

NATIONAL PARKS IN PERIL THE THREATS OF CLIMATE DISRUPTION

State Fact Sheet: Alaska

Human disruption of the climate is the greatest threat ever to our national parks.

At risk are nearly every resource and value that make our national parks so special. In National Parks in Peril, the Rocky Mountain Climate Organization and the Natural Resources Defense Council identify 25 national parks as having the greatest vulnerabilities to human-caused climate change. In Alaska, Denali National Park and Preserve is among the 25 parks most at risk as human activities change the climate. Denali is vulnerable to a loss of ice and snow, a loss of water, more downpours and floods, a loss of plant communities, and a loss of wildlife.

Unfortunately, how a disrupted climate may affect parks in Alaska is not yet well documented. As the National Park Service (or NPS) and others further assess the impacts of climate change on parks, it may become clear that some Alaska parks not on the list actually have greater vulnerabilities than ones on it. For now, Denali, the one Alaskan park on our list, should be considered as broadly representative of the threats to all parks in Alaska. Some documentation, described below, does exist for Gates of the Arctic, Glacier Bay, and Kenai Fjords national parks, and Lake Clark and Wrangell-St. Elias national parks and preserves.

Many of these impacts are already happening, as human activities—the emission of heat-trapping gases—are now changing the climate. To preserve our national parks for ourselves and future generations, we need to both stop changing the climate and take actions to preserve the resources and values that make our parks special. For detailed recommendations, see the full report, National Parks in Peril.

Loss of Ice and Snow

As the climate gets hotter, national parks in the Northern Hemisphere are losing ice and snow—one of the most obvious effects of a changed climate on our national parks. The Intergovernmental Panel on Climate Change reported in 2007 that glaciers are melting worldwide in response to higher temperatures since 1970. In the United States, glacial melting is concentrated in our national parks, which contain the vast majority of the nation's glaciers.

Not surprisingly, glaciers are melting in Alaska, which has heated up more than any other state. Alaska's glaciers are melting so rapidly that they are responsible for about half of the worldwide loss of ice from glaciers, and are responsible for the world's largest documented glacial contribution to sea-level rise. Most of the state's glaciers are in national parks. Wrangell-St. Elias, our largest national park, by itself has 60 percent of all glaciers in Alaska. The park's glaciers have not yet been well studied, but the scanty evidence that exists verifies their decline. In Denali, where glaciers cover one-sixth of the park, twice-yearly measurements for a decade have documented the shrinkage of Kahiltna Glacier, one of the park's great glaciers, which begins on Mount McKinley and flows for 36 miles. In Kenai Fjords, the Harding Icefield crowns the park and is the source of 38 glaciers



To read the full report on the impacts of global warming on national parks, visit www.nrdc.org/policy or www.rockymountainclimate.org

For more information, please contact:
Theo Spencer at NRDC
(212) 727-2700
Tom Easley at RMCO
(303) 861-6481

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that have sculpted the park's landscape. University of Alaska Fairbanks's researchers have documented that nearly all the park's glaciers are thinning and in retreat.

In Glacier Bay, melting glaciers have geologic effects. There, the rapid loss of glacial ice mass has eased an enormous weight on the underlying land, leading it to rise dramatically. The changes are so profound that they actually could set off earthquakes because the Earth's tectonic plates are more prone to shift without the extreme weight of the ice holding them in place.

Other Alaskan parks that could experience a loss of glaciers include Gates of the Arctic, Kenai Fjords, and Lake Clark.

Loss of Water

A changed climate likely will bring less snowfall, earlier snowmelt, and hotter and drier summers, reducing water availability, especially in the summer when it is most needed by wildlife, plants, and entire ecosystems.

National parks losing glaciers will also lose meltwater from the glaciers, which normally is a reliable source of water in late summer. Among parks suffering a loss of water as glaciers shrink could be Denali, Gates of the Arctic, Glacier Bay, Kenai Fjords, Lake Clark, and Wrangell-St. Elias.

More Downpours and Floods

With a changed climate, more precipitation now comes in downpours. The amount of rain falling in heavy storms increased by 20 percent over the past century, while there has been little change in the amount from light and moderate storms. In its recent report, the U.S. Global Change Research Program says there is at least a 90 percent likelihood that heavy downpours will become even more frequent and intense. With an increase in downpours, flooding also is likely to increase. Virtually all national parks in Alaska and elsewhere are at risk, as the forecast is for more downpours everywhere. An extreme downpour in Mount Rainier National Park in 2006 illustrates the risk—it caused so much flooding that the entire park was closed for a full six months.

Loss of Wildlife

For many Americans, the highlight of a trip to a national park is the wildlife they see. But a changed climate could mean less of the wildlife species now in the parks. Some species may go completely extinct, and, local populations in particular parks may be eliminated or decline sharply.

There is some evidence in particular parks of how habitat changes could affect park mammals. In Denali, Gates of the Arctic, and Wrangell-St. Elias, frequent winter thaws could lead to ice-crusting snow that is harder for foraging caribou to penetrate to get sufficient food in winter. The caribou also could suffer from changes in park plant communities that diminish their food sources.

For documentation of the sources used for this fact sheet, please see the full report, *National Parks in Peril: The Threats of Climate Disruption*, at www.nrdc.org/policy or www.rockymountainclimate.org.