

# Big storms more important than thought

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U.S. researchers have determined typhoons and hurricanes are the dominant cause of mixing between the Earth's troposphere and stratosphere.

Deep air convection influences climate through injecting water-vapor-rich, ozone-poor air from Earth's near surface to the upper troposphere and lower stratosphere and displacing water-vapor-poor, ozone-rich air downward. However, scientists say the mechanisms driving that convection are poorly understood, especially in the tropics, where, instead of being marked by a sharp transition in temperature, the boundary between the troposphere and the stratosphere is a diffuse region of nearly constant temperature.

William Rossow of the City University of New York and Cindy Pearl of the Goddard Institute for Space Studies at Columbia University, conducted a 22-year survey of tropical convection. They found deep convection occurs mostly in larger, more organized convective systems, with smaller, unorganized convective systems rarely penetrating the stratosphere.

Durations of penetration are longest for the larger systems, such as hurricanes and typhoons, which generally exceed one day. The authors suggest the role of such tropical storms should be examined more closely, since, although intermittent, they dominate stratosphere-troposphere exchanges.

The study appears in the journal *Geophysical Research Letters*.

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