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Cloud Seeding Research May Improve Rain Enhancement, Hail Suppression

By Darin Langerud

The familiar buzz of airplanes over parts of the northern Red River Valley included something a little different this summer. No, it wasn't another crop duster spraying the patchwork quilt of farmer's fields, but a cloud seeding airplane doing research on summer rainfall development.

A flare burns at the base of a towering cumulus cloud.

This cooperative effort between the North Dakota Atmospheric Resource Board, the University of North Dakota and Weather Modification, Inc. of Fargo attempted to evaluate a new cloud seeding method. The Polarimetric Cloud Analysis and Seeding Test (POLCAST) sought to determine whether this type of seeding can be effective in North Dakota clouds.

The method, called hygroscopic flare seeding, has shown great promise for increasing rainfall from cumulus clouds in prior experiments in South Africa, Thailand and Mexico. The flares, produced and donated to the project by Ice Crystal Engineering of Davenport, N.D., when burned, produce billions of microscopic salt particles that serve as the "seeds" for raindrop formation in water laden clouds.

The research was not designed to increase rainfall on the ground, but to determine with UND's radar whether changes in rainfall formation occurred and could be detected in seeded clouds. If the POLCAST experiment is successful the new seeding technique may soon be applied to the ongoing operational seeding program in western North Dakota.

The cloud seeding experiment was conducted from July 10 to Aug. 5 during daylight hours over North Dakota counties within 100 kilometers (62 miles) of UND's Grand Forks-based radar.

During POLCAST a total of eight flights were flown on seven days. In the 12 hours of flight time, 37 flares were ignited and dispersed into the bottom of developing rain clouds.

Seeded clouds will be analyzed and compared to non-seeded clouds using UND's sophisticated polarimetric Doppler radar.

"POLCAST is a great opportunity to utilize the capability of the UND polarimetric Doppler radar," said Paul Kucera, assistant professor at the University of North Dakota. "The use of polarimetric technology allows scientists to better observe the internal structure of storms because of its ability to determine areas of rain, hail, and snow within a storm. Only a handful of radars in the world have polarimetric capability, which makes this project so unique."

Analysis of the radar data will be undertaken by Dr. Kucera at UND. It is hoped that the analysis will show two things; the effectiveness of UND's radar in detecting seeding-induced changes to rainfall formation in clouds, and the potential for hygroscopic flare seeding in North Dakota clouds. Final results should be available by spring of 2007.

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