

# Asian air pollution affect Pacific Ocean storms

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In the first study of its kind, scientists have compared air pollution rates from 1850 to 2000 and found that anthropogenic (man-made) particles from Asia impact the Pacific storm track that can influence weather over much of the world.

The team, which includes several researchers from Texas A&M University, has had its work published in the current issue of *Proceedings of the National Academy of Sciences (PNAS)*.

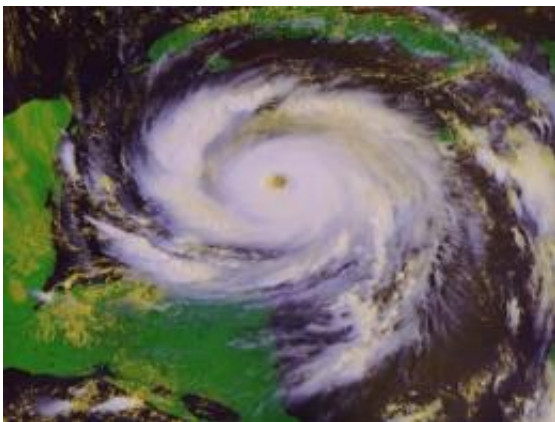
Yuan Wang, Yun Lin, Jiayi Hu, Bowen Pan, Misti Levy and Renyi Zhang of Texas A&M's Department of Atmospheric Sciences, along with colleagues from Pacific Northwest National Laboratory, the

University of California at San Diego and NASA's Jet Propulsion Laboratory, contributed to the work.

The team used detailed pollution emission data compiled by the Intergovernmental Panel on Climate Change and looked at two scenarios: one for a rate in 1850 – the pre-Industrial era – and from 2000, termed present-day.

By comparing the results from an advanced global climate model, the team found that anthropogenic aerosols conclusively impact cloud formations and mid-latitude cyclones associated with the Pacific [storm](#) track.

"There appears to be little doubt that these particles from Asia affect storms sweeping across the Pacific and subsequently the [weather](#) patterns in North America and the rest of the world," Zhang says of the findings.



"The climate model is quite clear on this point. The aerosols formed by

human activities from fast-growing Asian economies do impact storm formation and global air circulation downstream. They tend to make storms deeper and stronger and more intense, and these storms also have more precipitation in them. We believe this is the first time that a study has provided such a global perspective."

In recent years, researchers have learned that atmospheric aerosols affect the climate, either directly by scattering or absorbing solar radiation, and indirectly by altering cloud formations. Increasing levels of such particles have raised concerns because of their potential impacts on regional and global atmospheric circulation.

In addition, Zhang says large amounts of aerosols and their long-term transport from Asia across the Pacific can clearly be seen by satellite images.

The Pacific storm track represents a critical driver in the general global circulation by transporting heat and moisture, the team notes. The transfer of heat and moisture appears to be increased over the storm track downstream, meaning that the Pacific storm track is intensified because of the Asian [air pollution](#) outflow.

"Our results support previous findings that show that particles in the air over Asia tend to affect global weather patterns," Zhang adds.

"It shows they can affect the Earth's weather significantly."

Yuan Wang, who conducted the research with Zhang while at Texas A&M, currently works at NASA's Jet Propulsion Laboratory as a Caltech Postdoctoral Scholar.

**More information:** "Assessing the effects of anthropogenic aerosols on Pacific storm track using a multiscale global climate model," by Yuan

Wang et al. *PNAS*, 2014.

[www.pnas.org/cgi/doi/10.1073/pnas.1403364111](http://www.pnas.org/cgi/doi/10.1073/pnas.1403364111)

Provided by Texas A&M University

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