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## Frequent, Severe Fires Turn Alaskan Forests Into a Carbon Production Line

*Alaskan forests used to be important players in Mother Nature's game plan for regulating carbon dioxide levels in the air. It's elementary earth science: Trees take up carbon dioxide and give off oxygen.*

But now, American and Canadian researchers report that climate change is causing wildfires to burn larger swaths of Alaskan trees and to char the groundcover more severely, turning the black spruce forests of Alaska from repositories of carbon to generators of it. And the more carbon dioxide they release, the greater impact that may have in turn on future climate change.

"Since the proliferation of black spruce, Alaskan soils have acted as huge carbon sinks," says Evan Kane, a Research Assistant Professor in Michigan Technological University's School of Forest Resources and Environmental Science. "But with more frequent and more extensive burning in recent decades, these forests now lose more carbon in any fire event than they have historically been able to take up between fires."

Kane is co-author on a paper published in the January 2011 issue of the journal *Nature Geoscience*. Lead author on the research study titled "Recent Acceleration of Biomass Burning and Carbon Losses in Alaskan Forests and Peatlands" is Merritt R. Turetsky of the University of

Guelph, Ontario.

The overall impact of burning northern forests depends on both the frequency and severity of the fires, the researchers note. A majority of the carbon in these forests is stored in the layers of moss, peat and leaf litter that cover the ground, and those are the layers most likely to burn in forest fires.

This burning not only releases carbon emissions, but the loss of that ground layer affects a number of natural processes, such as regulation of soil climate, maintenance of permafrost and the kinds of trees that can grow back. The new forest types likely to establish after repeated severe fires act as a much weaker carbon sink than black spruce forests.

**Source:** Merritt R. Turetsky, Evan S. Kane, Jennifer W. Harden, Roger D. Ottmar, Kristen L. Manies, Elizabeth Hoy, Eric S. Kasischke. Recent acceleration of biomass burning and carbon losses in Alaskan forests and peatlands. *Nature Geoscience*, 2010; 4 (1): 27 DOI: 10.1038/ngeo1027