Wildfires in the Arctic
KEY FACTS

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"The average annual number of large fires in Alaska has doubled, and climate change is causing bigger and more frequent fires. In the Arctic, permafrost contains vast quantities of carbon that can be emitted, not only as carbon dioxide but also as methane, which is a very, very, powerful greenhouse gas. So you can get into a situation where the fires are accelerating the loss of carbon from these landscapes and actually feeding climate change even further."
Nicky Sundt, WWF Climate Policy Analyst and Smokejumper in 1980's

Wildfires in the Arctic and Sub-Arctic directly emit large volumes of greenhouse gases to the atmosphere and accelerate the long-term release of carbon from the areas burned. The smoke from the fires travels vast distances, poses serious health hazards, and if deposited on snow or ice can accelerate melting.

Since the 1980s the average annual number of large wildfires in Alaska has doubled; and there has been a dramatic increase in the average area burned. In the 1980s, large fires on average blackened less than a half million acres annually.

From 2000-2009, the average annual acreage was about four times that amount (The Age of Alaskan Wildfires, 2015). According to Climate Change Impacts in the United States "the annual area burned in Alaska is projected to double by mid-century and to triple by the end of the century."

There are similar trends elsewhere in the Arctic. Data released in April 2015 by the Global Forest Watch partnership indicates that Russia and Canada jointly accounted for 34% of global tree cover loss from 2011 to 2013 – mostly because of wildfires. It found "a recent increase in tree cover loss in parts of the world's boreal forests in Russia, Canada and Alaska," noting that "the boreal region showed the steepest increase of loss of any region."

Fires do not just affect forests – tundra fires are also becoming more common, and they also release large amounts of stored carbon into the atmosphere.
http://www.nature.com/nature/journal/v475/n7357/abs/nature10283.html

The combined acreage burned in wildfires in Siberia, Canada and Alaska by early August 2015 was over 31 million acres or over 48,000 square miles – bigger than the land area of New York (47,126 square miles). Smoke from the fires has encircled the northern hemisphere.

The Intergovernmental Panel on Climate Change (IPCC) report Climate Change 2014: Impacts, Adaptation and Vulnerability warns that "most models suggest that rising temperatures, drought and fires will lead to forests becoming a weaker sink or a net carbon source before the end of the century."

Climate change is driving a dramatic increase in fire suppression costs. Firefighting budgets at the U.S. Forest Service and the Department of the Interior amounted to $3.5 billion in 2015. That's an average 25 percent growth per year over the last two decades, adjusted for inflation, the government reports. It is important to recognize that firefighting costs are only a fraction of the full costs of wildfires, so the economic consequences of climate-driven changes in wildfires are far greater than suggested by federal firefighting budgets alone.

The sources used in calculating the wildfire acreage are as follows:

- **Russia:** "The current estimate of the Sukachev Institute for wildfires affecting Siberia between March and July 2015: Number of wildfires: ca. ~12,700. Burned area: ~ 7 million hectares." That is over 17 million acres – more than burned in Canada and Alaska combined
  Source: The Global Fire Monitoring Center
- **Alaska:** As of 10 August 2015: 5,081,585.90 acres (5.1 million acres) had burned
  Source: Alaska Interagency Coordination Center Situation Report.
  http://fire.ak.blm.gov/content/aicc/sitreport/current.pdf
- **Canada**: Total burned as of 10 August 2015: 3,918,822.09 hectares (9.7 million acres)
  Source: Canadian Interagency Forest Fire Centre Inc., National Wildland Fire Situation Report,
  http://www.ciffc.ca/firewire/current.php

How can climate change affect the frequency and severity of wildfires?

- Climate change affects the nature of what firefighters call "fuel," the quantity and quality of live vegetation and other burnable material above the surface of the earth and in the soil.
- Changes in temperatures, humidity, and precipitation influence the amount of fuel, the type of fuel and its moisture levels. The timing and duration of fire seasons can be altered. Fire behavior (the amount of heat released by fires and the rate at which fires spread, for example) and fire size are also affected.
- Climate change also influences thunderstorms—a major ignition source for wildfires—and the winds that feed oxygen into fires.

What can we do to manage the interconnected problems of climate change and wildfires?

We need to do two things:

- We need to prepare for wildfire patterns that differ from those we have experienced in the past, including larger and more intense wildfires. To do that, we need to change land management and fire suppression policies, and
- We need to sharply reduce our burning of fossil fuels. That will slow the buildup of greenhouse gases in the atmosphere, slow the pace of climate change, and lessen the threat posed by rapid changes in wildfire regimes.

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