

Climate Change and Wildfire in Alaska

Climate change has caused increasing temperatures and longer growing seasons in Alaska, which have intensified wildfire seasons.

Temperatures are rising

Average annual temperatures have **risen 3°F since 1925** and are likely to increase by **2-15° F by 2100**. Night temperatures are also rising, complicating fire suppression efforts.

Snow is melting earlier

Snowpack **develops a week later in autumn and melts two weeks earlier in spring** compared to the late 1990s, lengthening fire seasons.

Fire seasons are lengthening

Fire seasons **start earlier and end later** (May - September). Warmer temperatures, increasing tundra burning, and changing snowpack lengthens seasons.

Area burned by fire has increased

Wildfires are burning more acres and expanding into new areas of the state. Model projections suggest that **there will be more fire in Alaska in the future**.

Reburned areas are more common

Since 1980, an **increasing trend in acres reburned** has emerged. A reburn occurs when fire affects a spot that has been recently burned.

Tundra fires are more common

The tundra could experience **twice as much total burned area and up to four times more frequent burns** by 2100, compared to historical records.

How will changing wildfire patterns affect Alaska?



- **Shift from conifers to hardwoods in boreal forests:** Increasing fire severity in the Interior has led to a shift from spruce-dominated boreal forests to deciduous forests of birch and aspen.
- **Reburns, fire return intervals, and holdover fires:** Warmer temperatures and drier conditions are expected to increase fire frequency in the tundra and forests.
- **Increased smoke:** As wildfires have become more frequent and severe, smoke from wildfires is also increasing, with implications for human health, particularly for Alaska Natives and other rural residents.
- **Thawing permafrost:** Although warming temperatures are the primary driver of permafrost thaw in Alaska, wildfires accelerate the rate of thaw by removing duff.
- **Increased tundra burning:** Warming temperatures and increased drought have contributed to an increase in wildfires in the tundra.

Can we say that a wildfire is caused by climate change?

A single fire cannot be attributed to climate change unless a scientific attribution analysis of fire conditions is conducted. Many other factors influence wildfire, including human ignitions, short-term weather conditions, winds, fuel levels, and forest management. Yet, recent trends in wildfire are consistent with climate change projections and what is expected in the future.



Additional Resources

- [Climate Change and Wildfire in Alaska: Northwest Climate Hub](https://www.climatehubs.usda.gov/hubs/northwest/topic/climate-change-and-wildfire-alaska) <https://www.climatehubs.usda.gov/hubs/northwest/topic/climate-change-and-wildfire-alaska>
- [Alaska's Changing Wildfire Environment](https://uaf-iarc.org/alaskas-changing-wildfire-environment)—International Arctic Research Center <https://uaf-iarc.org/alaskas-changing-wildfire-environment>
- [Management Actions for Northwest Forests: Northwest Climate Hub](https://www.climatehubs.usda.gov/hubs/northwest/topic/management-actions-northwest-forests) <https://www.climatehubs.usda.gov/hubs/northwest/topic/management-actions-northwest-forests>