ADAPTING TO CLIMATE CHANGE
ALASKA

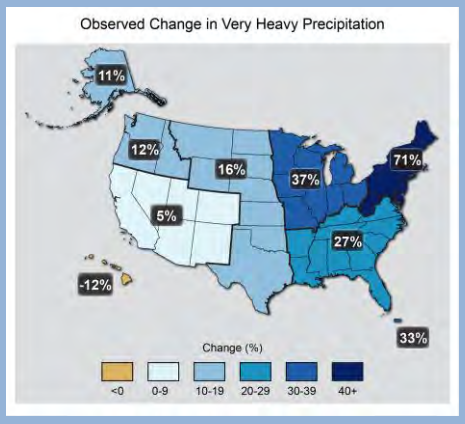
Alaska accounts for about 20% of the total U.S. landmass, twice that of Texas. It is the only U.S. Arctic region, with lands on both sides of the Arctic Circle. Projected higher temperatures and more precipitation pose challenges to communities as they try to protect air quality, prepare for impacts to Native communities, and protect coastal areas. Many communities are building resilience to the risks they face under current climatic conditions. This fact sheet provides examples of communities that are going beyond resilience to anticipate and prepare for future impacts.

Moving Beyond Resilience to Adaptation

Climate change adaptation goes beyond resilience by taking actions to address future risks. Adaptation refers to how communities anticipate, plan, and prepare for a changing climate.

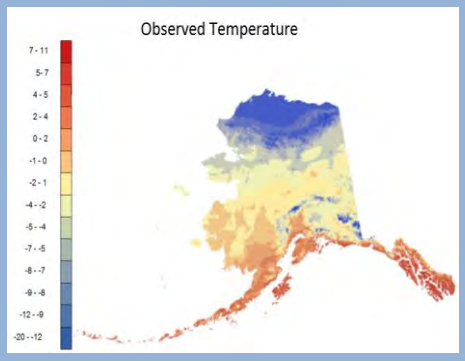
Observed and Projected Changes in Alaska

Intense storms have increased



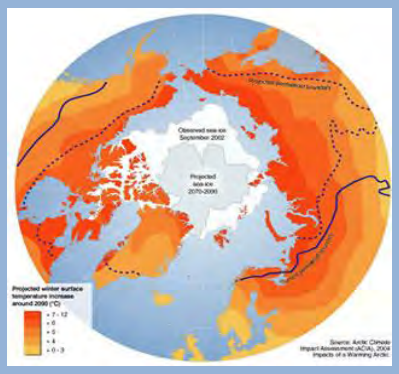
Alaska experienced an 11% increase in the amount of precipitation falling in very heavy events (the heaviest 1%) from 1958 to 2012.

Average Annual Temperature



This map shows the average annual temperature (°C) from 2000-2009 in Alaska.

Permafrost is melting



The area inside the solid line marks where permafrost exists today in the Arctic. The dotted line shows where the permafrost boundary might be by the year 2090.

Maintaining Air Quality

Climate factors that promote more frequent and intense wildfires include warmer weather, little or no precipitation, low relative humidity and high winds. Longer summers and higher temperatures create an environment that is conducive to larger fires. Between 1970 and 2000, the length of the snow-free season increased by about ten days across Alaska, primarily because of earlier snowmelt, leading to an earlier spring. These conditions give vegetation and soils more time to dry out, increasing the likelihood of wildfires.

- Climate change can increase the impacts of wildfires on humans, such as respiratory illness and smoke inhalation.
- Climate change can significantly increase summertime ground-level ozone concentrations in many areas.

Adaptation in Action

The Alaska Interagency Wildland Fire Management Plan (AIWFMP) is working to protect human health, cultural, and natural resources as the climate changes. In order to anticipate, prepare, and plan for more frequent and intense wildfires, AIWFMP developed several wildfire management options to ensure best use of limited resources. These options prioritize firefighting actions and how to best protect public health, ecosystems, and critical infrastructure. The management plan allows aggressive suppression where human health, property, and other critical resources are at risk, and also allows fires to be monitored where there is no immediate threat to public health.

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Impacts on Native Communities

Alaska is home to 229 federally recognized tribes, 40% of the total U.S. tribal population. Many are already experiencing the effects of climate change. Higher temperatures, decreasing sea ice, and melting permafrost are threatening the health, economy, and culture of Alaska Native peoples, despite their history of living close to the land and adapting to natural changes. Key vulnerabilities include:

- Climate change will increase coastal erosion, thus threatening coastal communities.
- Climate change will push Alaska Native communities to retreat and relocate away from climate-battered areas, due to high costs and constraints on relocation funds.
- Climate change will reduce the availability of food due to changes in species migration, and by making hunting and fishing more difficult.
- Climate change is already affecting the lives and culture of people who depend on traditional way of acquiring and storing their food.

Adaptation in Action

After two cases of paralytic shellfish poisoning in Sitka, AK, 11 of 17 tribal communities joined the Southeast Alaska Tribal Toxins (SEATT) partnership to combat the risks of harmful algal blooms (HABs) to subsistence shellfish harvesters. As ocean temperatures rise due to climate change, HAB outbreaks are expected to become more frequent and severe. Since the state does not test recreational and subsistence shellfisheries, the Sitka tribe is developing a shellfish testing laboratory, with support from the EPA. Weekly plankton monitoring will show when HABs are more likely to occur, thus protecting the health and economy of southeast Alaska tribal communities, as the climate changes.

In several Alaskan Native communities, urgent planning discussion are underway about how to adapt, and potentially relocate, due to climate change. Newtok, a Yup'ik Eskimo coastal community, has worked for a generation to relocate to a safer location as the climate has changed. Between 2004 and 2006, three storms accelerated coastal erosion and repeatedly flooded the village water supply, caused raw sewage to be spread throughout the community, displaced residents from homes, destroyed subsistence food storage, and shut down essential utilities. The loss of the town's barge landing, where most supplies and heating fuel were delivered, created a fuel crisis. Saltwater is contaminating the community water supply, and by 2017, erosion is projected to reach the school, the largest building in the community. Federal legislation does not authorize relocation funding, nor does it authorize the community to repair or upgrade storm-damaged infrastructure in flood-prone locations.

Permafrost

Permafrost is frozen ground that restricts water drainage and strongly influences water flows and affects the design and maintenance of infrastructure. In Alaska, permafrost is under 80% of the land. Some climate models project the complete loss of near-surface permafrost from large parts of Alaska by the end of this century. Key vulnerabilities include:

- Climate change increases temperatures, which leads to increased thawing of permafrost. This causes surface instability, sinking of infrastructure and buildings, and impairs human and animal movement on the land.
- With higher temperatures due to climate change, water drains away or evaporates into the air, soils dry out, further destabilizing critical infrastructure, as the permafrost melts.

Adaptation in Action

The Climate Housing Research Center in Fairbanks, AK, has advised businesses and residents to avoid building on permafrost as a way to anticipate, prepare and plan for a changing climate. The Center also designs homes with adjustable foundation piers, which can be moved if permafrost conditions deteriorate. To protect the permafrost from melting, damaged roadways are rebuilt with the same type of insulation used in foundation walls. Federal and state officials are laying an extra four inches of insulation under a roads that was damaged by thawing permafrost before repaving it. In some areas, structures have been built with refrigerated supports to ensure structural integrity in the face of a changing climate.

For a comprehensive view of projected climate changes in your region, consult:

- ***Climate Change Impacts in the United States: The Third National Climate Assessment***
- ***EPA's Climate Change Adaptation Resource Center***

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