Jan 15, 2013 02:15 PM EST

Black Carbon Causes Twice as Much Global Warming

By Catherine Griffin

Soot spewing into the air from burning wood and diesel exhaust is never a good thing. But the results of a recent study show that it's more worrisome than previously thought. This "black carbon" may be the second most important man-made agent of climate change, and may have two times more impact on global warming than previously realized.

Black carbon particles absorb incoming and scattered heat from the sun. This can promote the formation of clouds that can have either a warming or cooling effect. In addition, these particles can fall on the surface of snow and ice. Since the white reflective surface of ice helps keep the planet cool, the black particles can promote warming and further melting (See Figure 1.1).
Figure 1.1 Schematic overview of the primary black carbon emission sources and the processes that control the distribution of black carbon in the atmosphere and determine its role in the climate system [Bond et al., 2013].

The study, published in the *Journal of Geophysical Research-Atmospheres*, quantified all of the complexities of black carbon and the impacts of co-emitted pollutants for different sources. Not only did it find that black carbon was a major cause of the rapid warming in the Northern Hemisphere, but that its impacts could also be found further south in the form of changing rainfall patterns.

It's not all doom and gloom, though. The study theorizes that because black carbon has a larger impact than first realized, there may also be a greater potential to curb warming by reducing these black carbon emissions.