

Climate Change Response Program
Natural Resources Stewardship and Science

National Park Service
U.S. Department of the Interior



National Park Service
Climate Change Response Program

Strategic Plan



In addition to guiding the priorities and work plans of Program staff, this document can inform numerous audiences. For those working in parks, the document provides a clear explanation of the work of the Climate Change Response Program, and the principles that lie behind it. For colleagues in other National Park Service programs and in partner organizations, we hope it will facilitate opportunities for collaboration.

— NPS CLIMATE CHANGE RESPONSE PROGRAM STAFF



*Volunteers at Joshua Tree National Park assist park staff with monitoring vegetation to study climate change impacts. NPS image.
Cover image: NPS employee observes the Howe Ridge Fire in Glacier National Park, August 2018. NPS image.*



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Introduction

As stewards of America’s iconic natural, cultural and historic resources, the National Park Service (NPS) is responsible for their care while we support and encourage their public use – today and for generations to come.

The NPS uses science to understand:

- how park ecosystems function and what affects them,
- factors that affect historic and cultural resources, and
- risks to park resources, facilities, and visitor use from environmental hazards.

Climate change is a significant factor that affects park ecosystems, resources, infrastructure, and visitor experiences. The NPS must understand and manage effects from a changing climate in order to protect park resources, just as we manage the impacts of invasive species and pests, or erosion, or wildfire. Accounting for climate change in park management helps ensure the wise use of public funds, minimize risks and hazards, and provide enjoyable, safe experiences for visitors.

Our work to understand and manage the effects of a changing climate on natural and cultural resources, infrastructure, and operations is part of the NPS core responsibility to protect parks and support visitor experience and enjoyment for present and future generations.



*Joshua Tree National Park
NPS image by Brad Sutton*

The NPS Climate Change Response Program

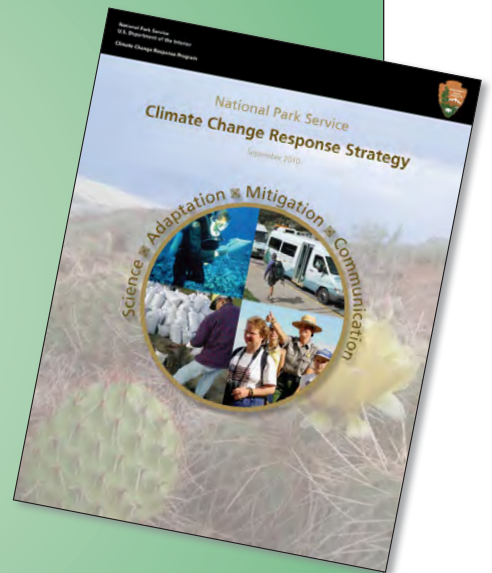
Established in 2010, the NPS Climate Change Response Program (CCRP or Program) advances the Service's efforts to address the effects of climate change across the breadth of NPS responsibilities. The Program works across directorates and other NPS program areas to support parks through technical expertise and research, guidance and training, project and planning support, and provision of communication products. The program works with other agencies, organizations, and stakeholder groups—nationally and internationally—to maximize information sharing, support, learning, and project effectiveness. The Program office is located in Fort Collins, Colorado, while staff members serve a variety of NPS directorates, disciplines, and regions across the NPS.

The NPS Climate Change Response Strategy (2010) describes four fundamental components to address climate change in the NPS: Science, Adaptation, Mitigation and Communication. Servicewide goals and objectives articulated in the strategy remain relevant and continue to guide the Program. But since 2010, the context of our work and the evolution of park needs have grown in tandem with our increasing understanding of the issue. Hence, there is an ongoing need for the Program to strategically prioritize efforts going forward.

The NPS will:

- *Participate fully in partnerships that increase **scientific understanding** of climate change and its effects*
- *Analyze potential climate change impacts and **adaptively apply** the information to improve planning, resource conservation, and visitor experience*
- *Set high standards for **mitigation** through energy efficiency and greenhouse gas emissions reduction*
- *Communicate broadly about climate change and its impacts and the actions that can be taken to mitigate and adapt*

— NPS Climate Change Response Strategy, 2010



A Changing Context

An evolution in public awareness about climate change is underway. A growing majority of Americans acknowledge that climate change is occurring and express concern over potential impacts.¹ Indeed, 63% of adults in the United States say the issue of global warming is important to them personally.

Substantial scientific evidence shows that our world is experiencing global rapid and directional increases in temperature,² changing ecosystems well beyond the bounds of historical conditions. Over 80% of National Park Service units with significant natural resources now experience mean temperatures that are extreme compared with the recent historical record.³ Moreover, due to the proportion of national park acreage in extreme environments, climate change exposes the National Park System more than the U.S. as a whole.⁴ These realities challenge the ability of the NPS to fulfill its mission and legislated purpose of managing resources in an unimpaired condition. Many of the natural and cultural resources, infrastructure assets, and recreational opportunities under our care are vulnerable to climate change.

There is a growing desire for understanding and use of climate change science among NPS managers, who increasingly recognize the importance of exploring climate projections and adaptation options in resource management and facilities protection. Actions are also underway in parks to enhance energy efficiency, foster sustainability, and reduce emissions from park operations. Park units seek more (and more detailed) information about climate change and its impacts, as well as guidance in developing adaptation, mitigation, and communication strategies, particularly in light of continued visitor interest on the topic.⁵

Beyond parks, many innovations in climate change response through local, regional, and international collaborative efforts now seek to limit carbon emissions and/or adapt to inevitable changes in the environment. Additionally, agencies, municipalities, and other organizations are actively working to contend with the unpredictable consequences of a very different future. These developments are particularly relevant for the NPS, as conservation efforts often rely on robust partnerships across large spatial scales. The continued protection of our national parks in the face of global change will increasingly rely on shared stewardship efforts.

¹ Leiserowitz, A., Maibach, E., Roser-Renouf, C., Rosenthal, S., Cutler, M., & Kotcher, J. (2017) Climate change in the American mind: March 2018. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

² Allen, M. et al. (2018) Global Warming of 1.5° C. Intergovernmental Panel on Climate Change.

³ Monahan, WB and NA Fisichelli. 2014. Climate exposure of US national parks in a new era of change. PLoS ONE 9(7): e101302. doi:10.1371/journal.pone.0101302.

⁴ Gonzalez, P., F. Wang, M. Notaro, D.J. Vimont, and J.W. Williams. 2018. Disproportionate magnitude of climate change in United States national parks. Environmental Research Letters 13: 104001. doi:10.1088/1748-9326/aade09.

⁵ Davis, S., Karg, S. & Thompson, J. L. (2012) Climate Change Education Partnership Visitor Survey Summary Report. Colorado State University, Fort Collins, CO.

The Purpose of this Plan

Within this ever-evolving context, this plan updates goals and priorities to guide the work of CCRP staff over the next several years. Simultaneously, just as strategic plans should never be static documents, organizations dealing with an issue as dynamic as climate change must always prepare for surprises, and plan for flexibility. While this document describes near-term priorities for CCRP, it also incorporates flexibility to respond to advances in knowledge and changing conditions, and invites a conversation regarding how the Program can continue to work with others going forward to address the challenges of climate change within our national parks.



Figure 1: Conceptual model of CCRP strategic plan

Figure 1 illustrates the components and progression of the plan. While we may revisit and update any component whenever warranted, we expect the upper “tiers” will remain relatively constant over several years, with review and potential revision of the lower elements annually (particularly Actions and Effectiveness Measures).

Mission and Vision (Roles, Responsibilities)

CCRP’s overarching purpose is to “help the NPS meet its mission by understanding, interpreting, and responding to climate change.” Objectives described within the 2010 Climate Change Response Strategy provide high-level guidance to parks and program areas servicewide in responding to climate change. In addition to its work under the Strategy, CCRP responsibilities call on Program staff to serve several different, but related roles:

1. **Catalyst** for Response and Adaptation: CCRP helps lead the agency to navigate and respond to new and unprecedented challenges imposed by a changing climate. Climate change is a crosscutting issue that requires heightened coordination across many different parts of the agency. While climate change is one of many constraints and influences on decision-making in parks, it will become an increasingly prevalent one in future years. Across the Service, the CCRP is responsible for helping to develop new thinking and approaches that deal with this complex agent of change.
2. **Representative** of the NPS: This role involves collaborating and working with other agencies and organizations to advance effective conservation measures in the face of climate change. Like many conservation issues, climate change presents challenges that are far beyond the scope of one organization to effectively solve. Progress requires shared learning and working with others who are facing similar issues. The CCRP is a focal point for connecting NPS climate work with other organizations nationally and around the world.

*As a **catalyst** and **representative**, CCRP helps position the NPS to manage the challenges of climate change over the long-term. Given the rapid development of climate science, and the reality of adaptation as an ongoing, continual process (not an end state), it is impossible to know precisely how the NPS will need to respond over time. However, a core team with responsibility to advance our thinking, acquire, develop, and help apply best available science, and continue to learn from—and share with—other places and organizations is essential. The CCRP translates climate projections and other scientific findings for use in parks, identifies new approaches, anticipates effects of climate-related changes, and determines the best ways to position the NPS to respond to climate change as we move into the future.*



NPS image by Neal Herbert

3. **Information Source:** Park managers, other staff, and partners rely on the Program as a source of climate information for specific places, vulnerability assessments about resources, facilities or visitor experience, and information about suitable approaches in responding to climate change. Drawing from the best available science (and interpreting this science for managers and decision-makers) is at the heart of this role.
4. **Guide, Supporter, and Capacity Builder:** The Program provides ongoing guidance and support for parks as they address climate change effects in decision-making processes and discussions with park visitors. In this role, CCRP provides or supports training for park staff in climate change science, adaptation, and communication, helping to share knowledge and possible approaches across the service.

As an information source and guide, CCRP provides direct benefits to parks and other partners. CCRP’s work succeeds only to the extent that we help parks navigate and adapt to the changes and risks posed by climate change. Assisting staff of parks and program areas in managing amidst change will enable them to be better stewards of resources—the heart of the mission of the NPS.

In serving as a Catalyst or Representative, the CCRP provides value in positioning – it positions the Service for effective and responsible leadership in climate change adaptation, helping parks servicewide, as well as NPS partners in managing current and future climate change challenges. This is a unique duty of CCRP within the Service—no individual parks, regions, or other programs have this responsibility. In this role, CCRP remains mindful that the capacity of parks to adapt has implications for neighboring lands (and vice versa) as well as ecosystems as a whole.

In its role as an Information Source or Guide, CCRP provides value to individual parks, so that they are able to plan for and cope with the immediate (and future) impacts of climate change. Providing such direct assistance is an ongoing responsibility of the Program.

CCRP has responsibilities across all of these roles, but an appropriate balance must exist among them. Figure 2 (opposite) illustrates the alignment of CCRP activities with these roles.



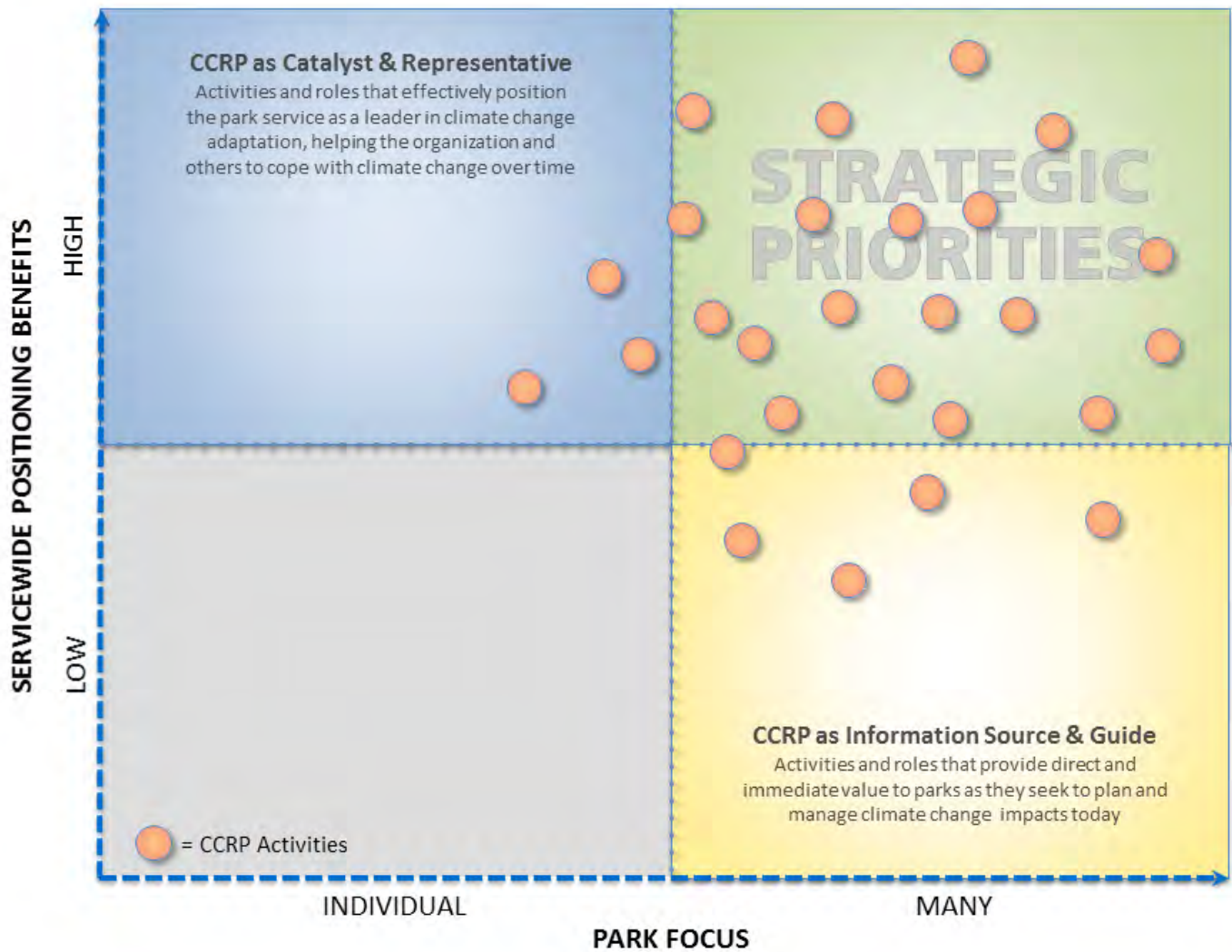


Figure 2. The NPS Climate Change Response Program invests in actions that serve multiple roles. However, the predominant responsibility of the CCRP is to focus on work that advances, or “positions,” the Service overall for maximum success in responding to climate change, while also benefitting the maximum number of park units, as illustrated in the green quadrant above.

Overall, CCRP work includes a portfolio of activities, some of which position the Service for effective leadership in climate change adaptation, with less individual park focus, while others deliver high individual park value with lesser contributions to overall positioning. Our aim is that our collective activities will provide contributions spanning both of these purposes. When possible, we will design and support work to address individual park needs in a way that provides broad, servicewide benefits through advancing understanding, knowledge transfer, and support to other parks. This “sweet spot” supports and positions parks to serve as primary vehicles for an effective, comprehensive, and sustained servicewide response to climate change over the long term.



Setting Goals and Strategic Priorities

For a broad program that serves many needs, the process of setting priorities for the CCRP must address three factors. Figure 3 (below) frames the context for identifying the most important Program investments from a wide range of potential work.

In determining strategic priorities, CCRP considered these parameters through three fundamental questions about its work over the next several years: (a) what are operational goals for the Program, (b) what capacities and resources are available, and (c) what context and future conditions do we expect to work within?



Figure 3. Factors that Influence our Strategic Priorities

Goals and Intent

CCRP identified six goals for the Program. The Program endeavors to enable parks and the NPS to achieve these outcomes:

1. Parks are knowledgeable about the challenges of climate change, understand how to prepare for future possibilities, and draw from best available climate science and assessment tools to inform and assist relevant management decisions.
2. Climate change adaptation is a routine component of park planning, decision-making, and management.
3. Parks inform their audiences about climate change effects in parks and how the NPS is responding to these challenges.
4. NPS promotes sustainability by seeking ways to reduce its carbon emissions.
5. Parks and programs across the NPS and in other agencies and organizations find value in collaborating with the Program, and the Program similarly benefits from these partnerships.
6. CCRP staff are satisfied, valued, and work well together within the Program, and with other NPS employees, agencies, organizations, and the public.

Capacity and Available Resources

The CCRP team includes staff with expertise in climate science, adaptation and communication, based in several directorates and regions. This enables its work to have greater leverage and provide broader benefits. It has developed place-based climate science at park and regional scales, and numerous guidance documents and training courses to help park staff and others manage parks under a changing climate.

All parks face the need to respond to climate change, presenting challenges for the CCRP team in providing adequate assistance to meet the tasks ahead. For example:

- It is a challenge to consistently serve more than 400 park units and work with fellow program areas, while also undertaking the “positioning” work necessary to prepare the NPS as a whole for climate change in the decades ahead. This will require innovative approaches to work both with parks and other programs.
- Expertise of staff supported by the Program largely lies in natural resource adaptation, communication, and climate science. The Program has less direct staffing capacity for cultural resources or facilities adaptation, although program staff work very closely with relevant experts in other NPS programs and directorates. Maintaining and expanding the routine collaboration already underway with personnel across directorates is a priority and will continue to be needed in the future as climate-related risks affect parks.
- The Program houses park-level climate data, vulnerability assessments, and adaptation case studies, but systems to store and easily access this information require attention, including ways to interface with other park data systems.

Future Conditions

CCRP must plan to operate in an uncertain future, as climate effects, public expectations, and funding are all highly unpredictable. Given this, CCRP conducted scenario exercises to identify possible future conditions, and potential responses. Across these scenarios, the Program highlighted several developments that are almost certain to occur, and therefore require advance planning.

First, climate change is a persistent and accelerating challenge. Its impacts will continue for many decades or centuries, including extreme weather events, species range shifts or extirpation, damage to infrastructure and facilities, etc. Helping parks to anticipate and prepare for these changes is central to CCRP responsibilities. As climate change proceeds, associated risks and impacts to natural and cultural resources and facilities will likely increase. The scale of the potential effects from climate change-related incidents might increase significantly. The manner in which parks and the NPS responds to such events can either promote adaptation to climate change, or exacerbate the impacts of continuing climate change on park resources and assets. CCRP will need to assist parks in preparing for, and responding to such incidents with urgency, but also with perspective.

Second, we can expect that public expectations about how to respond to climate change will continue to evolve. CCRP must anticipate and continue to assist parks in communication about climate change effects in national parks as more and more people who visit parks, and engage over social media and in other ways, will have more views, opinions and information on climate change than ever before.

Third, the policy environment around climate change efforts is unpredictable. Depending on emerging societal or political priorities, there could be changes to Program resources and funding, and periods where messages emerging from national or world leaders about climate change are variable. This will necessitate policy awareness and functional dexterity on the part of CCRP to remain responsive, relevant, and effective.



*Lamar Valley in Yellowstone National Park. NPS image by Jacob Frank
Opposite: Bodie Island Lighthouse in Cape Hatteras National Seashore. The North Carolina Outer Banks parks are projected to experience large areas of inundation as sea levels rise. NPS image*

Finally, amid organizational changes in and across federal agencies that work on the variety of climate change concerns, the Program will continue to provide direct support to parks relevant to climate change. The staff working on the front line in parks will continue to be the most important resource in responding to climate change, and providing support to their efforts will remain the fundamental responsibility of the CCRP. The Program is prepared to operate within an unpredictable environment, as uncertainties around climatic effects, public expectations, policy priorities, budget availability and organizational arrangements are likely to combine in surprising ways.

Strategic Priorities

The sections above describe the desired goals, the potential future conditions and the current capacity and associated challenges for CCRP. Demand for the Program's services is expected to continue to grow, while resources will be stretched. Vital new priorities may need to be addressed with little or no additional funding or resources. Consequently, the intent of this strategic plan is to focus effort for maximum benefit and efficiency, and avoid being ineffective by spreading our efforts too thin.

That said, it is also important to work as widely as possible across the NPS, so that staff in parks are fully able to build climate change considerations into their decisions. It is essential to ensure that parks are able to deal with the complexities of climate change to meet stewardship responsibilities over coming years, even as context and perspectives around this issue continue to change.

Given the Program goals, existing and projected conditions and resources, these are the Strategic Priorities for CCRP over the next several years:

Improve integration of our science and adaptation support and products, providing actionable information to address current and future needs of park units

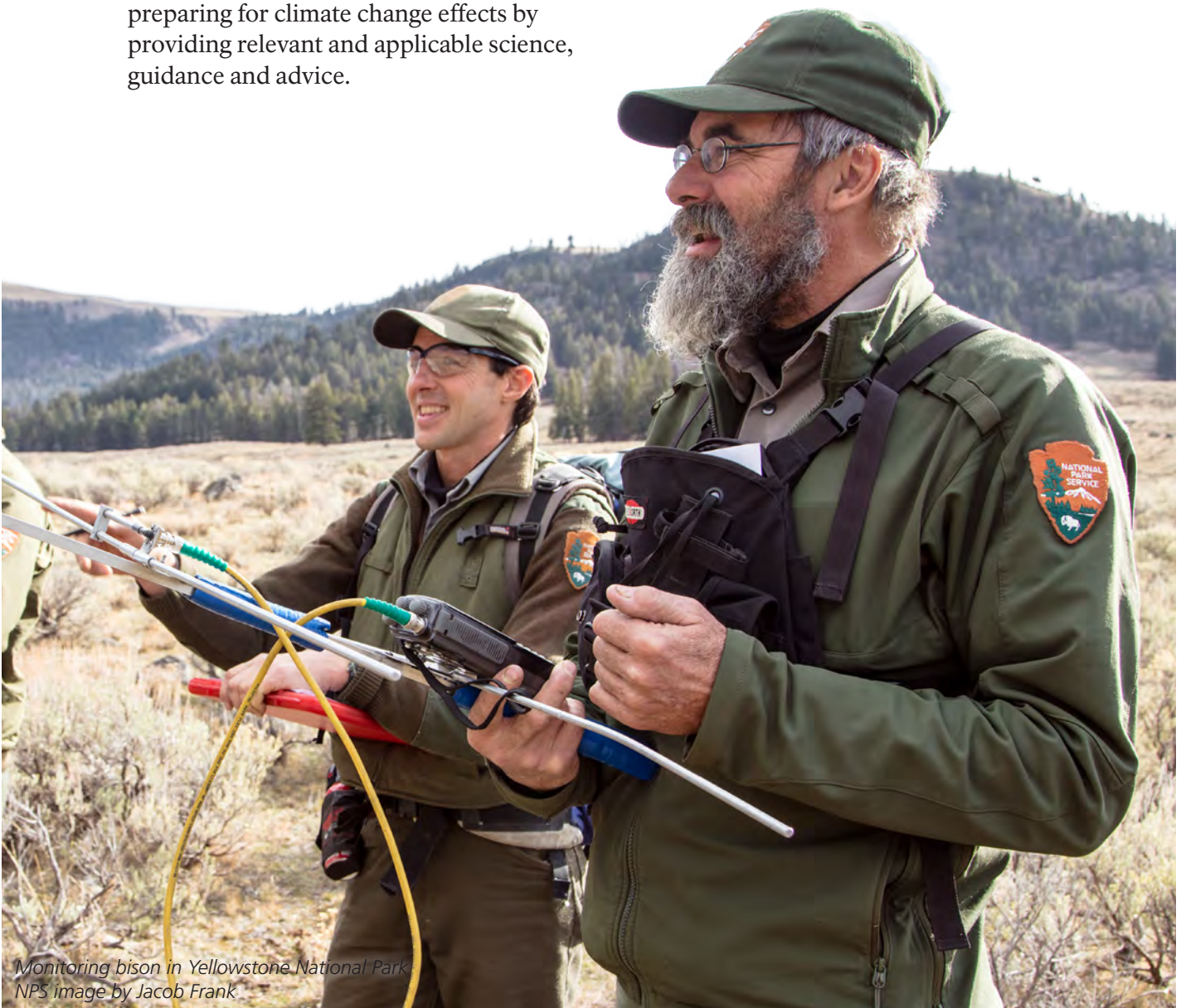
CCRP must ensure that park units have the guidance and tools they need to address climate change as a routine part of their work. For this to happen, park units must be aware of the Program's work (as well as other pertinent sources), be able to access it easily, and find it relevant in terms of informing the important choices they need to make. This requires developing streamlined and repeatable approaches that allow the Program to serve numerous park units in an efficient manner. Simultaneously, CCRP must retain the capacity to work on specific, innovative, integrated projects with proactive parks and collaborators.

The following objectives will be key to delivering on this Strategic Priority:

- Obtain or develop scientific information to support park adaptation planning and management decisions under climate change.



- Enable and encourage ongoing communication with parks and programs, to ensure that research and products provided or facilitated by the Program respond to current and ongoing park management questions.
- Devise ways to ensure that vulnerability assessment work becomes operational, repeatable and scalable across park units
- Support, and provide climate trend and projection information to planning workshops such as Resource Stewardship Strategy workshops, Climate Friendly Parks workshops, etc.
- Actively support applied, place-based projects that integrate science and adaptation work addressing specific decisions facing parks, and extend this work as a model for others.
- Complete and support a database to catalog adaptation actions within national park units as a source of information, and assist parks with addressing challenging adaptation questions regarding policy and guidance.
- Maintain a comprehensive, multi-disciplinary portfolio of skills to assist all aspects of park operations (resource management, park facilities & maintenance, interpretation, and incident response) in understanding and preparing for climate change effects by providing relevant and applicable science, guidance and advice.



*Monitoring bison in Yellowstone National Park
NPS image by Jacob Frank*

Invest in training, guidance, and other capacity building that supports understanding of climate change implications for parks

It is important that NPS employees are aware of the challenges of climate change so that they may better meet their responsibilities to protect parks, and appropriately prepare for and respond to accelerating changes. CCRP can assist this through a continued focus on providing and fostering training, and supporting the park workforce so that considering climate change issues becomes customary in their work and communication. This will help to incorporate accurate and relevant climate change considerations as a routine business practice for the NPS.

The following objectives will be key to delivering on this Strategic Priority:

- Develop and implement a cross-disciplinary training plan for NPS staff, building on existing training curricula and offerings.
- Implement the guidance document, *Planning for a Changing Climate*, and provide associated training for planners and park managers.
- Train a cadre of planners in climate change issues and scenario planning, so that they are able to guide parks and other planners in addressing climate change as a routine component of planning and decisions.
- Support development and sharing of park-based climate stories and associated adaptation actions through direct assistance to parks.
- Where desired and beneficial, support a “community(ies) of practice” for responding to climate change (such as a Superintendents’ Community of Practice, the ongoing Climate and Culture Community of Practice etc.)



2017 intern Shanasia Sylman studied the vulnerability of coastal structures at Salem Maritime National Historic Site. NPS image

Actively engage with directorates and programs across the NPS, and with partners, in order to create a more effective, efficient, and coordinated response to the challenges of climate change

The CCRP will only achieve its goals by working well with others. The scope, magnitude, and complexity of changes we face, and the tools needed to adapt to and mitigate climate change require a capacity beyond that of any individual park unit, program, or the NPS as a whole. Meeting the challenge of climate change requires cooperation and collaboration within the NPS and with our partners. CCRP staff must catalyze and support the work of other NPS programs in addressing climate change and its effects on all aspects of park operations.

The following objectives will be key to delivering on this Strategic Priority:

- Develop and support opportunities to bring NPS directorates together in assisting parks in addressing climate change.
- Support regional level discussions and attention to climate change across the Service, through more effective engagement of climate change representatives or teams in each region.
- Engage with NRSS divisions (e.g. Inventory and Monitoring) to discuss ways in which climate-related data collection and its use may be enhanced.
- Support appropriate policy development if needed to more effectively guide parks in responding to climate change.
- Work with partners outside the NPS to advance understanding of climate change impacts and adaptation approaches that can directly benefit parks and neighboring areas.
- Support and facilitate engagement of CCRP staff with interagency and non-governmental partners to build networks, share practices, and work collectively on broad issues at large spatial scales to better protect parks.



*Solar panels at Craters of the Moon National Monument
NPS image*

Implementation

Effective strategic plans include mechanisms for implementing the plan and monitoring progress toward fulfilling the goals and meeting objectives included within them. This section describes how the CCRP will implement this strategic plan and monitor progress over the next several years, including the following:

- **Annual Work Plan**—The Program will develop an annual work plan consisting of high priority actions, responsibilities, and timelines to inform the individual work plans of CCRP-supported staff, and share with parks and other programs.
- **Tracking Progress**—To monitor the implementation of goals, the Program will track progress on priority actions, including the following information:
 - Description of the action within the goal that the action targets
 - Key steps or milestones to implement action
 - Action “champion” (person identified as action lead)
 - Timeframe of implementation
 - Key resource needs (specific people, equipment, funds, etc.)
 - Measures of success (how the action outcome will be evaluated)
 - Challenges expected
- **Reporting and Transparency**—The Program will prepare an annual status report summarizing progress in achieving the Program’s goals, priority strategies and actions and make these available to update the NPS and partners.
- **Evolution**—The Program will revisit the Strategic Priorities (and the actions that underpin them) in 3-5 year intervals, or as circumstances merit.

These steps will help the Program ensure the strategic plan remains a useful document over the next several years.



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