Time for a rain dance? Research finds 'cloud seeding' doesn't produce rain

November 1 2010

In many areas of the world, including California's Mojave Desert, rain is a precious and rare resource. To encourage rainfall, scientists use "cloud seeding," a weather modification process designed to increase precipitation amounts by dispersing chemicals into the clouds.

But research now reveals that the common practice of cloud seeding with materials such as silver iodide and frozen carbon dioxide may not be as effective as it had been hoped. In the most comprehensive reassessment of the effects of cloud seeding over the past fifty years, new findings from Prof. Pinhas Alpert, Prof. Zev Levin and Dr. Noam Halfon of Tel Aviv University's Department of Geophysics and Planetary Sciences have dispelled the myth that seeding is an effective mechanism for precipitation enhancement.

The findings were recently reported in *Atmospheric Research*.

Throwing seeds into the wind

During the course of his study, Prof. Alpert and his colleagues looked over fifty years' worth of data on cloud seeding, with an emphasis on the effects of seeding on rainfall amounts in a target area over the Sea of Galilee in the north of Israel. The research team used a comprehensive rainfall database and compared statistics from periods of seeding and non-seeding, as well as the amounts of precipitation in adjacent non-seeded areas.

"By comparing rainfall statistics with periods of seeding, we were able to show that increments of rainfall happened by chance," says Prof. Alpert. "For the first time, we were able to explain the increases in rainfall through changing weather patterns" instead of the use of cloud seeding.

Most notable was a six year period of increased rainfall, originally thought to be a product of successful cloud seeding. Prof. Alpert and his fellow researchers showed that this increase corresponded with a specific type of cyclones which are consistent with increased rainfall over the mountainous regions. They observed that a similarly significant rain enhancement over the Judean Mountains, an area which was not the subject of seeding.

The researchers concluded that changing weather patterns were responsible for the higher amount of precipitation during these years. Their research method may be useful in the investigation of cloud seeding in the U.S. and other regions.

Considering the alternatives

Despite being relatively expensive, there are more than 80 cloud seeding projects around the world, according to a recent World Meteorological Organization report. In Beijing, China, for example, Prof. Alpert notes, a large amount of chemical particles were introduced to the clouds to inhibit precipitation — a process called "overseeding" — to limit rainfall during the 2008 Olympics. Seeding is also used in the Sierra Mountains of California and in Wyoming to try to increase precipitation in the mountains, thus increasing water levels in reservoirs. However, he says, there is no proof that this method is successful.

The only probable place where cloud seeding could be successful, Alpert says, is when seeding is performed on orographic clouds, which develop over mountains and have a short lifespan. In this type of cloud, seeding

could serve to accelerate the formation of precipitation.

Provided by Tel Aviv University