



Climate Change Science in National Parks

Background

Climate change is shifting environmental conditions across vast landscapes, but national parks remain at fixed locations. To help meet this challenge, climate change science in the National Park Service (NPS) provides information to help manage resources and contributions to advance scientific understanding. Scientists from the NPS, universities, the U.S. Geological Survey, and other partners conduct and apply research that capitalizes on the unique conditions of U.S. national parks to advance active climate change adaptation.

Applied Research

Scientists from the NPS and its partners conduct applied research to answer key resource management questions:

- **Climate Trends** – Computational analyses of large datasets provide an ever-expanding understanding of climate in parks, both recent past climates and plausible future climates. These show that climate is already changing in most parks. Knowing the range of plausible future climates helps managers understand and prepare for their potential impacts.
- **Historical Impacts** – Field research in national parks has detected substantial changes in ecosystem processes and conditions that are attributable to human-caused climate change. These impacts include melting glaciers, increased wildfire, tree death, coastal erosion caused by sea level rise, bleaching coral, and upslope shifts in vegetation and wildlife. Understanding these historical impacts helps managers prepare for future impacts.
- **Vulnerability** – Spatial analyses of species, ecosystems, and other resources identify what is at risk and why. Climate change vulnerability assessments help parks prioritize vulnerable resources and future adaptation actions. Scientists have analyzed climate impacts to cultural and natural resources, infrastructure, and visitor experiences. These assessments provide a sound foundation for developing and implementing climate adaptations.
- **Monitoring** – The NPS Inventory and Monitoring Program tracks important climate and ecological indicators over time, including glacier perimeters and plant and animal species ranges.

NPS scientists carefully monitor bird species that are vulnerable to climate change impacts.
NPS Photo by Jacob Frank



Scientists in Glacier National Park regularly monitor glaciers to determine rates at which they are retreating. NPS Photo

- **Carbon** – Quantification of local greenhouse gas emissions (e.g., from facilities and vehicle exhaust) helps the NPS reduce contributions to climate change, and quantification of ecosystem carbon stocks helps the NPS understand how forests, wetlands, and other ecosystems naturally store carbon. The *Green Parks Plan* reports on changes in emissions and successful mitigation efforts by parks.

Collectively, this growing body of knowledge is rapidly expanding the NPS' capacity to *understand and adapt* to unprecedented change.

Reports and data products from these efforts can be found on the [National Park Service Data Store](#).

More Information

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