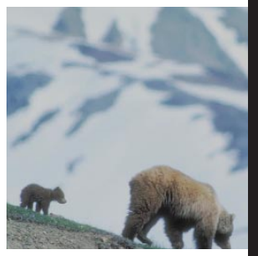
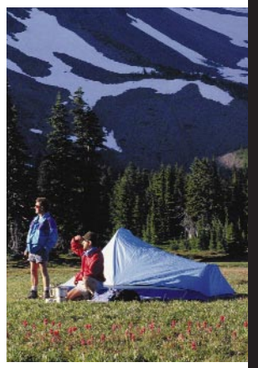
CLIMATE CHANGE AND ECOSYSTEMS

Thousands of scientists predict that the earth's climate will change because human activities are altering the chemical composition of the atmosphere through the buildup of greenhouse gases. The heat-trapping property of such gases as carbon dioxide, methane, nitrous oxide, and chloroflurocarbons is undisputed. Greenhouse gases are released into the atmosphere in large quantities by motorized vehicles, utilities, factories, appliances, and landfills.





Although there is uncertainty about exactly how and when the earth's climate will respond to higher concentrations of greenhouse gases, observations indicate that detectable changes are underway. Temperatures will most likely rise by an average of 2 to 6˚F over the next century, along with measurable changes in precipitation, soil moisture, and sea level. All of these changes could have adverse effects on many ecological systems, as well as on human health and the economy.

WHAT CAN YOU DO?

- Inform yourself and others. For more information on climate change and national parks, visit EPA's website at www.epa.gov/globalwarming; and click on "impacts." Or call EPA's National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198 and ask for information on climate change and how it affects wildlife, forestry, and/or sea level rise.
- Encourage more research. If you work for an organization that carries out related scientific studies, suggest including a climate change component to the research.
- Reduce greenhouse gases. Use a more fuel-efficient (or non-motorized) mode of transportation. Carpool. Purchase electronic devices and appliances with the ENERGY STAR® label. Plant trees.

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Policy (2171)
401 M Street, SW
Washington, DC 20460

Printed on Recycled Paper

United States Environmental Protection Agency
EPA-236-F-99-004
May 1999
Office of Policy (2171)

EPA

Climate Change and PUBLIC LANDS

National Parks At Risk

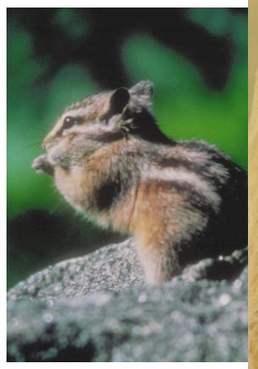
CLIMATE CHANGE AND WILDLIFE

America's national parks were established to preserve valuable natural resources while providing environmentally diverse settings for recreation. They were intended for use by Americans of all generations to come. But these natural treasures may be at risk from global climate change if we do nothing to address the problem. Other public lands, such as national seashores, national forests, wildlife refuges, and Bureau of Land Management lands also could be affected.

Global warming could have numerous impacts on wildlife and their habitat on public lands and the waters that flow through those lands. Many inland freshwater rivers, lakes, and streams may become too warm for the fish and other aquatic species that currently inhabit them.

Climate change also may contribute to a loss of wetlands, beaches, and other habitat. As the oceans warm, the sea level rises and erosion of beaches and wetlands during storms increases. Such national park units as Padre Island, Assateague Island, Fire Island, Cape Hatteras, and Cape Cod could be affected by sea level rise.

States in coastal areas that cannot enact land use planning may find that wetlands and other coastal ecosystems cannot migrate inland as the sea rises. Critical wetlands in wildlife refuges and other public lands could be lost as a result.



CLIMATE CHANGE: PUBLIC LANDS AT RISK

Glacier National Park is located in a pristine mountainous area in northwestern Montana. The park provides habitat for an abundance of wildlife, including the densest population of grizzly bears (a threatened species) in the United States. Climate change could have a serious impact on this national park. Today, the park has approximately 50 glaciers, down from an estimated 150 in 1850. The recession of Sperry Glacier illustrates the impact of recent warming temperatures. If warming trends continue, it is estimated that the park will have no glaciers by 2030. Without glaciers, stream temperatures are expected to rise. Higher water temperatures could affect aquatic ecosystems, especially trout species. Climate change also could alter the types of trees found in the park.

Alaska's pristine ecosystems are especially vulnerable to climate change since warming is projected to be greater at higher latitudes than in other parts of the world. With sufficient increases in temperature, tundra ecosystems are expected to decline significantly. Melting permafrost in Alaska's ruggedly beautiful Denali National Park could jeopardize essential habitats for caribou herds. Melting permafrost also affects freshwater wetland habitats and may lead to increased landslides and erosion. It may clog spawning rivers with silt and trigger the loss of some boreal forests.

Reductions in tundra and related ecosystems also would mean the loss of mammal and migratory waterfowl habitats. In addition, Alaska's native Coho, sockeye, and chinook salmon found in Glacier Bay, Katmai, and Wrangell-St. Elias national parks may be affected by the warming of lakes and rivers.

Saltwater already has intruded 5 miles into **Everglades National Park** from Florida Bay. Increased salinity resulting from sea level rise could damage freshwater ecosystems in the Everglades that provide important habitat for birds, fish, and other wildlife. Freshwater wetlands such as sawgrass, slough, and wet prairie, which are important foraging habitat for wading birds and other wildlife, would decrease in area. These habitat changes could increase pressures on endangered species such as the Florida panther, Key deer, American crocodile, and the Everglades mink.

Without the promise of a stable climate, the history, heritage, wilderness, and beauty preserved by America's public lands are at risk. Climate change could increase the possibility of drought and thus kill the whitebark pines, a source of edible nuts for grizzlies in Yellowstone Park. Fires and flooding also could change the composition of Yellowstone and many other of our nation's celebrated landscapes.