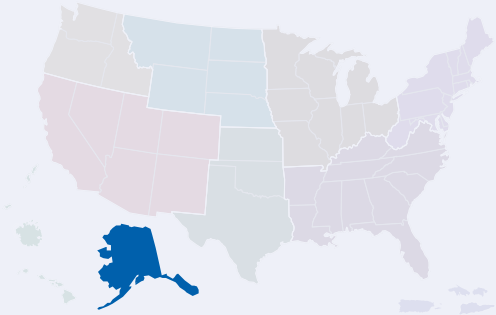
Preparing for the Health Impacts of Climate Change in **Alaska**



Temperature-Related Death and Illness

Winter travel has long been a key feature of subsistence food-gathering activities for rural Alaska communities. Higher winter temperatures and shorter durations of ice seasons may delay or disrupt usual patterns of ice formation on rivers, lakes, and the ocean. For hunters and other travelers, this increases the risk of falling through the ice, having unplanned trip extensions, or attempting dangerous routes, leading to exposure, injury, death, or drowning.

Air Quality Impacts

Climate-driven increases in air pollution in Alaska are primarily linked to the increases in wildfire frequency and intensity. Wildfires threaten individual safety in adjacent communities and pose risks downwind from smoke inhalation, particularly for children and persons with chronic respiratory and cardiovascular conditions. Moreover, wildfire smoke exposure is associated with an increased risk of adverse health outcomes among Alaska Natives and rural residents. This increased risk is thought to be due, in part, to underlying differences in rates of chronic disease, as well as access to healthcare and resources for exposure reduction (e.g., air filters). Common exposure reduction strategies may not be an option for many households. Air conditioning in homes is rare in Alaska, so relief is seldom available for persons disproportionately at risk to escape smoke exposure due to wildfires. Simultaneously, more intense seasonal pollen blooms and mold counts can increase the risk of respiratory allergies and trigger asthma attacks in those who are sensitive. Increased respiratory symptoms have also been reported in communities that are experiencing increased windblown dust

Extreme Events

Extreme weather events such as major storms, floods, and heavy rain have all occurred in Alaska and threaten human health. For coastal areas, the damage from late-fall or winter storms is likely to be compounded by a lack of sea ice cover, high tides, and rising sea levels. These can increase damage to infrastructure such as roads, homes, and buildings, and subsequently threaten lives. Similar events threaten communities on rivers, where flooding due to increased glacial melt or heavy rains can cause extensive structural damage and loss of life.

Vector-Borne Diseases

Changes in insect and arthropod ranges due to climate change have increased human exposure to vector-borne diseases. Tick-borne human illnesses are uncommon in Alaska, but reports of ticks on domestic dogs without travel exposure outside the state raise concerns about tick-range expansion into Alaska and the potential for the introduction of new pathogens, such as Lyme disease. While there have been no known locally acquired human cases of Lyme disease in Alaska, the risk of occurrence is expected to increase, especially for those who spend a lot of time outdoors.

Rabies is another vector-borne disease whose range is shifting with its host species. In Alaska, changes in sea ice and prey availability may have introduced red foxes to rabid Arctic foxes and contributed to the widespread outbreak of rabies in western Alaska during the 2020/21 winter. This event may have contributed to the expansion of rabies along the Alaskan coast and further inland.

Water-Related Illness

In Alaska, climate change has created new challenges to building and supporting sanitation systems and exacerbates inequitable health-related infrastructure. Climate-related environmental changes such as surface water loss, storm surges, river or coastal erosion, saltwater intrusion, and flooding lead to wastewater treatment system damage. Perhaps the biggest threat is permafrost thawing, as shifting soil undermines the integrity of household foundations and wastewater distribution systems. Already, many households lack in-home piped water and sewer services; this lack is associated with multiple adverse health outcomes and contributes to health disparities, especially in rural Alaska.

Simultaneously, the documented northward range expansion of beavers has been postulated to increase the threat of waterborne Giardia infections in humans; however, human Giardia illness reports have been stable in Alaska and show no increasing regional trends.

Food Safety, Nutrition and Distribution

With changes in the habits and habitats of fish, birds, and mammals, traditional subsistence hunters and fishers in Alaska will be particularly impacted by climate change. For example, traditional fishers face an increasing risk of consuming contaminated and toxic wildlife as a result of exposure to harmful algal blooms (HABs). The Chukchi Sea hosts the largest bed of resting HAB cysts, which are primed to hatch as ocean water warms. Thus, there will likely be an increase in HAB-related illnesses in the region, including paralytic shellfish poisoning (PSP), an untreatable and potentially fatal illness caused by a potent neurotoxin in shellfish. Moreover, traditional ice cellars, used in Alaska for storing food, will be disturbed by permafrost thawing and coastal erosion. This could lead to food spoilage or infectious disease outbreaks.

Climate change will have some positive impacts on Alaska's food security, particularly in the agricultural sector. A longer growing season, and increased yields are expected to enhance the share of locally grown foods consumed by Alaskans. On the other hand, pests, flooding, and ground collapse resulting from permafrost thaw will pose challenges.

Mental Health and Well-Being

Climate change is a common concern among Alaskans and is associated with depression, increased rates of suicidality, and other negative mental health effects. In particular, many Alaskan Native populations experience negative mental health impacts and spiritual grief about the potential changes to communities, subsistence foods, culture, traditional knowledge, and the potential of relocation from long-established traditional sites as a result of climate change. Alaska Native populations already experience significantly elevated rates of suicide, especially among youth. The climate-driven mental health crisis is only exacerbated by existing disparities in mental health services.

Populations of Concern

The Alaskans most vulnerable to these climate-related changes are those who are most dependent on subsistence foods, the socioeconomically disadvantaged , the geographically isolated, the very young, the elderly, and those with existing health conditions that require ongoing care, that limit mobility, or that reduce capacity to accommodate changes in diet, family support, or stress.

Native American and Alaska Native communities are particularly vulnerable as the health risks of climate change are expected to compound existing health issues, in part due to the loss of traditional foods and practices, the mental stress from permanent community displacement, increased injuries from lack of permafrost, storm damage and flooding, smoke inhalation, damage to water and sanitation systems, decreased food security, and new infectious diseases.

Additionally, climate impacts have severe socioeconomic consequences for Indigenous peoples, small rural communities, and industries throughout Alaska. For example, a multiyear closure of the subsistence king salmon fishery due to climate change and the overharvesting of ocean king salmon via bycatch has been disastrous to Indigenous peoples' self-sufficiency and financial independence.

CDC Success Stories

Village of Wainwright

The Tribal Village of Wainwright identified that the effects of climatic changes on sea ice are of particular concern to community members as it creates unstable and hazardous transportation conditions on previously stable routes used by snowmobiles in the spring. In response, a project was implemented that supported existing accident prevention and rescue programs through the promotion of the use of location technology (inReach devices) and developed new community-based programs that increase knowledge of health risks due to climate change to reduce injury and death resulting from subsistence and travel activities. This project was supported by a 2017 mini-grant from the CDC via the National Indian Health Board (NIHB).

Sitka Tribe of Alaska

The Sitka Tribe of Alaska relies heavily on shellfish and seafood for nutrition and cultural purposes. Warming water temperatures threaten the safety of shellfish for human consumption. With a 2019 mini-grant from the CDC via the National Indian Health Board (NIHB), the Tribe coordinated a regional project to monitor shellfish contamination. Through this project, they are building capacity to support testing and notification of threats to traditional shellfish and sea-dependent diets.

This fact sheet was prepared by the CDC Climate and Health Program, which empowers communities to protect public health from a changing climate. Information on the health impacts of climate change is provided by the Fifth National Climate Assessment. For more information on the CDC Climate and Health Program, visit https://www.cdc.gov/climate-health/index.html, and the Fifth National Climate Assessment, visit https://nca2023.globalchange.gov/.