table 4 above but indicates that the flood potential will increase such that slightly more of the Department's current building portfolio (~300 buildings) are within areas with an AEP of at least 0.2 percent at mid-century. This has implications for decisions regarding how to maintain or protect those buildings. More broadly, these data are useful for planning the location of new buildings in the coming decades given projected changes in flood probability.

Wildfire

Approximately 25 percent of Interior-owned or managed buildings in the contiguous United States are in areas where wildfire presents a high-to-extreme risk to structures. This includes more than 2,500 housing structures, nearly 500 office buildings, and over 90 visitor centers—a portfolio with a replacement value of more than $49 billion.[23] Exposure levels are similar across the Bureaus, with highest exposures in the Upper Colorado Basin (42 percent), California-Great Basin (41 percent), and Columbia-Pacific Northwest (39 percent) regions (see appendix B – table A10). Wildfires have the potential to damage or destroy buildings and to disrupt critical services such as power, gas, communications, transportation, and water supply.

Sea Level Rise

Rising sea levels have detrimental impacts on infrastructure, causing flooding, erosion of supporting soils, building collapses, saltwater surges into waterways, and transportation delays. A relatively small percentage of buildings owned by Interior, primarily located in the Southeast, are projected to be inundated due to sea level rise under any scenario. However, they represent a significant overall investment[24] for specific Bureaus, namely FWS and NPS, that manage cultural, historical, and natural resources in coastal areas.

2C. Climate Risks Affecting Federal Employees

The table below summarizes exposures to climate hazards for Department employees. The text below the table provides context on what these exposures mean across the Department's Bureaus and Offices.

Table 5. Climate Hazard Exposure to Interior Employees

Indicators of Exposure of Employees to Climate Hazards	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Extreme Heat: Percent of employees duty-stationed in counties projected to be exposed to more days with temperatures exceeding the 99th percentile of daily maximum temperatures (calculated annually), from 1976-2005*	99%	99%	99%	99%
Extreme Precipitation: Percent of employees duty-stationed in counties projected to be exposed to more days with precipitation amounts exceeding the 99th percentile of daily maximum precipitation amount (calculated annually), from 1976-2005*	99%	99%	99%	99%
Sea Level Rise: Percent of employees duty-stationed in counties projected to be inundated by sea level rise**	12%	19%	13%	21%
	High Risk		**Very High Risk**	**Extreme Risk**
Wildfire: Percent of employees duty-stationed in counties at highest risk to wildfire**	30%		5%	6%

Notes:
***** The number of extreme heat days, and number and frequency of extreme precipitation events, impacting employees varies across Interior regions, please see appendix C for more details.
****** The percentage of employees exposed to inundation from sea level rise and to wildfire risk varies greatly across regions, please see appendix C for details.

The Department employs more than 77,000 people and a cadre of volunteers to perform a wide range of duties that span various positions, including the following:

- park rangers
- natural resource (e.g., forestry, biological science, hydrologic) technicians and managers
- wildland firefighters
- scientists
- cultural resource (e.g., archeology, history, architecture, anthropology) technicians and managers

- law enforcement officers
- maintenance mechanics
- administrative and program staff (human resources, financial, budget staff)
- engineers
- custodial workers

The Department manages public lands and waters in all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam and supports communities across the United States and territories. As such, the Department's workforce is very geographically distributed, but has large concentrations (>1000 employees) in locations, including the following:

- Jefferson County, CO
- District of Columbia
- Fairfax County, VA
- Ada County, ID
- Bernalillo County, NM
- Sacramento County, CA
- Anchorage Borough, AK
- Coconino County, AZ

All Department employees will experience one or more of the impacts of climate change through 2080, and some workers will be more vulnerable to impacts than others. Climate-related impacts may make existing health and safety issues worse or lead to new hazards. Some of the most pressing climate-related occupational hazards and exposures for Interior employees include the following:

- ***Heat Stress.*** An increasing number of hotter days is expected across nearly all Department worksites under every emissions scenario (table 5, see also appendix C – tables A12 and A13). This change will be experienced through higher average temperatures, more frequent extreme heat events (such as heat waves), and shifting and expanding hot seasons.[25] Higher temperatures increase worker risk for heat-related morbidity including heat stroke and exhaustion. Heat-related fatigue can impact workers' alertness to other on-the-job hazards, increasing the chance of injury.[26] Heat stress is especially hazardous for the Department's outdoor workers, many of whom work outside through the hottest months of the year. Employees who serve in firefighting or emergency responder roles that require intense physical activity even during extreme heat events will be disproportionately affected.
- ***Health Impacts from Wildfires***. More than two in five Interior employees (41 percent) currently work in locations with high to extreme wildfire risk (table 5) and many more work in locations that experience air pollution due to wildfires extending well beyond fire locations. Climate change is projected to increase the number and severity of wildfires in parts of the United States, which will increase air pollution (emissions of particulate matter and ozone precursors).[27] This air pollution can cause acute health effects (e.g., short-term coughing and eye irritation) and long-term health effects (e.g., heart disease, respiratory diseases, and allergic disorders), and can be exacerbated by extreme heat.[28] These impacts will be especially hazardous for the Department's outdoor workers, including wildland firefighters subject to close exposure to fire and smoke. In addition, the increasing risk and frequency of wildfires close to home can have mental health effects on the wildland firefighter workforce.

- ***Biological Hazards.*** Changes in temperature and precipitation enable population growth, range shifting, or range expansion of organisms that can be harmful to human health.[29] This includes vectors (fleas, ticks, mosquitoes), pathogens (bacteria and viruses), and allergens (pollen, mold), which can spread disease and trigger asthma and allergies. As with heat stress and wildfires, impacts of these changes will likely fall on outdoor workers.
- ***Extreme Weather and Natural Disaster Dangers.*** Increasing extreme weather events or natural hazards such as floods, landslides, storms, droughts, and wildfires can contribute to occupational deaths, injuries, and diseases.[30] This is especially true for workers involved in rescue, cleanup, and restoration efforts, as these workers may be exposed to hazardous conditions both during and after extreme weather events.
- ***Productivity and Workplace Disruptions.*** Climate change may lead to work disruptions, as hazards like extreme precipitation events, fire, or coastal flooding amplified by sea level rise affect commutes, close offices, or otherwise challenge workers' ability to do their job safely and effectively.

2D. Climate Risks Affecting Federal Lands, Waters and Cultural Resources

Climate change will impact nearly all—if not all—of the lands and waters that the Department stewards. Summarizing the myriad ways in which these impacts will be expressed is beyond the scope of this Plan, but responding to them will dominate the work of the Department's Bureaus and Offices in the coming decades. The table below presents several of the most significant climate hazards to Interior-managed lands, waters, and cultural and natural resources, and the narrative elaborates on the implications of these potential changes.

Table 6. Key Climate Hazard Exposures to Interior-Managed Lands, Waters, and Associated Resources[31,32,33]

Resource Type	Federal Asset	Current Climate Hazard Impact or Exposure	Future Climate Hazard Impact or Exposure
Cultural Resources	Recreation and tourism on Interior-managed public lands	Extreme heat and wildfire influence visitation and public safety.	Increases in extreme temperature and changes in the presence of wildfire smoke will affect visitation patterns across Department-managed sites.
	Sites in the National Register of Historic Places and other historic sites	Storm surges and sea level rise, inundation and erosion, and uncharacteristically severe wildfire activity threaten historic places.	Changing weather patterns, stronger hurricanes, other extreme weather events, sea level rise, nuisance flooding, and king tides are causing flooding of historic places. Flooding events are occurring at increased frequency and magnitude. Some historic properties that have never flooded before may now be exposed to this risk, and those that flooded infrequently in the past may experience more instances of flooding or of water reaching higher levels than ever before. In addition, uncharacteristically severe wildfires increase the risk of loss of historic places.
	Archeological resources	Sea level rise, uncharacteristically severe wildfire activity, and permafrost loss lead to deterioration of archeological resources due to exposure to the elements.	Depending on location, the impacts of climate change can accelerate the deterioration and loss of archeological resources. Sea level rise and uncharacteristically severe wildfire activity may have locally and regionally significant impacts, as would permafrost loss in Alaska.
	Cultural landscapes	Decline or disappearance of important values (e.g., important species, landscape features) or loss of use due to events like natural disasters or long-term changes.	Cultural landscapes reveal the history of human relationships with the land and its natural systems, and a wide variety of cultural traditions, habits and practices. The range of climate hazards discussed in this Plan will affect cultural landscapes. Changes in temperature and precipitation will affect where species are found, where historic features can be sustained, and whether certain resources are available in the same places over time. Other events, including sea level rise, storm surge, and

Resource Type	Federal Asset	Current Climate Hazard Impact or Exposure	Future Climate Hazard Impact or Exposure
			uncharacteristically severe wildfire, will have similar impacts on the presence of important wildlife and plants (e.g., salmon, wild rice), and may limit or eliminate access to certain places entirely.
Natural Resources	Ecosystems nationwide	Temperature and precipitation changes are affecting the timing of biological events and driving range shifts for wildlife and plants, including invasive species. A changing climate, along with the impacts of fire suppression, invasive species, and land use change, have altered fire regimes in many ecosystems. Climate change also impacts disturbance regimes, including flooding, fire (both frequency and intensity), and extreme weather events.	Changes in precipitation and temperature will continue to affect species ranges and survival, potentially transforming ecosystems. This could threaten species with extinction and affect ecological resilience and function, including the provision of ecosystem services. Climate change is likely to alter precipitation and temperature in ways that increase the likelihood and severity of wildfire, which will have consequences for vegetation composition and structure and wildlife in many landscapes.
	Coastal Lands	Low-lying areas of Interior-managed lands—especially in southern Florida, along the Gulf Coast and Atlantic Coastal Plain, the Caribbean, the central California coast, Hawaii, and USAPI —are exposed to sea level rise. Coastal areas are vulnerable to extreme precipitation events.	Approximately 200 units (e.g., national parks, NWRs, BLM-managed national monuments) are projected to be affected by mid-century (195-200 units) and late-century (197-207 units). Effects include inundation of lands as well as exposure to stronger hurricanes, storm surges and saltwater intrusion that will transform local ecologies.
	Arctic Lands	Permafrost, glaciers, and sea ice are being lost as temperatures increase.	Continued increases in temperatures in these regions will continue to reduce the extent of permafrost, glaciers, and sea ice in Arctic regions. This will have significant impacts on local ecologies.
	Managed Water Resources	Warming/Aridification Drought Intensification from Warming Changing Precipitation Patterns	Long-term warming and changes in annual precipitation amounts set up aridification, drought intensification, and transitions from snow to rain during precipitation events, all affecting the management and delivery of water for irrigation, generation of hydropower, and other uses.

Cultural Resources

Broadly speaking, cultural resources represent a record of the human experience. Cultural resources managed by the Department are varied, and include historic buildings and sites, archeological sites, ethnographic resources and cultural landscapes, and museum collections.[34] Museums are included in section 2B; the other resources described here share a common vulnerability in that they are exposed to environmental forces, including forces that will be shaped by climate change.

The specific impacts of climate change on cultural resources can be broadly categorized into two types of impact: (1) changes that degrade the physical qualities of the resource and (2) loss of use for the groups for whom the resource is important. Changes in temperature or precipitation can accelerate degradation of resources, and severe wildfire or inundation as sea levels rise may result in complete loss of resources. Loss of use can occur due to physical changes in a cultural resource (e.g., the loss of important species in a given location as habitats change) or due to climate hazards like extreme heat that limit opportunities to visit and engage with landscapes or sites that are culturally important.[35]

Natural Resources

A changing climate will influence the condition of the natural resources managed by the Department at different scales, ranging from the timing of seasonal events and composition of species present, to significant changes in the physical environment with the potential to affect the ecology of a location well into the future.

Examples of the former include changes in freshwater runoff due to earlier snowmelt or shifts in precipitation from snow to rain. This could cause deviations from historical streamflow and water temperature patterns that affect aquatic species, like salmon or other cold-water species. For example, NPS staff in Glacier National Park have relocated bull trout, which is listed as threatened under the Endangered Species Act (ESA), within park watersheds to drainages that are projected to retain cold water temperatures.[36] This introduction is intended to protect the park's population from warming water temperatures and the invasive lake trout.

These changes may influence human and wildlife health. For example, climate driven changes in seasonal weather patterns, including longer warm seasons, affect the transmission of *Borrelia burgdorferi*, the bacteria that causes Lyme disease, from infected nymphal black-legged ticks to uninfected larval ticks.[37] Simultaneous feeding of nymphal and larval ticks facilitates successful transmission of the pathogen to larvae.[38] This influences its prevalence in the environment, which in turn could increase the probability of transmission to humans.

Changes in climate will also affect life cycles of species and ecological patterns.[39] These impacts can happen broadly across ecosystems—and can also influence changes in species composition, as changes pass thresholds where certain organisms are able to persist, causing declines in or extirpation of historically occurring species while allowing colonization by new species.

Wildfire is one key example of a natural process that will impact Interior-managed lands as climate changes.[40] Millions of acres of Department-managed lands are at high risk of wildfire, including more severe fires that depart from historic fire regimes. This acreage is concentrated in the Western United States. Climate change will exacerbate conditions for more frequent high-severity fire, which, when combined with a history of fire suppression, invasive species, and changes in land use that have altered vegetation structure and composition, could lead to substantial ecological transformations in many locations and further increase hazard potential.

Finally, long-term changes in the physical world, driven by climate change, will affect the distribution and condition of natural resources in the future. Trends in permafrost in Alaska are one example—the extent of permafrost is declining as temperatures increase, with consequences for Arctic ecosystems, wildlife, and communities.[41] Sea level rise is another—changing sea levels will inundate coastal lands and ecosystems, but also alter patterns of erosion, tidal extents, and groundwater resources upslope in ways that local species and ecosystems may not be able to withstand.[42] Hundreds of coastal Interior-managed units are exposed to sea level rise, especially along the Gulf Coast, Caribbean, Atlantic Seaboard, and in the Pacific region, and will need to adapt to this change in their environment.[43]

2E. Climate Risks Affecting Tribal Nations and Indigenous Communities

There are many communities, including federally recognized Tribes, the Native Hawaiian community, and communities in the U.S. territories with strong cultural connections to the lands and waters managed by the Department. The climate hazards mentioned above threaten many of these cultural connections, including availability of foods that support subsistence lifestyles, cultural sites that are important to community history and identity, and culturally important practices.[44] Some of these connections are reflected in treaties as reserved rights.

At the same time, communities themselves are being impacted by climate change. Permafrost loss and coastal erosion affect Alaska Native villages, sometimes requiring relocation of communities and infrastructure.[45,46] Sea level rise, increasing ocean temperatures, variability in rainfall and storm intensity are degrading natural infrastructure in the Pacific islands, like coral reefs, as well as communities themselves.[47,48,49] Warming air and ocean temperatures are also expected to impact food systems and human health in the region.[50] Addressing these exposures is a consideration of the Department given its responsibilities to fulfill trust responsibilities and special commitments to federally recognized Tribes, the Native Hawaiian community, the territories of American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands, and overseeing U.S. Federal assistance provided to the freely associated states.

2F. Impacts from Additional Hazards

There are several hazards that are linked to climate change and have clear potential effects on the missions, operations, and services provided by Interior Bureaus and Offices. Two are described here: invasive species, and drought and changing precipitation patterns.

Invasive Species

Invasive species impose substantial costs on the environment and society. Economic costs have exceeded $26 billion every year in North America for the last decade.[51] Invasive species outcompete native species and are a major contributing factor in native species extirpation and extinction. Invasive species also disrupt ecosystem functions, deplete resources important to cultural heritage and subsistence living, exacerbate the threat of wildfire (e.g., cheatgrass in sagebrush ecosystems), increase the cost of delivering water and power, damage infrastructure, diminish recreation activities, and spread pathogens that transmit disease in both wildlife and human populations.[52]

Climate change exacerbates risks from invasive species. It can accelerate their spread and amplify adverse impacts and costs. Invasive species can also dramatically reduce the resilience of lands and waters to climate change. Furthermore, invasive species can inhibit the success of resilience and adaptation efforts implemented to forestall climate change impacts. The Invasive Species Advisory Committee released a white paper in 2024 that provides an overview of the interactions of invasive species and climate change.[53] They include the following:

- Damage to ecosystem function that affects the efficacy of NBS.
- Degradation of natural and built infrastructure, impacting rural and urban communities. Including coastal communities' resilience to storms, erosion, flooding.
- Impacts to indigenous cultural practices, food security, and ways of life.
- Threats to island sustainability, human health, food systems, and traditional practices.

Drought and Changing Precipitation Patterns

The precipitation figures in sections 2B and 2C above project increasing extreme precipitation events (i.e., more instances of heavy precipitation). In addition to these extreme precipitation projections, some areas may experience increased drought conditions (i.e., periods of low precipitation). The impacts of climate change on precipitation can manifest in several ways, including the following:[54]

- Long-term decreases in precipitation, potentially spanning decades, that constrain water availability and the ability to protect natural resources and water supplies for communities.
- Shifts in precipitation from snow to rain that alter the timing of water flows and availability.
- Onset of drought conditions, including rapid onsets, that stress vegetation and soils, alter wildfire regimes, and increase the risk of severe wildfire.
- Increasing evapotranspiration, accelerated snowmelt, and soil desiccation due to temperature increases.

Drought has significant implications for Interior's mission, operations, and services—affecting terrestrial and freshwater ecosystems and their associated wildlife and cultural resources, as well as the capacity to deliver water through Bureau of Reclamation projects.

Distinct from drought is the matter of warming that leads to aridification.[55] Without any change in precipitation pattern, warming leads to increased landscape evapotranspiration, reduced precipitation-runoff efficiency, increased drought intensity, and long-term reduction in water availability as a result. This hazard exists in much of the Southwest United States, including the Colorado River Basin. It contributes to the wildfire hazard and has significant impacts on ecosystems—causing tree mortality events and other ecological transformations—and on human communities.[56]

The NPS has projected drought conditions for all park units in the lower 48. The BOR has developed tools, including the 2021 SECURE Water Act Report[57] that provide information on projected changes in the intensity, duration, and frequency of drought due to climate change—specifically, that drought duration and variability are likely to increase for the Western United States, along with drought severity. These data were not used to assess exposures in this update as they cover specific regions and resources but represent an important line of work within the Department (section 3A3).

SECTION 3: PLANNING FOR ADAPTATION AND RESILIENCE

The following section provides an overview of work the Department has undertaken since its 2021 Climate Action Plan was posted, including implementation of BIL, IRA, and appropriated funds toward climate adaptation and resilience, updates to Departmental policy, and steps to improve sustainability and climate literacy across the Department. It also outlines actions Interior plans to take to continue building adaptive capacity and resilience throughout its work.

Section 3A outlines steps the Department plans to take to address the exposures and corresponding impacts of climate change on the Department's buildings, its employees, and the lands, waters, and natural and cultural resources it stewards.

Sections 3B1-5 provide an overview of Department progress toward incorporating climate adaptation and resilience into its operations, including by accounting for climate risk in planning and decision making (section 3B1), incorporating climate risk assessments into budgeting (section 3B2), updating and implementing Department policies and programs (section 3B3), by identifying key supply chains and making them more resilient (section 3B4), by incorporating adaptation and resilience into grants, loans, and agreements with external parties (section 3B5).

Section 3C describes the Department's work to date to advance climate literacy across its workforce, as well as steps that will be taken over the lifespan of this Plan.

3A. Addressing Climate Hazards and Risks

The sections below provide an overview of the Department's work to date and planned actions specific to addressing the exposure of its buildings, employees, and lands and waters (and associated natural and cultural resources) to climate hazards. This includes specific planned investments and initiatives (sections 3A1-3).

Overall, these actions fall into 3 broad themes aligned with best practices for achieving resilience:[58]

- **Understand and assess current and future impacts of climate change on Department assets, mission, operations, and services**. This includes improving understanding of key vulnerabilities, pursuing research on climate hazards and stressors, and integrating findings into decision support tools and enterprise-wide planning.
- **Prioritize and scale adaptation and resilience efforts.** This includes implementation of new Department policies, targeted investments in conservation and resilience, wider adoption of NBS, and enhancement of equitable funding opportunities for communities and partners to adapt to climate change.
- **Build capacity for adaptation within the Department's workforce and by strengthening partnerships.** This includes developing new guidance, training, and performance expectations for the Department's workforce, and continued meaningful engagement and collaboration with communities, including American Indians, Alaska Natives, Native Hawaiians, and affiliated island communities.

1. Addressing Climate Risks Affecting Interior Buildings

Table 7. Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Federal Buildings.

Climate Hazard	Overarching Theme	Priority Action	Timeline for implementation (2024-2027)
All climate hazards, including extreme heat, extreme precipitation, flooding, sea level rise, and wildfire risk. Nationwide: specific risks vary by region.	Understand climate hazards and assessing exposure	**Incorporate natural disaster resilience into individual projects by assessing climate hazards and natural disaster risk.** Utilize SHIRA Risk Mapper tool (or approved Bureau alternative) to assess climate hazards and natural disaster risks for individual projects to help determine how to design projects and address risks.	Initiated 2024-2025, ongoing
All climate hazards, including extreme heat, extreme precipitation, flooding, sea level rise, and wildfire risk. Nationwide: specific risks vary by region.	Understand climate hazards and assessing exposure	**Review major investments for risk and resiliency measures through quarterly Capital Planning and Investment Control reviews**, to implement Department policy "Addressing Natural Hazards Risk for Real Property Assets."	2024-2027

Climate Hazard	Overarching Theme	Priority Action	Timeline for implementation (2024-2027)
All climate hazards, including extreme heat, extreme precipitation, flooding, sea level rise, and wildfire risk. Nationwide: specific risks vary by region.	Prioritize and scale adaptation	**Incorporate hazard resilience into individual projects by using design standards and building codes, such as the Federal Flood Risk Management Standard (FFRMS).** Use applicable and current design standards (exceeding standards where necessary based on professional judgment) and building codes in new construction and repair projects.	2024-2027
Impacts to building design and operations, and to employee/visitor health and wellness – nationwide.	Prioritize and scale adaptation	**Incorporate applicable sustainability and resiliency measures into all new construction and building modernizations and implement the Guiding Principles for Sustainable Federal Buildings at existing buildings greater than 25,000 gross square feet,** which include risk assessments and the incorporation of resilient design and operational adaptation strategies.	2024-2027. Bureau progress tracked annually through Sustainability Organizational Assessment.

Interior will make progress to address the exposure of its buildings to climate hazards through several strategies, including updating Department-level asset management policy and guidance to include best practices for resiliency and sustainability, incorporating climate hazards and natural disaster risk into decision support tools that staff can use to assess risk, and pursuing Bureau and agency-level efforts to stepdown policy and practices to address specific hazards.

Implement Department-Level Changes to Asset Management Policy

Departmental policy requires Bureaus and Offices to identify and avoid investments that are likely to be undermined by climate change impacts, such as investing in infrastructure likely to be adversely affected by repeated floods or inundation. The Department's policy, "Addressing Natural Hazards Risk for Real Property Assets" (DOI-AAAP-0026), outlines specific actions for Bureau asset managers to take such as conducting vulnerability assessments, incorporating resilient codes and standards, including the FFRMS and Standards of Seismic Safety for Existing Federally Owned and Leased Buildings, deploying NBS, and considering relocation and divestment in master planning activities. Department policy is updated to meet the requirements of the Disaster Resiliency Planning Act and the Office of Management and Budget's (OMB) Memo M-24-03.[59]

Addressing exposure to hazards is only one aspect of preparing the Department's building portfolio for a changing climate. Recently, a sub-working group under the Department's Sustainability Council created implementing guidance for incorporating resilient and sustainable measures into project design, addressing both new construction and retrofits. This guidance is intended to serve as a reference for Bureau sustainability managers, architects, and engineers who will play a major role in how Interior buildings function for the next generation. In addition to adaptation measures, building

electrification, deep energy retrofits, carbon-pollution free electricity, and net zero emissions building design are emphasized.

Major facility investments funded by appropriations are integrated into the Department's 5-year real property capital plan. Interior's Lifecycle Investment Planning Guidance, updated annually, describes Bureau responsibilities for creating the 5-year plan and requires Bureaus to incorporate all applicable climate adaptation and mitigation strategies, including sustainability components required by EO 14057, into projects. These projects are reviewed for compliance by Bureau Investment Review Boards and—in the case of projects $20 million and greater—by the Department. As individual projects move through the 5-year plan from programming to design to construction, they are reviewed as part of the Department's Capital Planning and Investment Control (CPIC) process. This oversight, which aligns with OMB's A-11 Capital Programming Guide, helps to ensure that opportunities to implement adaptive measures are not missed. Other programs, including the GAOA Legacy Restoration Fund, have developed selection criteria that consider climate resilient approaches.

During the coming years, the Department will work to improve the resilience of its buildings by evaluating site-specific vulnerabilities and updating construction and management standards in line with guidance laid out in DOI-AAAP-0026 and the Guiding Principles for Sustainable Federal Buildings. If tools such as SHIRA's Risk Mapper receive support to include climate hazards, guidance will be updated to incorporate its use and enable finer-scale evaluation of resilience across Department buildings (rather than exposure, which is reported in section 2B).

Incorporate Climate Hazards and Natural Disaster Risk into Decision-Support Tools

Management decisions, including relocation or divestment, are often made at the local site level. Vulnerability assessments are also often conducted at the local—or sometimes regional—level. To make climate-informed decisions, staff need tools and accessible information about the present and probable future scenarios.

The Department is investing in internal tools—led by USGS—to extend its use of future climate risk hazard information broadly through the SHIRA project. The SHIRA project's tools, which are freely available to all Department staff, identify risks to Interior real property and personnel both in real-time and in a series of forward-looking timeframes. As that development is supported, the Department will incorporate use of Risk Mapper (or of an approved alternative) into policy for Bureaus to screen major investments for climate and natural hazard risks and to demonstrate how project designs address these risks during the CPIC review process.

Examples of climate-informed project design could include the following:

- Elevating buildings that cannot be moved out of the floodplain.
- Sizing heating, ventilation, and air conditioning equipment for predicted future temperature extremes.
- Integrating NBS such as green roofs and bioswales.
- Using fire-resistant building materials, following building codes and standards to protect against fire risk, and designing defensible space around facilities in the Wildland Urban Interface.

In addition to its work on SHIRA's Risk Mapper, the Department is participating in interagency efforts to develop a Governmentwide decision support tool as part of the Federal FFRMS to help manage the exposure of Federal buildings to future floods. As with SHIRA, this tool reaches will inform Department vulnerability assessments as it reaches maturity.

Bureaus pursuing best practices to address climate hazards to buildings—and other facilities

Similar changes to Bureau-level policy are accompanying the Department-level changes described above. NPS, for example, released its NPS Facility Investment Strategy in October 2023, which includes requirements for proposed project investments to consider sustainability and climate resilience before they are presented for approval by the Investment Review Board. Subject matter experts within NPS, including its Climate Change Response Program, review projects to ensure that climate change vulnerabilities are addressed during project development, and a climate change and natural hazards checklist has been developed for project proponents to identify potential hazards and adapt plans to improve resiliency, including through relocation of key functions and potentially disinvestment in facilities.

Work like this helps Interior Bureaus manage more than buildings. It also guides planning and investment in facilities and structures that are central to their missions, from hiking trails and scenic viewpoints to levees and dams. Other examples of hazard-specific responses underway at the Bureau-level include the following:

- Applying results of climate change vulnerability assessments for coastal NPS units in FYs 2024-2026 to complete adaptation strategies for park infrastructure.
- The NPS National Capital Region is developing a dynamic flood risk assessment model in FYs 2023-2025 to address flash flooding risks to historic structures and cultural resources.
- The FWS is beginning to implement a Rapid Vulnerability and Risk Assessment Methodology for FWS-managed infrastructure.
- The BIA Tribal Climate Resilience Annual Awards Program Request for Proposals includes funding for implementation for relocation, managed retreat, or protect-in-place actions, climate adaptation planning, and implementation for climate adaptation strategies.
- Through its Climate Change Adaptation Strategy, BOR's Asset Management Division is including climate change in tools that support capital investment and repair decisions. Climate change impacts are also being incorporated into facility reliability ratings.
- The BOR is also working with water management partners to develop guidance on how to mainstream climate change into water and hydropower management.

2. Addressing Climate Risks Affecting Interior Employees

Table 8. Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Interior Employees.

Climate Hazard	Overarching Theme	Priority Actions	Timeline for implementation (2024-2027)
Heat Stress	Prioritize and scale adaptation	**Finalization of the National Integrated Heat Health Information System (NIHHIS) draft National Heat Strategic Plan**, followed by implementation.	2024
	Prioritize and scale adaptation	**Improve communication approaches** to raise awareness and adoption of best practices to reduce negative health effects of extreme heat.	2024
	Prioritize and scale adaptation	**Update contingency plans** to meet occupational health and safety and public health standards in response to changes in the frequency of extreme heat.	2024
Health Impacts from Wildfires	Understand climate hazards and assess exposure	**Work to understand the effects of smoke on the general public** as part of a 2024 Memorandum of Understanding (MOU) between the U.S. Department of Agriculture (USDA), Interior, U.S. Environmental Policy Agency (EPA), and Centers for Disease Control and Prevention (CDC).	2024-2027
	Understand climate hazards and assess exposure	**Invest in research and equipment**, in coordination with USDA and National Institute for Occupational Safety and Health (OSHA), to mitigate impacts to firefighter health and safety.	Initiated in 2024, ongoing.
	Prioritize and scale adaptation	**Adapt policies to promote best practices in fire management while protecting the wildland fire workforce**, building on recently started research and data collection initiated under the Dingell Act.	Initiated in 2024, ongoing.
	Understand climate hazards and assess exposure; Build capacity	**Work with EPA and public health agencies to increase staffing and expertise** to support work on fire emissions.	Initial staffing efforts are underway, with a response due to the Government Accountability Office (GAO) by Oct. 1, 2024.
Health and Safety Related to All Climate Hazards	Build Capacity	**Ensure adherence to occupational safety and health standards are enforced.**	Ongoing

Almost the entire Interior workforce will experience one or more impacts of climate change—from increases in extreme heat and extreme precipitation events to increased risk of wildfire—at mid-century and late-century under both emissions scenarios (section 2C).

The occupational hazards associated with these changes in climate present significant workforce-specific challenges for the Department. For some employees, risks due to heat stress, health impacts from wildfire, and extreme weather and natural disaster dangers can be mitigated through early warning systems, sheltering, and other emergency management best practices. However, the tasks and responsibilities of many Department employees require long periods of outdoor work—often strenuous in nature—that are not compatible with public health and occupational safety guidance and regulations during periods of extreme temperatures, wildfire, and extreme weather.

In addition to protecting the health and safety of more than 70,000 employees and more than 200,000 volunteers, Interior Bureaus, such as NPS, offer recreational and learning experiences for more than 300 million annual visitors. Adapting operations to climate change may affect visitor experiences and help the Department reduce one of the risks visitors may face while enjoying public lands and resources.

The Department's planned efforts to increase its adaptive capacity and the well-being of its employees are described below. These efforts complement the Department's obligations under OSHA and its policy on worker safety, which remain in effect and guide its work.

Better understand the risks to employees from climate hazards and natural disasters

Research on the human health and safety risks associated with climate change continues to advance, and the Department is active in working groups and other interagency efforts to understand these risks and identify best practices to create safe working environments and visitor conditions.

For example, the Department has an MOU with EPA, CDC, and USDA, to understand the effects of smoke on the general public and apply lessons to managing its lands and the safety of its visitors while increasing the use of prescribed fire. It is also working to implement the recommendations from GAO, published in a report on wildland fire and smoke emissions, to better coordinate with EPA and public health agencies and increase expertise, internally and with partners, on fire emissions.

Improve the adaptive capacity of the workforce

The Department will work to scale best practices to improve the adaptive capacity of its workforce, as many climate-related hazards are already having impacts on Interior employees and visitors.

Raising Awareness. One mechanism for expanding adaptation actions is by raising awareness. The Department is engaged in the development of the White House Heat Illness Strategic Plan, which will support more aligned, consistent, and coordinated messaging across the Nation to address extreme heat. In addition, with the increased incidence and risk of extreme heat conditions, the NPS

Public Risk Management Program has launched a heat safety campaign to provide safety messages and guidance for parks to better communicate risk to the public. Individual parks have also implemented messaging campaigns around heat illness prevention, including online warnings and information, wayside information, signs along trails, newspaper briefings upon entry to parks, and information provided at visitor centers.

Reducing Worker Risk. Because many employees serving in Interior Bureaus have jobs requiring them to be outdoors and potentially at risk for extreme heat, smoke, and other harmful exposures, adherence to occupational safety and health standards is imperative and enforced. This includes taking actions such as monitoring conditions, requiring and providing personal protective equipment, reducing exposures where possible (relocating or rescheduling work tasks to less hazardous areas or times of day), requiring or encouraging breaks, reducing levels of physical activity where possible, and making other accommodations for workers to perform their duties in ways that reduce exposure.[60] The Department is also acting on workforce recommendations delivered to Congress in the Wildland Fire Mitigation and Management Commission's final report in September 2023. In the near term, this includes investing in research and equipment to mitigate wildfire impacts to firefighter health and safety, taking steps to build and maintain a workforce with capacity to manage prescribed fire and wildfire, and adapting policies to promote basic smoke management practices to predict, reduce, and document impacts, communicate with communities, and enable interagency coordination. In addition, the Interagency Wildland Fire Air Quality Response Program uses air resource advisors with incident management teams to forecast smoke impacts and communicate with State, Tribal, and local public health agencies.

Protecting workers from the impacts of climate changes may require making decisions that reduce the ability to address the agency's mission critical functions—limiting employee outdoor engagement may impact provision of visitor services as well as resource protection activities such as maintenance activities, wildlife support and management work, and biological and/or wildlife research activities. The Department must consider these impacts carefully and prepare for these contingencies.

3. Addressing Climate Risks Affecting Interior-Managed Lands, Waters and Resources

Table 9. Prioritized Actions to Address Climate Hazard Exposures and Impacts Affecting Interior-Managed Lands and Waters.

Hazard/ Resource	Overarching Theme	Priority Action	Timeline for implementation (2024-2027)
All hazards and resources	Understand climate hazards and assess exposure	**Develop more comprehensive and actionable climate hazard information.** This includes improving data availability and projections for specific geographies (e.g., outside the contiguous United States) and additional climate hazards.	Ongoing
	Understand climate hazards and assess exposure	**Conduct vulnerability assessments**, engaging with Tribal Nations and Indigenous communities as appropriate, as part of the implementation of 523 DM 1 – Climate Change Policy.	Ongoing
Wildfire	Understand climate hazards and assess exposure	**Work through the Joint Fire Science Program to understand fire management approaches for ecological and air quality benefits.** Identify practices for prescribed fire and fire management based on insights from Western science and Indigenous Knowledge (IK).	Through 2024
Offshore Sand and Sediment Resources	Understand climate hazards and assess exposure	**Advance the National Offshore Sand Inventory initiative to improve our understanding and management of sediment resources on the U.S. OCS.** Data availability and accessibility will help to reduce response time in disaster recovery and facilitate long-term planning to strengthen the resilience of coastal communities and infrastructure as climate changes.	Ongoing
All hazards and resources	Prioritize and Scale Adaptation	**Develop guidance and training for landscape-scale conservation, NBS, and inclusion of IK**. Guidance on implementing these DM chapters will enable staff to adopt best practices as part of their adaptation and resilience efforts.	2024-2025
	Prioritize and Scale Adaptation	**Implement a landscape-level approach to restoration and resilience**. Building evidence through the Restoration and Resilience Framework and the Keystone Initiatives will support future work.	2025
Drought and Freshwater Resources	Prioritize and Scale Adaptation	**Implement the Bureaus' climate change adaptation strategies**. Strategies focus on increasing water management flexibility, enhancing climate adaptation planning, improving infrastructure resilience, identifying priority water needs, using scenario planning, working with permittees on range management, and expanding information sharing.	Ongoing
Invasive Species	Prioritize and Scale Adaptation	**Implement the Department's Invasive Species Strategic Plan**. Plan activities include reducing the risk of invasive species introduction by using best management practices, including during the response to and recovery from disasters, and	Ongoing

Hazard/ Resource	Overarching Theme	Priority Action	Timeline for implementation (2024-2027
		prioritizing strategic control and eradication efforts where success is likely and climate preparedness and resilience goals can be met.	
	Prioritize and Scale Adaptation	**Advance the National Early Detection and Rapid Response Framework.** This Keystone Initiative helps develop capacity, tools, and processes to find and eradicate invasive species before they become established.	Initiated in 2023, ongoing
All hazards and resources	Build Capacity	**Support jobs in restoration and resilience**. The American Climate Corps, and Indian Youth Service Corps, provide a pathway to careers with the Department and support current resilience work.	Ongoing
	Build Capacity	**Update guidance and resources for partnerships.** The Department's newly established Office of Partnerships will help Bureaus and Offices work with external organizations to pursue strategic priorities, including adaptation and resilience.	2025
	Build Capacity	**Implement Equity Action Plan.** Strategies in the Equity Action Plan promote partnership with communities with environmental justice concerns and strengthen capacity to support their climate adaptation and resilience efforts.	2024-2027
	Build Capacity	**Collaborate with White House offices, including the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders, and White House Council on Native American Affairs, to build capacity**. These offices are working to identify funding and capacity barriers, and help communities address them.	2024-2027
Invasive Species	Build Capacity	**Support regional and national networks to address invasive species.** This includes support for the Regional Invasive Species and Climate Change Management Networks.	Ongoing

The Department is the single largest land managing entity in the United States and is also responsible for the stewardship of large portions of the country's marine areas. The lands, waters, and associated natural and cultural resources that Interior stewards are projected to face substantial and varied hazards and stressors due to climate change. The Department also has significant commitments and responsibilities to Tribes, the Native Hawaiian community, and the U.S. territories and freely associated states that will be affected by climate change.

Adaptation and resilience on Interior-managed lands and waters requires several strategies, including the following:

- Improving our understanding of climate change impacts and the approaches that will increase resilience.

- Applying insights and best practices to make decisions that increase adaptation and resilience.
- Building capacity for adaptation and resilience within its workforce and with partners.

Improve understanding of climate change impacts and the approaches that will increase resilience of lands, waters, and associated natural and cultural resources.

Research capacity across the Department is already leveraged to advance understanding of climate change impacts and to translate that information to inform plans and actions. Major research programs—including the USGS Climate Adaptation Science Centers and other USGS centers, BOR's Research and Development Office and Water Resources Planning Office, and BOEM's Environmental Studies Program—work to understand climate change trends and potential impacts on the lands, waters, and resources the Department manages.

Yet gaps remain that limit the ability of the Department and its partners to plan for and adapt to climate change. Over the time period covered by this Plan, the Department will work to close data gaps and improve available data, assess vulnerabilities of the lands and waters it manages to climate change, and integrate climate change into its actions in line with updated Departmental policy.

Develop more comprehensive and actionable climate hazard information

There are several key data gaps that currently affect the ability of the Department to evaluate climate risks:

- **Data coverage outside the contiguous United States.** Many regions outside the contiguous United States (lower 48), have limited representation within current climate projections, which hinders the ability of Department staff and their partners and neighbors in Alaska, Hawaii, and the U.S. territories to evaluate climate risks. Many of these geographies are affected by data inequities for social and economic indicators as well. The Department has already taken steps to address the latter and ensure disadvantaged communities in the U.S. territories are able to access Federal resources.[61] The Department and its Bureaus will work through their research centers and with partners to ensure that all U.S. communities have relevant, informative climate projections as they adapt to climate change.
- **Data availability in offshore marine environments**. Bureaus with responsibilities in marine environments, such as BOEM and BSEE, have identified climate projections in offshore environments as an area of need for updating policy to plan and manage offshore energy operations safely. Relatedly, data on climate hazards (e.g., tropical storms) and stressors (e.g., marine heat effects on coral ecosystems) that affect marine, coastal, and island environments would be useful for management of Interior units and for communities. Closing these data gaps will support community and region-level climate adaptation planning and Departmental operations, including resilience efforts such as the National Offshore Sand Inventory.
- **Data gaps for specific climate hazards and stressors**. The impacts of climate change are complex, and the prevalence and intensity of hazards vary by location. The Department is already working to develop hazard data tailored to specific regions—for example, permafrost loss in Alaska as temperatures rise—and will work with field staff and partners

to research and develop useful projections related to drought, invasive species, and other hazards and stressors at relevant scales.

Conduct vulnerability assessments of lands and waters

The Department's updated Departmental Manual (DM) chapter 523 DM 1, "Climate Change Policy," (section 3B3) clarifies Departmental approaches to incorporating climate change into its planning and operations, including the use of vulnerability assessments to identify potential impacts of climate change on resources. These assessments are a key step toward making informed decisions, and several efforts across the Department provide examples of how the Department will conduct assessments and use them to prioritize actions during the lifespan of this Plan (see text box).

In the coming years, the Department and its Bureaus will extend the application of climate change vulnerability assessments to all its managed lands and waters, contingent on resources and capacity. These vulnerability assessments will enable prioritization of management actions. As appropriate, Bureaus will engage with Tribal Nations, the Native Hawaiian community, and U.S. territories when identifying resources and threats to consider in an assessment.

Progress toward assessing vulnerability across Interior

Climate change vulnerability assessments are an important tool for adaptation and resilience—bridging the knowledge gap between assessing exposure to climate hazards and stressors and planning and implementing actions to address them. In addition to assessing exposure, vulnerability assessments consider the sensitivity of a resource to a climate hazard, and the adaptive capacity of the resource. Some examples of Department efforts to extend vulnerability assessments are below.

- In late 2023, FWS published a Water Resource Inventory and Assessment[62] of 471 NWR units, over half of which identified at least one climate-related threat serious enough to potentially compromise their conservation mission. Work is ongoing at the regional and field office level to take specific actions where appropriate. For example, sea level rise and storm events are impacting Crocodile Lake NWR in the Florida Keys, depleting sandy areas needed for crocodile nesting habitat. The refuge is providing "built" sand mounds as habitat for crocodiles to protect the population.
- The NPS has developed the NPVuln project[63] to assess risks to parks in a management-relevant way and is using IRA funding to conduct vulnerability assessments in several regions, including evaluations of risk from sea level rise and flooding in the Northeastern United States, and wildfire in Alaska and the Western United States. The NPS is also working with the National Conference of State Historic Preservation Officers to develop protocols for conducting climate change vulnerability assessments for cultural resources, which is expected to be complete in 2026.
- The USGS has developed mapping tools to assess coastal marsh vulnerability that are used by Department Bureaus and other partners.
- The BOR is implementing the SECURE Water Act by using the best available science to assess climate change risks to water supplies in each major BOR basin, analyze potential impacts on water uses and services, and use those insights to develop mitigation strategies.

Apply insights and best practices to implement adaptation efforts.

The Department invests in a wide range of conservation and restoration actions every year across the lands and waters it stewards. It is also committed to a leadership role in whole-of-government efforts, including the America the Beautiful initiative (see text box) and work under the National Climate Resilience Framework to enhance resilience on lands and waters and achieve climate, equity, and biodiversity benefits.[64]

The Department will continue to make these contributions going forward. It also commits to equipping staff with guidance and tools that enable climate adaptation and resilience decisions and to supporting learning through implementation of new approaches—including landscape-scale approaches to management and the use of NBS—that will help improve outcomes for natural and cultural resources in the face of climate change and other stressors.

Develop policy guidance and other tools that enable adaptation decisions

Guidance and tools help staff translate insights from climate change research and vulnerability assessments into plans and action. The Department will work with Bureaus and Offices to update or develop appropriate policies, guidance, and decision support tools that enable better decisions.

At the Department level, work is underway to develop a range of relevant guidance—on the application of climate science to planning and decision making; seeking and incorporating IK; managing cultural and natural resources at the landscape-scale in both terrestrial and marine environments; and identifying co-benefits of NBS to inform planning and monitoring processes. These efforts help staff apply the best available science and knowledge to address climate risks. For more information, see section 3B3.

Guidance is also being developed at the Bureau and Office level to enable field staff to plan and implement projects and programs that promote adaptive capacity and resilience. Some examples include the following:

- Development of best practices guidance and tools by BOR to build climate resilience into river and ecosystem restoration activities.
- An agreement between FWS's Science Applications team and the NWRS to work together on landscape conservation planning, design, and implementation. The work integrates landscape-scale principles into NWRS Comprehensive Conservation Plans.
- Updates to both general Bureau guidance and the "Guidelines on Flood Adaptation for Rehabilitating Historic Buildings" by NPS to include adaptation methods from "The Secretary of the Interior's Standards for the Treatment of Historic Properties."

As guidance is being developed, the Department is supporting improvements in knowledge and technical capacity that enable adaptation. For example, the Department is working through the Joint Fire Science Program to identify fire management strategies that promote land health and reduce potential smoke emissions, using insights from Western science and IK.

As appropriate, the Department and its Bureaus will incorporate new research into guidance and tools for planning and decision-making. The SHIRA project includes data layers relevant to evaluating climate risks across the Department's lands and waters—including flooding, wildfire, and

sea level rise. As resources are available, other hazards, such as temperature and precipitation projections, will be evaluated for inclusion in SHIRA tools. Similarly, region-specific tools, such as the Sagebrush Conservation Design, will be supported as resources are available to help the Department and its partners plan investments in conservation and restoration.

Implement a landscape-scale approach to restoration and resilience

Since the release of the 2021 Climate Action Plan, the Department has received significant resources through BIL and IRA. The Department has leveraged funding from BIL and IRA to strategically amplify existing programs and implement new landscape-scale restoration efforts. In March 2023, the Department announced the Restoration and Resilience Framework, including nine keystone initiatives through which BIL and IRA investments could be coordinated to achieve greater landscape-scale impact. Implementation efforts included the following:

- Investing in priority projects for impact at scale in sagebrush, grasslands, and salt marsh ecosystems; advancing resilience and reducing hazards in Appalachia, salmon spawning grounds of Alaska, and the Klamath basin; working to halt the extinction of Hawaiian forest birds; and making substantial investments in proactive planning and actions for the National Seed Strategy and the National Early Detection and Rapid Response Framework for invasive species.
- Strategically directing funding from BIL, IRA, GAOA, and annual appropriations to efforts to improve resilience, such as greatly expanding the National Fish Passage Program which improves aquatic climate resilience and using BIL Ecosystem Restoration Program funding to institute NBS, such as beaver dam analogs to rewet wetlands and funding science and planning tools to identify recreational resources most at-risk.
- Coordinating efforts to establish shared learning questions for restoration and resilience and facilitate adaptive program management, as well as funding a project to develop a pilot restoration outcome monitoring framework, through the BIL Ecosystem Restoration Program, intended to build the Department's ability to use data and evidence to assess impact at the landscape scale and inform priorities.

Similar investment strategies have been coordinated at the Bureau level as well. The BLM, for example, announced 21 Restoration Landscapes in 2023, which serve as a tool to focus funding of restoration and resilience funding received through IRA for greater impact. In addition to strategically funding vulnerability assessments, the National Park Service is directing some of its resilience funding through IRA to projects that support forest resiliency in the Northeast, Midwest, and Southeast regions.

Identifying and applying lessons learned from these efforts to coordinate restoration and resilience investments and build evidence regarding the outcomes will improve the Department's present and future landscape-level, cross-Bureau initiatives. Moreover, this evaluation will lay the groundwork for implementing best practices in landscape-level resource management more comprehensively across the Department, in accordance with 604 DM 1 (section 3B3). Ultimately, this evaluation framework will enable the Department to better synergize work across Bureaus, programs, and regions, thereby maximizing outcomes for communities and ecosystems throughout the country and delivering a high return on investment. As such, much of this work is also relevant to the America the Beautiful Initiative (see text box).

Build capacity for adaptation internally and through partnerships.

Section 2 of this Plan provides high-level perspective on the scale of the challenges that climate change will present to Department-managed lands and waters, and they exceed the capability of a business-as-usual approach to getting work done on the ground. Working at scale will require capacity, and the Department will take steps to develop the workforce needed to adapt to climate change, and to strengthen its work with partners, including Tribes.

The Department's next steps for building a climate-literate workforce are discussed in section 3C. These broad steps cut across roles and responsibilities within the Department, including budget, procurement, and leadership positions. At the same time, the Department will also work to recruit the next generation of its workforce, including through the Indian Youth Service Corps—part of the American Climate Corps initiative—and the various fellowship and training programs managed by Bureaus.

Partnerships are another key opportunity area for generating and deploying resources toward adaptation. The Department currently engages with a wide range of partners, including Federal and State agencies, nongovernmental organizations, and philanthropic entities to plan, finance, and implement projects. Over the course of this Plan, the Department will enhance this work, including through the following actions:

- Partnering with other Federal agencies on efforts that advance conservation and climate resilience, including its work with USDA and the Department of Defense on the Sentinel Landscapes program, as it implements its landscape-level approach to resource management.
- Supporting Department and Bureau/Office ability to enter partnerships. The Department's newly established Office of Partnerships will develop guidance and best practices for working with external partners to achieve their missions. This could include adaptation and resilience actions, such as NBS.
- Supporting national and regional networks that address climate hazards such as the Regional Invasive Species and Climate Change Management Networks, which works to prevent the introduction, establishment, and spread of invasive species and the National Fish, Wildlife, and Plants Climate Adaptation Network.
- Partnering with the National Conference of State Historic Preservation Officers through the NPS to significantly advance both internal and external tools, resources, and guidance related to several cultural resources-specific initiatives, including improving compliance pathways for adaptation projects, developing menus of adaptation strategies, and creating minimum necessary benchmarks for inventory and monitoring.

Enabling partnerships is also an avenue for the Department to advance environmental justice and fulfill its trust responsibilities. The Department will continue to follow direction in Joint Secretarial Order 3403, entitled "Joint Secretarial Order on Fulfilling the Trust Responsibility to Indian Tribes in the Stewardship of Federal Lands and Waters," including development of collaborative and cooperative agreements with Tribes. For example, BLM provided additional guidance to its staff through Permanent Instruction Memorandum 2022-011[65] to help identify opportunities for Tribes to shape the direction of BLM's land management activities and has developed State-level plans to build relationships and collaborative and formal co-stewardship opportunities.

The Department will also work to ensure potential partners have the capacity and opportunities they need to work toward their climate adaptation and resilience priorities. Interior's 2024 Equity Action Plan outlines several strategies to achieve this, including through advancing equity through contracting practices and ensuring communities with environmental justice concerns benefit from Department programs (sections 3B3 and 3B5). In addition, the Department will collaborate with White House offices such as the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders, and White House Council on Native American Affairs to build capacity for disadvantaged communities to better compete for grants and cooperative agreements.

Advancing the America the Beautiful Initiative

This Plan's summary of the myriad threats that will affect lands and waters managed by the Department—and the ecosystems and cultural resources they contain—highlight the need for actions commensurate with the scale of the challenge. The America the Beautiful initiative is an acknowledgement of that need, and an acknowledgement of the value of locally led and collaborative conservation.

The Department's contributions to America the Beautiful are reflected in the initiative's annual report, but several actions are worth noting here as examples that advance climate adaptation and resilience.

- **New tools to support conservation and restoration actions that improve adaptation and resilience.** The Department partnered with USDA, the Department of Commerce's NOAA, and CEQ to launch conservation.gov in 2024. This website provides a clearinghouse for the public to find opportunities for conservation funding and partnerships. It also hosts the American Conservation and Stewardship Atlas, a webtool that helps document conservation and restoration work across the United States.
- **Designations on public lands**, including the Avi Kwa Ame National Monument in Nevada and Baaj Nwaavjo I'tah Kukveni – Ancestral Footprints of the Grand Canyon National Monument. The proclamation for Avi Kwa Ame calls for BLM and NPS to manage the monument in partnership with several Tribes through a co-stewardship agreement. This will help ensure that cultural resources important to these Tribes are considered in future climate adaptation planning for these units.
- **Establishment of new conservation areas**, including the Paint Rock River NWR in Tennessee, which will help connect habitats so wildlife can respond to climate change.
- **Resources for locally led conservation,** including through the America the Beautiful Challenge grants and the America the Beautiful Freshwater Challenge.

3B. Climate-Resilient Operations

Sections 3B1-5 provide an overview of Department progress toward incorporating climate adaptation and resilience into its operations, including by accounting for climate risk in planning and decision making (section 3B1), incorporating climate risk assessments into budgeting (section 3B2), updating and implementing Department policies and programs (section 3B3), identifying key supply chains and making them more resilient (section 3B4), and incorporating adaptation and resilience into grants, loans, and agreements with external parties (section 3B5).

1. Accounting for Climate Risk in Planning and Decision Making

Department Bureaus and Offices have varied missions and responsibilities (section 2A). As a result, the incorporation of climate risk into planning and decision making varies across those Bureaus and Offices. Updates to the DM make climate change adaptation Department policy, and Bureaus and Offices will work to ensure their policy and guidance integrate adaptation into their planning and decision making given their missions and authorities.

Several Bureaus with resource management responsibilities have well-developed guiding documents to help staff apply risk assessments into plans and decisions. The NPS has a suite of policy guidance (see appendix D) that lays out processes for its units to incorporate vulnerability assessments into park planning and decisions, and both NPS and USGS use climate risk measures as part of their decision frameworks for capital investments. The BOR coordinates basin studies—exercises with stakeholders to assess water supply and demand into the future—as a strategy for identifying potential water shortfalls and approaches to address them. The BOR is also developing guidance to apply climate change information into its decision making, which is expected to be released in 2024.

In other Bureaus, the application of climate risk occurs for specific programs. The FWS uses risk assessments in its Ecological Services program, management of the NWRS and assessing invasive species risk in the Fish and Aquatic Conservation program. Similarly, BIA uses risk registers and other risk management approaches for its Safety of Dams and Tribal Climate Resilience programs.

For some Bureaus establishing the process for incorporating climate risk into planning and decision making is underway. While BOEM considers climate change in its National Environmental Policy Act (NEPA) documents, as appropriate, BSEE's actions have to-date not necessitated climate risk assessments in its work. As information on climate change impacts to the safety and performance of offshore operations improves, BSEE will update its procedures, as applicable. The OSMRE does not currently incorporate climate risk into its decision making but intends to revisit its policies as Department implementation of NBS and other adaptation and resilience policies advances.

In late 2023, Interior published several new DM chapters that provide direction on considering climate change in Department decisions (section 3B3). In addition to 523 DM 1, which sets Department policy on climate change adaptation, other chapters set policy on tools and approaches to use the best available science and practice to make informed decisions and increase adaptation

and resilience. They provide a standard for incorporating climate risk across the Department and complement the Bureau efforts to incorporate climate risk into their work. Additional detail on Bureau-level incorporation of climate risk into plans and decisions is included in appendix D.

2. Incorporating Climate Risk Assessment into Budget Planning

Responses to the risks of climate change are incorporated into budgeting for the Department's programs primarily through field-level identification of current and future needs. For existing programs, resource needs to address climate risks are identified during planning (e.g., incorporation of insights from vulnerability assessments), or in response to observed changes on the ground. Additionally, programs have been established to specifically address climate change impacts.

The Department will prioritize available resources to address climate risk through formulation of the Interior budget and through enterprise risk management. Interior budget formulation will incorporate policy and on-the-ground information using bottom-up and top-down processes to make climate-smart, resilient decisions.

Interior's program staff are leaders in evaluating climate risk and developing and deploying climate adaptation tools and strategies to inform planning and budgeting decisions (section 3A1 and appendix D for summaries). Field units within Bureaus and Offices evaluate climate risk for individual projects and mission-delivery responsibilities, which includes the effects of climate change on their mission-critical assets, natural resources, surrounding communities, and the health and safety of the public and employees. This guides their budgeting for specific risk mitigation, adaptation, and resiliency actions.

Interior has promulgated guidance to Bureaus and Offices to incorporate climate risk into project planning and budgeting (section 3B3 below). Implementing this guidance will help expand the application of climate science to decisions, use of vulnerability assessments, and development of other tools and strategies that inform budgeting to make the Department more resilient and help avoid maladaptive actions.

For example, Interior owns more than 41,800 buildings and 80,000 structures. Climate risks can be significant and varied across this portfolio of assets, many of which are situated in environments subject to temperature and precipitation extremes. This portfolio includes buildings and structures that are historic or iconic for the United States, which cannot easily be adapted or relocated to respond to changing climate. Updated guidance and tools from the Department and its Bureaus (section 3A1) will help identify opportunities to increase resilience among existing structures and avoid identified risks in the siting and design of new facilities.

The NBS provide another example of how this works. After Hurricane Sandy decimated the Mid-Atlantic coast in 2012, many wildlife refuges along the Atlantic Flyway lost critical feeding wetlands and nesting habitat to storm surge. With both supplemental and regular appropriations, Interior invested in dozens of projects that helped communities prepare for and protect against increasingly frequent intense storms. At Prime Hook NWR, land managers and partners at the refuge executed a

plan that let natural patterns lead in restoring the marsh and correcting the site's water flow, making the refuge and the surrounding communities safer and more resilient. This sort of project, based on augmenting and enabling natural processes, has become a model for restoration projects nationwide. Project budgets are built from these approaches to ensure they include the costs of climate risk mitigation.

Some programs have an explicit mandate to focus on climate risks through climate adaptation and resilience. The BIA's Branch of Tribal Climate Resilience provides funding through its Tribal Climate Resilience Annual Awards to Tribal Nations to mitigate climate risks and facilitate resilience activities. These historically underserved and underrepresented communities exist at some of the places most vulnerable to climate change. Incorporating climate risk mitigation into the budget is critical to helping these communities remain on their homelands, delivering not just transformational assistance in the face of climate change, but also advancing environmental justice and upholding the Federal Government's trust responsibilities.

Interior has made substantial progress in evaluating climate risk to specific programs and sharpened understanding of the largest impacts of climate change on the mission requirements. This includes pursuing many pathways to decarbonize Interior assets and using a broad portfolio of research, planning, and deployment support activities to facilitate meeting the President's goal of building a clean energy economy. Through Interior's budget development process, at each stage, we identify the benefits of carbon reduction investments, conservation, and hazard mitigation measures to deliver adaptation and resilience, and scientific pursuits that proactively address climate risks.

3. Incorporating Climate Risk into Policy and Programs

Department policy provides a mechanism for incorporating climate risks into agency actions, and for aligning work on conservation, equity, and climate change mitigation in ways that also produce adaptation and resilience benefits. Since the publication of the 2021 Climate Action Plan, the Department has updated policy to improve adaptive capacity and resilience, incorporate NBS, and better engage with Tribal Nations, the Native Hawaiian community, and insular area communities. At the same time, its climate mitigation policies have been updated in ways that integrate adaptation principles.

Climate Adaptation and Resilience

The Department completed a major series of policy updates in 2023 that enable increased resilience and adaptive capacity across its Bureaus and Offices. Six DM chapters were published that lay out the Department's approach to considering climate change and climate science, utilizing adaptive management and NBS, applying landscape-level approaches to resource management in both terrestrial and marine environments, and elevating IK, and a seventh chapter is in review at the time of publication of this Plan. The full list of DM chapters follows:

- **301 DM 7, Indigenous Knowledge** requires the promotion and inclusion of IK in Departmental decision-making and developing lasting relationships with holders of IK. ***(New chapter)***
- **522 DM 1, Adaptive Management Implementation Policy** emphasizes increasing need for Adaptive Management to increase the effectiveness of resource management under uncertainty. ***(Updated chapter)***
- **523 DM 1, Climate Change Policy** emphasizes that consideration of changing climate is the default for planning and decision making to support adaptation and resilience. ***(Updated chapter)***
- **526 DM 1, Applying Climate Change Science** reinforces the need to apply high-quality climate information and consider climate uncertainty in resource management planning and decisions. ***(Updated chapter)***
- **600 DM 7, Nature-based Solutions** provides overarching guidance for consistent NBS delivery and implementation principles. ***(New chapter)***
- **604 DM 1, Implementing Landscape-Level Approaches to Resource Management** provides guidance on implementing landscape-level approaches to natural and cultural resource management. ***(Updated chapter)***
- **604 DM 3, Landscape-level Mitigation** mitigates adverse impacts to trust resources in the context of landscape-level considerations and processes. ***(Under review in early 2024)***

The Department has established several working groups called for in the DM chapters to develop tools, guidance, and metrics. Organized through the Coordination Program on Resilience and Environment, which is housed in the Office of the Secretary, the working groups have been rostered and have developed workplans. They are now developing guidance, training resources, and other products and are working with the Office of Planning and Performance Management to develop metrics to evaluate their integration into and impact on Department actions.

As part of their workplans, the working groups are updating several key policies and guidance documents. These include the following:

- A handbook and training in implementing and including IK in Departmental actions and scientific research.
- Technical guidance on the application of climate science to Department decisions,
- Updates to the Department's adaptive management technical guidance.
- A Department NBS Roadmap (*completed; see below*).
- Guidance on implementing landscape level approaches to conservation (section 3A3).

These updates are intended to be complete by the end of calendar year 2025. At the same time, Bureaus have been updating their own policies, as needed, to align with these Department-level changes.

Nature-based Solutions

The DM chapter (600 DM 7) on NBS is a first-of-its-kind policy for the Department. The Department also developed the recently published Interior NBS Roadmap as guidance for implementing the chapter.[66] The Department has formally chartered the NBS Working Group (NBSWG), which is working to refine and revise its FY 24/25 Work Plan. The working group is currently finalizing recommendations on funding and, partnerships and on evaluation, monitoring, and metrics.

The Department has set up an internal SharePoint site with resources for permitting, funding and partnerships, relevant NBS laws and policies, and additional tools and resources. The Department is also investing in the development of an online, searchable version of the Department's NBS Roadmap, a suite of Interior NBS Case Studies, an NBS gap analysis, and a metrics framework for assessing the human and environmental co-benefits of NBS implementation, produced in conjunction with partners at Duke University. This is expected to be complete by the end of FY 2025.

As those online resources mature, Bureaus will work internally and across the Department and agencies to scale best practices, overcome barriers to NBS adoption, and build capacity. For example, FWS has already hired a dedicated Nature-based Resiliency Coordinator. The Green Infrastructure Federal Collaborative—an interagency group—is developing guidance on best practices for NBS permitting. The Department's NBSWG will be developing reporting guidance to ensure Department level success in implementing 600 DM 7 as a biennial report, starting in 2025, and evidence building activities for metrics and monitoring.

Environmental Justice

In October 2022, the Department convened the Environmental Justice Steering Committee (EJSC) to evaluate opportunities to advance environmental justice across Interior programs and activities. The Department's EJSC reports to the Department's Climate Task Force and is chaired by the Department's Environmental Justice Officer. The Department's Environmental Justice Officer is also its Climate Adaptation Official and has reviewed this plan for consistency with the Department's environmental justice priorities and implementation.

In April 2023, the EJSC developed a work plan that includes updating the Department's Environmental Justice Strategic Plan and Environmental Justice Implementation Policy, providing Departmental environmental justice, incorporating environmental justice in employee performance evaluations, developing a stakeholder engagement toolkit, and developing barriers analysis around grants and technical assistance, among others.

The Department included environmental justice and the evaluation of IK in the recently approved climate related polices – Nature-based Solutions, Adaptive Management, Climate Change, Climate Change Science, and Landscape-level Approaches. For example, in the NBS Chapter, the Department focuses on equity and environmental justice through the following actions:

- Implementing NBS in a manner that does not exclude or discriminate, nor has adverse disproportionate impacts to, communities with environmental justice concerns, or Tribal Nations.
- Incorporating equity and environmental justice principles in the NBS feasibility, siting, design, and delivery process by meaningfully engaging with relevant communities, whenever possible.
- Encouraging implementation of NBS in communities experiencing or at risk of experiencing disproportionate and adverse environmental and climate-change impacts.

Tribal Nations

As the agency responsible for fulfilling government-to-government responsibilities with all federally recognized Tribes, and for working with the Native Hawaiian community, the Department has had numerous consultations and meetings related to climate adaptation and resilience. A full list of past consultations and meeting are available on BIA and Department websites, but several are worth calling out given their connection to climate change adaptation and resilience. They include the following:

- Implementation of Joint Secretarial Order 3403 on collaboration and co-stewardship.
- An interagency MOU to protect and increase access to Indigenous sacred sites.
- Implementation of Tribal and Native Hawaiian climate resilience programs.

In December 2023, the Department announced a policy to respect, and equitably promote the inclusion of, IK in the Department's decision making, program implementation, and other activities. The evaluation of IK in climate policy and activities advances environmental justice through meaningfully engaging with and evaluating impacts on Indigenous people.

Climate Mitigation Policies and Adaptation Co-Benefits

The Department has been deliberate in integrating climate change adaptation into its climate change mitigation actions, as have its Bureaus. In addition to the policy updates above, the Department is taking steps to promote renewable energy development that incorporates climate change adaptation to better inform decision making.

Some examples of mitigation policies that integrate adaptation principles and/or identify co-benefits include the following:

- The BLM updated land management planning and regulations to promote renewable energy, including wind and solar energy development. In line with this effort, BLM has signed an MOU with FWS that incorporates conservation recommendations into its 11-State programmatic Environmental Impact Statement on solar energy development on public lands. This helps ensure that development aligns with identified climate adaptation needs for species.

- The BOR has updated its climate change adaptation-associated guidance, which supports management of water resources.
- The BOEM has contributed to the Ocean Climate Action Plan and the Ocean Justice Strategy, which incorporate adaptation and equity into climate mitigation priorities, including the deployment of offshore wind projects and development of an offshore carbon sequestration program.
- The Department has incorporated adaptation principles into its 5-year lifecycle investment plan. As discussed in section 3A, prioritization of major real property investments conforms to the guidance and ranking criteria within the Interior's Lifecycle Investment Planning Guidance (LIPG). The LIPG emphasizes a lifecycle cost-effectiveness approach, and measures such as energy efficiency, sustainability, and resilient design are required where applicable and strongly encouraged in all projects. Incorporating sustainable and resilient design into projects saves taxpayer money over the life of the investment and improves mission delivery in the event of natural hazards and climate impacts.

4. Climate-Smart Supply Chains and Procurement

The Department has conducted a thorough assessment of climate hazard risks associated with its critical supplies and services. Utilizing the GSA Framework for Managing Climate Risks to Federal Agency Supply Chains, the Department has systematically evaluated five critical supplies or services, employing a risk management approach to address the challenges posed by a changing climate. These five areas include data centers, construction materials, electric fleet vehicles, emergency management services, and communications infrastructure.

In alignment with the Department's commitment to climate resilience, a comprehensive policy has been enacted, compelling all Bureaus and Offices to integrate sustainability and resilience principles into various aspects of agency operations. This encompasses real and personal property management, fleet and energy management, acquisition, solid waste management, and capital planning.

To better identify potential risks related to climate, the Department included the Associate Director for Asset Management in the Acquisition Program Advisory Council (APAC) Review of all major acquisitions involving Federal facilities or infrastructure, with a total value of $50 million or greater. The APAC includes a presentation of all known acquisition risks. The Department has also added a sustainability section to its Acquisition Toolkit, which shares resources for contracting officers such as the GSA Federal Contractor Climate Action Scorecard, EPA's Significant New Alternatives Policy (SNAP) Program, and the Federal Buy Clean Initiative.

Recognizing the evolving climate landscape, the Department is currently in the process of revising its Incident Response Business Management Handbook. This revision aims to enhance preparedness and procurement process for extreme weather events and climate change impacts such as wildfires, floods, and storms. The improved guide will comprehensively address the spectrum of climate-related events, ensuring readiness and resilience in the face of changing environmental conditions.

While the Department has identified five supply chains or services that are most at-risk to potential disruption due to acute weather events or the effects of long-term climate change, it is important to note that specific goals and a formalized plan to assess progress are currently under development. The Department is actively working on formulating precise goals and an effective monitoring framework to track and evaluate advancements in climate resilience strategies for critical supplies and services. This ongoing process underscores the Department's commitment to continuous improvement and proactive management in the face of climate challenges. As the Department moves forward, Interior is monitoring the FAR guidance in this area to influence the formulation of our precise goals. Table 10 below outlines priority actions.

Table 10. Summary of Department Progress toward Addressing Risks to Critical Supplies and Services Identified in 2021 CAP.

At Risk Supplies/Services	Actions to Address Hazards	Progress Towards Addressing Hazards
Data Centers (Flooding, wildfire, other extreme weather cam damage data centers)	Partner with the Office of the Chief Information Officer (OCIO) to ensure risks are handled in accordance with the Department's Security Controls Standard and the NIST 800-53 guidance/guidelines for Data Centers.	The OCIO and the Office of Acquisition and Property Management (PAM) have jointly issued the Department's Information and Communications technology Supply Chain Risk Management (SCRM) Strategy. In major acquisitions, the Contracting Officer works to identify the risk items and mitigation strategies in the Acquisition Program Advisory Council. Both the Senior Procurement Executive and the Chief Information Officer sit on this Council.
Emergency Management Services (Flooding, wildfire, other extreme weather can increase demand for services)	Ensure acquisition workforce has access to adequate tools and training for emergency acquisition.	The Acquisition Management Partnership hosted the first emergency management sprint to discuss needed tools for acquisition workforce for effective emergency management operations. The collaboration included acquisition representation from all Bureaus, Department Incident Response Acquisition SMEs, and the Office of the Solicitor. The sprint narrowed down existing resources and tools we can provide to the acquisition workforce and identified necessary policy development actions. PAM also established a landing page and links for emergency acquisition tools for the acquisition workforce. Shared best tools and practices among Bureaus. PAM hosted an acquisition-focused town hall to review all emergency acquisition resources to help the acquisition workforce effectively tackle climate concerns. This resulted in connections with the Office of Emergency Management and Federal Emergency Management Agency (FEMA) to prepare training best practices for effective emergency management. In addition, PAM collaborated with all the Bureaus and the Office of Emergency Management (OEM) to develop a Draft Department of the Interior Incident Response Business Management Handbook to ensure this handbook would be a resource for the acquisition workforce.

At Risk Supplies/Services	Actions to Address Hazards	Progress Towards Addressing Hazards
Construction (Multiple supply chain exposures to climate hazards)	Updated guidance on acquiring construction materials.	In major construction acquisitions, the Contracting Officer identifies supply chain risk areas and mitigation strategies to the Acquisition Program Advisory Council. We have also updated our economic price adjustment guidance for use when appropriate to help with supply chain issues on construction materials. The USGS is pursuing complementary work. The USGS Earth Mapping Resources Initiative is using disaster supplemental funding to collect foundational data to identify potential construction resources in Florida and Puerto Rico following recent hurricanes. Understanding sources of construction materials – particularly sand, gravel, stone, rock, and cement –will strengthen supply chains for these materials.
Communications Infrastructure (Operations are vulnerable to extreme weather events)	Ensure effective acquisition and implementation of resilient modern connectivity communications and IT solutions for real time distribution of information during emergency management events.	Progress has not yet been made.

5. Climate Informed Funding to External Parties

Department Bureaus and Offices offer a wide range of financial assistance to support climate adaptation and resilience of communities, ecosystems, and infrastructure. In FY 2023, the Department managed more than 90 financial assistance programs with direct relevance to climate adaptation and resilience. In total, these programs provided more than $4.8 billion in Federal assistance in FY 2023.

Several established financial assistance programs have criteria to incentivize projects and activities that promote climate adaptation and resilience (see text box). Some of these programs were bolstered by funding made available by BIL and IRA. In addition, BIL and IRA funding supported several additional financial assistance activities/programs which consider climate change criteria. These include the following:

- America the Beautiful Challenge Grants (Interior contributed to this National Fish and Wildlife Federation-administered program).
- Restoration and Resilience (NPS).
- Refuge System Resiliency (FWS).
- Conservation, Resilience, and Ecosystem Restoration (BLM).
- Climate Change Technical Assistance for Territories (Office of Insular Affairs).
- Community-Driven Relocation Initiative and Demonstration Projects (BIA).
- Kapapahuliau Native Hawaiian Climate Resilience (Office of Native Hawaiian Relations).

The Department will pursue agencywide steps to encourage climate-adapted and resilient investments through its financial mechanisms (i.e., grants, cooperative agreements, loans, technical assistance, contracts, and awards), as appropriate. This will be accomplished by taking the following actions:

- Identifying financial assistance programs where the outcomes (e.g., facility development, ecological restoration, site cleanups) are sensitive to climate change.
- Including a requirement for evaluation of climate risk and/or consideration of climate adaptation and resilience in funding announcements, as appropriate and consistent with existing law.
- Factoring climate change considerations into the evaluation process for discretionary grants and awards.

As the Department takes steps to better integrate climate adaptation and resilience considerations into its financial assistance programs, it is also working to ensure that historically marginalized communities have greater input on and receive enhanced benefits from the financial assistance that the agency provides to support climate adaptation and resilience though efforts such as the following:

- **Justice40 Initiative.** Many of these programs promote climate adaptation and resilience, while also helping to advance environmental justice because they are covered programs within the Justice40 Initiative, which sets a goal that 40 percent of the overall benefits of certain Federal climate and other investments flow to disadvantaged communities that are

marginalized by underinvestment and overburdened by pollution.[67] Consistent with the Memorandum 23-09[68], the Department uses the Climate and Economic Justice Screening Tool (CEJST) to assist in identifying disadvantaged communities for the Justice40 Initiative and programs where a statute directs resources to disadvantaged communities, to the maximum extent possible and permitted by law.

- **Equity Action Plan.** In early 2024, the Department released its updated Equity Action Plan,[69] which included an analysis of the barriers faced by Tribes when accessing Interior's discretionary grants. Many of the barriers that Tribes reported have also been highlighted as issues for other communities with environmental justice concerns. The Department is working to incorporate environmental justice considerations into policies and program designs and expand outreach to communities with environmental justice concerns to increase the proportion of the benefits of the Department's Justice40 Initiative covered programs that reach disadvantaged communities.
- **Tribal Climate Resilience Liaison Program.** The BIA Regional Tribal Climate Resilience Liaison Program is a model Federal program for effective coordination for climate resilience executed in partnership with and under the leadership of inter-Tribal organizations[70] The resource managers established through the program are a multiregional support network that helps Tribal Nations and Alaska Native villages incorporate climate considerations into planning and decision making. They serve as extension agents facilitating research, linking Tribal needs to available resources and coordinating trainings, workshops, forums and exchanges, including incorporating climate science into adaptation planning efforts through resources available through the Department's Climate Adaptation Science Centers.
- **Territorial Climate and Infrastructure Workshop and Insular Area Ecosystem Restoration funding**. The Office of Insular Affairs has held two workshops with over 350 local, Federal, and territorial representatives to discuss territorial climate and infrastructure needs as well as agency resources and technical assistance. Topics ranged from energy and broadband to invasive species and NBS, and enabled territories to pursue funding, including $12 million for climate change adaptation and resilience and $4 million for ecosystem restoration available through BIL.
- **Kapapahuliau Climate Resilience Program.** In November 2023, the Office of Native Hawaiian Relations announced a $20 million climate resilience initiative that is funded by the IRA.[71] The program reflects ongoing engagement with the Native Hawaiian Community to identify strategies to cope with and adapt to climate change while maintaining community identity and integrity.

As the Department implements this Plan, it will take steps to address lessons learned since the 2021 Climate Action Plan was released, as well as recommendations provided by the WHEJAC on climate planning, preparedness, response, and recovery. This includes the development of goals and timelines for climate resilience funding to Tribal communities provided through BIL.

The wide breadth of funding programs managed by Interior

Below is a non-exhaustive list of programs managed by the Department that support climate adaptation and resilience.

- Small Surface Water and Groundwater Storage Projects (BOR)
- Snow Water Supply Forecasting (BOR)
- Water Recycling and Desalination Construction Programs (BOR)
- WaterSMART (Sustain and Manage America's Resources for Tomorrow) (BOR)
- Cooperative Watershed Management (BOR)
- Applied Science Grants (BOR)
- SECURE Water Act Research Agreements (BOR)
- Aquatic Ecosystem Restoration Program (BOR)
- Emergency Supplemental Historic Preservation Fund (also known as Disaster Recovery Grants) (NPS)
- Recreation and Visitor Services cooperative agreements and grants (BLM)
- National Landscape Conservation System cooperative agreements and grants (BLM)
- National and Regional Climate Adaptation Science Centers cooperative agreements and grants (USGS)
- Tribal Climate Resilience (BIA)

3C. Building a Climate Informed Workforce

In the 2021 Climate Action Plan guidance, agencies were asked to describe the priority offices and management with the most critical need for climate literacy training, and how the agency provides climate literacy training. Agencies were also requested to provide an estimate of the timeline and any measures for indicating annual progress and success.

The table and narrative below articulate progress on the Department's agencywide climate adaptation training initiatives, including development of new training and efforts to extend training to the Senior Executive Service as well as acquisition, budget, and planning staff.

Table 11. Tracking Department Progress on Training and Building Capacity for a Climate-Informed Workforce

Agency Climate Training Efforts	Percent of the agency's Federal staff that have taken a 60+ minute introductory climate training course (e.g., Climate 101).	1%
	Percent of the agency's senior leadership (e.g., Secretary, Deputy Secretary, SES members, Directors, branch chiefs, etc.) that have completed climate adaptation training.	<19%[72]
	Percent of budget officials that have received climate adaptation related training.	0.2%
	Percent of acquisition officials that have received climate adaptation related training.	0.2%
Agency Capacity	Number of full-time Federal staff (FTE) across the agency that have tasks relevant to climate adaptation in their job description.	No data are available on the number of Federal or contracting staff with tasks relevant to climate adaptation in their job description. However, 86 percent of respondents to a Departmentwide needs assessment survey agree that climate change "will have an impact on my work."

Following the release of the 2021 Climate Action Plan, Interior established a Climate Training Working Group (CTWG) to plan and coordinate climate training across the Department. The CTWG developed a detailed 3-year workplan to improve the availability of climate training resources to staff across the Department through a wide range of activities. Some of these activities include the following:

- Establishing agreements among Interior Bureaus to improve access to training for employees of other Bureaus and Offices.
- Creating a one-hour basic climate training, accessible to all Interior employees, explaining the basics of climate science and how it affects Interior's mission.
- Developing an inventory of climate trainings offered at Interior to make it easier for interested staff to find them.
- Assembling new communications tools, such as a Departmentwide intranet site and email lists, to publicize climate training and other climate learning resources.
- Developing climate-related competencies for use in employee performance plans.

Since the CTWG was established in 2021, the working group and its partners across Interior Bureaus and Offices have made progress in a number of areas. Accomplishments thus far include the following:

- A full-day "Climate 101" training session has been developed and is offered annually to Senior Executive Service candidates as part of the Candidate Development Program (CDP).
- A 2023 needs assessment survey of Interior employees to gather data on their needs and preferences for climate training, gathering over 2,000 responses (3 percent of Interior employees).
- Performance criteria encouraging climate training and the use of climate considerations in management decisions was developed for Senior Executive Service employees and will be incorporated into their performance plans.
- An initial inventory of over 70 climate trainings was assembled and made available to all Interior employees on an internal SharePoint site.
- A set of training metrics and a survey instrument for tracking these metrics have been developed for assessing the effectiveness of climate trainings.

In 2024, the CTWG will complete development of a Basic Climate Training module accessible to all Department staff and begin exploring applied trainings for specific topics and job series. The CTWG will also work to establish inter-Bureau agreements to share training, develop an internal communications strategy to improve awareness of climate literacy resources, and work to expand use and awareness of the products already developed, such as the metrics survey instrument and the training inventory.

As of 2024, the Department is in the early stages of implementing its efforts to expand climate training and build a climate literate workforce. Because many of these efforts are preliminary, only limited data are available to estimate their early effects on climate literacy at Interior generally. Most of percentages provided in the table above—those reporting employees who have taken an introductory climate course, budget employees who have taken an adaptation course, and acquisition employees who have taken an adaptation course—are based on the completion records of nine different climate training courses offered through Interior's online learning management system, DOI Talent.[73] While these data are the best available primary data on climate training completion, they do not include trainings for which records were not available in DOI Talent, such as the

region-specific Climate 101 trainings through the USGS Climate Adaptation Science Center network, or in-person courses through universities or other agencies.

Data from DOI Talent are complemented by responses from the December 2023 needs assessment survey, which asked respondents whether they had taken a 1-hour basic climate training course or a training on climate adaptation. Of the 2,099 respondents (approximately 3 percent of Interior's workforce), 1 percent reported having taken a one-hour basic training course. Additionally, 19 percent of senior leaders, 8 percent of budget staff and 4 percent of acquisitions staff reported having taken a climate adaptation course. However, participation in the survey was voluntary, and results may reflect relatively higher response rates by employees with interest in climate-related issues.

SUMMARY OF PRIORITY ACTIONS

Section 3A. Addressing Climate Risks and Hazards

Section	Theme	Description of Action	Timeline	Indicators for success
Buildings (Section 3A1)	Understand climate hazards and assessing exposure	Incorporate natural disaster resilience into individual projects by assessing climate hazards and natural disaster risk.	Initiated 2024-2025, ongoing	Internal rollout of climate hazard exposure functionalities. Incorporation into guidance, and implementation of guidance for new projects and across the Department's building portfolio.
Buildings (Section 3A1)	Understand climate hazards and assessing exposure	Implementation of Department policy "Addressing Natural Hazards Risk for Real Property Assets."	2024-2027	Number of vulnerability assessments conducted.
Employees (Section 3A2)	Understand climate hazards and assessing exposure	Understanding the effects of smoke on firefighters and the general public.	2024-2027	Research findings relevant to operational and public health policy.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Understand climate hazards and assessing exposure	Improved data on climate hazards and stressors with a geographic scope outside the lower 48 (e.g., Alaska, Hawaii, insular areas, offshore).	Ongoing	Releases and updates of climate hazard data that close the following gaps: • Outside the lower 48 • For offshore marine environments • For regionally significant climate hazards/stressors
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Understand climate hazards and assessing exposure	Conducting vulnerability assessments of lands and waters.	Ongoing	Percent of Department-managed units that have conducted a vulnerability assessment. Percent of Interior-managed units that have taken an action to improve conditions based on a climate change vulnerability assessment.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Understand climate hazards and assessing exposure	Advance the National Offshore Sand Inventory initiative to improve our understanding and management of sediment resources on the U.S. OCS.	Ongoing	Completion of the inventory. Response time for coastal disaster recovery.
Buildings (Section 3A1)	Prioritize and scale adaptation	Incorporate appropriate design standards and codes for resiliency and sustainability in new construction and retrofits.	2024-2027	Adoption of practices reported as part of review processes, as well as project level tracking through the following: • Strategic Sustainability Plan submissions • OMB Scorecard reporting • Annual Department Sustainability Organizational Assessments.

Section	Theme	Description of Action	Timeline	Indicators for success
Employees (Section 3A2)	Prioritize and scale adaptation	Develop communication approaches and contingency plans to respond to increasing frequency of extreme heat.	2024	Rollout of comms strategies and plan updates. Influenced by recommendations in the NIHHIS draft National Heat Strategic Plan
Employees (Section 3A2)	Prioritize and scale adaptation	Adapt policies to promote best practices in fire management while protecting its workforce, including application of Western science and IK.	Initiated in 2024, ongoing	Updates to policies.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Prioritize and scale adaptation	Develop policy guidance and metrics for climate science applications, landscape-level management, IK, and NBS to help Interior staff use best-available tools and practices, and monitor outcomes.	2024-2025	See below, row for section 3B3.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Prioritize and scale adaptation	Invest in targeted adaptation efforts—such as land acquisitions to promote connectivity and restoration to improve ecological function—across the lands and waters that the Department manages.	Ongoing	Activities and impacts reported through America the Beautiful, the BIL-ER monitoring framework, or similar effort.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Prioritize and scale adaptation	Build the Department's ability to use data and evidence to assess impact at the landscape scale.	Through 2026	Develop a pilot restoration outcome monitoring framework.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Prioritize and scale adaptation	Implement the Bureaus' climate change adaptation strategies.	Ongoing	Varies by Bureau (see, for example, the Bureau of Reclamation Climate Change Adaptation Strategy)
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Prioritize and scale adaptation	Implementation of the Invasive Species Strategic Plan and supporting national and regional efforts to prevent the introduction, establishment, and spread of invasive species, including partnerships and joint educational efforts such as the Regional Invasive Species and Climate Change Management Networks.	Through 2025	Performance metrics are listed in appendix D of the Invasive Species Strategic Plan.
Employees (Section 3A2)	Build capacity	Working with EPA and public health agencies and increase staffing and expertise on fire emissions.	2024	Staffing levels

Section	Theme	Description of Action	Timeline	Indicators for success
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Build capacity	Developing the Indian Youth Service Corps as part of the American Climate Corps initiative.	Initiated 2023, ongoing	Corps Enrollment Projects completed
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Build capacity	Establishment of the Department's Office of Partnerships.	2025	Development of policy and guidance by the Office to support Bureaus and Offices.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Build capacity	Continuing to implement Joint Secretarial Order 3403, including development of collaborative and cooperative agreements with Tribal Nations.	Ongoing	Number of agreements. Input from Tribes on their implementation.
Lands, Waters, and Cultural and Natural Resources (Section 3A3)	Build capacity	Collaborate with White House offices such as the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders, and White House Council on Native American Affairs to build capacity for disadvantaged communities to better compete for grants and cooperative agreements.	Ongoing	Identification of barriers and capacity needs.

Section 3B. Climate-Resilient Operations

Section	Description of Action	Climate Risk Addressed	Timeline	Indicators for success
Incorporating Climate Risk into Policy and Programs (Section 3B3)	Implementation of WG workplans, specifically development of the following: • A handbook and training in implementing and including IK in Departmental actions and scientific research, • Technical guidance on the application of climate science to Department decisions, • Updates to the Department's adaptive management technical guidance, • A Department NBS Roadmap (*completed; see below*), and • Guidance on implementing landscape level approaches to conservation (section 3A3).	*All hazards*	Through 2025	Publication of working group guidance and handbooks Utilization of knowledge projects (specific metrics are under development by working groups and the Office of Planning and Performance Management)

Section	Description of Action	Climate Risk Addressed	Timeline	Indicators for success
Climate-Smart Supply Chains and Procurement (Section 3B4)	Developing an implementation plan for addressing risks to critical supplies/services and applying it.	*All hazards*	2024-2027	Development of a plan. Implementation of plan.
Climate-informed Funding to External Parties (Section 3B5)	Identifying all financial assistance programs that can include climate risk.	*All hazards*	2024-2025	Process metric.
Climate-informed Funding to External Parties (Section 3B5)	Updating requirements and evaluation processes for discretionary grants and awards, as practicable and consistent with existing law.	*All hazards*	Ongoing	Updated announcements and review instructions.

Section 3C. Building a Climate-Informed Workforce

Section	Description of Action	Climate Risk Addressed	Timeline	Indicators for success
Climate Training and Capacity Building for a Climate Informed Workforce (Section 3C)	Complete a Basic Climate Training module.	*All hazards*	2024	Utilization of training module.
Climate Training and Capacity Building for a Climate Informed Workforce (Section 3C)	Establish inter-Bureau agreements to share training.	*All hazards*	2024-2025	Number of agreements Assessment of training needs

SECTION 4: DEMONSTRATING PROGRESS

4A. Measuring Progress

The table below captures Department progress related to several performance indicators and process metrics that will be used across the Federal Government to track climate resilience and adaptive capacity.

Key Performance Indicator: Climate adaptation and resilience objectives and performance measures are incorporated in planning and budgeting of agency programs by 2027.

Section of the CAP	Process Metric	Agency Response
3A –Addressing Climate Hazard Impacts and Exposure	Step 1: Agency has an implementation plan for 2024 that connects climate hazard impacts and exposures to discrete actions that must be taken. (Y/N/Partially)	*Step 1.* ***Yes****, the implementation plan reflects that linkage between exposure to climate hazards and discrete actions.*
	Step 2: Agency has a list of discrete actions that will be taken through 2027 as part of their implementation plan. (Y/N/Partially)	*Step 2.* ***Partially****. Many actions are planned through 2025, longer term actions may reflect strategic commitments rather than discrete projects.*
3B1 – Accounting for Climate Risk in Decision-making	Agency has an established method of including results of climate hazard risk exposure assessments in planning and decision-making processes. (Y/N/Partially)	***Partially.*** *Some Bureaus within the Department have established methods for including results of climate hazard risk exposure assessments in planning and decision-making processes. See section 3B1 for additional details.*
3B2 – Incorporating Climate Risk Assessment into Budget Planning	Agency has an agencywide process and/or tools that incorporate climate risk into planning and budget decisions. (Y/N/Partially)	***Partially****. The agency has an agencywide enterprise risk management system maintained by the Office of Planning and Performance Management. Regarding budget decisions, the functions and responsibilities of the Department's Bureaus and offices vary significantly, and there is no single process for incorporating climate risk into budget decisions.*
3B5 – Climate Informed Funding to External Parties	Step 1: By July 2025, agency will identify grants that can include consideration and/or evaluation of climate risk.	*Step 1.* ***Yes****. The agency will identify grants.*
	Step 2: Agency modernizes all applicable funding announcements/grants to include a requirement for the grantee to consider climate hazard exposures. (Y/N/Partially)	*Step 2.* ***Partially****. The agency is considering options to incorporate climate hazard exposures into funding announcements and grants.*

Key Performance Indicator: Data management systems and analytical tools are updated to incorporate relevant climate change information by 2027.

Section of the CAP	Process Metric	Agency Response
3A –Addressing Climate Hazard Impacts and Exposure	Agency has identified the information systems that need to incorporate climate change data and information and will incorporate climate change information into those systems by 2027. (Y/N/Partially)	***Partially****. SHIRA currently serves as a useful tool for emergency management, and it includes some climate change information, which can be extended through additional support and funding. At the same time, the Office of Planning and Performance Management has an enterprise risk management system that includes climate risks.*

Key Performance Indicator: Agency CAPs address multiple climate hazard impacts and other stressors, and demonstrate NBS, equitable approaches, and mitigation co-benefits to adaptation and resilience objectives.

Section of the CAP	Process Metric	Agency Response
3B3 – Incorporating Climate Risk into Policy and Programs	By July 2025, 100 percent of climate adaptation and resilience policies have been reviewed and revised to (as relevant) incorporate NBS, mitigation co-benefits, and equity principles. (Y/N/Partially)	***Partially****. Following on the publication of updated DM chapters, Bureaus/offices and Departmentwide working groups are updating policies and guidance identified as playing key roles in adaptation and resilience.*

Key Performance Indicator: Federal assets and supply chains are evaluated for risk to climate hazards and other stressors through existing protocols and/or the development of new protocols; response protocols for extreme events are updated by 2027.

Section of the CAP	Process Metric	Agency Response
3B4 – Climate-Smart Supply Chains and Procurement	Step 1: Agency has assessed climate exposure to its top-five most mission-critical supply chains. (Y/N/Partially)	*Step 1.* ***Partially****, the supply chains have been identified and methods for assessments have been reviewed.*
	Step 2: By July 2026, agency has assessed services and established a plan for addressing/overcoming disruption from climate hazards. (Y/N/Partially)	*Step 2.* ***Partially****, a process to meet this deadline is being developed but awaits implementation.*
	Agency has identified priorities, developed strategies, and established goals based on the assessment of climate hazard risks to critical supplies and services. (Y/N/Partially)	***Partially****. The Department has successfully identified priorities pertaining to the five critical supplies or services areas through a comprehensive assessment of climate hazard risks, but specific goals and a formalized plan to assess progress are currently under development.*

Key Performance Indicator: By 2027, agency staff are trained in climate adaptation and resilience and related agency protocols and procedures.

Section of the CAP	Process Metric	Agency Response
3C – Climate Training and Capacity Building for a Climate Informed Workforce	Step 1: By December 2024 100 percent of agency leadership have been briefed on current agency climate adaptation efforts and actions outlined in their 2024 CAP. (Y/N/Partially)	*Step 1.* ***Yes****. Agency leadership, via the Department's Climate Task Force, have been briefed in February 2024.*
	Step 2: Does the agency have a Climate 101 training for your workforce? (Y/N/Partially) If yes, what percent of staff have completed the training?	*Step 2.* ***Partially****. This training is currently under development and is planned for release at the end of June 2024.*
	Step 3: By July 2025, 100 percent of employees have completed climate 101 trainings. (Y/N/Partially)	*Step 3.* ***No****. Such training will be available in July 2024, and Departmental leadership will promote it widely to all employees, but completion is not expected to be mandatory.*

4B. Adaptation in Action

While this update to the Department's climate adaptation plan highlights several ongoing and planned efforts, it does not capture the full range of actions we have taken to address the priorities identified in our previous CAP, released in 2021. Several of these accomplishments are listed below, along with references to previous sections of this Plan where related work is described.

2021 CAP Priority Actions	Key Accomplishments
Action #1. Promote Climate-Resilient Lands, Waters, and Cultural Resources (Section 3A3, 3A4, 3A5, 3B, 3D)	Key accomplishments here include steps the Department has taken to direct funding from BIL/IRA into meaningful conservation and restoration actions that increase adaptive capacity and resilience, including the following: • Contributions to the America the Beautiful Challenge. • Establishment of the Restoration and Resilience Framework, which provides a lens for making strategic investments in conservation and restoration. • Advancement of NBS in policy and Department investments, including the Department's NBS Roadmap.
Action #2. Advance Climate Equity (Sections 3A2, 3B, 3D)	Several Department accomplishments to-date are described in section 3. Advancing on these initiatives and looking toward their implementation, it is also important to note in this Plan the work of the Environmental Justice Steering Committee (EJSC), which reports to the Department's Climate Task Force. In addition to updating Department policy, the EJSC is pursuing a workplan including barrier analyses and a toolkit (including screening tools) for Department staff that will make it easier for equity to be incorporated into programs and decisions.
Action #3. Transition to a Resilient Clean Energy Economy (Section 3B, 3C)	Key accomplishments include the following: • Investing in research and partnerships to inform development of renewable energy in both on- and offshore environments, including BSEE's funding to the Ocean Energy Safety Institute's Wind Energy Roadmap, and an FWS-BLM NEPA cooperating agency MOU to include conservation recommendations in BLM's programmatic Environmental Impact Statement on solar energy development on public lands. • Working with communities to ensure informed decision-making as regulations are developed or updated for carbon sequestration and renewable energy, including consultations with Tribes. • Updating policy to enable renewable energy development in a safe, responsible way, including proposed rules from BOEM and BLM. • Approvals of significant offshore wind farms along the Atlantic coast, with potential to add over 7 gigawatts of clean, renewable energy—enough to power more than 2.2 million homes each year.

Action #4. Support Tribal and Insular Community Resilience (Sections 3A3, 3B, 3D)	Many of the Department's key accomplishments are described above in section 3. Important specific activities to note are the development of the Tribal Climate Resilience Program, the Kapapahuliau Climate Resilience Program, and Insular Area Ecosystem Restoration funding.
Action #5. Empower the Next Generation of Conservation and Resilience Workers (Sections 3A2, 3B, 3D, 3E)	Several Bureau-level accomplishments—including NPS's Scientists in Parks program and BIA-FWS collaborations to offer conservation leadership training—were highlighted in past CAP progress reporting. In 2022, the Department announced the Indian Youth Service Corps (IYSC), and in 2023 the IYSC was expanding through a $15 million commitment as part of the launch of the American Climate Corps.

Implementation of the actions above is a testament to the dedication of Department staff and provides some key insights for advancing the priorities in this Plan. They include the following:

1. **The importance of guidance and frameworks as tools for prioritizing and scaling adaptation**. The 2021 CAP acknowledges the key role of policy and guidance to mainstream adaptive capacity and resilience at scale. Updating these policies has taken time—the DM chapters were released in 2023—and provide important groundwork for implementation in the coming years.
2. **Consultation and public input as keys for incorporating adaptation into programs.** Department Bureaus and Offices engage in consultation on a number of topics, it is important to acknowledge the value of consultation and outreach specifically to the development of resilience programs. Engagement led by the Office of Native Hawaiian Relations to develop the Kapapahuliau Climate Resilience Program, for example, helped incorporate community values into the program structure and ensure funding can be directed to community priorities.
3. **Alignment of climate with other aspects in Department work.** Gathering data and applying it to decisions, targeting work to improve outcomes, and building capacity are not priorities unique to climate adaptation and resilience, and absent coordination other aspects of the Department's work—to improve equity or address biodiversity loss, for example—could advance in ways that are duplicative of adaptation efforts or inefficient. Building on the 2021 CAP, the Department has maintained a focus on advancing these lines of work in a coordinated manner.

APPENDIX A: RISK ASSESSMENT DATA

The Federal Mapping App uses the following building and personnel data, in addition to the climate hazard data described in table 1.

Buildings

Buildings data comes from the publicly available Federal Real Property Profile (FRPP). The GSA maintains FRPP data and Federal agencies are responsible for submitting detailed asset-level data to GSA on an annual basis. Although FRPP data is limited—for example, not all agencies submit complete asset-level data to GSA, building locations are denoted by a single point and do not represent the entirety of a structure or could represent multiple structures, and properties may be excluded on the basis of national security determinations— it is the best available public dataset for Federal real property. Despite these limitations, this data is sufficient for screening-level exposure assessments to provide a sense of potential exposure of Federal buildings to climate hazards.

Personnel

Personnel data comes from the Office of Personnel Management's (OPM) nonpublic dataset of all personnel employed by the Federal Government that was provided in 2023. The data contains a number of adjustments, including exclusion of military or intelligence agency personnel, aggregation of personnel data to the county level, and suppression of personnel data for duty stations of less than five personnel. Despite these adjustments, this data is still useful for screening-level exposure assessments to provide a sense of key areas of climate hazard exposure for agency personnel.

In addition to these data, the Department used data layers available in the SHIRA project tools:

Personnel

The SHIRA tools include the OPM non-public dataset described above but are not aggregated to the county-level. Results in table 5 reflect overlay of climate hazard data on this nonaggregated layer, but these nonaggregated data were not used elsewhere in the Plan.

Additional Climate Hazard Data

The SHIRA team worked with the Department's Office of Policy Analysis to validate results from the Federal Mapping App and, where possible, apply data layers available through SHIRA or the CMRA tool that provide additional insight into the exposure assessment. They include the following:

- *Alternative flood potential data*. In addition to the FEMA National Flood Hazard Layer, the SHIRA project tools include flood potential data released by the First Street Foundation. More information on their flood model is available here.
- *Complementary sea level rise data*. The SHIRA tools include sea level rise data released by NOAA in 2017 and available in 1-foot increments, with coverage that extends to Alaska, Hawaii, the U.S. Virgin Islands, and the U.S.-affiliated Pacific islands. Categorization of inundation followed source methods, in which a location was considered inundated if it was within a raster boundary for the mean higher high water level, which is typically used as a tidal line for coastal boundaries, regardless of depth. To align with the scenarios described in section 2, the following sea level rise extents were used:
    - Sea Level Rise Intermediate (mid-century) – 2 feet
    - Sea Level Rise Intermediate (late-century) – 3 feet
    - Sea Level Rise Intermediate-High (mid-century) – 2 feet
    - Sea Level Rise Intermediate-High (late-century) – 4 feet

The SHIRA team also worked with CMRA data to provide additional detail in the implications of change in extreme heat and extreme precipitation events, specifically the types of changes that would affect management for Department buildings and the well-being of Department employees and visitors. They included the following:

- Cooling Degree Days, defined as the annual cumulative number of degrees in which the daily average temperature is greater than 65°F.
- Heating Degree Days, defined as the annual cumulative number of degrees by which the daily average temperature is less than 65°F.
- Annual number of days with a maximum temperature greater than 95°F.
- Days with more than 2 inches of precipitation.

Listening Session Input

The CEQ recommended that agencies engage with Tribes, the Native Hawaiian community, and insular area communities, as feasible, to inform decision making. The Department held six listening sessions during the development of this Plan—four for Tribal audiences, one for the Native Hawaiian community, and one for the U.S. territories—in 2024 to gather input on data sources to evaluate climate risk, important resources to include in adaptation planning, and barriers their communities face as they plan and implement climate adaptation and resilience efforts. Written and oral comments from these listening sessions were referenced in the development of this Plan.

APPENDIX B. ADDITIONAL INFORMATION ON CLIMATE RISKS AFFECTING INTERIOR BUILDINGS

In addition to reporting high-level exposure to climate hazards under different climate scenarios, the SHIRA project also provides data on the future estimates of meteorological conditions, which can be evaluated by facility, unit (e.g., national park, NWR), agency, or region.

The tables below break down projected changes in exposure of Interior-owned or managed buildings to the climate hazards reported in section 2B by Unified Interior Regions, along with projected exposure to several additional climate hazards that help contextualize the impacts of climate change. Table A1 shows the distribution of buildings across the Unified Regions.

Table A1. Percentage of Interior-owned or managed buildings in each Unified Interior Region.

Unified Interior Region	Percentage of Interior-owned or managed buildings
Alaska	4%
Arkansas-Rio Grande-Texas Gulf	4%
California-Great Basin	12%
Columbia-Pacific Northwest	10%
Great Lakes	6%
Lower Colorado Basin	14%
Mississippi Basin	4%
Missouri Basin	8%
North Atlantic-Appalachian	17%
Pacific Islands	2%
South Atlantic Gulf	8%
Upper Colorado Basin	18%
Total	100%

Extreme Heat

As is reported in section 2, nearly every building owned or managed by the Department will experience an increase in the number of days where temperatures exceed the 99th percentile of high temperatures observed from 1977-2005. The projected increase in exposure to extreme heat varies by geography.

Tables A2 and A3 below break down the changing exposure to extreme heat by Department region, providing greater context on how the temperature changes will be experienced across the lower 48. For example, increases are especially large in the South Atlantic-Gulf region and the Upper Colorado Basin.

This increase in temperature affects operation of Interior-owned and managed buildings. Table A4 shows projected changes in cooling degree days,[74] by region and RCP scenario. Across the Interior building portfolio, the number of cooling degree days projected to increase by 48 to 129 percent, with notable regional increases in regions like the Great Lakes and Pacific Northwest.

Table A5 depicts projected changes in the number of heating degree days the average building in each Department region will experience under different RCP scenarios. In every Department region, the number of heating degree days is projected to decrease under both RCP4.5 and RCP8.5 scenarios at both mid- and late-century.

Table A2. Average percent increase in extreme heat days (where temperatures exceed historical highs) for an Interior-owned or managed building in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	462%	690%	667%	1628%
California-Great Basin	346%	527%	500%	1126%
Columbia-Pacific Northwest	287%	445%	419%	969%
Great Lakes	364%	558%	547%	1246%
Lower Colorado Basin	437%	643%	632%	1480%
Mississippi Basin	478%	713%	697%	1624%
Missouri Basin	336%	502%	487%	1118%
North Atlantic-Appalachian	365%	543%	544%	1295%
South Atlantic Gulf	611%	915%	904%	2012%
Upper Colorado Basin	505%	729%	730%	1573%
Total	**414%**	**616%**	**605%**	**1380%**

Table A3. Average number of extreme heat days (where temperatures exceed historical highs) for an Interior-owned or managed building in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	17	25	24	60
California-Great Basin	13	19	18	41
Columbia-Pacific Northwest	10	16	15	36
Great Lakes	13	20	20	46
Lower Colorado Basin	16	24	23	54
Mississippi Basin	18	26	26	59
Missouri Basin	12	18	18	41
North Atlantic-Appalachian	13	20	20	47
South Atlantic Gulf	22	34	33	74
Upper Colorado Basin	19	27	27	58
Total	**15**	**23**	**22**	**51**

Table A4. Percent change in cooling degree days for an Interior-owned or managed building in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	32%	42%	42%	79%
California-Great Basin	53%	77%	74%	157%
Columbia-Pacific Northwest	93%	138%	131%	294%
Great Lakes	73%	101%	99%	200%
Lower Colorado Basin	39%	52%	52%	100%
Mississippi Basin	39%	51%	50%	96%
Missouri Basin	67%	93%	90%	187%
North Atlantic-Appalachian	56%	75%	74%	147%
South Atlantic Gulf	34%	45%	45%	84%
Upper Colorado Basin	73%	100%	100%	216%
Total	**48%**	**65%**	**65%**	**129%**

Table A5. Percent change in heating degree days for an Interior-owned or managed building in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	-20%	-26%	-26%	-43%
California-Great Basin	-17%	-23%	-22%	-37%
Columbia-Pacific Northwest	-16%	-21%	-20%	-34%
Great Lakes	-16%	-21%	-19%	-33%
Lower Colorado Basin	-18%	-23%	-23%	-38%
Mississippi Basin	-18%	-23%	-21%	-36%
Missouri Basin	-12%	-18%	-17%	-29%
North Atlantic-Appalachian	-16%	-21%	-20%	-33%
South Atlantic Gulf	-18%	-23%	-22%	-36%
Upper Colorado Basin	-17%	-21%	-20%	-34%
Total	**-16%**	**-21%**	**-20%**	**-35%**

Extreme Precipitation and Flooding

As shown in tables 6 and 7, nearly every Interior-owned or managed building will be exposed to an increase in extreme precipitation events under both RCP 4.5 and RCP 8.5 scenarios at mid- and late-century.

Table A6 shows the average increase in frequency of these events, by Interior region. Table A7 includes historical frequency of these events, along with their frequencies under different climate scenarios, to provide additional context on what these changes will look like across Department regions.

Changes in extreme precipitation are not perfectly correlated with flood frequencies, but table A8 provides a breakdown, by Interior region, of First Street Foundation flood data for present-day (2022) exposure of Department buildings to 1 percent and 0.2 percent annual exceedance probability flood events.

Table A6. Average annual increase in extreme precipitation events for an Interior-owned or managed building in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	16%	21%	22%	31%
California-Great Basin	11%	20%	21%	39%
Columbia-Pacific Northwest	19%	28%	25%	44%
Great Lakes	57%	59%	72%	132%
Lower Colorado Basin	48%	70%	60%	107%
Mississippi Basin	19%	29%	31%	46%
Missouri Basin	23%	32%	31%	57%
North Atlantic-Appalachian	35%	52%	47%	89%
South Atlantic Gulf	17%	26%	24%	37%
Upper Colorado Basin	45%	67%	62%	105%
Total	**20%**	**30%**	**29%**	**51%**

Table A7. Average annual number of precipitation events over 2 inches for an Interior-owned or managed building in a given region.

Region	Historical	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	0.71	0.83	0.86	0.87	0.94
California-Great Basin	1.64	1.83	1.96	1.98	2.27
Columbia-Pacific Northwest	1.55	1.84	1.99	1.94	2.24
Great Lakes	0.16	0.26	0.26	0.28	0.38
Lower Colorado Basin	0.05	0.08	0.09	0.08	0.11
Mississippi Basin	1.28	1.52	1.66	1.68	1.88
Missouri Basin	0.25	0.31	0.33	0.33	0.39
North Atlantic-Appalachian	0.63	0.85	0.96	0.93	1.20
South Atlantic Gulf	1.42	1.66	1.79	1.76	1.95
Upper Colorado Basin	0.02	0.03	0.03	0.03	0.04
Total	**0.68**	**0.82**	**0.89**	**0.88**	**1.03**

Table A8. Percentage of Interior-owned or managed buildings in a region that are located in an area with 1 percent or 0.2 percent AEP flood risk.

Region	2022 1% AEP	2022 0.2% AEP	Total
Arkansas-Rio Grande-Texas Gulf	30%	5%	35%
California-Great Basin	27%	7%	34%
Columbia-Pacific Northwest	43%	9%	52%
Great Lakes	22%	6%	28%
Lower Colorado Basin	14%	7%	21%
Mississippi Basin	31%	5%	36%
Missouri Basin	21%	6%	27%
North Atlantic-Appalachian	29%	5%	34%
South Atlantic Gulf	54%	5%	59%
Upper Colorado Basin	22%	6%	28%
Total	**28%**	**6%**	**34%**

Sea Level Rise

Table A9 provides a breakdown, by Interior region, of the percentage of Interior-owned or managed buildings that would be inundated under different climate scenarios. Note that this dataset does include the Pacific Islands region (Region 12), and that it does not evaluate exposure to storm surge, saltwater intrusion, or other hazards beyond inundation that are linked to sea level rise, and so likely underestimates overall exposure to sea level rise-associated risks.

Table A9. Number (Percent) of Interior-owned or managed buildings inundated under different sea level rise scenarios, by Interior region.

Region	Sea Level Rise Intermediate (2050)	Sea Level Rise Intermediate (2090)	Sea Level Rise Intermediate-High (2050)	Sea Level Rise Intermediate-High (2090)
Alaska (No 2017 data)	N/A	N/A	N/A	N/A
Arkansas-Rio Grande-Texas Gulf	1 (0.07%)	7 (0.48%)	3 (0.2%)	20 (1.36%)
California-Great Basin	19 (0.39%)	35 (0.72%)	28 (0.58%)	50 (1.04%)
Columbia-Pacific Northwest	4 (0.1%)	9 (0.23%)	7 (0.18%)	18 (0.46%)
Great Lakes	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Lower Colorado Basin	1 (0.02%)	1 (0.02%)	1 (0.02%)	1 (0.02%)
Mississippi Basin	17 (1.17%)	22 (1.51%)	19 (1.30%)	40 (2.75%)
Missouri Basin	0 (0%)	0 (0%)	0 (0%)	0 (0%)
North Atlantic-Appalachian	37 (0.54%)	148 (2.14%)	86 (1.24%)	410 (5.93%)
Pacific Islands	1 (0.15%)	1 (0.15%)	1 (0.15%)	14 (2.05%)
South Atlantic Gulf	44 (1.43%)	310 (10.06%)	143 (4.64%)	614 (19.92%)
Upper Colorado Basin	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	**124 (0.30%)**	**533 (1.31%)**	**288 (0.71%)**	**1167 (2.87%)**

Wildfire

Nearly one-quarter of Department buildings are in areas with high, very high, or extreme risk to potential structures from wildfire. As shown in table A10, highest overall exposures in this category are observed in regions in the Western United States, this is discussed in section 2B.

However, extreme exposures are highest in the South Atlantic-Gulf and Arkansas-Rio Grande-Texas Gulf regions—areas with high levels of lightning-ignited fires and historically short fire return intervals.

Table A10. Percent of Buildings in Each Risk Category, by Risk Category and Region

Region	None	Low	Moderate	High	Very High	Extreme
Arkansas-Rio Grande-Texas Gulf	2%	18%	48%	18%	3%	11%
California-Great Basin	5%	9%	46%	28%	10%	2%
Columbia-Pacific Northwest	10%	33%	18%	28%	7%	3%
Great Lakes	14%	74%	10%	1%	1%	>1%
Lower Colorado Basin	16%	31%	23%	24%	3%	3%
Mississippi Basin	6%	28%	57%	5%	>1%	2%
Missouri Basin	3%	15%	51%	31%	1%	0%
North Atlantic-Appalachian	30%	54%	15%	2%	0%	>1%
South Atlantic Gulf	8%	22%	43%	9%	3%	15%
Upper Colorado Basin	3%	18%	38%	36%	5%	1%
Total	**11%**	**30%**	**32%**	**17%**	**4%**	**2%**

APPENDIX C. ADDITIONAL INFORMATION ON CLIMATE RISKS AFFECTING INTERIOR EMPLOYEES

The SHIRA project can also be used to assess exposure of Department employees to future estimates of meteorological conditions related to climate hazards, including by Unified Interior Region. The distribution of employees across unified regions is shown in table A11.

Table A11. Percentage of Interior employees with a duty station in each Unified Interior Region.

Unified Interior Region	Percentage of Interior Employees
Alaska	4%
Arkansas-Rio Grande-Texas Gulf	3%
California-Great Basin	10%
Columbia-Pacific Northwest	11%
Great Lakes	5%
Lower Colorado Basin	9%
Mississippi Basin	3%
Missouri Basin	7%
North Atlantic-Appalachian	19%
Pacific Islands	1%
South Atlantic Gulf	6%
Upper Colorado Basin	22%
Total	100%

The tables below break down projected changes in exposure of Interior employees to some of the climate hazards reported in section 2C—specifically the extreme heat and wildfire hazards.

Extreme Heat

As is reported in section 2, nearly every employee at the Department will experience an increase in the number of days where temperatures exceed the 99th percentile high temperatures observed from 1977-2005. The scale of the projected increase in exposure to extreme heat varies by geography and is shown in table A12.

Table A13 provides regional projections of the increased exposure of Interior employees to days with high temperatures that exceed 95 degrees Fahrenheit. Significant increases are projected across all Department regions, with the greatest increases in the South Atlantic Gulf and Lower Colorado Basin, where employees can be expected to experience these high temperatures for several months each year.

Table A12. Average percent increase in extreme heat days (where temperatures exceed historical highs) for an Interior employee in a given region.

Region	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	451%	673%	647%	1557%
California-Great Basin	323%	484%	460%	1027%
Columbia-Pacific Northwest	309%	472%	443%	1014%
Great Lakes	398%	609%	598%	1322%
Lower Colorado Basin	419%	621%	604%	1435%
Mississippi Basin	513%	780%	762%	1806%
Missouri Basin	337%	506%	493%	1135%
North Atlantic-Appalachian	387%	573%	578%	1347%
South Atlantic Gulf	605%	906%	897%	2012%
Upper Colorado Basin	511%	730%	736%	1616%
Total	**419%**	**620%**	**611%**	**1391%**

Table A13. Average number of days >95F an average Interior employee will experience in a given region, historically and under each climate scenario.

Region	Historical	RCP 4.5 2050	RCP 4.5 2080	RCP 8.5 2050	RCP 8.5 2080
Arkansas-Rio Grande-Texas Gulf	39	76	87	85	121
California-Great Basin	27	46	52	51	71
Columbia-Pacific Northwest	9	22	28	27	45
Great Lakes	2	12	18	18	40
Lower Colorado Basin	69	91	98	98	121
Mississippi Basin	14	47	58	56	96
Missouri Basin	10	27	34	33	57
North Atlantic-Appalachian	4	19	26	26	53
South Atlantic Gulf	7	31	42	42	81
Upper Colorado Basin	11	30	38	38	66
Total	**17**	**36**	**43**	**43**	**69**

Wildfire

Section 2C included an assessment of employees working in counties with high, very high, and extreme risk to wildfire. The SHIRA project enables duty station-level assessments of exposure for Interior employees, which is reported by region in table A14.

Over one in ten Department employees work at duty stations with high, very high, or extreme risk to potential structures from wildfire. Highest overall exposures in this category are observed in regions in the Western United States, this is discussed in section 2B. However, extreme exposures are highest in the South Atlantic-Gulf and Arkansas-Rio Grande-Texas Gulf regions—areas with high levels of lightning-ignited fires and historically short fire return intervals.

It is also worth noting that this dataset—Risk to Potential Structures—does not reflect the impact of wildfire smoke.

Table A14. Percentage of a region's employees with a duty station at a given level of wildfire risk.

Region	None	Low	Moderate	High	Very High	Extreme
Arkansas-Rio Grande-Texas Gulf	26%	22%	45%	5%	2%	0%
California-Great Basin	34%	14%	24%	23%	4%	3%
Columbia-Pacific Northwest	42%	22%	20%	13%	1%	2%
Great Lakes	39%	51%	9%	0%	0%	0%
Lower Colorado Basin	32%	38%	13%	17%	1%	1%
Mississippi Basin	46%	33%	20%	1%	0%	0%
Missouri Basin	31%	25%	33%	10%	0%	0%
North Atlantic-Appalachian	46%	48%	6%	0%	0%	0%
South Atlantic Gulf	26%	23%	38%	5%	0%	8%
Upper Colorado Basin	43%	24%	20%	12%	0%	0%
Total	39%	30%	19%	9%	1%	1%

APPENDIX D. BUREAU APPROACHES TO INCORPORATING CLIMATE RISK ASSESSMENTS INTO PLANNING AND DECISION MAKING

Bureau/Office	*Approach to using climate risk assessments in planning and decision-making*
National Park Service	Several documents guide how national park units address climate change vulnerability assessments in planning and decisions, including the following: ○ Policy Memo 15-01 (*Addressing Climate Change and Natural Hazards for Facilities*) *and the associated Climate Change and Natural Hazards Handbook (*updated 2023) ○ Policy Memo 14-02 (*Climate Change and Stewardship of Cultural Resources*) ○ Policy Memo 12-02 *(Applying NPS Management Policies in the Context of Climate Change)* ○ *Cultural Resources Climate Change Strategy* ○ *Planning for a Changing Climate* The *NPS Facility Investment Strategy* includes environmental sustainability and climate resiliency when considering whether to approve proposed facility investments. Project proponents are required to identify potential natural and climate change related hazards, how those hazards may be addressed, and include review by subject matter experts at concept development and design stages. Numerous projects in NPS (>$18M) funded through IRA directly address climate change vulnerabilities in national park units, focusing on issues including the vulnerability of water supplies, floodplains (riparian habitat and infrastructure), museum facilities, cultural resources, fish species, Joshua trees, and others. Results from these projects will inform decisions regarding adaptation strategies.
Bureau of Reclamation	The BOR has established a Climate Change Community of Practice reaching all employees having roles in adaptation and building resilience, has several lines of work that support climate risk assessments, and has developed guidance for staff to share findings with stakeholders and incorporate them into decision making. *Reclamation Basin Studies* are cost-shared, stakeholder-driven studies to assess water supply and demand within a river basin now and in the future, considering existing infrastructure and operations, and projected changes to water supplies resulting from population growth, changes in water demands and changes to the hydrologic regime due to climate change. They bring together basin partners and stakeholders—frequently including groups with competing demands—to identify potential strategies to resolve water supply shortfalls and avoid conflict. *Reclamation's Climate Informed Decision-making Guidance (Guidance)* will provide a roadmap to incorporate climate change information into existing BOR decision-making processes. The goal of the Guidance is to make climate analysis methods more widely available across the organization; help staff determine the adequacy of data; address uncertainty; and address current and future risks associated with climate change. Target release of the Guidance is mid-2024.

Bureau/Office	*Approach to using climate risk assessments in planning and decision-making*
Bureau of Reclamation (cont'd.)	*Building climate resilience through planning and environmental review processes.* The BOR's Directives and Standards for Water and Related Resources Planning (CMP P09), Water and Related Resources Appraisal and Special Studies (CMP 09-01), Water and Related Resources Feasibility Studies (CMP 09-02), and Planning for Major Rehabilitation and Replacement of Existing Assets (CMP 09-04), will be revised to require BOR to do the following: • Engage with stakeholders in the project formulation and design phases, before formal planning begins, to prioritize climate resilient building opportunities, challenges, and costs. • Incorporate a quantitative climate change analysis in planning and environmental review processes, as appropriate, including: (1) identifying problems, needs, and opportunities; (2) inventorying existing resources; (3) formulating action alternatives; (4) forecasting future conditions to evaluate action alternatives for feasibility; and (5) in the case of a NEPA or ESA study, analyzing the environment of the area(s), species, or habitat to be affected or created by the alternatives considered. This activity is ongoing and the completion of updates to CMP 09-02 and CMP 09-04 are expected in early 2024 and end 2024, respectively. *Incorporating Climate Change impacts and considerations in infrastructure investment and decision-making.* The BOR's Asset Management Division will incorporate climate change into infrastructure investment decision making by adding "Climate Change" to a list of "Mission Enhancements" tied to each activity in the Capital Investments and Repair Needs (CIRN) application. The CIRN users will be able to select this option if their activity supports climate change adaptation. This activity is ongoing, and completion is expected in FY 2025. *Incorporating climate change science into operations and maintenance processes.* The goal of this activity is to incorporate climate change impacts and considerations in Facility Reliability Rating score methodology and reservoir sediment monitoring plans. The BOR plans to begin with its reserved works facilities and then provide guidance to its transferred works partners on how they can also consider climate change at their facilities. This activity was implemented in FY 2023 and is ongoing. *Estimating climate change-driven extreme precipitation and runoff impacts to dams.* This activity advances dam safety and the protection of downstream public safety by improving the community's ability to identify climate change effects on flood risks and potential dam failure. This activity is ongoing and expected to be complete in FY 2025.
U.S. Fish and Wildlife Service	The FWS uses risk assessments in some aspects of its work, including management of the NWRS and its Ecological Services program.

Bureau/Office	*Approach to using climate risk assessments in planning and decision-making*
	Management of Species and Refuges. The FWS has collaborated with other Interior Bureaus to develop the Resist-Accept-Direct Framework, which is a decision-making tool that helps resource managers make informed strategies for responding to ecological changes resulting from climate change. The FWS has developed technical guidance to support incorporation of climate change data into assessments of at-risk, threatened, and endangered species. The Fish and Aquatic Conservation program is working to provide future climate match information in Ecological Risk Screening Summaries to inform invasive species prevention and control efforts. The NWRS conducts climate change vulnerability assessments. The NWRS is working to improve its capacity to conduct these assessments across the entire NWRS to better understand and address risks. The NWRS also utilizes a landscape resiliency ranking within the Targeted Resource Acquisition Comparison Tool to provide leadership with climate related information when making land acquisition decisions. *Asset Management*. The Infrastructure Management Division developed a 20-year horizon document for planning—the National Long Range Transportation Plan—that outlines six goals for selecting transportation projects. The Asset Management goal is driven by climate change and is defined as: "The program will operate and maintain a functional, financially sustainable, and resilient transportation network to satisfy current and future land management needs in the face of a changing climate."
U.S. Geological Survey	The USGS supports science that other Interior Bureaus and Offices can use to assess climate risk and has guidance for incorporating risk assessment into its capital investment decisions. *Science Programs*. The USGS develops the science necessary to incorporate risk into planning and decision processes The SHIRA project mentioned in this plan is led by the Natural Hazards Mission Area Risk Project, which conducts risk research and provides applications and services to support efforts like the CAP. The USGS also operates the Science and Decisions Center (SDC) and other decision support operations within its regional science centers. The SDC is a unique and small interdisciplinary center which conducts integrated physical, biological, socioeconomic, and information science, advances decision-analytic methods in USGS and investigates innovative data collection and analysis methods with a goal of increasing the use and value of USGS science in decision making. In addition, USGS provides high-performance computing services (i.e., machine access, training, model tuning) to better enable the analysis and delivery of science results to key stakeholders. *Capital Investments*. The USGS has a standard Business Case Analysis (BCA) template that it is required for all major capital investments. This BCA template has a risk analysis section that includes "Climate Change Adaptation Risk." This helps to ensure that climate risk is considered and woven into planning and decision making for large capital investments for the Bureau.

Bureau/Office	*Approach to using climate risk assessments in planning and decision-making*
Bureau of Indian Affairs	The BIA uses climate risk assessments to inform implementation of some of its programs. *Tribal Climate Resilience*. Risk registers have been completed for the Branch of Tribal Climate Resilience's assessable units. Risk registers have been completed (and are ongoing) for the Annual Awards Program funding opportunity, the Voluntary Community Driven Relocation Program, and the co-planned/co-convened Native Youth Climate Adaptation Congress. *Safety of Dams (SOD) Program*. Funding for rehabilitation, replacement and/or improvement for dams managed by the SOD Program is prioritized using a risk-informed approach that includes consideration of climate hazard (flooding) risks.
Office of Surface Mining Regulation and Enforcement	The OSMRE does not currently incorporate climate risk assessments related to adaptation in their decision-making processes. The OSMRE is awaiting Departmental implementation guidance on NBS and climate adaptation/resilience before evaluating any policy modification, such as to its BIL Abandoned Mine Lands Guidance. Recognizing that OSMRE authority under the Surface Mining Control and Reclamation Act is limited, OSMRE may rely on mine operators/grantees for voluntary NBS policy implementation.
Bureau of Land Management	The BLM programs have flexibility to incorporate climate risk into their decisions. For example, BLM's Land and Water Conservation Fund criteria have flexibility to address climate hazard risks. The BLM will use Departmental guidance, once available, to develop its own guidance on incorporating climate risk into land management decisions. The BLM anticipates that it will need to develop tools, procedures, and training for specific programs and geographies.
Bureau of Safety and Environmental Enforcement	The BSEE does not currently incorporate climate risk into decisions. The BSEE uses various approaches to improve safety and environmental performance during design, installation, operation, and decommissioning of offshore operations, including wind energy. However, BSEE's actions have to-date not necessitated using climate risk assessments in its planning and decision-making. The BSEE will pursue further research and data development to better understand climate exposures and risks to its mission delivery, including its field workforce
Bureau of Ocean Energy Management	The BOEM considers climate change as part of its responsibilities under NEPA. As part of its responsibilities under NEPA and to manage development of U.S. OCS energy and mineral resources in an environmentally and economically responsible way, BOEM considers climate change, and its associated hazards and risks, in its NEPA documents, as appropriate (e.g., environmental impact statements). This includes the discussion of climate change as a stressor to the environment as well as the ways in which BOEM-regulated activities may either contribute to or redress climate change and its impacts. The BOEM is evaluating climate change in accordance with the interim NEPA guidance issued by CEQ (NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change).

[1] The Inflation Reduction Act added the Exclusive Economic Zones of the U.S. territories to BOEM's responsibilities. Notice on the boundaries of the U.S. Exclusive Economic Zone is available at: https://www.federalregister.gov/documents/2023/12/21/2023-28159/continental-shelf-and-maritime-boundaries-notice-of-limits
[2] 117 P.L 103, 117 P.L. 328, President's Budget.
[3] RCPs were used in this Plan because the Governmentwide approach for creating this iteration of climate adaptation plans uses analyses based on the IPCC's AR5, which utilized CMIP5. After guidance was shared with agencies, projections from IPCC AR6, based on CMIP6, have been made available. (For more background on these protocols and scenarios, see here: https://www.climatehubs.usda.gov/hubs/northwest/topic/what-are-climate-model-phases-and-scenarios). The Department uses climate projections related to AR5 here to follow CEQ guidance and allow for comparison to other agency climate adaptation plans but recognize that other planning efforts within and outside the Department may benefit from examining AR6-associated results.
[4] USGCRP, 2023: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023
[5] Northern Climate Reports for Changing Arctic Ecosystems
[6] USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.
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[8] ANTHC [Alaska Native Tribal Health Consortium] 2024. Unmet Needs of Environmentally Threatened Alaska Native Villages: Assessment and Recommendations. https://www.anthc.org/wp-content/uploads/2024/01/Unmet_Needs_Report_22JAN24.pdf
[9] Drought Management | Bureau of Land Management (blm.gov)
[10] Effects of Greenhouse Gas Emissions and Climate Change on U.S. Coastal and Marine Environments: A High-Level Harm Summary (boem.gov)
[11] Global climate change implications for coastal and offshore oil and gas development - ScienceDirect
[12] Climate change impacts on wind power generation | Nature Reviews Earth & Environment
[13] The Bureau of Reclamation brings water to more than 31 million people and provides 1 out of 5 Western farmers (140,000) with irrigation water for 10 million acres of farmland that produce 60 percent of the Nation's vegetables and 25 percent of its fruits and nuts.
[14] Climate Change Adaptation Strategy (usbr.gov)
[15] Tribes and Indigenous Peoples (globalchange.gov)
[16] Climate Change | U.S. Fish & Wildlife Service (fws.gov)
[17] NPS Climate Change Response Strategy 2023 Update
[18] Megaproject reclamation and climate change | Nature Climate Change
[19] Climate | U.S. Geological Survey (usgs.gov)
[20] See appendix A for a description of cooling degree days.
[21] See appendix A for a description of heating degree days.
[22] https://pubs.usgs.gov/gip/106/pdf/100-year-flood_041210web.pdf
[23] From the Federal Real Property Profile data set, accessed through SHIRA.
[24] Replacement value estimated at over $940 million and does not include the value of associated structures.
[25] Occupational Safety and Health and Climate | NIOSH | CDC
[26] Climate Change and the Health of Workers | US EPA

[27] NCA5
[28] Occupational Safety and Health and Climate | NIOSH | CDC
[29] Ibid.
[30] Ibid.
[31] USGCRP, 2023: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023
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[33] Future of Fire: Towards a National Synthesis of Wildland Fire Under a Changing Climate
[34] Cultural Resources Climate Change Strategy (nps.gov)
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[63] NPVuln - Climate Change (U.S. National Park Service) (nps.gov)

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[66] https://doi.gov/sites/doi.gov/files/doi-nbs-roadmap.pdf
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[69] Equity Action Plan Summary: U.S. Department of the Interior (whitehouse.gov)
[70] Our Work and Partnerships | Indian Affairs (bia.gov)
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