

# Weather deserves medal for clean air during 2008 Olympics

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Smog surrounds the Bird's Nest, the Beijing National Stadium built for the 2008 Olympics. Photo courtesy of A. Aruninta.

(PhysOrg.com) -- New research suggests that China's impressive feat of cutting Beijing's pollution up to 50 percent for the 2008 Summer Olympics had some help from Mother Nature. Rain just at the beginning and wind during the Olympics likely contributed about half of the effort needed to clean up the skies, scientists found. The results also suggest emission controls need to be more widely implemented than in 2008 if pollution levels are to be reduced permanently.

Reporting their findings December 12 in the journal [Atmospheric Chemistry and Physics](#), co-author atmospheric chemist Xiaohong Liu at the Department of Energy's Pacific Northwest National laboratory said, "In addition to the emission controls, the weather was very important in

reducing [pollution](#). You can see the rain washing pollution out of the sky and wind transporting it away from the area."

Liu and colleague Chun Zhao at PNNL and at the [Chinese Academy of Sciences](#) in Beijing took advantage of the emission controls China put into play before and during the August Olympics to study the relative contributions of both planning and nature. [Chinese officials](#) restricted driving, temporarily halted pollution-producing manufacturing and [power plants](#), and even relocated heavy polluting industries in preparation for the games.

To find out if the controls worked as well as people hoped, the researchers modeled the pollution and [weather conditions](#) in the area before, during and after the Olympics. They compared the model's results with measured amounts of pollution, which matched well.

Adding up the sources of pollution and the sinks that cleared it out, the team found that emission sources dropped up to a half in the week just before and during the Olympics. And while some pollution got washed out by rain or fell out of the sky, most of it got blown away by wind.

"They got very lucky. There were strong storms right before the Olympics," said Liu.

In addition to rain, wind also helped. Beijing is bordered on the south by urban areas and on the north by mountains, so wind blowing north would carry more pollution into the city. Examining the direction of the wind, the researchers saw that it generally blew south in the time period covering the Olympic period.

"The area we looked at is about 50 miles south. This suggests that emission controls need to be on a regional scale rather than just a local scale," said Liu.

The importance of regional controls meshes well with [previous research](#) on 2008 Olympics air quality that focused on nitrogen-based pollutants.

Next, the researchers will be examining the effect of pollution on other weather events and climate change in China. Pollutants are very small particles, and some suspect they might be causing fog to form rather than rain due to numerous pollution particles in China, Liu said.

**More information:** Yi Gao, Xiaohong Liu, Chun Zhao, and Meigen Zhang. Emission controls versus meteorological conditions in determining aerosol concentrations in Beijing during the 2008 Olympic Games, 2011 *Atmos. Chem. Phys.* 11, 12437-12451, [www.atmos-chem-phys.net/11/12437-2011.html](http://www.atmos-chem-phys.net/11/12437-2011.html)

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