

Energy and Environment

Alaska's terrifying wildfire season and what it says about climate change



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By Chris Mooney July 26

Alaska's wildfire season of 2015 may be the state's worst ever



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Almost 5 million acres have burned, and scientists say the blazes are the latest sign of a region transformed.

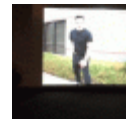
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FAIRBANKS, Alaska — Hundreds of wildfires are continually whipping across this state this summer, leaving in their wake millions of acres of charred trees and blackened earth.

At the Fairbanks compound of the state's Division of Forestry recently, workers were busy washing a mountain of soot-covered fire hoses, which stood in piles roughly six feet high and 100 feet long. About 3,500 smokejumpers, hotshot crews, helicopter teams and other workers have traveled to Alaska this year from across the country and Canada. And they have collectively deployed about 830 miles of hose this year to fight fires.

An hour north of the state's second-biggest city, firefighters were attacking flames stretching across more than 31,000 acres, including an area close to the Trans-Alaska pipeline system, which stretches from Prudhoe Bay to Valdez. And that's just one of about 300 fires at any given time.

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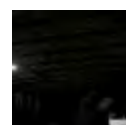


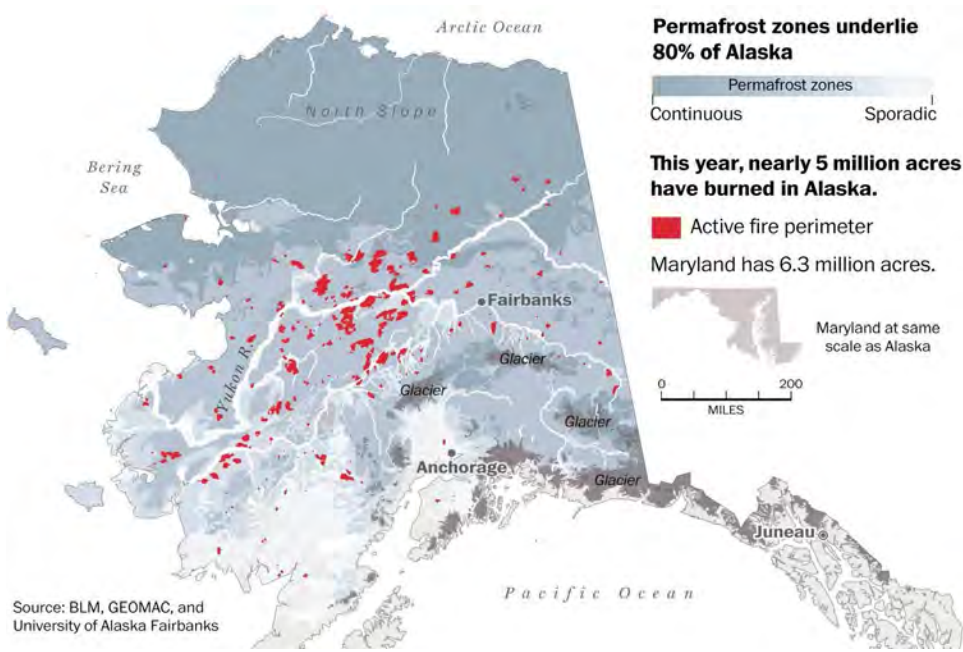
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“People don’t fathom how big Alaska is. You can have a 300,000-acre fire, and nobody knows anything about it, because nothing’s been done about it, because of where it is,” says Tim Mowry, spokesman for the Alaska Division of Forestry.

The staggering 2015 Alaska wildfire season may soon be the state’s worst ever, with almost 5 million acres already burned — an area larger than Connecticut. The pace of the burn has moderated in the last week, but scientists say the fires are just the latest indicator of a climatic transformation that is remaking this state — its forests, its coasts, its glaciers, and perhaps most of all, the frozen ground beneath — more than any other in America.

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[Fahrenheit](#) in the past half-century, much more than the continental United States. The consequences have included an annual loss of [75 billion metric tons](#) of ice from its iconic glaciers — including those covering the slopes of Denali, the highest peak in North America — and the destabilization of permafrost, the frozen ground that underlies [80 percent of the state](#) and whose thaw can undermine buildings, roads and infrastructure.

Also pummeled are the state's Arctic coastlines, which are facing intense erosion as seas rise and declining sea ice exposes shores and barrier islands to punishing waves. The situation has grown so bad that some native communities, including tiny [Kivalina, Alaska](#), sitting on a barrier island along the Chukchi Sea, may now have to be relocated, given the dangerous loss of land to the sea.

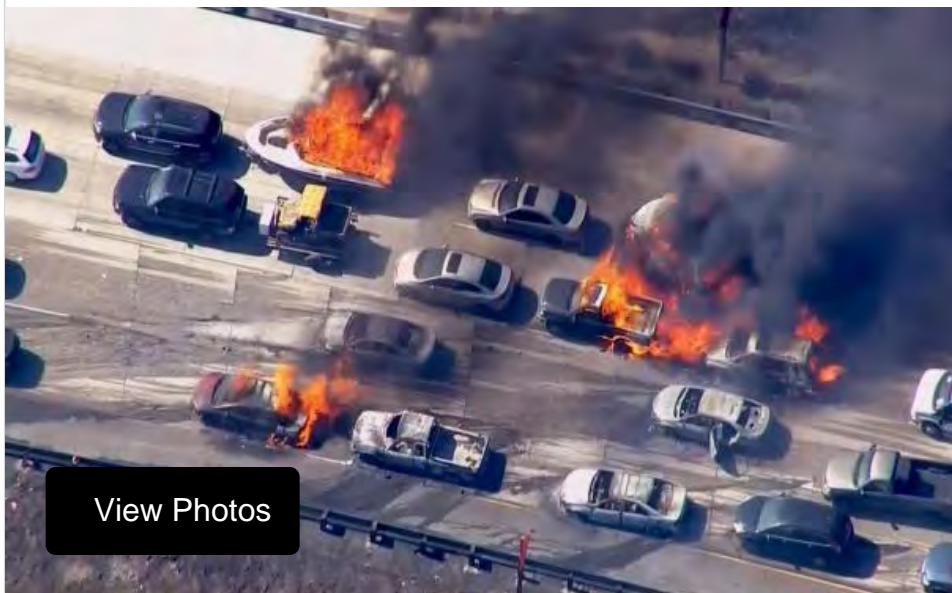
Earlier snowmelt transforms the state further. In 2015, the starting place of the Iditarod sled dog race had to be relocated north, to Fairbanks, because there wasn't enough snow on the ground in some places.

But arguably the most dramatic change — threatening to transform the state's 126 million acres of forests and, perhaps, worsen climate change in the process — is occurring with the state's wildfires.

Alaska's forests make up 17 percent of the U.S. total, and while they've always burned, they may now be entering a major new combustive period. The blazes are so intense and extensive that they could transform an entire

ecosystem, even as the fires also hasten the thawing of permafrost — which itself contains vast quantities of ancient carbon, ready to be emitted to the air.

Stunning images from this summer's western wildfires



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Firefighters continue to battle fires along the western coast of the United States.

“The more severe the fire, the deeper that it burns through the organic layer, the higher the chance it will go through this complete conversion,” says Ted Schuur, an ecologist at Northern Arizona University who spends summers in Fairbanks and specializes in studying permafrost. “What happens in the summer of 2015 has the potential to change the whole trajectory of [the burned area] for the next 100 years or more.”

The nearly 5 million acres burned in Alaska so far this year

[dwarfs](#) all burning across all states in the Lower 48. Three of Alaska's top five wildfire seasons have occurred since the year 2004, with 16 million acres burned between them (2004, 2005 and 2015).

Indeed, the 2015 fire season is a poster child for how strongly climatic factors influence wildfire dangers — it's one in which most fires have been caused by lightning, rather than people. The whole system was simply ready to burn.

[\[Scientists say the planet's weather is becoming more conducive to wildfires\]](#)

In May, Alaska experienced its [hottest temperatures in 91 years](#) of record-keeping, 7.1 degrees Fahrenheit above average. As a result, seasonal snowmelt was well ahead of schedule, allowing the ground to dry out sooner.

In late June, 152 fires were lighted in a single weekend, mostly by lightning strikes. Since then, the number of acres burned has leapt forward by sometimes as much as 300,000 a day. The current record year, 2004, saw 6.59 million acres burned, but 2015 is ahead of its pace — although thanks to recent rainfall, the pace of burn has slowed.

This year is part of a trend that should continue as Alaska gets warmer and drier, says Scott Rupp, a professor of forestry at the University of Alaska at Fairbanks, who also heads the university's Scenarios Network for Alaska +

Arctic Planning. “What we’ve been seeing in the last two decades is an increase in the extent of area burned from year to year and a fairly substantial increase in the frequency of these very large fire years,” Rupp says.

The result, in 2015, has been an influx of out-of-state firefighters who have had to get a crash course on the state’s unique fire ecosystem: highly flammable black spruce forests in which a thick ground layer of mosses, lichens and other organic materials, which firefighters call “duff,” can nourish fires and keep them smoldering even in damp conditions.

“A day or two after the precipitation . . . the fire will stand up and burn, just like it hasn’t even rained,” said Chad Martin, a “helitack” crew member from Rifle, Colo., stationed at the fire north of Fairbanks known as the Aggie Creek Fire.

Alaska has brought in a small army of firefighters and staff from Canada and the Lower 48 states to supplement 2,000 firefighters based here. The expected cost — a bill split between Alaska and federal agencies — is forecast to be \$100 million, an unhappy wake-up call to a state that reduced staff at the McGrath, Alaska, fire outpost this year as a result of budget constraints. The state faces a massive \$3.5 billion budget deficit, largely because of the declining price of oil.





Firefighters from across the country and Canada have collectively deployed about 830 miles of hose this year to fight fires. (Thomas Johnson/The Washington Post)

Aside from the financial burden, there are other concerns, including risks to residents' health and the state's vital tourism industry.

When winds blow the wrong way, vast fires can lead to air-quality dangers in cities such as Fairbanks — earlier this month, smoke caused a “hazardous” air-quality rating, and many outdoor activities in the area were canceled. Large wildfires and smoke hazards are also bad news for tourism. No one wants to have low visibility — or problems breathing — while visiting Denali.

More troubling to climate scientists, the fires could contribute to the worsening of climate change.

On a walk into an unburned black spruce forest south of Fairbanks recently, ecologist Schuur dug a foot down into the soft and spongy duff layer with his pruning saw, pulling out a long core of organic material. “This is, like, 50 percent carbon,” he said. Reaching down half an arm's length into the hole, through the duff layer's cooling insulation, one

can then touch frozen Earth: the beginning of the permafrost layer.

Intense wildfires burn not only trees — sending the carbon they contain into the atmosphere — but also deep into the duff layer, sending up still more carbon. Sometimes, fires burn all the way down to the mineral soil. When that happens, the frozen ground loses its insulation, even as the scorched earth then absorbs more heat from Alaska's steady summer sun — and permafrost can thaw, sometimes so much that the ground sinks and becomes bumpy and hilly as it loses solid ice mass.

“Everything's connected,” says Bob Bolton, a hydrologist at the University of Alaska at Fairbanks. “The climate, the permafrost, the water, the fires. You can't look at one without looking at the other. Changes in one changes everything else. It's a really, really sensitive system.”

That's why changing it can have such big effects. Indeed, the trees that return after an intense Alaskan fire tend to be aspens and birches, which are more fire-resistant, rather than evergreen spruces. The change could have major consequences, such as harming habitats for iconic species such as caribou, which feed on lichen that grow at the bases of black spruce. But it also means that vast Alaska wildfires may not only be worsening because of climate change — but also have climate change consequences.

“What's happening here really is affecting everyone in the world, because we're all linked by our atmosphere,” says

Nancy Fresco, a researcher at the University of Alaska at Fairbanks, who studies Arctic ecosystems and climate adaptation.

Across the global north, it is estimated that permafrost contains twice as much carbon as the planet's atmosphere. If wildfires in Alaska — or Canada or Siberia — hasten its already expected thawing, that could make global warming worse. “The permafrost that we degrade now in these forest fires might never return in our lifetimes,” Schuur said.

Granted, scientists are still trying to figure out how fast this could unfold and to what extent it will be offset by another key effect of Arctic warming. Plants pull carbon dioxide out of the atmosphere through photosynthesis, including as forests regrow after fires. And as the Arctic warms up dramatically, there will be a longer growing season and also more carbon dioxide in the air — which, along with other nutrients and water, boosts plant growth.

And there are experts, including University of Alaska Fairbanks ecologist Dave McGuire, who think that new plant growth could offset the carbon lost by the combustion of more intense fires and emissions from permafrost, at least to the year 2100.

Out at the Alaska pipeline, meanwhile, the oil continues to flow. It has been well protected.

“The pipeline is the economic artery of the state, so that's very significant,” says Jeff Andrews, the third in command

at the Aggie Creek Fire.

“People keep wanting to pin the paradox on people who live in the Arctic,” said Mead Treadwell, Alaska’s former lieutenant governor and a Republican who ran unsuccessfully for Senate in 2014. “And the fact is that, yes, we make our living from developing oil and gas, and yes, we’re seeing effects of climate change.”

Humans' staggering effect on Earth



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Images of consumption are the theme of the book, “Overdevelopment, Overpopulation, Overshoot.” It addresses environmental deterioration through subjects including materialism, consumption, pollution, fossil fuels and carbon footprints.

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