

# Probing Question: Can humans control the weather?

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Credit AZ Rainman

Chinese officials claimed they prevented rain on the first day of the 2008 Beijing Olympics by launching rockets into the rain clouds the night before. Emeritus professor of meteorology Charles L. Hosler asserts that the good weather that day was coincidental. While the impact that humans can have on the weather is currently negligible, Hosler predicts that in the future we will be able to alter precipitation patterns in a predictable manner.

Opening night of the 2008 Beijing Olympic summer games was an awesome spectacle: thousands of dancers, acrobats and singers performed in carefully choreographed unison to produce a thrilling display. No detail was too big or too small to be left to chance; from the

cuteness of the child performers, down to one factor that seemed uncontrollable—the weather. It was widely reported that the Chinese government's "weather modification office" was launching rockets from 20 strategically placed locations into any ominous looking clouds on the horizon, causing them to release their moisture as rain before the big night. Right on schedule, the first day of the Olympics dawned clear, with low humidity and a high of 83 degrees—a notable contrast to the usual hot and muggy conditions of South East Asia in August.

Does this prove that humans have learned how to control the weather?

“Not really,” says Charles L. Hosler, Penn State professor emeritus of meteorology and former Vice President for Research. “In certain, limited [weather conditions](#), humans can have some impact on the weather. But not on the scale needed to change the weather conditions in China during the rainy season. It is more likely that it was just good luck.” And, he notes, “apart from that opening night, the Beijing games were a washout” in terms of weather.

The idea of humans controlling the weather is not a new one. “Back in medieval France, people would shoot cannons into the clouds to try to prevent crop-damaging hail,” says Hosler. But it wasn’t until the 1940s that human attempts to influence the weather had any real results. “A series of weather modification experiments carried out by General Electric Laboratories showed that releasing chemicals such as silver iodide into supercooled clouds caused droplets to turn to ice at higher than normal temperatures and the ice crystals to grow large enough to fall as snow or rain, a practice known as seeding,” Hosler explains.

This discovery was met with great excitement. In 1951, a Senator from the arid state of New Mexico introduced the Weather Modification Act, which proposed the establishment of a commission to control U.S. weather with the goal of creating “an equitable distribution of

precipitation among the states.” But despite the hype, some scientists, including Hosler, had their doubts.

“On a cloud-by-cloud basis, and on some types of clouds, seeding worked,” says Hosler. “For example, during very cold conditions, it would be possible to clear fog over an airport for long enough for a plane to land.” But in order to have an impact on the weather on the scale necessary to redistribute rainfall around the United States, or to change the weather ahead of a big event “the clouds in thousands of cubic miles of airspace would have to be seeded at just the right time and place, and that isn’t viable. The idea that a minor alternation in a cloud process could overcome the multitude and magnitude of forces that determine where and when it rains is a gross oversimplification of the process that produces rain on a large scale,” he adds. Under most conditions, seeding has no impact at all. Nature is in charge.”

Hosler participated in experiments in weather modification in the U.S. throughout the 1950’s, 60s and 70s. “Our goal was to investigate the many mechanisms that play roles in the production of precipitation,” he recalls. “There were experiments to seed clouds to produce rain or snow, to prevent hail and lightning, and even to reduce the intensity of hurricanes.”

The fact that weather is a constantly changing entity made the results difficult to interpret, leading to open hostility between opposing research groups. Hosler recounts an attempt by a commercial group to prevent hail in southern Pennsylvania. “A thunderstorm detected by radar would be seeded, and sure enough, the thunderstorm would dissipate within 20 to 30 minutes.” However, Hosler notes, “Further investigation showed that thunderstorm or rain shower cells in that region would naturally dissipate in about half an hour—so the seeding was really not having any effect.”

In time, these attempts at weather modification were terminated, Hosler adds. “With the technology of the times, they could not demonstrate any effect of seeding. Variations in weather could occur based on so many different factors. We came to the conclusion that the impact that humans can have on controlling weather is negligible.”

But that doesn’t mean that weather modification is impossible. “There is no doubt in my mind that one day, we will be able to alter precipitation patterns in a predictable manner,” says Hosler. "But that will be some time in the future," he predicts. " We will have to improve our understanding of cloud physics and dynamics, our ability to monitor weather on a real-time basis, and better understand the physical processes going on in clouds."

What of China's claims that they engineered the clear skies on opening night?

“Having a grand sounding weather modification office, and releasing press reports about weather control makes a country sound powerful," concludes Hosler. "It was likely a P.R. stunt to create a splash in the run up to the Olympics.”

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