

THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

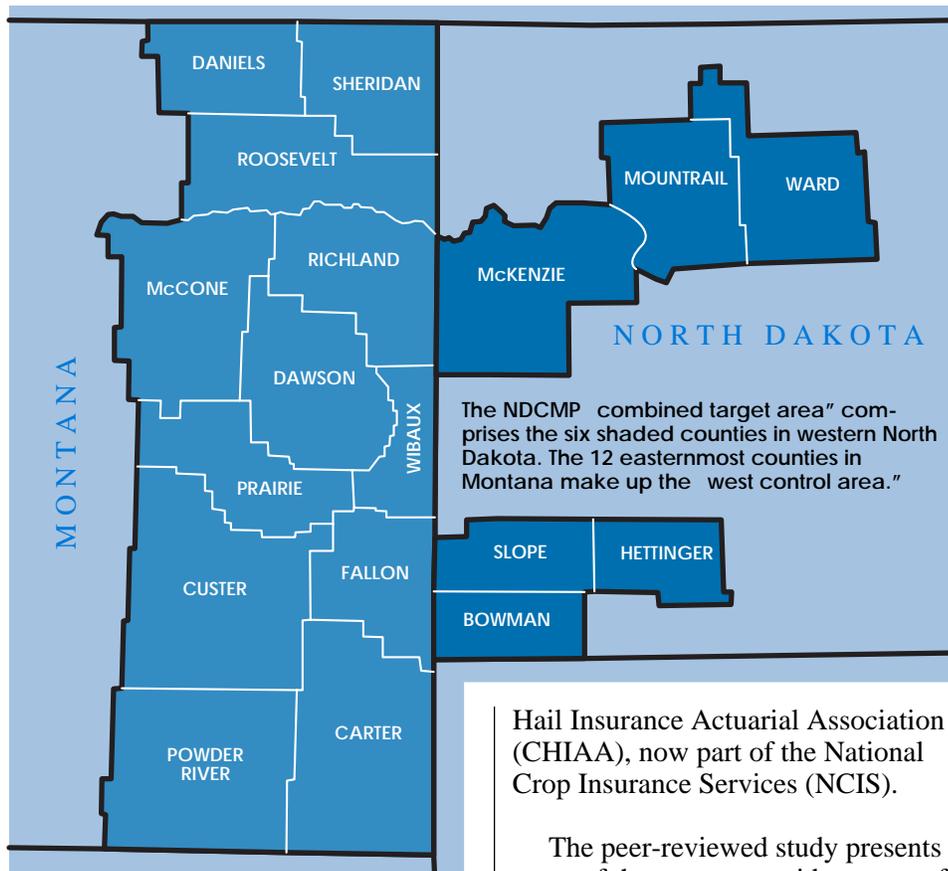
Cloud seeding evaluation completed

by Bruce Boe

A detailed study of crop-hail insurance data for North Dakota and eastern Montana has recently been completed by scientists at the South Dakota School of Mines and Technology and Colorado State University. The study, which will formally appear in the April 1997 issue of the *Journal of Applied Meteorology*, examines crop-hail insurance loss records for the period from 1924 through 1988, searching for indications of changes in crop-hail losses within the multi-county target area of the North Dakota Cloud Modification Project (NDCMP). The primary purpose of the county-sponsored NDCMP has been to reduce hail damage.

In the first portion of the study, crop-hail losses within the NDCMP target counties are compared with losses in adjacent upwind counties in Montana in the years prior to the NDCMP (1924-1975). It is found that during this historical period prior to the NDCMP, there is no indication that hail losses were different between the two areas. This establishes that the hail climatologies of the two areas are similar.

In the second part, crop-hail losses reported from the same two areas are compared again, but this time, for the 13 years (1976-1988) during which cloud seeding was regularly conducted. For the NDCMP (cloud seeding) period, a marked difference in crop-hail losses is noted, with the target counties showing reduced losses averaging 45 percent. Several different statistical tests were conducted, with each



yielding essentially the same results.

The years 1989 and later are not used in the study because the target area changed that year. In addition, two other counties did not conduct operations at all during 1990 because funding was not available. With the completion of the 1996 season, seven seasons' data are now available from the new target areas, meaning a new evaluation should become possible within a few more years. Because of the strong natural variability of storms, dependable evaluations cannot be made with less than 10 years' data. The crop-hail insurance data were obtained from the Crop

Hail Insurance Actuarial Association (CHIAA), now part of the National Crop Insurance Services (NCIS).

The peer-reviewed study presents some of the strongest evidence yet of the effectiveness of the NDCMP hail suppression operations, and supports the conclusions of a previous (1992) study which found wheat yields are about 6 percent higher in project target counties.

Copies of the report will be available upon request from the addresses below— after the formal publication in April, of course. ■

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