

NATIONAL PARKS IN PERIL

THE THREATS OF CLIMATE DISRUPTION

State Fact Sheet: Texas

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 Texas, **Padre Island National Seashore** is among the 25 parks most at risk. Padre Island is vulnerable to higher seas and more storms, more downpours and floods, a loss of plant communities, a loss of wildlife, more crowding, a loss of fishing, and more air pollution. **Big Bend National Park** faces similar vulnerabilities.

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*.

Higher Seas and Stronger Storms

A hotter climate raises sea levels by melting ice from land-based glaciers and ice sheets, which adds more water to the oceans, and by heating water so that it expands in volume, which also pushes sea levels higher. Current estimates are that with a high-emissions future sea level will rise three to four more feet by the end of the century; under a lower-emissions future, the seas are expected to rise about 2.3 feet. A second major risk to coasts and coastal parks comes from stronger coastal storms, including hurricanes. According to a recent U.S. government report, climate models project that further warming of ocean waters will lead to stronger tropical storms.



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

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Padre Island could be one of the first losses of entire national parks, as it could be totally submerged by rising seas. Padre Island has the world's longest stretch of undeveloped barrier island, much of it less than three feet above current sea level. The park is a Globally Important Bird Area because of its role in migration and the most important U.S. nesting site for the world's most endangered sea turtle, the Kemp's ridley. The seashore is also vulnerable not just to coastal storms hitting it directly but also to others in the Gulf of Mexico, because prevailing currents bring debris ashore from storms elsewhere. Following Hurricane Ike in 2008, the NPS had to remove 580 tons of trash washed up on park beaches by the hurricane.

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 a 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 Texas 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 Plant Communities

An altered climate can lead to fundamental changes in the natural plant communities of parks. At Padre Island, the plant communities of the coastal dune ecosystems and marshes, intertidal areas, and near-shore ecosystems could be lost to the effects of sea-level rise, stronger coastal storms, storm surges, and saltwater intrusion, all of which are projected to result from a human-changed climate.

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.

Sea-level rise could pose problems for some bird populations. With a three-foot sea-level rise, much of Padre Island and an adjacent estuary would be inundated, eliminating habitat for migrating and overwintering shorebirds and waterfowl.

The beaches of Padre Island provide key nesting habitat for the Kemp's ridley sea turtle, the most endangered of all sea turtles in the Gulf of Mexico. After successful reintroduction of Kemp's ridley turtles from Mexico to Padre Island, the seashore now hosts most Texas nests of these turtles. But the seashore is vulnerable to sea-level rise and stronger storms, and as a result so are the sea turtles.

Loss of Historical and Cultural Resources

By preserving some of the best of our historical and cultural resources—buildings, landscapes, archaeological sites, and artifacts—America's national parks provide information about the past and provide important links to the present. Many of these resources are at risk from the possible effects of a climate disrupted by human activities.

Increased downpours, flooding, and erosion likely will increase damage to historic structures and cause a loss of artifacts. This is particularly true in arid areas, where the land is dry and hard enough that downpours are not absorbed into the soil but instead produce floods and erosion. Not all sites that could be affected are even known to the Service; in Big Bend National Park, for example, the NPS has estimated that there could be 26,000 archaeological sites in the park, only three percent of which have even been identified and inventoried. And, the NPS program points out, these cultural resources are also at risk because the Service lacks the funding to inventory and preserve them.

More Overcrowding

As temperatures soar with a changed climate, to escape oppressive heat enough people may flock to cooler national seashores to overcrowd them. In these parks, the impacts of additional visitation could include less visitor enjoyment and damage to park resources. Overcrowding could be a significant problem particularly for those parks that offer a break from heat and are close to major population centers, including Padre Island.

Loss of Fishing

Fishing is a popular pastime in national parks. But now a changed climate threatens to reduce fish populations and recreational fishing opportunities in the parks. In the nation's coastal parks, fishing for marine species could be affected. At Padre Island, surf fishing is popular, but the beaches where people fish—or access to them—could be lost if the island is fragmented or inundated by sea-level rise.

More Air Pollution

A hotter climate is projected to worsen concentrations of ground-level ozone, a component of smog created when pollutants mix in sunlight. Ground-level ozone has been firmly established to harm people's health, and the U.S. Environmental Protection Agency has set air quality standards at the levels necessary to prevent adverse health effects.

Many people think of ozone as a big-city air pollution issue, but it is a problem in many national parks, affecting both the enjoyment and the health of visitors. Based on monitoring with portable equipment, monitoring sites near the seashore, and other methods, the NPS thinks that Padre Island in 2005-2007 violated the ozone standard. Because future climate-change driven increases in ozone levels are expected to be greatest where ozone levels already are high, the seashore is at risk of continued, perhaps worsened, levels of unhealthy air.

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.