

**AMERICAN METEOROLOGICAL SOCIETY
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FOR IMMEDIATE RELEASE
3 November 2003

**WATER VAPOR FROM VOLCANIC ERUPTIONS
COULD IMPACT CLIMATE CHANGE**

A computer model shows that large volcanic eruptions, which can affect global weather patterns by adding tiny particles or droplets of liquid called aerosols to the atmosphere, also add water vapor to the stratosphere, the region between 10-50 kilometers above the Earth's surface. Stratospheric water vapor is potentially an important factor in climate change.

Dr. Manoj Joshi and Prof. Keith Shine, researchers from the Department of Meteorology at the University of Reading in Britain, simulated the effect of the eruption of Mount Pinatubo on atmospheric temperature using a model designed to study weather and climate. They found a significant increase in stratospheric water amount in the years following the eruption in their model.

"Observations show that water vapor in the stratosphere has increased by 1% per decade since the 1960s," said Joshi, whose research was published in the November issue of the American Meteorological Society's *Journal of Climate*. "There is a need to fully explain this trend, because stratospheric water vapor is potentially a significant factor in climate change because it can force surface temperatures to rise in the same way as carbon dioxide does."

The aerosol clouds from volcanic eruptions typically disappear after 1 to 2 years, but the water vapor increases could typically take 5-10 years to dissipate, according to Joshi. If large volcanic eruptions took place frequently enough, the water vapor pulse from one eruption would add to the decaying pulse from the previous one, thus "ratcheting" water vapor amounts upwards.

Between 1960 and 2000, five volcanoes have erupted with sufficient strength to significantly alter the water vapor level in the stratosphere, so Joshi and Shine hypothesise that these eruptions could make a large contribution to the observed increase in stratospheric water vapor amounts.

“The long-term results would include stratospheric cooling, stratospheric humidification and surface warming,” added Manoj. “It is important to understand that adding tiny amounts of water vapor in that region can play a significant role in increasing surface temperatures on Earth. If we have more frequent volcanic eruptions in the future, this could become an even larger issue.”

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Note to Editors and Assignment Desks: PDF or faxed copies of the paper, "A GCM Study of Volcanic Eruptions as a Cause of Increased Stratospheric Water Vapor," are available to journalists from **Stephanie Kenitzer**, AMS press office at (425) 432-2192, or kenitzer@dc.ametsoc.org.

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