

WILDFIRES AND CLIMATE CHANGE

In North America, wildfires are destroying vast swaths of forest and creating massive plumes of smoke which extend across the continent and all the way to the Mid-Atlantic.



In Canada, there are huge fires raging in B.C., the Northwest Territories, and Ontario. As of August 6, a total of 3,840 wildfires have destroyed over 3,508,582 million acres so far this year. As of August 12 there were a total of 41 large wildfires burning in the U.S. Ten in California, ten in Washington and ten in Oregon. A total of eight fires are burning in Idaho and three in Montana. The land mass impacted by these fires totals 714,044 acres.

As revealed by a [Climate Central analysis](#), wildfires are on the increase. Their examination of 42 years of U.S. Forest Service records for 11 Western states shows that there are now 7 times more fires greater than 10,000 acres each year and nearly 5 times more fires larger than 25,000 acres each year. There are also twice as many fires over 1,000 acres each year, with an average of more than 100 per year from 2002 through 2011, compared with less than 50 during the 1970's. On average, wildfires burn twice as much land area each year as they did four decades ago.

The price tag for U.S. wildfires this year is around \$1.4 billion, which is 40 percent more than the amount of money budgeted.

Pollution

The costs of wildfires are not only material, they also produce smoke which can harm and even kill. Wildfires produce "fine particle" air pollution, which is a direct threat to human health even during relatively short exposures. The fine particulates in wildfire smoke can penetrate deep into the lungs,

increasing the mortality risk and health problems. This risk is particularly pronounced for those who have respiratory illnesses, heart conditions and the elderly.

One study showed that the [air quality from wildfires](#) is worse than air pollution levels in Beijing. According to the study, wildfires burning within 50-100 miles of a city routinely caused air quality to be 5 to 15 times worse than normal, and often 2-3 times worse than the worst non-fire day of the year.

In North America, high smoke particle concentrations have compromised air quality in parts of the northern Rockies, the Great Lakes and the Northeast. Last year Grants Pass, Oregon recorded one of the worst examples of poor air quality attributable to wildfire. For nine days last summer, Grants Pass had air quality so poor that it was unhealthy for anyone to be outside. On five of those days, fine particle pollution was literally off the charts — higher than the local air quality meter could read.

Smoke from wildfires can travel great distances. It is often pushed into the stratosphere by the heat from fires. Smoke from Canada's wildfires has even crossed the Atlantic and made its way to Europe.

Climate change

The [relationship between wildfires and climate change](#) was made recently by President Obama's Science Adviser [John Holdren](#). The day after wildfires prompted California Governor Jerry Brown to declare a state of national emergency and mobilize the national guard, Holdren pointed out that the situation is getting worse. He explained that the length of U.S. fire seasons has expanded by 60 to 80 days since the 1980s, and the amount of acres consumed by wildfires each year has doubled to more than seven million.

Heat and drought

Hotter springs and summers make the fire season last longer. Hotter, dryer weather produces more fuel for these fires which feed on a mix of desiccated kindling. Heat dries out dead vegetation on the forest floor which increases the number of fires and causes more energetic fires. Climate change also increases the incidence and intensity of wildfires through reduced levels of snowpack, and earlier snow melt.

In California, a state being devastated by a [three year drought](#), at least 3,600 fires have burned about 63 square miles so far this summer. In 2013, there were a total of 3,000 fires in the state. The five-year average for this time of year is about 2,500 fires and 54 square miles burned.

The Northwest Territories may ring the Arctic, but even here, high temperatures are fueling wildfires. The hottest and driest weather in half a century has caused the worst fire season ever in the Territories.

We are already experiencing warmer temperatures, and as explained in the IPCC 4th Assessment Report, summer temperatures in western North America could increase between 3.6 F and 9 F by the middle of this century.

As the planet continues to warm, wildfires will increase in intensity and size. The combination of high temperatures and low precipitation could drive a six-fold increase in wildfires over the next 2 decades.

Lightening

Fires are often caused by lightning strikes which are expected to increase as the planet warms. Research suggests that climate change causes more intense thunderstorms and more lightening.

A study examining the [impact of climate change on the world's lightning and thunderstorm patterns](#) found that for every one degree Celsius of long-term warming, there will be a near 10 percent increase in lightning activity.

As explained by the study's lead author, Professor Colin Price, head of the Department of Geophysics, Atmospheric and Planetary Sciences at Tel Aviv University in Israel, while there may be somewhat less thunderstorms, the data shows that these storms have "fifty percent more lightning activity."

Feedback loops

Climate change causes fires which emit carbon, which in turn exacerbates global warming. This feedback loop is especially pronounced in boreal forests because they are commonly located on top

of peat. When peat is burned it releases far more carbon than non-peat fires, this accelerates global warming and sets the stage for more fires.

A 2010 study illustrates why [wildfires in boreal forests are particularly worrisome](#). As explained by the study's lead author, University of Guelph professor Merritt Turetsky:

"...half the world's soil carbon is locked in northern permafrost and peatland soils. This is carbon that has accumulated in ecosystems a little bit at a time for thousands of years, but is being released very rapidly through increased burning."

The wildfires ravaging the Northwest Territories are expected to destroy between one and two million hectares of boreal forest this year alone. Last year, the province of Quebec lost 1.7 million hectares to fire.

To put this in context, the relatively small Anaktuvuk river fire in 2007 was found to have released [2.1 million metric tons of carbon](#) into the atmosphere. Larger, deeper burning fires could release much larger quantities of carbon.

"Essentially this could represent a runaway climate change scenario in which warming is leading to larger and more intense fires, releasing more greenhouse gases and resulting in more warming," Turetsky said.

Put simply, wildfires are not only caused by climate change, they also add to it. The widespread burning of boreal forests in particular could represent a tipping point from which we may not be able to recover.

Source : <http://globalwarmingisreal.com/2014/08/14/feedback-loop-between-wildfires-and-climate-change/>