

2025 SENATE ENERGY AND NATURAL RESOURCES

SB 2106

2025 SENATE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee Peace Garden Room, State Capitol

SB 2106
1/30/2025

Relating to weather modification; to repeal section 37-17.1-15 and chapter 61-04.1 of the North Dakota Century Code, relating to weather modification; and to provide a penalty.

2:53 p.m. Chairman Patten opened the hearing.

Members present:

Chairman Patten, Vice Chairman Kessel, Senators: Beard, Boehm, Enget, Gerhardt, and Van Oosting.

Discussion Topics:

- Rainfall enhancement
- Permit for weather modification counties
- Scientific proof of effectiveness
- Appletree program
- Cloud Seeding
- Local choice
- Economic, scientific, and educational aspects

2:53 p.m. Senator Beard introduced the bill and submitted testimony in favor #32851.

2:58 p.m. Roger Nashem testified in favor.

3:05 p.m. John Wert testified in favor.

3:07 p.m. Jamie L. Kouba testified in favor and submitted testimony #32834.

3:12 p.m. Doug Stangeland, Stangeland Farm, testified in favor and submitted testimony #32328.

3:18 p.m. Amy E. Dennis testified in favor and submitted testimony #31419.

3:21 p.m. Dani Quissell, ND Weather Modification Association, testified in opposition and submitted testimony #32740.

3:23 p.m. Pine Abrahamson, Commissioner of Bowman County Commission, testified in opposition and submitted testimony #32951.

3:27 p.m. Wayne Murdock, testified in opposition.

3:33 p.m. Darin Langerud, Director of Atmospheric Resources, testified in opposition and submitted testimony #32465.

3:41 p.m. Lenor Dalanger, Resource Board, testified in opposition.

3:45 Jody Fischer, Vice President of Weather Modification International, testified in opposition and submitted testimony #32857.

Additional written testimony:

Brandon Garaas submitted testimony in favor #32342.

Mary Dennis submitted testimony in favor #32666.

James Horob, Farm and Ranch, submitted testimony in favor #32800.

Travis F. Bateman submitted in favor testimony #32036.

Jacob Grieger submitted testimony in favor #32867.

Robert J. Kraus, Dean of Aerospace UND School of Aerospace Science, submitted testimony in opposition #32675.

Mary Massad, President, ND Water Users Association, submitted testimony in opposition #32742.

James Sweeney, President of Weather Modification International, submitted testimony in opposition #32775.

David J. Delene submitted testimony in opposition #32865.

Wes Andrews, ND Water Users Association, submitted testimony in opposition #32847.

3:51 p.m. Chairman Patten closed the hearing.

Kendra McCann, Committee Clerk

Hello,

My name is Amy Dennis and I am a resident of Mountrail County. Our county voted to end our convective weather modification program by 66% in the 2024 November election.

Thank you so much for to opportunity to submit testimony in regards to Weather Modification in our state. I am so grateful to be able to do so.

Below are just some examples as to why I would like to see warm convective modification end in our state entirely:

*Regarding precipitation:

- no county has seen an increase in precipitation in the 40 years in the program.
- 25 years or so PRIOR to entering the program, the average rainfall was higher (for June, July and August)
- Western ND is not wetter overall.
- if you attempt reducing hail by 40%, you reduce rain by 30% (1/3 on average)
- places like Kansas have hail that TOWERS ours in size, yet, they have ended their programs and haven't turned back
- there are studies showing (and can be found on the State Water Commission's website) hail suppression WEAKENS storms, causes less intense rainfall AND can cause a storm to rain out earlier than it would have if it hadn't been seeded for hail suppression.
- there is no proof rain lasts longer or seeding clouds increases updrafts
- Another problem is the excessive number of flights. There are real world (not studies or numbers based on hypotheticals) statistics showing there has been no significant increase in our rainfall in the last 50 years. Instead of just focusing on hail suppression which would mean flying ONLY when there is a severe forecast with clouds likely to bring hail, nearly every little cloud we see gets seeded. That is when the project becomes excessive and out of control. That is when Weather Modification loses its purpose as something for good. The excessive nature of the project creates an atmosphere rife with overspending, questionable benefits, cronyism and harm.

*Regarding livelihood and well-being

- In areas previously performing hail suppression, residents claim they had MORE hail storms WITH weather modification than without
- Every drop of precipitation that falls when Weather Modification is in practice contains silver iodide. Are you convinced that's safe?
- we and many other farm families oppose Weather Modification. We pay high premiums for hail insurance protection every year and every year we have hail losses. Neighboring counties who do NOT modify the weather report fewer crop hail losses than we do.
- I would argue the amount of revenue lost in at least Mountrail County from an agronomic standpoint due to the overall drought conditions in Western North Dakota in just the past 5 years FAR surpasses what appears to be 'cheap' insurance that is harming us instead.
- Government funded studies quoted by proponents of weather mod. claim over 30 to 1 economic returns from weather modification. This claim has not and cannot be proven. If real world data supported the claim, everybody would be bringing it home...but they're not, because the studies

they quote are based on hypothetical data gleaned from hypothetical scenarios. We cannot accurately measure the results of hypotheticals and scientifically apply them to real world data.

-If funding everywhere is so tight, and we know it is, why would we continue to fund a project like Weather Modification that sounds good in theory but is based on hypotheticals and has no real-world proof? It is a cold, hard fact we need the money for roads, parks, law enforcement, county extension services, social services, etc.

If this program was doing what its proponents claim, we'd all support it. Ward Count recently ended their program by a 9-1 margin as well. Why are counties leaving the program and not coming back to it?

Amy Dennis
Stanley, North Dakota

TO: NORTH DAKOTA LEGISLATURE-69TH LEGISLATIVE SESSION

RE: **TESTIMONY IN FAVOR OF SENATE BILL 2106**

1/30/2025

Chairman Patten and committee members,

Good morning, my name is Travis Bateman and I reside in McKenzie County. I am here today to speak in favor of Senate Bill 2106.

My thoughts on the topic of weather modification are relatively simple. It is messing with Mother Nature and God's will and in that, as is stated in the literature of the weather modification program, it is experimental. That word alone I find troubling.

For decades North Dakota has been getting milked of funds to provide for experimentation in our skies to take place under the guise of hail suppression and rain enhancement.

Let me give you my observation of what this experiment has done, more often than not since I have been paying attention.

One summer afternoon I left Watford City and was headed to my house. To the west and southwest of the area one could observe a thunderstorm. Being that we have the technology today, I remember looking at the weather app on my phone and thinking, "Nice, we are going to get some rain." The area was parched and very due for some beneficial moisture. I remember contacting some neighbors about the approaching storm so that people could get their outdoor items secured and such. The rain curtain of this storm was wide and matched what I saw on radar to what I could see with my own eyes.

I got home and while outside, I could hear an airplane in the area, towards the approaching storm. I opened the app on my phone called "Flight Aware". It was there that I observed the flight path of the airplane and checked the registration of it, Weather Modification Inc. The app shows the flight path of the plane and it looked just like that of a farmer in his field going back and forth in rows.

Within twenty minutes, what was a five plus mile wide rain curtain had shrunk to maybe one mile wide. And in another ten minutes, what was a storm was reduced to a wimpy looking cloud and it was barely dropping any moisture.

I can tell you that this story matches several over the years with our area having this experimental program flying over our counties. In my opinion, it is nothing short of fraud, waste, and abuse of government funds. There has been nothing conclusive to say either way of what the program does. However, I have seen what it does with my own two eyes.

The weather modification program is nothing short of an exploitative program that is lining certain people's pockets and tied in to our state's water resources programs and also boasts about training student pilots and meteorologists from countries like South Korea.

McKenzie County has \$140,000 budgeted for weather modification in 2025. The contract is set to renew or end in March. Our county may be swimming in the dough from oil and gas but I can assure you that as a citizen of that county, I would much rather see those funds be allocated to far more proven and essential needs. Many citizens are active in ending this program in our county. If the state legislature doesn't end it here this session, we will continue to gather signatures to place it on the ballot for the citizens to decide while we also are applying pressure on the county commission to pull the plug as well.

In 2024, Williams and Mountrail county voters abolished this program, leaving McKenzie, Bowman, and half of Slope counties as participating in this....experiment.

These two and a half counties are all that remains in the entire United States of this worthless program and it needs to die, just like the beneficial rains have every time a storm pops up over our western skies when these planes go up.

That's something else too. These planes are only supposed to go up and spray during severe warned storms, yet it seems to me that every time a cloud popped up in the sky, they come swarming as if our airspace were being invaded.

Others will speak to the health hazards and other observances and knowledge on the waste and failure that this program has been since it has been allowed to exist. It needs to end. The experiment needs to be over. And I say this. You would be hard pressed to find a majority of farmers or ranchers that support this farce continuing.

I thank you and I ask for you to vote for a DO PASS on Senate Bill 2106.
Send these planes packing. Shut this experiment down. Let God and Mother Nature dictate whether we have drought or beneficial moisture.

Thank you and I stand for any questions that you may have.

Respectfully,

Travis F. Bateman

Travis F. Bateman
Watford City, North Dakota

...

To the committee of SB2106:

My name is Doug Stangeland, I am a third-generation farmer from Williams County, residing in the Williston area.

In 2022, a bunch of farmers gather to discuss the weather modification program that was going on in our area. The consensus of the group was that the program wasn't doing what we were led to believe.

In January of 2023, my family took it upon ourselves to start a petition in hope to finally bring this matter before the voters of Williams County. We needed 2795 signatures, we turned 2998. In getting these signatures, we had an overwhelming support of the local businesses to help in collecting the signatures.

When this was brought before the last legislative session, it failed to pass. We had heard that there wasn't anything from the people to warrant for a vote on the floor. Well, we the people in Williams and Mountrail Counties have spoken, and have spoken loudly.

In an overwhelming turn out of voters, they resoundingly voted 71.8% (10,152 votes) to Abolish the weather modification program in Williams County. In Mountrail County, it was voted to be abolished by 66.46% (2574 votes). It is the general consensus that the people are tired of the government controlling our weather. It is time to let God do what He does best since He is the creator of the weather.

From our experience in living in a county with weather modification, when they do fly into the clouds of a potential storms with rain, they either disperse the clouds or it becomes so violent that the crops are lost due to heavy rain and hail and the hail then causes an astronomical amounts of property damage. Altering weather patterns can disrupt natural ecological balances affecting plants and animals. So that right there tells you that it affects our crops and cattle!

One of the chemicals used in cloud seeding is silver iodide, it could have unknown environmental impacts, potentially affecting the quality of the water and ecosystems.

According to the Utah Appletree Program, some of the symptoms of silver iodide toxicity are as follows:

- *Irritation of the eyes, skin and mucous membranes

- *Gastrointestinal irritation

- *Vomiting

- *Diarrhea

- *Coughing and difficulty breathing

- *Kidney Damage

- *Brain Damage

- *Death

Sounds like some very serious health issues can occur from over exposure. After 60 approximate years of this program, it's time to put the program in the grave before any more damage can be done. Let's put the health of the people of the Great State of North Dakota First!

So we are encouraging this committee to pass SB 2106 for a YES vote!

Respectfully,

Doug Stangeland

Williston, ND

Testimony in favor of SB2106

Good morning, my name is Brandon Garaas. I'm a 4th generation farmer in Williams County. I'm writing in favor of SB2106 today. I was very vocal about abolishing weather modification in Williams County. I've been following weather modification and the airplanes that have controlled it for the last 10 years or so. I've been farming for the last 12 years and have received some sort of hail damage in at least 4 years of it. The most notable years were an early storm in 2020 that took out our roof at our home and devastated about 25% of our crops. Almost every roof in Williston was replaced, and many vehicles and private properties were damaged. I wonder what the final tally on damage to this area was for that storm. The storm on August 1st, 2023, was the icing on the cake. We only were able to harvest about 25% of our farm, only 15% had little or no hail. The rest was a complete wipeout. This storm started at the 13-mile corner north of Williston and left a devastating path all the way north of Bismarck. The tens of millions if not hundreds of millions of dollars in crop losses were left out of the final summary for the 2023 weather modification meeting. The droughts we had in 2020 and 2022 were another example of why we shouldn't mess with mother nature. The countless times I've watched rain showers or storms develop only to have these airplanes make them disappear is very frustrating being a farmer. Then there are times where you hope they will "suppress" the hail only to have your crop destroyed. If this program was so beneficial for our farming community or for reducing damage to property, why aren't there more states or counties involved in this? Ending this program in Williams and Mountrail counties last year should make a clear point that most of the residents in North Dakota do not want this program and we should leave the weather up to Mother Nature herself.

Thank you and I will answer any additional questions, if need be,

Brandon Garaas

Williston, ND

TESTIMONY OF

Darin Langerud, Director, Atmospheric Resource Division

Chairman Patten, and members of the Senate Energy and Natural Resources Committee, I am Darin Langerud, the Director of the Atmospheric Resource Division of the Department of Water Resources. I'm here today to provide testimony in opposition of SB 2106.

SB 2106, if passed, would do several things. It would ban weather modification (also known as cloud seeding) operations in the jurisdictions that choose to participate in the program, making it a class B misdemeanor for a person to perform or contract for the performance of weather modification in the state, it would eliminate research field trials used to better understand the science and improve the technology, and it would eliminate the Atmospheric Resource Board (ARB) and its regulatory role through the repeal of Chapter 61-04.1 of the North Dakota Century Code.

Existing statutes related to weather modification are working as intended. The same options exist to allow for counties to create or abolish a weather modification authority. Over the last ten years counties have chosen to continue in the cloud seeding program and to leave it. These decisions are made at the county or township level, not by the State. Passage of SB 2106 would eliminate this choice for those wishing to participate in the program and realize its benefits.

Those benefits have been demonstrated through several independent evaluations of the North Dakota Cloud Modification Project (NDCMP), to determine the effects of the project on rainfall, crop-hail damage, crop yields, and economic impact. A study of crop-hail insurance data showed a 45 percent reduction of crop-hail damage in the seeded counties. Five independent studies focused on precipitation have found that rainfall was increased in the target counties (and downwind) from 3 to 14 percent, an increase of up to an inch of additional growing-season moisture. Another study showed wheat yields were 5.9 percent higher in the seeded counties versus an adjacent control area with no cloud seeding.

The economic effects of cloud seeding have been analyzed by economists at NDSU's Department of Agribusiness and Applied Economics. The most recent by Bangsund and Hodur (2019) examined the benefits to the eight most common crops grown in North Dakota. Using long-term evaluations of 5-10 percent increases in rainfall and a 45 percent reduction in crop-hail losses, they calculated annual direct benefits to agricultural production of \$28.1-\$48.8 million in the project area. Estimated additional state tax revenues ranged from \$576,000 to \$999,000; more than double the amount of state cost-share funds expended on the program. Benefit to cost ratios ranged from 31-53 to 1.

A more recent (2021) Michigan State University study using 30 years of USDA Risk Management Agency data found that average annual wheat yields in seeded counties were 3.87 bushels higher than wheat yields in non-seeded counties. Further, their analysis showed crop-hail insurance loss ratios were lower in the seeded areas, with both results being statistically significant. The economic benefit to cost ratio was more than 36 to 1.

The ARB maintains a Memorandum of Understanding (MOU) with the University of North Dakota's John D. Odegard School of Aerospace Sciences for academic and field training of weather modification intern pilots, the only program of its kind in the U.S. Another ARB program provides meteorology students a summer educational opportunity working as intern meteorologists at the Bowman and Stanley radar sites. Through these training programs, 412 pilots and 76 meteorologists have participated as interns on the NDCMP. These training programs would end should SB 2106 be adopted.

Another impact of SB 2106 would be the loss of research and development opportunities in North Dakota. R&D in the U.S. is currently done by the states, not the Federal government. Elimination of state programs would limit the advancement of weather modification technologies in the U.S. at a time when foreign adversaries are accelerating their investment in R&D. China already has the world's largest weather modification program with an estimated 40,000-person workforce and tens of millions of dollars in annual expenditures. These technologies will continue to be developed and deployed whether the U.S. participates or not, potentially putting our country at a competitive disadvantage.

Lastly, one of the common concerns raised by the public is the environmental safety of the materials used in cloud seeding. Because silver iodide is such an effective ice nucleus, it is used in very small quantities. Based on the average rate of seeding material used in North Dakota each summer, only one one-hundredth of a gram (0.01g) would be expected to be deposited per acre of land in the operations area during the summer project, a nearly undetectable amount far below any existing safety thresholds. Published scientific literature from both domestic and international programs clearly shows no environmentally harmful effects from cloud seeding with silver iodide aerosols.

Thank you for the opportunity to testify, and I'm happy to answer any questions.

Submit Fiscal Note

Bill Number	SB 2106	Amendment	N/A	Engrossment	N/A
Original	250494.01000	In Context	N/A		
Fiscal Note	250494.01000				
Requested	12/30/2024 5:42 PM				
Revision Requested	01/03/2025 3:28 PM				
Next Hearing	N/A				
Agency Contact	<div></div>				
Assigned To/Due Date	Sarah Felchle, 01/04/2025 5:42 PM				
Agency Comments					

Fiscal Note

1 - STATE FISCAL EFFECT

IDENTIFY THE STATE FISCAL EFFECT AND THE FISCAL EFFECT ON AGENCY APPROPRIATIONS COMPARED TO FUNDING LEVELS AND APPROPRIATIONS ANTICIPATED UNDER CURRENT LAW.

	2023-2025		2025-2027		2027-2029	
	General Fund	Other Funds	General Fund	Other Funds	General Fund	Other Funds
Revenue			(\$200)	(\$559,690)		
Expenditures				(\$443,690)		
Appropriations						

2 - COUNTY, CITY, SCHOOL DISTRICT, AND TOWNSHIP FISCAL EFFECT

IDENTIFY THE FISCAL EFFECT ON THE APPROPRIATE POLITICAL SUBDIVISION.

	2023-2025	2025-2027	2027-2029
Counties		(\$532,961)	
Cities			
School Districts			
Townships		(\$26,729)	

3 - BILL AND FISCAL IMPACT SUMMARY

PROVIDE A BRIEF SUMMARY OF THE MEASURE, INCLUDING DESCRIPTION OF THE PROVISIONS HAVING FISCAL IMPACT (LIMITED TO 300 CHARACTERS).

SB 2106 removes the authority of the ND ARB, restricts the SWC authority as it relates to the statewide water development program and its ability to provide funding for the program, to the priorities identified in Section 61-02.1-02.1 and restricts it from providing funding for weather modification.

4 - FISCAL IMPACT SECTIONS DETAIL

IDENTIFY AND PROVIDE A BRIEF DESCRIPTION OF THE SECTIONS OF THE MEASURE WHICH HAVE FISCAL IMPACT. INCLUDE ANY ASSUMPTIONS AND COMMENTS RELEVANT TO THE ANALYSIS.

Section 2 and 4 removes the authority for electors and Water Resource Boards to expend funds for weather modification which reduces county expenditures and State revenue by \$559,690. Section 3 restricts the State Water Commission from expending funds for weather modification, however expenditures will not be reduced as these funds would be utilized for water projects other than weather modification. Expenditures include the cost to dismantle the Stanley radar, transport equipment for surplus, and demolish the building, estimated at \$120,000. Section 6 repeals Chapter 61-04.1 relating to weather modification eliminating all related licensing and permitting requirements and will result in a reduction in revenue to the state of \$200.

5 - REVENUES DETAIL

FOR INFORMATION SHOWN UNDER STATE FISCAL EFFECT IN 1 OR 2, PLEASE EXPLAIN THE REVENUE AMOUNTS. PROVIDE DETAIL, WHEN APPROPRIATE, FOR EACH REVENUE TYPE AND FUND AFFECTED AND ANY AMOUNTS INCLUDED IN THE EXECUTIVE BUDGET.

Section 6 repeals Chapter 61-04.1 relating to weather modification eliminating all related licensing and permitting requirements and will result in a reduction in revenue to the state of \$200, General Fund. SB 2106 removes the authority for electors and Water Resource Boards to conduct weather modification activity, to collect revenues related to such activity, and provides for a penalty for conducting such activity, which would be a \$559,690 reduction in revenue from counties and townships.

6 - EXPENDITURES DETAIL

FOR INFORMATION SHOWN UNDER STATE FISCAL EFFECT IN 1 OR 2, PLEASE EXPLAIN THE EXPENDITURE AMOUNTS. PROVIDE DETAIL, WHEN APPROPRIATE, FOR EACH AGENCY, LINE ITEM, AND FUND AFFECTED AND THE NUMBER OF FTE POSITIONS AFFECTED.

SB 2106 removes the authority for electors and Water Resource Boards to conduct weather modification activity and to collect revenues related to such activity. Expenditures reduction will match reduction in revenue of \$559,690, reduction of expenditures for the ND Atmospheric Resource Board member pay of \$2,300 and travel \$1,700, plus the addition of costs to dismantle and demolish the Stanley radar of \$120,000. Weather modification does receive funding from the DWR's cost-share program in the amount of \$288,325, however these funds will continue to be expended for other water projects in place of the weather modification program resulting in a net reduction of \$0 for expenditures of the cost-share program.

7 - APPROPRIATIONS DETAIL

FOR INFORMATION SHOWN UNDER STATE FISCAL EFFECT IN 1 OR 2, PLEASE EXPLAIN THE APPROPRIATION AMOUNTS. PROVIDE DETAIL, WHEN APPROPRIATE, FOR EACH AGENCY AND FUND AFFECTED. EXPLAIN THE RELATIONSHIP BETWEEN THE AMOUNTS SHOWN FOR EXPENDITURES AND APPROPRIATIONS. INDICATE WHETHER THE APPROPRIATION OR A PART OF THE APPROPRIATION IS INCLUDED IN THE EXECUTIVE BUDGET OR RELATES TO A CONTINUING APPROPRIATION.

There is no appropriation in the bill.

CONTACT INFORMATION

Name	Sarah Felchle
Agency	Dept of Water Resources
Telephone	(701) 328-4946
Date Prepared	01/03/2025 12:00 AM

RE: Weather Modification

I am in favor of ending all weather modification/geo-engineering in North Dakota. The chemicals that are being used have not been studied for the long-term effects on our land, on our water, on animals or on ourselves. We do know that there are considerably more allergies and asthma/breathing related illnesses than there used to be, and overall, more illnesses in general.

It is reasonable to consider that the chemicals being sprayed into our skies play a part in the health, or lack thereof, of our citizens. It is also reasonable to expect that these chemicals are getting into our food, our water and our land.

Please end all weather modification/geo-engineering in North Dakota.

Most sincerely,

Mary Dennis,

6989 84th Ave NW

Stanley, ND 58784



Office of the Dean
 Odegard Hall, Room 200
 3980 Campus Road Stop 9007
 Grand Forks, ND 58202-9007
 Phone: 701.777.2791
aero.UND.edu

January 29, 2025

Chair Patten and Members of the Senate Energy and Natural Resources Committee,

I provide this testimony in opposition to SB 2106 as currently drafted, specifically concerning the weather modification program. I understand there may be some anecdotal evidence that led to this bill, but I wanted to weigh in on the overall effectiveness of the program. As you may know, this program originally started within UND's John D. Odegard School of Aerospace Sciences before transitioning to its current location in Fargo. For many years, our Aviation and Atmospheric Science students have participated in the project as interns and many stayed with the company for continued work after that. Each year a report is submitted describing their efforts as well as scientific proof of its effectiveness across the entire state of North Dakota. Several of the anecdotes that led to the bill's creation are not backed by scientific proof or a connection to this program.

As this bill is currently written, there are several changes to existing code that remove or restrict current approval authorities for weather modification. The current arrangements for reviews, funding, and approvals are all in place and have worked successfully for many years and the annual reports justify the public benefits of the programs.

Here are some additional talking points:

1. The program provides significant direct benefits as described in their annual reports. Not only does cloud seeding provide significant direct benefits by suppressing hail and enhancing rain in the participating counties, but there are also additional economic benefits to our entire state, including the eastern part of the state. Among the indirect benefits:
 - a. Weather Modification International, located in Fargo, is a world leader in cloud seeding and atmospheric resources.
 - b. ICE Crystal Engineering is a sodium iodide plant located north of Kindred in District 22, which material is used in cloud seeding operations.
 - c. The UND Aviation program is one of the top aviation programs in the country. Over 400 pilot interns and 70 meteorologists have received training from the program.
 - d. Each participating county has improved economic activity because there are additional pilots and planes using county facilities and businesses.
2. Funding for all water projects is derived by the Resources Trust Fund, which receives 20.5% of the Oil and Gas Extraction Tax. The five counties which participate in cloud seeding are big producers of oil and gas. Those counties do not request significant cost share dollars from the

Office of the Dean

Odegard Hall, Room 200
3980 Campus Road Stop 9007
Grand Forks, ND 58202-9007
Phone: 701.777.2791
aero.UND.edu

Resources Trust Fund for flood control or drainage. Eastern counties opposing cost share for cloud seeding would be akin to western counties opposing cost share for drainage.

3. The water community has always supported cloud seeding, even though the funding for cloud seeding reduces funding for other water projects.
4. There is no evidence of negative impacts downwind of cloud seeding activity.

We stand in support of the Weather Modification program, but the current bill draft does not adequately address the needs of the state. If you have any additional questions, please contact me at robert.j.kraus@und.edu or (701) 777-3196.

Sincerely,



Robert J. Kraus, PhD, PfMP
Dean



North Dakota
Weather Modification Association

1605 E. Capital Ave.
P.O. Box 2599
Bismarck, ND 58502
701-223-4232

**Testimony on SB 2106
Senate Energy and Natural Resources Committee
January 30, 2025**

Good afternoon, Mr. Chairman and members of the Senate Energy and Natural Resources Committee. I am Dani Quissell with the North Dakota Weather Modification Association. I am here in opposition to SB 2106.

North Dakota has a long history of conducting weather modification activities, dating back to the 1950s. We are fortunate to have a framework in place that gives the people the choice, on a local level, on whether or not weather modification activities occur in their area.

Today, just two counties, Bowman and McKenzie, and a few townships in Slope have active weather modification programs. This is a change from just two years ago when we last talked about weather modification. In November, the people in Williams and Mountrail counties voted to discontinue their programs. In my opinion, this demonstrates that our current framework works.

I have heard the argument that individuals shouldn't have to go through the process of putting the question of the continuation of the program to a vote of the people. I would point out that while that is the most direct way to attempt to discontinue a program, it is not the only option available under current law. Regular reauthorization of the program is mandated in current century code. Reauthorization most often takes place by a vote of the elected county commissioners. In the past, county commissioners have put the question to a vote of the people as well when they felt that was most appropriate.

I understand that putting a question like this to a vote of the people requires both a commitment of time and dollar—and that that can be frustrating. However, that is the democratic process at work. Just as you each made a significant time and likely financial commitment when you ran for the legislature, putting a policy question to a vote of the people requires an investment regardless of whether that comes from the county or individuals.

I ask you to give SB 2106 a 'do not pass' recommendation and continue the current practice of allowing locals to decide for themselves whether to have weather modification in their area or not. Thank you for your attention this afternoon. I'd be happy to stand for any questions.



DEDICATED TO PROTECTING, DEVELOPING, AND MANAGING NORTH DAKOTA'S WATER RESOURCES
PO Box 2254, Bismarck, ND 58502-2254 701-223-4615 • 701-223-4645 (Fax)

SB 2106
Testimony of Mary Massad, President
North Dakota Water Users Association
Senate Energy and Natural Resources Committee

Chairman Patten and members of the Senate Energy and Natural Resources Committee thank you for the opportunity to provide testimony on SB 2106. The Water Users Association is the state-wide member organization dedicated to protecting, developing, and managing North Dakota's water resources. We have more than 150 members from all across North Dakota who have an active interest in water management in all its forms.

The Water Users has a long-term goal:

To support the North Dakota Cloud Modification Project and continued funding for weather modification activities and programs, including research and evaluation of atmospheric resources, expand cloud modification activities in the state; and to continue to form the technical base for further scientific progress and economic development.

North Dakota has a long history of conducting weather modification activities. Today, the state is at the forefront in developing and using this technology. Weather Modification International, based in Fargo, with a plant in Kindred, is the leader in this industry. Additionally, through a unique partnership with the University of North Dakota, students at UND are able to train as pilot interns through the weather modification program.

Cloud seeding in North Dakota increases the efficiency of clouds, maximizes precipitation and decreases the likelihood storms will develop into devastating hailstorms. Studies in North Dakota do show direct benefits for North Dakotans due to weather modification. These studies indicate a 5-10% increase in moisture and a 45% reduction in hail in areas where weather modification activities occur.

Weather modification is a tool of water management available to local political subdivisions on a voluntary basis. SB 2106 seeks to ban this tool through a vote in Bismarck rather than let local citizens make the decision for themselves. This would remove the ability of residents of McKenzie and Bowman Counties, as well as some townships in Slope County, to continue to utilize a program they find effective in managing water for them.

Please maintain local control over this important decision. I respectfully request a 'do not pass' recommendation on SB 2106.

Thank you.



January 28, 2025

Members of the Senate Energy and Natural Resources Committee,

I am writing to ask you to give SB 2106 a 'do not pass' recommendation.

Today, North Dakota has one of the premier weather modification programs in the country. While activities are concentrated in western North Dakota, Weather Modification LLC is based in Fargo and provides weather modification services across the globe and is considered the world leader in this industry.

The weather modification program has real benefits for the people in areas where the program operates. Without the program, there will be impacts to agricultural productivity and damage to homes and businesses.

A recent study by NDSU Department of Agribusiness and Applied Economics (Bangsund and Hodur, 2019), showed that the value of added growing season rainfall at 5 percent enhancement is estimated at \$21.2 million annually, or \$9.19 per planted acre. The cost per acre for the cloud seeding program is only \$0.40 per planted acre.

Referencing two studies completed on the topic of downwind effects, Wise, 2005 and Johnson, 1985 both concluded that there were no negative downwind effects and only positive effects downwind. This negates the argument that if seeding occurs upwind of a non-participating county, they "steal" the rain. It is to the contrary and studies have proven this.

The viability of cloud seeding is also evident from the fact that California, Arizona, and Nevada have been funding cloud seeding programs in Wyoming, Utah, and Colorado due to their own downstream water needs. Today, more than 50 countries operate cloud seeding programs due to its viability and success as a water management tool.

To combat misinformation in our industry, education is a critical part of our success. Please refer to references to studies in this letter and for more science-based facts and studies, please refer to the North American Weather Modification Council website at <http://www.nawmc.org/>.

Part of what has made North Dakota's program successful is that operation of the program is locally driven. Counties (and townships) have the ability to opt in or out of the program based on the wishes of their residents. SB 2106 would remove the ability of local entities from making this decision—taking away local control.

For these reasons, I would ask for a 'do not pass' recommendation on SB 2106.

Thank you,

A handwritten signature in blue ink that reads "James P. Sweeney".

James P. Sweeney
President

Bill SB 2106 my name is James Horob, have lived my entire life in western ND for 59 years, love living and working a farm and ranch for a living here. I am in favor of bill SB 2106. Weather modification has cost the people that work this land in ND much of their crops and grass that feed their livestock by suppressing rain. My family has witnessed many thunder showers that have made their way from Montana only to be suppressed by weather modification air planes, we live on the Montana border so get to see the livelihood of the farmers and ranchers that work the land here get their production droughted out by rain suppression.

Please pass this bill so our farmers and ranchers can produce more food for our great nation. Weather modification is man made climate change and not for the better. Thank you

Greetings today, Chairman Patten and members of the committee

Nice to meet you all, I'm Jamie Kouba from Regent

We've all been scammed at one time or another maybe someone bought that magic vitamin that would fix your sore back and reduce your weight, make you perform like a super hero, right?

Maybe one of you guys had your phone rang by a guy selling drill bits that could drill through anything and you gave him your money to find out they didn't...

Or did any of you ladies buy that

product that was going to make your skin perfect smooth? And it wasn't what you hoped for?

Now that we can admit it's happened before, even to the best of us

Let's imagine being a farmer, and for anyone in the room I'm sure you can only imagine back in the day not long after the horse and buggies, farms all over America are getting electricity and even phone lines and some guy calls you up and said Hey! You won't believe this! This guy can make it rain!! And get this? He says he can even make the hail go away!!

Out in the more arid parts of western North Dakota man's greed went straight to his heart thinking he's gonna be farming in the new Iowa, day dreams of 100 bu wheat enter his mind, new tractors and combines, even a new house for his wife!

And in 1951 the experiments in North Dakota began and they were going to make it rain and all the hail was going to go away....

Well.... it still didn't rain and the ice cubes still fell but they wholeheartedly believed they they were

making a difference and if they could only draw the attention of the lab coats followed by the suit and ties they could be rich!

You all know if you repeat a lie enough you will believe it and if you have someone's weakness at your hands you can exploit them...

They did just that and by 1976 they had the state convinced this was working and we only needed more of a bad thing to make it a good thing and the state cost shared 50% with every county that chose to join

This utopia of cloud seeding

brought a long lived drought into the 80's across the entire state and left counties scrambling to get out of it while the NDCMP made it harder and harder to exit leaving us stuck with the handful left for 30 plus years.

I often make my way through Bowman county where it was first born and after all these years of sowing cloud seeds of greed and I still fail to see the economic benefits, given the bogus ones that are often touted on the NDCMP web page by UND and NDSU these gains should be very evident and are absolutely not

Recently Burke County trialed the program and they exited it as soon as the trial period was over, following soon after in 2020 Ward County (the second longest continued program) gave them the boot with nearly 10 to 1 vote against it, and as recently as this past election Montrail and Williams also commanded to leave this program

So far all but 2 counties in this state have said NO to cloud seeding

Not one single county has ever left and came back, NOT ONE proving

it's benefits were blasphemous!

And it shouldn't matter if they were one of the 36 counties that have had it and exited or the other 17 that never allowed it in the first place, the people of this state have overwhelmingly rejected this, even Slope county that has some townships operating has voted it out only to be stuck with it.

Furthermore I advise that this state has no laws or guidelines in place under which any injured by weather modification may assume any form of compensation, they evade this by calling it a "project" aka "expirment"

that has never been proven while it has operated with state funding for nearly FIFTY YEARS!

Infact an environmental impact study has never been filed.

It's way past due time to stop playing God with the weather, I urge you to vote to end Weather Modification and geoengineering in North Dakota, and dont be fooled as it only serves to benefit those at the top of it as the scam that it is.

I thank you for your time and appreciate your willingness to listen and am happy to answer any of your

questions, is there any?

Jamie Kouba

Regent ND

701-209-0155

Swfarmservice@gmail.com

Senate Energy and Natural Resources Committee,

Pertaining to SB 2106, we as concerned farmers, ranchers, and business owners in Bowman and Slope counties respectfully request a do not pass recommendation on SB 2106. We feel weather modification is beneficial to agriculture, as well as homeowners and businesses locally and statewide. Recently, Bowman County voted overwhelmingly with 70% of the vote to continue the use of weather modification. The majority of the citizens of Bowman County know the loss of assets due to hail can be devastating to both the county and state economy. When farmers and ranchers are negatively affected by hail loss, the local economy suffers. Grain elevators, lumber yards, implement dealers, livestock supply stores, convenience stores, fertilizer plants, car dealerships and many other small-town businesses suffer when farmers and ranchers experience financial loss from hail. If this bill passes, the loss of the weather modification program of Bowman and Slope Counties would financially burden the citizens and businesses of the area. We ask that you consider allowing local control for weather modification.

In closing, we respectfully request a do not pass recommendation on SB 2106.

Sincerely,

Robb Narum—Slope County Farmer

Lyle Narum—Slope County Farmer

Chance Andrews—Bowman County Farmer

Steve Brooks—Slope County Rancher

Josh Buchmann—Bowman County Commissioner and Business Owner

Pine Abrahamson—Bowman County Commissioner

Aber Krinke—Slope County Farmer

Doug Pope—Slope County Rancher

Dan Powell—Slope County Farmer

Adam Powell-- Slope County Farmer

Thomas Burke-- Slope County Farmer

Donny Burke-- Slope County Farmer

Dave Stebbins—Bowman County Resident

Jerid Janikowski—Bowman County Commissioner and Business Owner

Wade Shaff—Bowman County Rancher

Ryan Brooks—Slope County Farmer

Roger Stuber—Slope County Rancher

Duane Stuber—Slope County Rancher

Bowman Grain—Business

Dick Folske—Slope County Rancher

Sam Juntunen—Slope County Farmer

Rick Braaten—Bowman County Commissioner

Duane Pope—Slope County Farmer

Rob Brooks—Slope County Rancher

Meryl McGee—Bowman County Rancher

Doug Rajewsky—Business Owner

Brandon Hoggarth—Business Owner

Wes Andrews—Bowman County Weather Modification Board Member

Ryan Brewer— Bowman County Weather Modification Board Member

Wayne Mrnak— Bowman County Weather Modification Board Member

Chad Miller— Bowman County Weather Modification Board Member

Wes Miller-- Bowman County Weather Modification Board Member

SB2106

Chair Patten and members of the committee. My name is Todd Beard. I am the Senator from District 23 serving the Williston and Trenton area.

Weather modification has been around a very long time. I'm not going to get into the history of weather modification other than to say over the years county by county across the state people have stopped weather modification practices to be done within their counties. Counties like Ward County and more recently Mountrail and Williams County have removed the weather modification practice within their borders. This was done by the will of the people.

Last session HB1166 was introduced in the House to allow people within the counties still doing weather modification the opportunity to vote in an election as to keeping or eliminating weather modification within their borders. This bill was passed in the House however, it failed in the Senate amid much discussion as to local control. One of the issues with the weather modification statute as it is written, namely 61-04.1-27, is that when the people initially petitioned to allow weather modification to be done in their county, that had to be renewed after 10 years. From that point on the county commissioners were allowed to vote and renew the weather modification program every five years. The only way the people had a voice to oppose these practices was to petition to remove weather modification within their county. After watching Ward county remove weather modification with a vote of around 70%, and witnessing local citizens in Mountrail and Williams County having to gather petitions

to get the weather modification program on the ballot for people to vote on, I decided something needed to be done to give the people back their voice without having to spend their time and personal finances to have a voice at the table. I witnessed these petition drives succeed in Mountrail and Williams counties, both of which removed weather modification by a vote of the people of around 70%. I also understand a petition drive in McKenzie County came close to having enough signatures to get it on the ballot in McKenzie County. I believe it's only a matter of time before McKenzie County will also join the ranks of Ward, Williams and Mountrail County along with all the other counties in the state with the exception of Bowman and part of Slope counties. Watching these citizens fight for the right to vote on this issue, and having to spend thousands of dollars in personal funds to fight the weather modification machine should make you question "what does local control really mean".

As to the merits of weather modification benefiting or hindering I can neither prove nor disprove personally. What I can say is I have witnessed rain systems on radar which appear to have substantial rain potential dissipate after the weather modification planes have flown their routes. It makes me wonder, where's the enhanced rain when the clouds disappear. After all these years there doesn't seem to be any evidence of benefit. In the ad campaigns that were put forward during the election it was cited that there was a financial benefit of potentially 5% or 10% economic gains due to the enhanced rainfall and hail suppression of the weather modification program. My question is which is it 5% or 10%? Where's the proof of their being even 1% enhanced rainfall. Or is it just about the money? Is it just the financial benefit of state and local tax dollars with potential federal

funds tied to a program the doesn't seem to have proof that it benefits anyone except those directly involved in the weather modification program. The time has come to end this program across the state especially in consideration there are only 2 1/2 counties still in the program. There will be more testimony following mine with a perspective on the importance of this legislation.

Thank you for your consideration and ask for a DO PASS recommendation on SB2106. I stand for any questions.



January 30, 2025

Members of the Senate Energy and Natural Resources Committee,

Thank you for the opportunity to testify this afternoon. I am Jody Fischer, the Vice President of Flight Operations at Weather Modification International. I am writing to ask you to give SB 2106 a 'do not pass' recommendation.

North Dakota has one of the premier weather modification programs in the world. Weather Modification LLC is based in Fargo and provides atmospheric services across the globe. We are considered the world leader in this industry. Our facilities in Fargo have become the hub for training and special mission airplane modifications for atmospheric science operations. At WMI we regularly host groups from around the world who want to get a better understanding of how to conduct cloud seeding operations effectively. This year we've hosted delegations from South Korea, Argentina, Romania, Greece, and Saudi Arabia. Additionally, ICE Crystal Engineering is a manufacturing plant located north of Kindred in Cass County, which manufactures the pyrotechnics used in cloud seeding operations.

The benefits to this program are not just in the western part of our state and Cass County. This program provides support for the University of North Dakota's Aviation program, one of the top aviation programs in the country. Over 400 pilot interns and over 70 meteorologists have received training because of the existence of weather modification activities in North Dakota.

This critical partnership between private industry, the University of North Dakota, the state Atmospheric Resource Board and most importantly the local political subdivisions and the citizens they serve have made North Dakota the 'go-to' place to learn about weather modification.

Often, we get questions about the safety of using cloud seeding materials, in particular silver iodide. The published scientific literature clearly shows no environmentally harmful effects have been observed; nor are they expected to occur. For example, silver iodide particles are barely detectable in snow and soil samples taken downwind of cloud seeding activities (2-3 parts per trillion). Compared to a generally considered "safe" range for drinking water is between 30 and 500 parts per million. In addition, the published scientific literature clearly shows no weather-related adverse effects downstream from cloud seeding operations.



SB 2106 would ban the exact collaboration between private industry, local political subdivisions and state entities that have pushed North Dakota to the forefront of this industry. For these reasons, I would ask for a 'do not pass' recommendation on SB 2106.

Regards,

A handwritten signature in blue ink, appearing to read "Jody Fischer", is written in a cursive style.

Jody Fischer, Vice President of Flight Operations

Dr. David J. Delene
41052 210th St. SW
East Grand Forks, MN 56721
507-533-5363; david.delene@gmail.com

Date: January 30, 2025

Reference: HB 2106

Senate Energy and Natural Resources Committee:

As an atmospheric scientist with 30 years of experience, published author on over 25 peer-review publications in highly rated scientific journals, and past Editor of the Journal of Weather Modification, I would like to provide testimony related to North Dakota House Bill SB 2106. These comments are my personal opinions and do not represent the opinion of my current employers, past employers, scientific organizations that I am a member of, nor sponsors of research grants that I have received.

The North Dakota House Bill 2106 prohibits weather modification and cloud seeding activities in the State of North Dakota. The current practice of conducting cloud seeding to modify the weather focuses on increasing precipitation and reducing hail. Cloud seeding entails releasing small particles into clouds to affect their development. Supercooled clouds (clouds with droplets at a temperature below 0 °C) can be seeded with ice nuclei, such as silver iodide. The introduction of silver iodide into supercool cloud regions by aircraft creates ice crystals (snow) which enhance the efficiency of precipitation production. Ice particles quickly grow in mixed-phase clouds at the expense of water droplets, obtaining sizes large enough to fall, pass into warm air, melt, and land as rain drops. The ice nuclei that typically occur naturally in the atmosphere only produce ice at cold temperatures (< -15 to -25 °C), while cloud seeding can produce ice in warmer (-5 to -15 °C) supercooled clouds. Production of ice at warmer temperatures increases the precipitation production efficiency of clouds, which is similar to how educated workers improve the efficiency of a factory.

Numerous scientific studies, including my own published papers, indicate that cloud seeding can increase precipitation 5 to 10 percent on a seasonal average. The 5 to 10 percent increase is relatively small compared to the 200 to 400 percent seasonal difference between precipitation that occurs year-to-year in North Dakota. However, even such a small percentage has been shown to have a positive economic benefits to local communities. The effect of weather modification are also confined to county size areas, not areas the size of the State of North Dakota. It is important to note that rainstorms only remove approximately 10 percent of the water vapor for an atmospheric region; therefore, there is always sufficient water vapor available to produce precipitation in other locations. Hence, it makes sense to **maintaining local control when it comes to making decisions regarding weather modification activities.**

In addition, to the economic benefits of reduced hail and increase precipitation, conducting weather modification enables increase understanding of the atmospheric and clouds. Precipitation formation processes involve scales from the very small, nanometer, to scales as large as hundreds of kilometers (100 miles). Conduct scientific research on these scales is not possible in the laboratory. Hence, weather modification activities enables scientific research to be conducted that improves our understanding of the atmosphere, which can not easily be

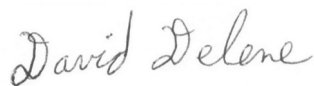
conducted with any other method. Such scientific understanding is important for determine the impact that different activities have the atmosphere and weather systems.

It is important to note what science research indicates that Weather Modification can not do. It does not curtain the development of large rain producing storms. Some people may see weather modification activities and then observer that a storm does not produce a lot of precipitation; however, such observations are correlations not causation. It is a very important to base decisions on a statistical analysis with a know uncertainty assessment than on the observations of a few people that may not be repressive.

Based on several scientific publications, the materials used to seed clouds are not environmentally harmful, and only a small amount of material is used relative to the area seeded. As may confuse many people, it is important to note the difference between the cloud seeding material, silver iodide and silver, which is a heavy metal. Silver iodide is insoluble in water and hence, very difficult to affect animals and humans. As a scientist that has conducted air quality research, I can state that the lead emitted from burning aviation fuel of the seeding aircraft has more of an impact on the environment that the cloud seeding materials release. Additionally, the environmental impacts of weather modification indicate little to no impact to plants and animals, and any such impacts are short term and local. While people's concerns with environmental impacts of human activities are important, eliminating weather modification actives due to possible environmental impact is a distraction from much more important issues, such as the use of lead containing fuels for general aviation. It is important to address concerns with allergies, illnesses, and health using science, and not based decision on the select opinions of a very un-informed individuals.

I am against the proposed bill HB 2106 and believe the current system protects the environment, promotes scientific research, and enables local control of weather modification activities.

Sincerely,

A handwritten signature in cursive script that reads "David Delene". The ink is dark and the signature is fluid, with the first and last names clearly legible.

Dr. David Delene, Scientist

TO: North Dakota Legislature, 69th Legislative Session

RE: Testimony in favor of 2106

1/30/2025

My name is Jacob Grieger, of Arnegard, Mckenzie County. I am a 6th generation, in America, farmer-rancher, with a degree in Agronomy from Purdue University. My family originally came over in 1850, homesteaded in Iowa, then the Red River Valley in 1873 Northwest of Fargo and from there to the Badlands of the west when they were opened.

Due to this interesting past, this has led to relatives spread from one end of the state to the other, giving me a chance to see the state in many different perspectives.

In the east you have the Red River Valley, full of high value, high yielding crops; 150 bushel or more corn, sugar beets, a variety of sensitive yet expensive beans, 80 bushel or more wheat and barley, and so on. It is also home to the relatively rich cities of Fargo and Grand Forks, both of which have delt with their share of storms and water problems, right now construction is under way to move water from Lake Sakakawea to the Sheyanne to help Fargo and the rest of the Valley from going thirsty, while also building the Fargo Diversion, which will flood the south half of the Valley when it inevitably holds back water and as shown by the numerous buyouts and forced relocations.

In the central region, you have a mix of the east and west, but with more irrigation-and hail. It is virtually a trademark of Burleigh and Morton counties, and Bismarck and Mandan, to be statewide news at least once a year with the extensive hail damage. I myself tried avoiding one of these storms a couple years ago, from Wing to New Salem, and yet was caught in the heaviest part right by the Cloverdale plant in Mandan on the interstate. I came over the small hill just before the plant into what looked like a blizzard. A wall of white, taillights everywhere, in the ditch, in the median, stopped in the middle of the interstate, people trying to put coats, blankets, anything on their windows to save them, people getting stuck trying to turn around, trucks sliding all over. I followed one semi that kept going, being shielded partly by the airflow over its van trailer. That did not save my new service pickup from extensive hail damage however and even then, I struggled to keep it on the road due to the amount of hail that had built up, it was similar to driving on black ice. By the time I made it to the scenic overlook west of Mandan, the service body was severely dented, my windshield was shot, and the cab and hood looked similar to a golf ball. When I got back in the pickup, AM 550 was being

overrun by the NWS warning: Large and severe hail west of Mandan detected and reported, Bismarck and Mandan prepare now. By the time I got home, I did catch it on KUMV that once again, it was statewide news. Bismarck and Mandan had been hit with severe hail again.

In the west we fight drought and hail. It is why the program started in the first place. My Grandmother talked about when they were trying to get the program started, when it was voluntary to pay in, how the neighbor who was against it didn't pay, and they did. We got hailed out, the pictures show it was like the hail hit just our field turning it black, avoiding the neighbors land on both sides. Since the program began, our farm and ranch has not seen any noticeable positive effects of this program. Hail insurance is not lower, we have at least one field hailed out every year, as well as a decent part of our pastureland, we appear to be in a drought "bubble" with Richland County, Montana, and Dunn County, North Dakota, better off moisture wise. Using flight trackers, and our own eyes, we have watched the planes go over us. I recorded every storm this past summer, overlaying FlightRadar24's data over the State's Williston radar. The results were as expected: the storms appear to break apart after they are treated and then rebuild as they leave the county, or intensify extremely, as shown by a storm two years ago in south Williams and northern McKenzie County.

My understanding of this program, all of it through my own research as very little fair information was ever provided by the State Water Commission, now the Department of Water resources, is what I observed is what is to be expected. When you treat a storm, it does not take effect instantly, it takes 25 to 75 miles to take effect, depending on the system, which is what we have seen on the radar, so it shorts us in McKenzie County and rebuilds in Dunn and other eastern counties. Dunn County is where more relatives of mine reside, and luck would have it that they are in line with us, weather wise. They, on average, receive at least two more inches of rain every summer. They successfully grow 100 bushel corn there, without irrigation, whereas we in McKenzie do not have an average, it usually is only cut, and insurable, for silage, as unless you have irrigation, it does not make it to combining and when it does, it is well below 75 bushels an acre.

Given this information, you may think I selected the wrong category. I have not, as I will explain.

During the last century, Weather Mod's planes were allowed to fly into Montana to treat the storms, 25 to 100 miles, at times, into Montana. In the 1980s and 1990s, Montana, who also at one time had a weather modification program in Eastern Montana, pushed to stop North Dakota from treating the storms in Montana, citing much debated studies and the same conclusion I reached above: it was breaking up storms, stopping the precipitation. Montana passed a state law requiring the State of North Dakota and Weather Modification Inc/LLC to provide a study that shows, with out question, that North Dakota/Weather Mod Inc was not and is not "stealing Montana's rain" and to put up a multi-million dollar bond for any damage claims.

The State of North Dakota and Weather Modification Inc/LLC responded by simply no longer flying in Montana. If that does not make a statement about this program, I do not know what does.

In the 1970s, a study was done by the South Dakota School of Mines, funded by a grant from the National Weather Service's own Weather Modification department and North Dakota's weather modification department, came to an interesting conclusion. This study which studies the "control" area of Eastern Montana, and the "test" area of Western North Dakota, came to the conclusion that it was possible that it possibly improved the rain and reduced the hail but explicitly stated that it could not be proven that weather modification was the reason, it could have been the way the weather pattern was. It also went on to note that most studies reference the turbulent weather of the 1930s, 1940s, and when the program started, 1950s as their control data, which is correct as some NDDWR studies do refence the weather of those decades as their control. Those same decades, as known by virtually all, were noted for the weather being extreme, the state records for high and low temperature were set, it is on record that one year was record dry and the following record wet, wind records were set, Fargo's infamous 1957 tornado occurred, partly forming over my Grandfather's farm by Absaraka, so it is clear that one can not honestly label those said decades as "control years".

(The study in question is found here:

<https://journalofweathermodification.org/index.php/JWM/article/download/384/423>)

The abstract of said study, for easy of testimony:

RESULTS OF HAIL SUPPRESSION EFFORTS IN NORTH DAKOTA AS SHOWN BY CROP HAIL INSURANCE DATA

James R. Miller, Jr.
Institute of Atmospheric Sciences
SD School of Mines and Technology
Rapid City, South Dakota 57701

and

Michael J. Fuhs
Harris Corporation
301 Washington Street
Bellevue, Nebraska 68005

Abstract. An examination of crop-hail insurance data as a tool to evaluate hail suppression efforts in western North Dakota is presented. Six western North Dakota county (Target area) data are compared to twelve eastern Montana county (control area) data. Target/control seed years versus non-seed years wheat yields, insurance liability, and loss cost values are compared. The data analysis using double ratios and target/control comparisons suggests that a 17 to 41% lower hail insurance loss experience is found for the areas participating in the North Dakota cloud seeding project. The data suggest that the direction of the hail loss experience supports the goals of the North Dakota project, but cannot be used to establish unequivocally that the direction and its magnitude are the result of the cloud seeding efforts.

Now, given all of that information, one can argue studies, data, recollections, memories, for decades, which we have already done. I say the most impactful argument is this:

The rich, fertile, Red River Valley of Eastern North Dakota, full of high value, high yielding crops, extremely sensitive to drought and hail, cities with water supply issues, and with Fargo and Grand Forks, the largest populations in the state, does not use weather modification.

The central region, home of the capital, the political center of North Dakota, known for farming like both the East and the West, known for its yearly hail barrage, does not use weather modification.

The west, known for its droughts, fires, the grasslands, "Big Western Farms", large cattle operations, and the "Banana Belt" of the Southwest, at one point fully used weather modification, over a quarter, almost a third of the state used weather modification, but is down to two counties: Mckenzie and Bowman. Mountrail and Williams overwhelmingly voted to end theirs last election. Mckenzie is on well on its way to putting weather modification to a vote this coming election. Those counties that have ended it have not seen a significant difference.

If weather modification worked, the central region would use it to cure its hail problems.

If weather modification worked, the East would use it to solve its water problems. Weather Modification Inc/LLC is even based in Fargo, at Hector Airport, by the jet center. They even train pilots to do this at UND in Grand Forks.

Neither the East nor Central use it, and the West is well on its way to shut it down. Even the State of North Dakota, and Fargo based Weather Modification Inc/LLC do not have enough faith in the program to do the required study and put up the required bond to continue flying in Montana, which is when the program was favored the most by the most.

The overwhelming majority of the state, and the state itself, does not have faith in this program anymore, if it had any in the first place, due to its share of reasons. The program should be halted due to that fact.

Respectfully,

Jacob Grieger

Arnegard, Mckenzie County, North Dakota.



Board of Commissioners

104 1st Street NW, Suite 1
Bowman, ND 58623
T: 701-523-3130
F: 701-523-4899

January 29, 2025

SB 2106 (Hearing on 1/30/2025)

Dear Chair Patten and Honorable Members of the Energy and Natural Resources Committee:

Pertaining to SB 2106, we as concerned farmers, ranchers, and business owners in Bowman County respectfully request a 'do not pass' recommendation on SB 2106. We feel weather modification is beneficial to agriculture, as well as homeowners and businesses here in Bowman County. The loss of assets due to hail could be devastating to both the county and state economy. When farmers and ranchers are negatively affected by hail loss, the local economy suffers. Grain elevators, lumber yards, implement dealers, livestock supply stores, convenience stores, fertilizer plants, car dealerships and many other small-town businesses suffer when farmers and ranchers experience financial loss from hail.

One state business that would be negatively affected by the loss of weather modification in Bowman County is the University of North Dakota. The University of North Dakota would suffer significantly through the potential loss of student hours in the flight training program. UND flight training students, because of their extensive training in turbulent conditions through the weather modification program, are sought after as pilots for international commercial airlines.

Currently, the people of Bowman County get to make the decision on whether to continue to have this program in our county. In 2016 the people of Bowman County were given the opportunity to vote to continue with the program. Bowman County citizens voted 70% in favor to keep the program.

Bowman County Commission appreciates your time and consideration for a DO NOT PASS on SB 2106.

Sincerely,

Rick Braaten, Chairman
Bowman County Board of Commissioners

2025 SENATE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee

Peace Garden Room, State Capitol

SB 2106

2/6/2025

Relating to weather modification; to repeal section 37-17.1-15 and chapter 61-04.1 of the North Dakota Century Code, relating to weather modification; and to provide a penalty.

9:34 a.m. Chairman Patten opened the hearing.

Members present:

Chairman Patten, Senators: Beard, Boehm, Enget, Gerhardt, and Van Oosting.

Vice Chairman Kessel absent.

Discussion Topics:

- End weather modification program state wide
- Local jurisdiction
- Mechanism for local control
- Petition signature requirements for ballot measures

9:42 a.m. Senator Van Oosting moved a Do Pass.

9:42 a.m. Senator Beard seconded the motion.

Senators	Vote
Senator Dale Patten	N
Senator Greg Kessel	A
Senator Todd Beard	Y
Senator Keith Boehm	Y
Senator Mark Enget	N
Senator Justin Gerhardt	Y
Senator Desiree Van Oosting	Y

Motion Passed 4-2-1.

9:42 a.m. Senator Beard will carry the bill.

9:42 a.m. Chairman Patten closed the hearing.

Kendra McCann, Committee Clerk

REPORT OF STANDING COMMITTEE
SB 2106 ([25.0494.01000](#))

Energy and Natural Resources Committee (Sen. Patten, Chairman) recommends **DO PASS** (4 YEAS, 2 NAYS, 1 ABSENT AND NOT VOTING). SB 2106 was placed on the Eleventh order on the calendar. This bill does not affect workforce development.