



## Climate Change Science in National Parks

### Background

Climate patterns are shifting in space and time, but national parks and other natural areas remain at fixed locations. Climate change science in the National Park Service is providing information to help ensure the stewardship of ecosystems, cultural resources, and infrastructure vulnerable to shifts in climate. Interdisciplinary research seeks to span the physical, biological, and social sciences and examine national parks, surrounding landscapes, and human communities in an integrated way.

Collaboration among scientists from the NPS and other government agencies, universities, and non-governmental organizations, together with peer-reviewed scientific publications on research in national parks, add to scientific knowledge of climate change impacts, adaptation, vulnerability, and forest carbon.

### Applied Research

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

- Estimation of carbon stocks (e.g. globally important forest carbon in Redwood National Park) and emissions (e.g. fossil fuel emissions from park vehicles and buildings) helps the NPS reduce the greenhouse gases that cause climate change.
- Detection of historical environmental changes (e.g. glacial melt in Glacier National Park) and attribution of the causes of those changes (e.g. climate change, invasive species, urbanization) provide basic information on whether or not a resource is changing and whether or not climate change is the cause.
- Analyses of the vulnerability of species (e.g. pikas in Rocky Mountain National Park) and ecosystems (e.g. vegetation shifts across the U.S.) identify vulnerable areas and potential refugia for the future.
- Development of specific adaptation measures (e.g. targeted wildland fire in Yosemite and Sequoia National Parks) can help increase the resilience of resources in the future.



Scientists at North Cascades National Park regularly monitor glaciers to determine the rate of change occurring in the high country. NPS photos by Jim McLeod.

### Strategic Goals

The NPS Climate Change Response Strategy sets high-level goals for climate change science:

- Goal 1:** Use the best available scientific data and knowledge to inform decision making about climate change.
- Goal 2:** Collaborate with partners to develop, test, and appropriately apply climate change models to NPS activities.
- Goal 3:** Inventory and monitor key attributes of the natural systems, cultural resources, and visitor experiences likely to be affected by climate change.
- Goal 4:** Use best available science to evaluate and manage greenhouse gas storage and emissions in national parks.

These goals support the adaptation, communication, and mitigation goals within the strategy.

### More Information

**Patrick Gonzalez, Ph.D.**  
Climate Change Scientist  
Climate Change Response Program

ph: (202) 513-7185  
email: Patrick\_Gonzalez@nps.gov

**Leigh Welling, Ph.D.**  
Manager  
Climate Change Response Program

ph: (970) 225-3513  
email: Leigh\_Welling@nps.gov

<http://www.nps.gov/climatechange>

