

Man-Made Activities Affect Blue Haze (w/ Video)

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(PhysOrg.com) -- "Blue haze," a common occurrence that appears over heavily forested areas around the world, is formed by natural emissions of chemicals, but human activities can worsen it to the point of affecting the world's weather and even cause potential climate problems, according to a study led by a Texas A&M University researcher.

Renyi Zhang, professor of atmospheric sciences who has studied air chemistry for more than 20 years, says blue haze (tiny particles or aerosols suspended in the air) can be negatively affected by human activities such as power plants or fossil-fuel burning.

Team members included researchers from Brookhaven National Laboratory in New York, the Molina Center for Energy and Environment in La Jolla, Calif., and the Massachusetts Institute of Technology. Their work is published in the current *Proceedings of the National Academy of Sciences* and the project was funded by the Welch Foundation and the U.S. Department of Energy.

Zhang says man-made activities, mainly large power plants that emit huge amounts of particles into the air, can worsen blue haze and cause previously unforeseen problems.

"The study shows that the natural way of blue haze formation is rather inefficient and that human activities make blue haze conditions worse," he confirms.

"What happens is that a mix of natural and man-made chemicals speeds up the formation of these particles in the Earth's [atmosphere](#), and there, they reflect sunlight back into space. The results can affect cloud formations and ultimately, much of the world's [climate](#)."

When you walk through a forest or even a large grassy area, it's not uncommon to be able to smell the plants around you, such as pine trees or other vegetation. That smell is nature's way of naturally making organic gases produced by the plants themselves, often millions of tons per day.

Plants, especially trees, emit such gases through their leaves and when an overabundance of such gases is produced, it creates a blue aura, commonly called a "blue haze." Perhaps the best example occurs in the Great Smokey Mountains National Park area of the Southeast United States, where blue haze exists almost on a daily basis, but the condition also occurs all over the world.

When man-made activities emit sulfur dioxide into the air, they contribute to blue haze, usually in a negative way, Zhang explains. Aerosols can be produced by many different processes that occur on land and water or in the atmosphere itself, he notes.

"[Weather](#) patterns can be affected worldwide and the blue haze can worsen the breathing problems of many people, such as those who suffer from asthma or emphysema," he adds.

"The chemistry of Earth's atmosphere can be directly affected by these aerosols. From cloud formations to health problems and air pollution, much of it can be traced back to these aerosol particles," he adds, noting that aerosol particles can influence the size and rate of cloud droplets, directly affecting cloud cover and precipitation.

Coal plants, Zhang says, often produced sulfur dioxide, a highly toxic substance that reach the Earth's atmosphere and helps the formation of aerosol particles.

The problem is not new. Zhang says former President Ronald Reagan mentioned it during a speech almost 30 years ago.

"About 80 percent of our air pollution stems from hydrocarbons released by vegetation," Reagan noted during a 1980 speech to an environmental group.

Zhang says more research is needed to "study the full extent of how blue haze is affected by human activities, and perhaps to look at ways to control the situation. It's a problem that can have global consequences."

Source: Texas A&M University

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