



THE
WILDERNESS
SOCIETY

CLIMATE CHANGE FACTS

Fossil Fuels are a Bigger Problem than Wildland Fires

The Earth's climate is changing. In the past, the climate warmed and cooled due to natural processes. Now humans are changing the climate by burning fossil fuels and permanently deforesting landscapes. Many of our wildlands are being stressed beyond their natural ability to adapt to these dramatic changes, and the full extent of how to deal with these changes remains unclear.

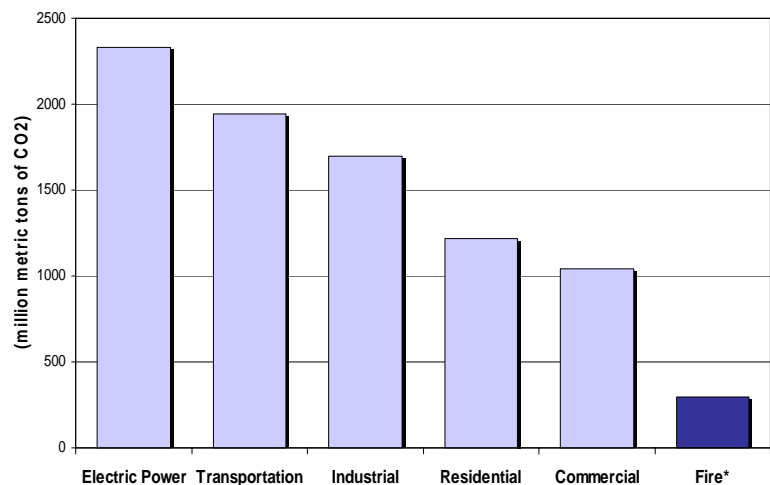
What is clear, however, is that emissions from wildland fires are significantly less harmful than emissions from fossil fuel.

Carbon Emissions from Wildland Fires Are a Fraction of Those Released from Burning Fossil Fuels

Carbon released in wildland fires is carbon that has been cycling through the environment for thousands of years. Wildland fires change the location and the state of carbon in the system, but they do not change the amount. On the other hand, burning fossil fuels takes non-cycled carbon—what nature permanently stored deep in the Earth—and puts it into the atmosphere. Fossil fuel burning has caused a significant net increase in the total carbon in our environment and subsequently has led to warming associated with climate change.

Wildland fires are natural occurrences, the frequency and extent of which have historically changed with changing climatic patterns. U.S. average annual carbon emissions associated with all fires, including wildland fires, are equal to only four to six percent of fossil fuel carbon emissions. While we can curb our consumption of fossil fuels, wildland fires are occurrences that cannot be readily stopped by human intervention.

U.S. Carbon Dioxide Emissions by Sector
(annual average 2002-2006)



Sources: <http://www.eia.doe.gov/oiaf/1605/ggrrpt/carbon.html>
*Wiedinmyer and Neff, 2007, Carbon Balance and Management Journal

Emissions from Fossil Fuels Are More Damaging than Those from Wildland Fires

The burning of fossil fuels also releases particulate matter such as black carbon and soot. However, the black carbon associated with fossil fuels tends to be oily, and thus does not readily attract water droplets. Without the presence of water on the soot and black carbon, the sun's energy is absorbed rather than reflected. The result is a warmer atmospheric environment and increased climatic warming.

Wildland Fires Can Actually Cool a Warming Planet

Production of particulate matter (soot, black carbon, and ash) from wildland fires or burning biomass that do not cause permanent deforestation (such as most wildland fires in North America) actually has a short-term global cooling effect. Carbon particulate matter emitted during a wildland fire is attracted to water. Those carbon particles become trapped in water droplets in clouds and reflect sunlight, thereby causing a net cooling effect on Earth.

Because wildland fires in North America occur at a time of year when there is less snow and ice, wildland fires are less likely to affect the melting rate of snow and ice. Fossil fuel burning, which occurs year-round, increases the amount of soot that is deposited on the surface of snow and ice. This soot makes the snow and ice melt faster, exposing water and land to direct sun, and leads to further increases in net global warming.

Wildland Fires Can Result in Long-term Carbon Storage

When a wildland fire burns, typically only about 10 to 30 percent of the forest biomass is consumed by fire and converted to gaseous carbon. The majority of biomass actually remains onsite as dead and live trees and as charcoal. Live trees will continue to store carbon and dead trees will decay and slowly release carbon dioxide over decades. Regrowth after a fire recaptures carbon from the atmosphere, reversing the emissions originally caused by the fire.

About one to 10 percent of the biomass killed by wildland fire is converted to charcoal, a uniquely stable form of carbon that, if mixed into mineral soil or washed into water bodies, will remain there for thousands of years. If charcoal is measured, along with forest regeneration, as a form of carbon storage, results would show that fires may actually help forests *store* carbon for the long term.

Conclusion

Natural wildland fires are not a significant source of greenhouse gas emissions and are not a significant contributor to climate change. Furthermore, wildland fires are beneficial in many ways. Wildland fires recycle carbon within the environment and aid in long-term storage of carbon. In addition, particulate matter released into the atmosphere from wildland fires in North America has a short-term net cooling effect on our planet, whereas the particulate matter from fossil fuel burning has a significant net warming effect.

Complete fire suppression is not possible, as evidenced by 100 years of failed U.S. Forest Service policy of wildland fire suppression in U.S. forests. Nor would eliminating wildland fires achieve any long-term reductions in greenhouse gases. We can, however, greatly reduce fossil fuel emissions, the primary cause of climate change, through conservation, technology, and innovation in energy production and transportation.