



# NORTH DAKOTA CLOUD SEEDING



## THE FACTS

A 2019 economic study of the NDCMP by Bangsund and Hodur at NDSU found benefit to cost ratios of 31-53 to 1 for summer season agricultural production.

As of 2022, the NDCMP has provided 402 UND aviation students and 70 meteorology students with internships.

Since 1996, insurance companies in Alberta, Canada have solely funded a hail suppression project to reduce property damage from hail.

Cloud seeding agents, including silver iodide and dry ice, meet all National Environmental Policy Act (NEPA) regulations and are safe for the environment.

**\$0.14**  
Per Acre

2020 NDCMP rain enhancement and hail suppression operations cost only \$0.14/acre. Participating counties pay 66% of the cost, while the state pays the remaining 34%.



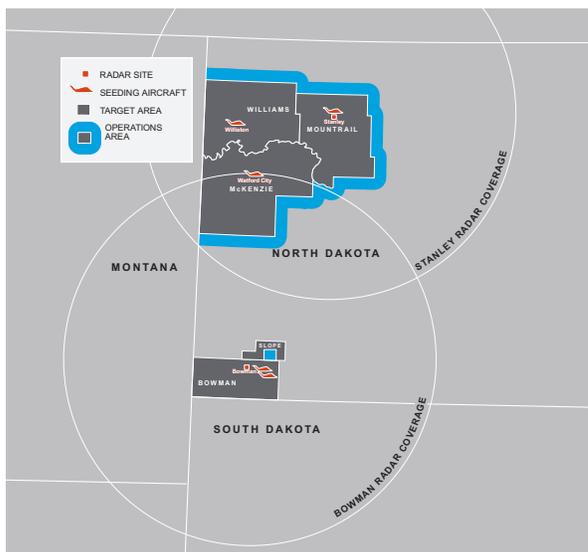
Cloud seeding studies in North Dakota indicate a 45% reduction in crop hail losses.

**5-10%**

Cloud seeding produces an estimated 5-10% in additional rainfall for farmers and ranchers in western North Dakota's project area.

**150,000**  
Square Miles

Operational cloud seeding programs in the United States cover approximately 150,000 square miles, or more than twice the area of North Dakota.



## ND PROJECT MAP

North Dakota Cloud Modification Project (NDCMP) Participants

Bowman                      Mountrail                      Part Of Slope  
McKenzie                      Williams                      County

North Dakota has conducted cloud seeding operations annually since 1961.

The NDCMP is the longest running aerial hail suppression project in the world.



# WEATHER MODIFICATION

PROGRAMS IN WESTERN  
US & CANADA

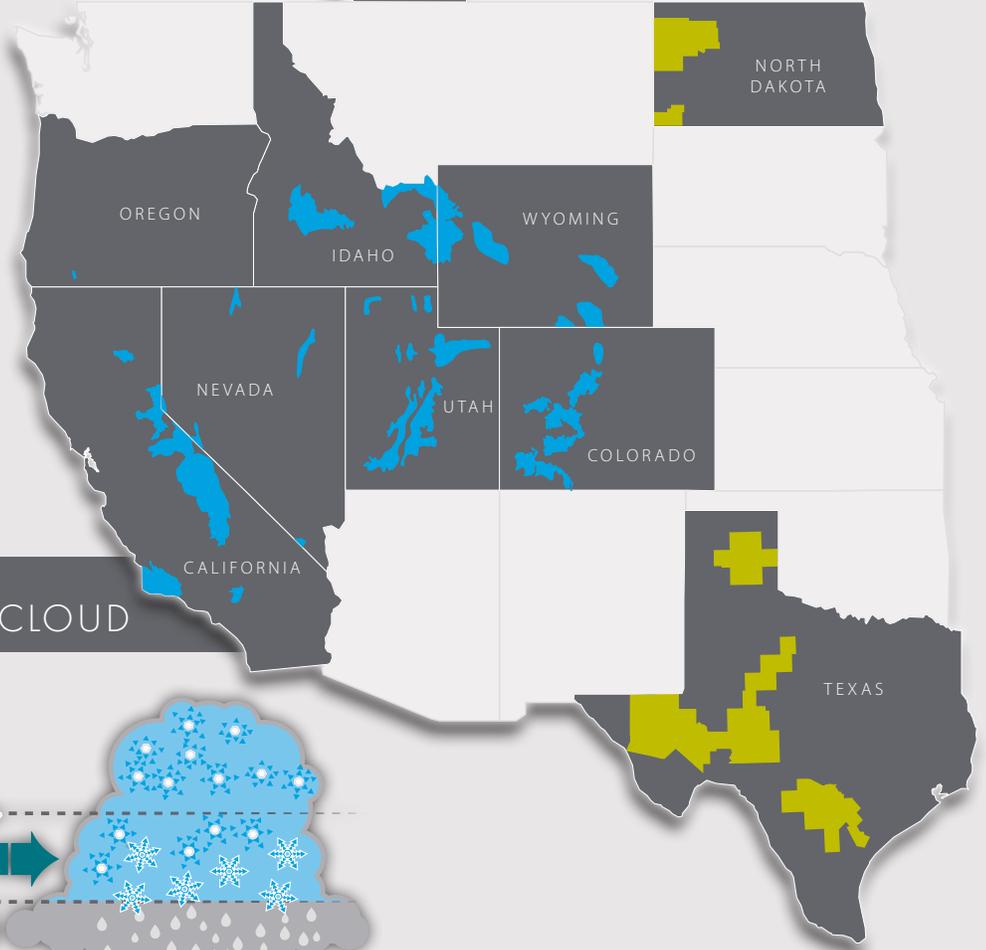
ALBERTA,  
CANADA

CANADA

## CLOUD SEEDING TARGET AREAS

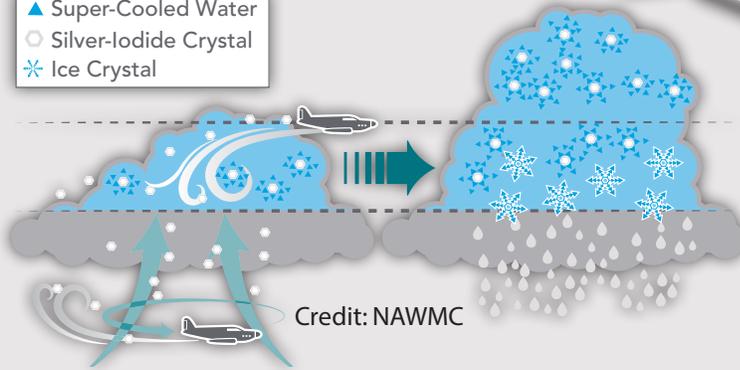
Cold-Season

Warm-Season



## WARM SEASON CLOUD

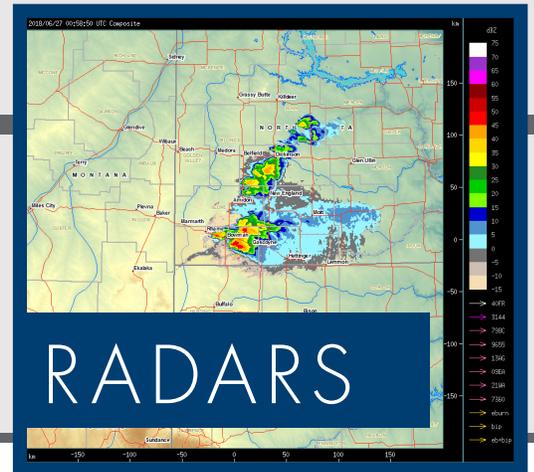
- ▲ Super-Cooled Water
- Silver-Iodide Crystal
- \* Ice Crystal



The Bowman and Stanley Radars display storm location, intensity, aircraft positions, and seeding tracks during cloud seeding operations.

Stanley and Bowman radar images are available online from June through August and updated every five minutes at <http://dwr.nd.gov/arb>.

The Bowman radar runs year-round through funding by eight regional counties and provides residents with improved radar coverage.



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