

Polluted snow causes early runoff, stronger monsoons in Asia

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New research shows that soot from industrial and agricultural pollution is landing on the Tibetan Plateau (pictured here from Yushu Zangzu, Zangzu, China), causing snow to melt earlier on the plateau. As a result, India and China are experiencing wetter winters, drier summers, and stronger monsoons. Credit: Jan Reurink

In some cases, soot -- the fine, black carbon silt released from stoves, cars and manufacturing plants -- can pack more of a climatic punch than greenhouse gases, according to a paper published in the journal [Atmospheric Chemistry and Physics](#).

Researchers at Pacific Northwest National Laboratory (PNNL), the University of Michigan, and the National Oceanic and Atmospheric Administration (NOAA) found that soot landing on snow on the massive Tibetan Plateau can do more to alter snowmelt and monsoon weather patterns in Asia than carbon dioxide and soot in the air.

Soot on snow causes the plateau's annual snowpack melt to happen sooner each year, causing farmers below it to have less water for their crops in the summer. In a domino effect, the melting then prods two of the region's monsoon systems to become stronger over India and China. "On the global scale, [greenhouse gases](#) like [carbon dioxide](#) cause the most concern related to [climate change](#)," said Yun Qian, the paper's lead author and an atmospheric scientist at PNNL. "But our research shows that in some places like the Tibetan Plateau, soot can do more damage."

More information: Qian Y, et al. "Sensitivity Studies on the Impacts of Tibetan Plateau Snowpack Pollution on the Asian Hydrological Cycle and Monsoon Climate." *Atmospheric Chemistry and Physics*. Published online March 2, 2010. www.atmos-chem-phys.net/11/192...cp-11-1929-2011.html

Provided by Pacific Northwest National Laboratory

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