

2023 HOUSE AGRICULTURE

HB 1166

2023 HOUSE STANDING COMMITTEE MINUTES

Agriculture Committee
Room JW327C, State Capitol

HB 1166
1/13/2023

| |
|--|
| Relating to state funding requirements for county weather modification operations. |
|--|

Chairman Thomas called to order 10:30 AM

Members present: Chairman Thomas, Representatives Beltz, Christy, Fisher, Headland, Henderson, Kiefert, Olson, Pritchard, Schreiber-Beck, Tveit, VanWinkle.
Member absent: Finley-DeVille

Discussion Topics:

- State funding level to counties
- Weather related homeowners' insurance claims.
- Neighboring counties affected.
- Annual state expenditures and cost share with counties
- Participating counties
- Hail suppression to rain enhancements.
- Cloud seeding
- Crop insurance hail data

In favor:

Matt Ruby, District 40 Representative, bill sponsor
Pete Hanebutt, Director of Public Policy, Farm Bureau oral testimony
Roger Neshem, Ward County Farmer, #17876
Jon Wert, SW ND Farmer, #20504
Travis Zabolney, Ward County Water Resource Board oral testimony
Jamie Kouba, Farmer oral testimony

Opposed:

Dani Quissell, North Dakota Weather Modification Association #13126
Jason Rice, Mountrail County Commissioner #13044
Pine Abrahamson, Bowman County Board of Commissioners oral testimony
Wes Andrews, Bowman Weather Modification Authority oral testimony

Neutral:

Darin Langerud, Director, Atmospheric Resource Division of the Department of Water Resources #13109

Additional written testimony:

Dan Wogsland, Executive Director ND Grain Growers Association ("NDGGA") #13199
Rick Braaten, Chairman Bowman County Board of Commissioners #13049
Barry Ramberg, Williams County Commissioner #13087
Aaron Skarsgard, Chair Mountrail County Weather Modification Authority #13167, #13168

House Agriculture Committee
HB 1166
01/13/2023
Page 2

Chairman Thomas adjourned the hearing 12:18 PM

Diane Lillis, Committee Clerk

2023 HOUSE STANDING COMMITTEE MINUTES

Agriculture Committee
Room JW327C, State Capitol

HB 1166
2/10/2023

| |
|--|
| Relating to state funding requirements for county weather modification operations. |
|--|

Chairman Thomas called to order 2:12 PM

Members present: Chairman Thomas, Vice Chairman Beltz, Representatives Christy, Finley-DeVille, Fisher, Headland, Henderson, Kiefert, Olson, Prichard, Schreiber-Beck, Tveit, VanWinkle.

Discussion Topics:

- Committee action

Representative M. Ruby presented an amendment #20586, LC #23.0099.01006

Representative Headland moved to adopt the amendment.

Representative Olson seconded.

Roll call vote:

| Representatives | Vote |
|---------------------------------------|------|
| Representative Paul J. Thomas | Y |
| Representative Mike Beltz | Y |
| Representative Josh Christy | Y |
| Representative Lisa Finley-DeVille | Y |
| Representative Jay Fisher | Y |
| Representative Craig Headland | Y |
| Representative Donna Henderson | Y |
| Representative Dwight Kiefert | Y |
| Representative SuAnn Olson | Y |
| Representative Brandon Prichard | Y |
| Representative Cynthia Schreiber-Beck | Y |
| Representative Bill Tveit | Y |
| Representative Lori VanWinkle | Y |

Motion passed 13-0-0

Representative Prichard moved a do pass as amended.

Representative Tveit seconded.

Roll call vote:

| Representatives | Vote |
|-----------------|------|
|-----------------|------|

| | |
|---------------------------------------|---|
| Representative Paul J. Thomas | Y |
| Representative Mike Beltz | Y |
| Representative Josh Christy | Y |
| Representative Lisa Finley-DeVille | N |
| Representative Jay Fisher | Y |
| Representative Craig Headland | Y |
| Representative Donna Henderson | Y |
| Representative Dwight Kiefert | Y |
| Representative SuAnn Olson | Y |
| Representative Brandon Prichard | Y |
| Representative Cynthia Schreiber-Beck | N |
| Representative Bill Tveit | Y |
| Representative Lori VanWinkle | Y |

Motion passed 11-2-0

Representative Olson will carry the bill.

Chairman Thomas adjourned the hearing 2:24 PM

Diane Lillis, Committee Clerk

4
2-10-23

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1166

Page 1, line 1, after "to" insert "create and enact a new section to chapter 61-04.1 of the North Dakota Century Code, relating to requirements to cease cloud seeding; to"

Page 1, line 1, replace "section" with "subsection 10 of section 61-04.1-03, section 61-04.1-23, subsection 3 of section 61-04.1-24, and sections 61-04.1-26, 61-04.1-27, 61-04.1-30, 61-04.1-38, and"

Page 1, line 2, after "operations" insert "and a prohibition on the use of state funds for weather modification; and to provide a penalty"

Page 1, after line 3, insert:

"**SECTION 1.** A new section to chapter 61-04.1 of the North Dakota Century Code is created and enacted as follows:

Cloud seeding operations - Requirement to cease.

A weather modification authority conducting cloud seeding on a storm must cease cloud seeding on the storm when the radar reflectivity core of a seeded storm exiting the county operations area crosses the boundary of a township that borders a township of an adjacent county that does not have an active weather modification authority conducting weather modification under this chapter.

SECTION 2. AMENDMENT. Subsection 10 of section 61-04.1-03 of the North Dakota Century Code is amended and reenacted as follows:

10. "Weather modification authority" means the governing body created or extended by a board of county commissioners under section 61-04.1-22.1, 61-04.1-23, 61-04.1-27, 61-04.1-29, or 61-04.1-31.

SECTION 3. AMENDMENT. Section 61-04.1-23 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-23. Weather modification authority created by petition.

1. A weather modification authority ~~shall~~must be created by resolution and five commissioners appointed ~~thereto~~to the authority for ten-year terms of office, by the board of county commissioners. A board of county commissioners ~~shall~~may not adopt a resolution creating an authority until ~~if the board~~ has received a valid petition signed by at least fifty-one percent of the qualified electors of a county, as determined by the vote cast for the office of governor at the last preceding general election. The board of county commissioners shall appoint five residents of the county as weather modification authority commissioners from those names set forth in the petition and designated by the petitioners to be appointed weather modification authority commissioners. ~~In the event~~If any one of the five candidates named in the petition to be appointed as a weather modification authority commissioner is unable or refuses for any reason to accept appointment as a commissioner, or is disqualified by not meeting

15

2-10-13

residence requirements, as a qualified elector in the county, the board of county commissioners shall name its own appointee for a ten-year term of office in place of any disqualified candidate selected by the petitioners. If any weather modification authority commissioner submits a resignation in writing to the board of county commissioners or becomes unable to serve or disqualified for any reason, after accepting office, the board of county commissioners shall name its appointee as a commissioner to the weather modification authority. All vacancies occurring otherwise than by expiration of term of office ~~shall~~must be filled for the unexpired term.

- 2. Any weather modification authority created pursuant to this section shall ~~expire~~expire ten years after the date of the initial appointment of the commissioners ~~thereto~~ to the authority. Any unexpended funds remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, ~~shall~~must be transferred into the county general fund by the officers of the weather modification authority on or before the ten-year termination date provided by this section. However, all unexpended funds remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, ~~shall~~must remain in the name of the weather modification authority if the board of county commissioners of such county by resolution ~~creates~~extends a weather modification authority and all its powers in accordance with section 61-04.1-27.
- 3. Nothing in this section shall ~~prevent~~prevents continuation or reinstatement of a weather modification authority, provided the authority is renewed for another ten years by petition of the qualified electors in the same manner as the initial weather modification authority was created by petition of qualified electors as provided for in this chapter.
- 4. In the event more than one petition is filed with the board of county commissioners on or about the same time, the petition with the highest percentage of the qualified electors of the county voting for the office of governor at the last preceding general election shall ~~be~~must be selected by the board of county commissioners. However, the petition with the highest percentage must have the signatures of at least forty percent of the qualified electors in the county and the sum total of all qualified electors signing all petitions filed must equal at least sixty percent of the qualified electors in the county. ~~In no case shall the~~The name of the same qualified elector may not appear on two or more petitions, but in such event, if the name shall of the same qualified elector appears on two or more petitions, the name must be stricken from both petitions.

SECTION 4. AMENDMENT. Subsection 3 of section 61-04.1-24 of the North Dakota Century Code is amended and reenacted as follows:

- 3. The following paragraph: We, the undersigned qualified electors of the (name of county), state of North Dakota, are notified hereby that the creation of the (name of county) weather modification authority and the appointment of its commissioners by the (name of county) board of county commissioners will grant unto the authority by law the power to certify to the board of county commissioners a mill levy tax not to exceed seven mills upon the taxable valuation of property in said county for a weather modification fund, which tax may be levied in excess of the mill levy limit

fixed by law for taxes for general county purposes and that such fund shall be used for weather modification activities ~~in conjunction~~under contract with the state of North Dakota. We, the undersigned, understand that the authority requested in this petition expires ten years after the creation of the weather modification authority, except that the board of county commissioners may by resolution ~~create~~extend a weather modification authority and all its powers, including the power to certify a tax levy as provided by section 61-04.1-26, for five-year periods in accordance with section 61-04.1-27.

2-10-23

SECTION 5. AMENDMENT. Section 61-04.1-26 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-26. Funding for support of weather modification authority.

The weather modification authority may request annually that the board of county commissioners provide funding from revenues derived from its general fund levy for support of the authority and to provide weather modification services. In the year for which the levy is sought, the weather modification authority seeking approval of a property tax levy under this chapter must file with the county auditor, at a time and in a format prescribed by the county auditor, a financial report for the preceding calendar year showing the ending balances of each fund held by the authority during that year. The funding under this section approved by the board of county commissioners must be deposited in the weather modification fund and shall be used only for weather modification activities ~~in conjunction~~under contract with the state of North Dakota.

SECTION 6. AMENDMENT. Section 61-04.1-27 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-27. ~~Creation~~Extension of weather modification authority and its powers by resolution.

1. When a weather modification authority is about to expire, the board of county commissioners of ~~any such~~a county ~~may~~shall by resolution place on the ballot, at the next countywide election, the question of whether the board of county commissioners shall authorize the ~~creation~~extension of ~~such~~the existing weather modification authority and all its powers, including the power to certify a tax levy as provided by section 61-04.1-26, for additional five-year periods; ~~provided, the. If the majority of the votes cast on the question are in favor of the measure, the weather modification authority is extended for an additional five-year period.~~
2. The resolution authorizing the ~~creation~~extension of ~~such~~the weather modification authority ~~is~~must be adopted by the board of county commissioners before the expiration date prescribed in the preceding resolution for its termination.
3. Upon passing ~~such~~a resolution for the ~~creation~~extension of the authority, the board of county commissioners shall appoint five weather modification authority commissioners to five-year terms of office, subsequently filling vacancies in the manner prescribed by section 61-04.1-23. The board of county commissioners may remove any weather modification commissioner from office whenever it appears, by competent evidence and

after hearing, that the commissioner has been guilty of misconduct, malfeasance, crime in office, neglect of duty in office, or of habitual drunkenness or gross incompetency.

HA
2-10-13

SECTION 7. AMENDMENT. Section 61-04.1-30 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-30. Abolishment of weather modification authority by election.

When a petition signed by not less than twenty percent of the qualified electors of the county, as determined by the vote cast for governor in the last preceding gubernatorial election, requesting an election upon the abolishment of a weather modification authority as ~~created~~extended in section 61-04.1-27 and created in section 61-04.1-29 is presented to the board of county commissioners, not later than sixty days ~~prior to~~before the next countywide election, the board of county commissioners shall submit the question to the qualified electors of the county at the next countywide election. Upon approval by a majority of the votes cast on the question, the board of county commissioners shall abolish the weather modification authority as of December thirty-first following the election. All unexpended funds remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, ~~shall~~must be deposited in the general fund of the county.

SECTION 8. AMENDMENT. Section 61-04.1-38 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-38. Board may receive and expend funds.

The board may receive and accept in the name of the state any funds that are offered or become available from any federal grant or appropriation, private gift, donation, or bequest, county funds, or funds from any other source except license and permit fees, and to expend these funds for the expense of administering this chapter, and, with the exception of county funds and funds from any other person contracting with the board for weather modification operations, for the encouragement of research and development in weather modification by any private person, the North Dakota state university, the university of North Dakota, or any other appropriate state, county, or public agency in this state by direct grant, contract, or other means.

All federal grants, federal appropriations, private gifts, donations, or bequests, county funds, or funds from any other source except license and permit fees, received by the board must be paid over to the state treasurer, who shall credit this amount to a special fund in the state treasury known as the state weather modification fund. All proceeds deposited by the state treasurer in the state weather modification fund are appropriated to the board and, if expended, must be disbursed by warrant-check prepared by the office of management and budget upon vouchers submitted by the board and must be used for the purpose of paying for the expense of administration of this chapter and, with the exception of county funds or funds from any other person contracting with the board for weather modification operations, for the encouragement of research and development in weather modification by any private person, the North Dakota state university, the university of North Dakota, or any other appropriate state, county, or public agency by direct grant, contract, or other means. The board may use county funds or funds from any other person contracting with the board for weather modification operations. The board may not use state funds for weather modification operations."

13

Page 1, line 6, overstrike "**State to provide funds**" and insert immediately thereafter "Use of state funds prohibited"

Page 1, line 8, overstrike "appropriate to" and insert immediately thereafter "pay one hundred percent of the costs associated with weather modification to the board. The board shall deposit any county funds in"

Page 1, line 9, overstrike "the amount determined by the board to be necessary to"

Page 1, line 10, overstrike "provide that weather modification authority or person with" and insert immediately thereafter "to provide"

Page 1, line 11, after "operations" insert "to the contracting party"

Page 1, line 12, after the second comma insert "only"

Page 1, line 12, overstrike "the board"

Page 1, line 13, overstrike "deems necessary to provide a" and insert immediately thereafter "received from the"

Page 1, line 14, remove "Before the board expends these funds, the"

Page 1, remove lines 15 through 19

Renumber accordingly

2/10/23

REPORT OF STANDING COMMITTEE

HB 1166: Agriculture Committee (Rep. Thomas, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (11 YEAS, 2 NAYS, 0 ABSENT AND NOT VOTING). HB 1166 was placed on the Sixth order on the calendar.

Page 1, line 1, after "to" insert "create and enact a new section to chapter 61-04.1 of the North Dakota Century Code, relating to requirements to cease cloud seeding; to"

Page 1, line 1, replace "section" with "subsection 10 of section 61-04.1-03, section 61-04.1-23, subsection 3 of section 61-04.1-24, and sections 61-04.1-26, 61-04.1-27, 61-04.1-30, 61-04.1-38, and"

Page 1, line 2, after "operations" insert "and a prohibition on the use of state funds for weather modification; and to provide a penalty"

Page 1, after line 3, insert:

"SECTION 1. A new section to chapter 61-04.1 of the North Dakota Century Code is created and enacted as follows:

Cloud seeding operations - Requirement to cease.

A weather modification authority conducting cloud seeding on a storm must cease cloud seeding on the storm when the radar reflectivity core of a seeded storm exiting the county operations area crosses the boundary of a township that borders a township of an adjacent county that does not have an active weather modification authority conducting weather modification under this chapter.

SECTION 2. AMENDMENT. Subsection 10 of section 61-04.1-03 of the North Dakota Century Code is amended and reenacted as follows:

10. "Weather modification authority" means the governing body created or extended by a board of county commissioners under section 61-04.1-22.1, 61-04.1-23, 61-04.1-27, 61-04.1-29, or 61-04.1-31.

SECTION 3. AMENDMENT. Section 61-04.1-23 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-23. Weather modification authority created by petition.

1. A weather modification authority ~~shall~~must be created by resolution and five commissioners appointed ~~thereto~~ to the authority for ten-year terms of office, by the board of county commissioners. A board of county commissioners ~~shall~~may not adopt a resolution creating an authority until ~~it~~the board has received a valid petition signed by at least fifty-one percent of the qualified electors of a county, as determined by the vote cast for the office of governor at the last preceding general election. The board of county commissioners shall appoint five residents of the county as weather modification authority commissioners from those names set forth in the petition and designated by the petitioners to be appointed weather modification authority commissioners. ~~In the event~~if any one of the five candidates named in the petition to be appointed as a weather modification authority commissioner is unable or refuses for any reason to accept appointment as a commissioner, or is disqualified by not meeting residence requirements, as a qualified elector in the county, the board of county commissioners shall name its own appointee for a ten-year term of office in place of any disqualified candidate selected by the petitioners. If any weather modification authority commissioner submits a resignation in writing to the board of county commissioners or becomes unable to serve or disqualified for any reason, after accepting

office, the board of county commissioners shall name its appointee as a commissioner to the weather modification authority. All vacancies occurring otherwise than by expiration of term of office ~~shall~~must be filled for the unexpired term.

2. Any weather modification authority created pursuant to this section ~~shall expire~~expires ten years after the date of the initial appointment of the commissioners ~~thereto~~ to the authority. Any unexpended funds remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, ~~shall~~must be transferred into the county general fund by the officers of the weather modification authority on or before the ten-year termination date provided by this section. However, all unexpended funds remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, ~~shall~~must remain in the name of the weather modification authority if the board of county commissioners of such county by resolution ~~creates~~extends a weather modification authority and all its powers in accordance with section 61-04.1-27.
3. Nothing in this section ~~shall prevent~~prevents continuation or reinstatement of a weather modification authority, provided the authority is renewed for another ten years by petition of the qualified electors in the same manner as the initial weather modification authority was created by petition of qualified electors as provided for in this chapter.
4. In the event more than one petition is filed with the board of county commissioners on or about the same time, the petition with the highest percentage of the qualified electors of the county voting for the office of governor at the last preceding general election ~~shall~~must be selected by the board of county commissioners. However, the petition with the highest percentage must have the signatures of at least forty percent of the qualified electors in the county and the sum total of all qualified electors signing all petitions filed must equal at least sixty percent of the qualified electors in the county. ~~In no case shall the~~The name of the same qualified elector may not appear on two or more petitions, ~~but in such event, if the name shall~~of the same qualified elector appears on two or more petitions, the name must be stricken from both petitions.

SECTION 4. AMENDMENT. Subsection 3 of section 61-04.1-24 of the North Dakota Century Code is amended and reenacted as follows:

3. The following paragraph: We, the undersigned qualified electors of the (name of county), state of North Dakota, are notified hereby that the creation of the (name of county) weather modification authority and the appointment of its commissioners by the (name of county) board of county commissioners will grant unto the authority by law the power to certify to the board of county commissioners a mill levy tax not to exceed seven mills upon the taxable valuation of property in said county for a weather modification fund, which tax may be levied in excess of the mill levy limit fixed by law for taxes for general county purposes and that such fund shall be used for weather modification activities ~~in conjunction~~under contract with the state of North Dakota. We, the undersigned, understand that the authority requested in this petition expires ten years after the creation of the weather modification authority, except that the board of county commissioners may by resolution ~~create~~extend a weather modification authority and all its powers, including the power to certify a tax levy as provided by section 61-04.1-26, for five-year periods in accordance with section 61-04.1-27.

SECTION 5. AMENDMENT. Section 61-04.1-26 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-26. Funding for support of weather modification authority.

The weather modification authority may request annually that the board of county commissioners provide funding from revenues derived from its general fund levy for support of the authority and to provide weather modification services. In the year for which the levy is sought, the weather modification authority seeking approval of a property tax levy under this chapter must file with the county auditor, at a time and in a format prescribed by the county auditor, a financial report for the preceding calendar year showing the ending balances of each fund held by the authority during that year. The funding under this section approved by the board of county commissioners must be deposited in the weather modification fund and shall be used only for weather modification activities ~~in conjunction~~ under contract with the state of North Dakota.

SECTION 6. AMENDMENT. Section 61-04.1-27 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-27. ~~Creation~~Extension of weather modification authority and its powers by resolution.

1. When a weather modification authority is about to expire, the board of county commissioners of ~~any such~~ a county may ~~shall~~ by resolution place on the ballot, at the next countywide election, the question of whether the board of county commissioners shall authorize the ~~creation~~extension of such ~~the existing~~ weather modification authority and all its powers, including the power to certify a tax levy as provided by section 61-04.1-26, for additional five-year periods; ~~provided, the~~ If the majority of the votes cast on the question are in favor of the measure, the weather modification authority is extended for an additional five-year period.
2. ~~The resolution authorizing the ~~creation~~extension of such~~ the weather modification authority ~~is~~ must be adopted by the board of county commissioners before the expiration date prescribed in the preceding resolution for its termination.
3. Upon passing ~~such~~ a resolution for the ~~creation~~extension of the authority, the board of county commissioners shall appoint five weather modification authority commissioners to five-year terms of office, subsequently filling vacancies in the manner prescribed by section 61-04.1-23. The board of county commissioners may remove any weather modification commissioner from office whenever it appears, by competent evidence and after hearing, that the commissioner has been guilty of misconduct, malfeasance, crime in office, neglect of duty in office, or of habitual drunkenness or gross incompetency.

SECTION 7. AMENDMENT. Section 61-04.1-30 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-30. Abolishment of weather modification authority by election.

When a petition signed by not less than twenty percent of the qualified electors of the county, as determined by the vote cast for governor in the last preceding gubernatorial election, requesting an election upon the abolishment of a weather modification authority as ~~created~~extended in section ~~section~~ section 61-04.1-27 and created in section 61-04.1-29 is presented to the board of county commissioners, not later than sixty days ~~prior to~~ before the next countywide election, the board of county commissioners shall submit the question to the qualified electors of the county at the next countywide election. Upon approval by a majority of the votes cast on the question, the board of county commissioners shall abolish the weather modification authority as of December thirty-first following the election. All unexpended funds

remaining in the name of the weather modification authority, after all proper bills and expenses have been paid, shall ~~must~~ be deposited in the general fund of the county.

SECTION 8. AMENDMENT. Section 61-04.1-38 of the North Dakota Century Code is amended and reenacted as follows:

61-04.1-38. Board may receive and expend funds.

The board may receive and accept in the name of the state any funds that are offered or become available from any federal grant or appropriation, private gift, donation, or bequest, county funds, or funds from any other source except license and permit fees, and to expend these funds for the expense of administering this chapter, and, with the exception of county funds and funds from any other person contracting with the board for weather modification operations, for the encouragement of research and development in weather modification by any private person, the North Dakota state university, the university of North Dakota, or any other appropriate state, county, or public agency in this state by direct grant, contract, or other means.

All federal grants, federal appropriations, private gifts, donations, or bequests, county funds, or funds from any other source except license and permit fees, received by the board must be paid over to the state treasurer, who shall credit this amount to a special fund in the state treasury known as the state weather modification fund. All proceeds deposited by the state treasurer in the state weather modification fund are appropriated to the board and, if expended, must be disbursed by warrant-check prepared by the office of management and budget upon vouchers submitted by the board and must be used for the purpose of paying for the expense of administration of this chapter and, with the exception of county funds or funds from any other person contracting with the board for weather modification operations, for the encouragement of research and development in weather modification by any private person, the North Dakota state university, the university of North Dakota, or any other appropriate state, county, or public agency by direct grant, contract, or other means. The board may use county funds or funds from any other person contracting with the board for weather modification operations. The board may not use state funds for weather modification operations.

Page 1, line 6, overstrike "**State to provide funds**" and insert immediately thereafter "Use of state funds prohibited"

Page 1, line 8, overstrike "appropriate to" and insert immediately thereafter "pay one hundred percent of the costs associated with weather modification to the board. The board shall deposit any county funds in"

Page 1, line 9, overstrike "the amount determined by the board to be necessary to"

Page 1, line 10, overstrike "provide that weather modification authority or person with" and insert immediately thereafter "to provide"

Page 1, line 11, after "operations" insert "to the contracting party"

Page 1, line 12, after the second comma insert "only"

Page 1, line 12, overstrike "the board"

Page 1, line 13, overstrike "deems necessary to provide a" and insert immediately thereafter "received from the"

Page 1, line 14, remove "Before the board expends these funds, the"

Page 1, remove lines 15 through 19

Renumber accordingly

2023 SENATE AGRICULTURE AND VETERANS AFFAIRS

HB 1166

2023 SENATE STANDING COMMITTEE MINUTES

Agriculture and Veterans Affairs Committee Fort Union Room, State Capitol

HB 1166
3/16/2023

| |
|--|
| A bill relating to requirements to cease cloud seeding and relating to state funding requirements for county weather modification; and to provide a penalty. |
|--|

There is no video provided at the start of this meeting. The video resumes at 10:46 AM.

10:17 AM Chairman Luick opened the meeting on HB 1166.

Members Present Chairman Luick, Vice Chairman Myrdal, Senator Lemm, Senator Hogan, Senator Weston, Senator Weber.

Discussion Topics:

- Cost share
- Cloud seeding
- Weather Modification
- Boundaries

10:17 AM Representative Matt Ruby introduced HB 1166 and testified in favor. Representative Ruby requested an amendment be added to HB 1166. #25569

10:26 AM Chairman Luick recessed the meeting.

10:47 AM Chairman Luick reopened the meeting.

10:47 AM Roger Neshem testified in favor of HB 1166. #25494

10:58 AM Pete Hanebutt, Public Policy Director, North Dakota Farm Bureau testified in favor of HB 1166. #25466

10:59 AM Jamie Kouba, testified in favor of HB 1166. #25503

11:00 AM Dani Quissell, Lobbyist, North Dakota Weather Modification Association, testified opposed to HB 1166. #25316

11:07 AM Pine Abrahamson, Bowman County Commissioner, testified opposed to HB 1166. No written testimony.

11:07 AM Vice Chairman Myrdal took over the meeting.

11:13 AM Jaye Sandstrom testified opposed to HB 1166. #25425

11:21 AM Darin Langerud, Director Atmospheric Research Division, North Dakota Water Resources, testified Neutral. #25877

11:30 AM Jamie Kouba provided additional information verbally.

Additional written testimony:

Stepanie Pappa, on behalf of Trudy Ruland, #24534
JoAnn Rademacher, #25091, #25092, #25093
Barry Ramberg, #25274
Rick Braaten, #25327
Tim Johnson #25362
Doug Stangeland, #25462
Tanner Vix, #25473
Jonathan Wert, #25483
Tonya Roschewski, #25485
Damon Mellmer, #25501
Ed Kessell, #25504
Kevin Buxa, #25517

11:30 AM Chairman Luick closed the hearing on HB 1166

Brenda Cook, Committee Clerk

2023 SENATE STANDING COMMITTEE MINUTES

Agriculture and Veterans Affairs Committee Fort Union Room, State Capitol

HB 1166
3/17/2023

| |
|--|
| A bill relating to requirements to cease cloud seeding and relating to state funding requirements for county weather modification; and to provide a penalty. |
|--|

10:04 AM Chairman Luick called the Committee Work meeting to order. Members present: Chairman Luick, Vice Chairman Myrdal, Senator Lemm, Senator Hogan, Senator Weston, Senator Weber.

Discussion Topics:

- Discussion on HB 1166

10:04 AM Senator Myrdal moved to adopt an amendment to HB 1166. Senator Lemm seconded the motion.

10:04 AM Committee discussion on HB 1166

10:11 AM Senator Myrdal withdrew her motion to adopt an amendment to HB 1166.

10:11 AM Senator Lemm withdrew his seconded to adopt an amendment to HB 1166.

Roll call vote:

| Senators | Vote |
|-----------------------|------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | Y |
| Senator Kent Weston | Y |

Vote: 6-0-0 Motion to withdraw motion.

10:12 AM Chairman Luick recessed.

Brenda Cook, Committee Clerk

2023 SENATE STANDING COMMITTEE MINUTES

Agriculture and Veterans Affairs Committee Fort Union Room, State Capitol

HB 1166
3/23/2023

| |
|---|
| A bill relating to requirements to cease cloud seeding; and relating to state funding requirements for county weather modification; and to provide a penalty. |
|---|

3:41 PM Chairman Luick opened the meeting. Members present: Chairman Luick, Vice Chairman Myrdal, Senator Lemm, Senator Hogan, Senator Weston, Senator Weber.

Discussion Topics:

- Bill review
- State funds

Chairman Luick reviewed the bill.

Committee discussed.

Legal Intern Victoria Christian discussed the proposed amendment by Representative Dan Ruby LC 23.0099.02002, #26942.

Dani Quissell provided information for the committee regarding HB 1166. No written testimony.

3:59 PM Chairman Luick adjourned the meeting.

Brenda Cook, Committee Clerk

2023 SENATE STANDING COMMITTEE MINUTES

Agriculture and Veterans Affairs Committee Fort Union Room, State Capitol

HB 1166
3/24/2023

A bill relating to requirements to cease cloud seeding; and relating to state funding requirements for county weather modification; and to provide a penalty.

2:06 PM Chairman Luick opened the meeting. Members present: Chairman Luick, Vice Chairman Myrdal, Senator Lemm, Senator Hogan, Senator Weston, Senator Weber.

Discussion Topics:

- Committee action

2:10 PM Senator Myrdal moved to adopt an amendment to HB 1166. LC23.0099.02002

2:10 PM Senator Hogan seconded the motion.

Roll call vote:

| Senators | Vote |
|-----------------------|------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | N |
| Senator Kent Weston | Y |

Vote: 5-1-0 Motion to adopt an amendment to HB 1166.

2:13 PM Senator Myrdal moved to DO PASS AS AMENDED HB 1166. Senator Lemm seconded the motion.

Roll call vote:

| Senators | Vote |
|-----------------------|------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | N |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | N |
| Senator Kent Weston | N |

Vote: 3-3-0 Motion failed.

2:17 PM Senator Hogan moved DO NOT PASS WITHOUT COMMITTEE RECOMMENDATION. Senator Weston seconded the motion.

Roll call vote:

| Senators | Vote |
|-----------------------|-------------|
| Senator Larry Luick | N |
| Senator Janne Myrdal | N |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | N |
| Senator Mark F. Weber | Y |
| Senator Kent Weston | Y |

Vote: 3-3-0 Recommendation to go to the floor without committee recommendation.

Senator Luick will carry the bill.

2:17 PM Senator Luick closed the meeting.

Committee reconsidered their action on March 30, 2023 at 8:51 AM.

Brenda Cook, Committee Clerk

DR
181
3-24-23

PROPOSED AMENDMENTS TO ENGROSSED HOUSE BILL NO. 1166

Page 1, line 4, after the second comma insert "and"

Page 1, line 4, remove ", 61-04.1-38, and 61-04.1-39"

Page 4, line 2, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 22, replace "countywide" with "general"

Page 4, line 25, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 27, replace "five-year" with "four-year"

Page 4, line 28, overstrike "authorizing" and insert immediately thereafter "to place the question on the ballot at the next general election to authorize"

Page 4, line 30, after the period insert "All weather modification operations may continue to operate and all weather modification authority board members may continue to serve under this chapter until the the next regular meeting of the board of county commissioners immediately following the general election in which the question of extension is voted upon."

Page 5, line 1, overstrike "passing"

Page 5, line 1, remove "a"

Page 5, line 1, overstrike "resolution" and insert immediately thereafter "an affirmative vote under subsection 1"

Page 5, line 3, overstrike "five-year" and insert immediately thereafter "four-year"

Page 5, remove lines 23 through 31

Page 6, remove lines 1 through 30

Renumber accordingly

2023 SENATE STANDING COMMITTEE MINUTES

Agriculture and Veterans Affairs Committee Fort Union Room, State Capitol

HB 1166
3/30/2023

A bill relating to requirements to cease cloud seeding; and relating to state funding requirements for county weather modification; and to provide a penalty.

8:51 AM Chairman Luick opened the meeting on HB 1166. Members present: Chairman Luick, Vice Chairman Myrdal, Senator Lemm, Senator Hogan, Senator Weston, Senator Weber.

Discussion Topics:

- Committee action

8:51 AM Senator Myrdal moved to reconsider HB 1166.
Senator Weston seconded the motion.

Roll call vote:

| Senators | Vote |
|-----------------------|------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | Y |
| Senator Kent Weston | Y |

Vote: 6-0-0 Motion DO PASS to RECONSIDER HB 1166.

8:53 AM Senator Myrdal moved to further amend and change the bill. LC 23.0099.02004
Senator Hogan seconded the motion.

Roll Call Vote:

| Senators | Vote |
|-----------------------|------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | Y |
| Senator Kent Weston | Y |

Vote 6-0-0 Motion DO PASS HB 1166

8:54 Senator Weber moved to send WITHOUT COMMITTEE RECOMMENDATION AS AMENDED.

Roll call vote:

| Senators | Vote |
|-----------------------|-------------|
| Senator Larry Luick | Y |
| Senator Janne Myrdal | Y |
| Senator Kathy Hogan | Y |
| Senator Randy D. Lemm | Y |
| Senator Mark F. Weber | Y |
| Senator Kent Weston | Y |

Motion passed 6-0-0

Senator Luick will carry the bill.

11:56 AM Chairman Luick closed the meeting.

Brenda Cook, Committee Clerk

AF
3-30-23

PROPOSED AMENDMENTS TO ENGROSSED HOUSE BILL NO. 1166

- Page 1, line 4, after the second comma insert "and"
- Page 1, line 4, remove ", 61-04.1-38, and 61-04.1-39"
- Page 1, line 6 remove "and a prohibition on the use of state funds for weather modification"
- Page 4, line 2, overstrike "five-year" and insert immediately thereafter "four-year"
- Page 4, line 22, replace "countywide" with "general"
- Page 4, line 25, overstrike "five-year" and insert immediately thereafter "four-year"
- Page 4, line 27, replace "five-year" with "four-year"
- Page 4, line 28, overstrike "authorizing" and insert immediately thereafter "to place the question on the ballot at the next general election to authorize"
- Page 4, line 30, after the period insert "All weather modification operations may continue to operate and all weather modification authority board members may continue to serve under this chapter until the the next regular meeting of the board of county commissioners immediately following the general election in which the question of extension is voted upon."
- Page 5, line 1, overstrike "passing"
- Page 5, line 1, remove "a"
- Page 5, line 1, overstrike "resolution" and insert immediately thereafter "an affirmative vote under subsection 1"
- Page 5, line 3, overstrike "five-year" and insert immediately thereafter "four-year"
- Page 5, remove lines 23 through 31
- Page 6, remove lines 1 through 30
- Re-number accordingly

REPORT OF STANDING COMMITTEE

HB 1166, as engrossed: Agriculture and Veterans Affairs Committee (Sen. Luick, Chairman) recommends AMENDMENTS AS FOLLOWS and when so amended, recommends BE PLACED ON THE CALENDAR WITHOUT RECOMMENDATION (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). Engrossed HB 1166 was placed on the Sixth order on the calendar. This bill does not affect workforce development.

Page 1, line 4, after the second comma insert "and"

Page 1, line 4, remove ", 61-04.1-38, and 61-04.1-39"

Page 1, line 6 remove "and a prohibition on the use of state funds for weather modification"

Page 4, line 2, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 22, replace "countywide" with "general"

Page 4, line 25, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 27, replace "five-year" with "four-year"

Page 4, line 28, overstrike "authorizing" and insert immediately thereafter "to place the question on the ballot at the next general election to authorize"

Page 4, line 30, after the period insert "All weather modification operations may continue to operate and all weather modification authority board members may continue to serve under this chapter until the the next regular meeting of the board of county commissioners immediately following the general election in which the question of extension is voted upon."

Page 5, line 1, overstrike "passing"

Page 5, line 1, remove "a"

Page 5, line 1, overstrike "resolution" and insert immediately thereafter "an affirmative vote under subsection 1"

Page 5, line 3, overstrike "five-year" and insert immediately thereafter "four-year"

Page 5, remove lines 23 through 31

Page 6, remove lines 1 through 30

ReNUMBER accordingly

TESTIMONY

HB 1166

WAYNE OLSON
District # 1
(701) 898-4898

**JOAN M
HOLLEKIM**
District #2
(701) 629-9669

TRUDY RULAND
District #3
(701) 627-3588

JOHN DEGROOT
District #4
(701) 898-4774

JASON RICE
District #5
(701) 641-0647

Mountrail County Commissioners

Mountrail County Courthouse
101 North Main Street - Box 69
Stanley, North Dakota 58784-0069
Tel. (701) 628-2145 Fax (701) 628-2276

January 12, 2023

HB # 1166 (1/13/2022 Hearing – 10:30 A.M.)

Dear Chair Thomas and Honorable Members of the Agriculture Committee:

The Mountrail County Commission is respectfully requesting you to support a "DO NOT PASS" on House Bill #1166 relating to state funding requirements for county weather modification operations.

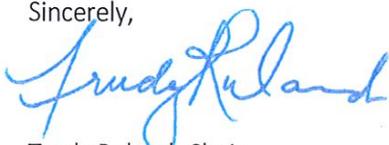
Mountrail County Weather Modification has been in operation since 1970 with the support of State, County and local tax dollars. The bill proposed is not about whether the Mountrail County Commission is in support or not in support of the continuance of weather modification operations, it is about proposed verbiage to potentially restrict funding from the State for weather modification operations by requiring approval from bordering counties before State funding is released. The likelihood of a non-participating bordering county opposing to State funding for weather modification operations is great as recent elections have indicated such.

This basically is taking the rights away from the residents of one county that have elected to participate in weather modification operations. A neighboring county should not have "control" as to whether or not weather modification operations exist in a participating county by making State funding dependent on their county's approval. It appears the proposed bill is a roundabout way of potentially eliminating weather modification operations in a county where citizens have petitioned or have voted to be part of the program.

Please consider the ramifications or the precedent that may be set by allowing a bordering county to "control" funding for a program brought to existence by the electors of a county. Further, please consider the significant negative economic impact to not only the producer but also the businesses that benefit from weather modification operations.

Your consideration and support for a "DO NOT PASS" on House Bill #1166 is greatly appreciated.

Sincerely,



Trudy Ruland, Chair
Mountrail County Board of Commissioners

E-mail:
District #2 & #4 House Representatives
ND House Agriculture Standing Committee
Williams, McKenzie & Bowman Boards of County Commissioners
Aaron Skarsgard, Chair Mountrail County Weather Modification
Aaron Birst, Director of NDACo



Board of Commissioners

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

January 12, 2023

HB #1166 (1/13/2023 – 10:30 AM)

Dear Chair Thomas and Honorable Members of the Agriculture Committee:

The Bowman County Commission is respectfully requesting you to support a “DO NOT PASS” on House Bill #1166 relating to state funding requirements for county weather modification operations.

Bowman County has participated in the weather modification operations for many years, in fact, for several decades. In the 2016 General Election, voters in Bowman County had the opportunity to decide whether to abolish the weather modification program or not. The election results were 70.13% in favor of **continuing** with the program.

Bowman County is located in the southwest corner of North Dakota. It borders counties with South Dakota and Montana, along with counties in North Dakota. Other counties should not be able to determine if a particular county receives state funding for a program, especially a county from another state such as South Dakota or Montana.

Please accept this written testimony in opposition of HB1166.

Thank you for your time and consideration.

Sincerely,

Rick Braaten, Chairman
Bowman County Board of Commissioners



Testimony
House Bill 1166
Agriculture Committee | January 9 | 10:30 am

Chairman Thomas,

My name is Barry Ramberg and I have been a Williams County Commissioner since 2009. One of my portfolios as Commissioner is Weather Modification. Thank you for accepting this written testimony in opposition of HB 1166 as I am not able to be in Bismarck today.

In November 2000, the citizens of Williams County voted to establish a Weather Modification Authority (WMA) with about 80% of 'yes' votes to 20% 'no' votes. The vote established the WMA for a 10-year period and beyond that, the Williams County Board of County Commissioners (BOCC) has the authority to renew the WMA, by resolution, for additional 5-year periods. We did this in November 2010, November 2015, and November 2020.

Since 2000, the Williams County WMA has contracted with the ND State Water Commission's Atmospheric Resource Board (ARB) to participate in the North Dakota Cloud Modification Project (NDCMP). This is an operational program that seeds clouds for hail damage reduction and rain enhancement in western North Dakota.

The two amendments described in HB 1166 are of concern:

- Line 16, 2a: This section states that the ARB would have to obtain approval from the BOCC in the county of each participating WMA prior to conducting weather modification.
 - In our case, this requirement is redundant with the process that is already in place today. As a BOCC, we can pass a resolution to keep the WMA going and the WMA then chooses whether or not to continue the contract with the ARB for weather modification operations. Thereby, the County is already involved with the approval process.
- Line 18, 2b: This section states that the ARB would need to get approval from each county bordering a participating county.
 - This type of approval would undermine the authority of the participating county's BOCC and WMA as well as the opinion of the citizens of the participating county. Each year, prior to, during, and after the weather modification season, the ARB provides us with information and expertise about how the season went, its effects, and future implications. This information and the input from our citizens are what we base our decisions on. Why should the decision of the BOCC in a different County have bearing on this?

Weather modification has been proven to be beneficial for both rain enhancement as well as hail suppression in western North Dakota (<https://www.swc.nd.gov/arb/ndcmp/pdfs/facts.pdf>) and a DO NOT PASS of HB 1166 is respectfully encouraged.

Thank you for your consideration,

Barry Ramberg, Williams County Commissioner

Testimony
House Bill 1166 – Department of Water Resources
House Agriculture Committee
Representative Paul Thomas, Chair
January 13, 2023

Chairman Thomas, and members of the House Agriculture Committee – I am Darin Langerud, Director of the Atmospheric Resource Division of the Department of Water Resources. I am here today to provide neutral testimony on HB 1166.

HB 1166 would enact a new subsection of code under § 61-04.1-39, requiring counties or persons who choose to contract with the atmospheric resource board for weather modification operations to obtain the approval from the board of county commissioners in counties adjacent to those participating in the program. This requirement would pose a serious impediment to those counties choosing to participate in the program, giving non-participating counties veto power over participating counties' legally established programs.

North Dakota Century Code establishes a specific process for counties to create a weather modification authority which is required for the county to participate in weather modification operations. This process involves public approval through a public vote, petition, or temporary authority after a public hearing. Initial establishment of a county weather modification authority provides a ten-year authorization, after which the board of county commissioners must review that authority for renewal every five years.

In addition to public assent for the establishment of a program, each operations area must complete a permitting process prior to conducting operations every year. This involves two weeks of public notice in the official newspaper of record in participating counties and all adjacent counties, followed by a 20-day comment period. Each comment is reviewed by the atmospheric resource board's director, and a final recommendation is made to the board for approval, modification, or denial.

Weather modification was originally established by the legislature 1965 to assist agricultural producers by addressing shortfalls in precipitation and the damage caused by hail. North Dakota has been a pioneer in the field, providing advancements to the science and technology of cloud seeding through its operations, research, and development. The board has an MOU with the University of North Dakota for pilot instruction and training, which has placed more than 400 intern pilots on the North Dakota Cloud Modification Project since 1976. Cloud seeding programs are currently established in ten western states, with new programs or expansions occurring in California, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming.

Several independent evaluations have shown cloud seeding operations in North Dakota increase precipitation in the general range of 5 to 10 percent and reduce crop damage from hail by up to 45 percent. Further, studies show that cloud seeding in an upwind operations area doesn't reduce downwind precipitation, but enhances it, as seeding effects don't arbitrarily end at county boundaries. This effect is shown to diminish with time and distance downwind. Finally, recent studies by NDSU (2019) and Michigan State University (2021) show that the economic benefits of cloud seeding on agricultural production far outweigh the cost of operations and provide significant benefits to producers.

Thank you for the opportunity to testify before you today. I would be happy to address any questions you may have.



North Dakota
Weather Modification Association

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

Testimony on HB 1166
House Agriculture Committee
January 13, 2023

Good morning, Mr. Chairman and Members of the House Agriculture Committee. I am Dani Quissell with the North Dakota Weather Modification Association. I am here in opposition to HB 1166.

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 county level, on whether or not weather modification activities occur in their county. Locals also foot the majority of the bill to pay for such activities, which amounts to about \$0.14/acre.

Studies done in North Dakota show benefit for North Dakotans due to weather modification. These studies have indicated a 5-10% increase in moisture and a 45% reduction in hail in areas where weather modification activities occur.

Today five counties have voted to conduct weather modification activities in their counties: Bowman, McKenzie, Williams, Mountrail and part of Slope. The people in those counties provide 66% of the funding for these activities. The Department of Water Resources, using Resources Trust Fund dollars, not general fund dollars, cost shares with these counties to support weather modification activities in their counties. HB 1166 would prevent the state from providing this cost share to counties that vote to conduct these activities unless *every surrounding county*, conceivably even counties in other states, agrees to the activity.

From our view, HB 1166 allows neighboring counties to interfere in the activity of a county, potentially disrupting activity the people in a county specifically voted for. We believe this is concerning on face value and could lead to a precedent for one county to interfere with the activity of another county.

I believe there will be further testimony that will provide additional detail on the technical aspects of weather modification and the current program as well as how this proposal would impact counties in western North Dakota.

Thank you for your attention this morning. I'd be happy to stand for any questions.

Aaron Skarsgard
PO Box 294
Stanley, ND 58784
(701)-629-0001
skarsgard_02@hotmail.com

January 12, 2023

Testimony regarding HB 1166

Dear honorable members of the Ag Committee,

I am writing you all today to urge a Do Not Pass on the proposed HB 1166 regarding state funds to the weather modification and the restriction of such funds by requiring permission from neighboring, non-participating counties in order to expend these funds.

The North Dakota Cloud Modification Project (NDCMP) is the longest running aerial hail suppression project in the world. As of 2022 the NDCMP, in partnership with the University of North Dakota, has provided 402 aviation and 70 meteorology internships. The 2020 rain enhancement and hail suppression operations cost \$.14/acre with studies indicating a 45% reduction in crop hail losses. The most recent economic study of the program done in 2019 by Bangsund and Hodur at NDSU found benefit to cost ratios of 31-53 to 1 for a summer season of ag production. (www.swc.nd.gov/arb/ndcmp/pdfs/facts.pdf)

Weather Modification Authorities were created by a majority public vote or petition in the counties they operate in. Requiring permission from other counties that are not participating inhibits the wishes of the citizens of participating counties. This is not a path I think our state should go down as it sets a precedent for further restriction of funding or programs based on what a neighboring county may or may not agree upon.

One of the main responsibilities I have by serving on the Mountrail County Weather Modification Authority is to make certain the wishes of the majority of the public are upheld, and this bill would be in direct contradiction of that as it stands, so I urge a Do Not Pass recommendation. I thank you all for your consideration of my testimony.

Sincerely,

Aaron Skarsgard, Chair
Mountrail County Weather Modification Authority



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%.

45%

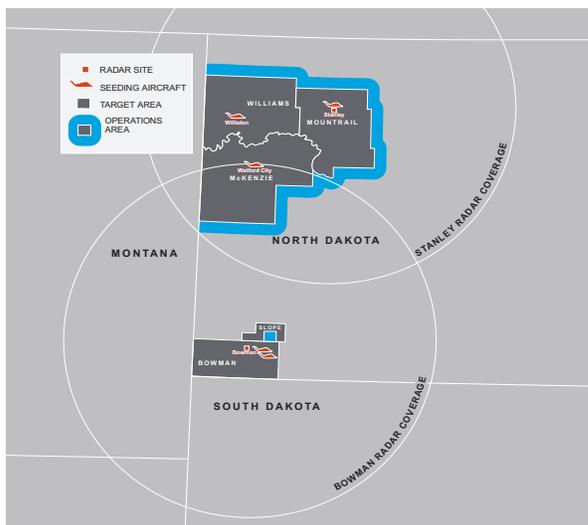
Cloud seeding studies in North Dakota indicate a 45% reduction in crop hail losses.

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
- McKenzie
- Mountrail
- Williams
- Part Of Slope 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

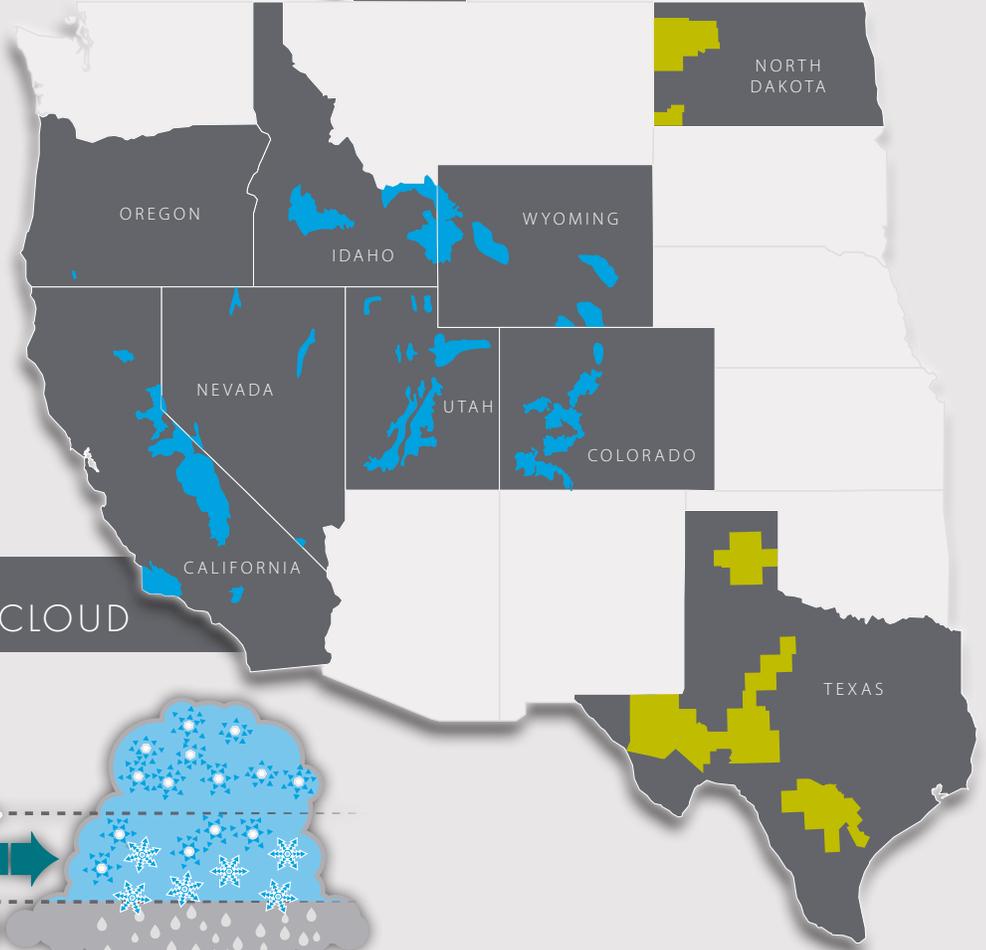
ALBERTA,
CANADA

CANADA

CLOUD SEEDING TARGET AREAS

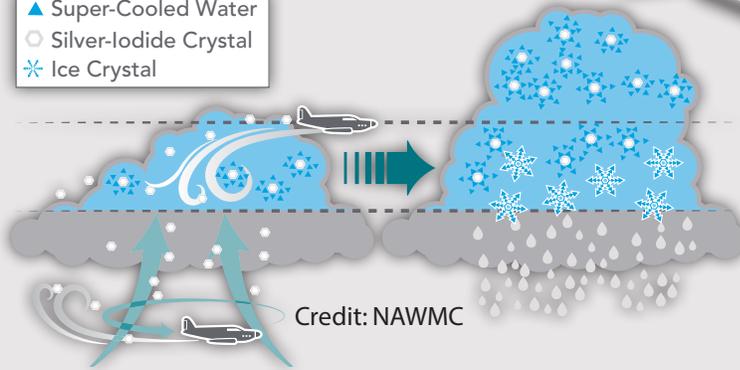
Cold-Season

Warm-Season



WARM SEASON CLOUD

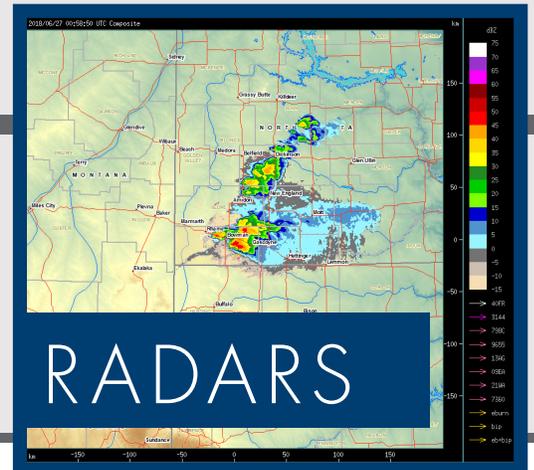
- ▲ Super-Cooled Water
- Silver-Iodide Crystal
- * Ice Crystal



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.



NORTH
Dakota
Be Legendary.

Atmospheric Resource Board
WATER RESOURCES



**North Dakota Grain Growers Association
Testimony in Support of
HB 1166
House Agriculture Committee
January 13, 2023**

Chairman Thomas, members of the House Agriculture Committee, for the record my name is Dan Wogsland, Executive Director of the North Dakota Grain Growers Association (NDGGA). NDGGA, through our contracts with the North Dakota Wheat Commission and the North Dakota Barley Council, engages in domestic policy issues on the state and federal level on behalf of North Dakota wheat and barley farmers. I am providing testimony for you today on behalf of NDGGA in support of HB 1166.

The NDGGA membership has adopted the following resolution: “NDGGA does not support weather modification in North Dakota.” That said, if there are counties in North Dakota that support weather modification then the provisions of HB 1166 seem to be a reasonable approach to the funding of weather modification efforts in said counties. Giving county commissioners in the participating and bordering counties the ability to authorize the expenditure of weather modification funds provides a local control mechanism for the authorization of the weather modification efforts should they decide to do so.

Therefore the North Dakota Grain Growers Association supports HB 1166 and would respectfully request that the House Agriculture Committee and the full House give the measure a Do Pass recommendation.

"You Raise; We Represent"

Phone: 701-282-9361 | Fax: 701-404-5187 | 1002 Main Ave W. #3 West Fargo, N.D. 58078

Chairman Thomas and members of the committee I would like to thank you for being given the opportunity to testify in support of HB 1166 today.

My name is Roger Neshem and I farm with my wife ~~and~~ near Berthold as we raise our two young daughters. I helped lead the fight to end the longest continuously operated hail suppression program in the world that existed in Ward County. Our grassroots campaign won with a 9-1 margin in a 2020 vote.

Prior to the termination of the weather modification program in Ward County I had been appointed to the county weather modification authority. I tried to implement changes there such as suspending hail suppression operations during times of drought, spending more time seeding for rain enhancement (80-90% of seeding operations are hail suppression typically no matter how bad of a drought we are in), passing by laws and asking questions about results and how operations and decisions are conducted. We would fill buildings for meetings that use to take up a single small table at a restaurant. In 2017 after listening to concerns of area farmers the Ward County Commission voted 5-0 to suspend all operations until the drought was over, but the seeding continued to take place because the county commission had no power over the weather authority board, and they ignored the vote and kept on seeding. Our weather authority board chairman broke open meeting laws, lied to our county commission about having by laws and took zero input from constituents who asked for changes. This proved to everyone these weather authority boards have too much power and no accountability.

My experience with the Atmospheric Resource Board has been much of the same. No one ever addresses questions about, abusing buffer zones, excess flights, doing hail suppression while in a

2

D4 drought or seeding out of the project area. When I asked ARB Chairman Tom Tupa about flights seeding eastbound storms in McHenry county, his response was the pilots are not able to see road signs to know where they are, so they sometimes seed outside of project area. I requested a detailed budget of the ARB in June of 2018 from both Chairman Tupa and Director Langerud. To this day I have received nothing. The ARB modus operandi is to tell you to talk to local authorities who in turn tell you to talk to the ARB and round and round you go getting nowhere.

Finally, there is the ND weather Modification Association of which I was a member of as a result of me holding my position on the ward county weather authority board. I however was blacklisted and never received the communications all other members on all the other boards received. I was frozen out. This association gets its members from the participating counties weather boards who take money from their mill levy that is to only be used for "weather modification activities" as stated in the statute, they then donate it to the NDWMA which in turn lobbies for more funding for the program. The NDWMA is represented by Clearwater Communications, co-owned by Senator Mike Dwyer, head of ND Water Users, and editor of ND Water magazine. To be clear, you have a senator who votes to fund the program, then in turn charges taxpayers to lobby for the program, thru his communications firm, which he then charges the NDWMA, his own client, for a sponsored article, highlighting the program, in each issue of the state funded ND Water magazine where he also holds sole editorial discretion. This is the way the program gets around using "taxpayer" money to lobby for the program itself. They launder it thru the NDWMA and then send that money right back to the state after Mike Dwyers firm takes

its cut. Taxpayers deserve much better than to be abused in such a fraudulent way and an ethics investigation is badly needed.

These are some of the bureaucratic issues with the program that makes HB1166 such a necessity. The program was intended to be open and take input from farmers about needs. The arrogance and lack of accountability with which weather boards and the ARB conduct themselves is wrong and they do not hold to the values the original program was intended to have.

Proponents of the program talk about how cheap it is and its high returns. The latest review of the program shows that it costs 40 cents per planted acre and in return it adds \$3.00 for hail suppression, \$9.19 per acre for a 5% rainfall increase and \$18.15 for a 10% rainfall increase. Over 40% of crop losses in the state are due to drought while less than 12% are due to hail and the numbers show rain enhancement is far more valuable to the state. Inexplicably weather authorities choose hail suppression 80-90% of the time over rain enhancement. 2016 marked the end of Kansas's hail suppression program after 12 of its 14 program members voted it out or had it terminated by county commissions. Today there are only 4 counties left conducting hail suppression in the US. All 4 of those counties are in drought plagued ND. It is worth noting that no county has ever returned to the hail suppression program after it has left in ND.

→ We must remember all of this started based on rain enhancement
 + that it could increase rain 20-30%.

A new study was published in the Atmospheric Research Journal in 2022 attempting to measure the effect of hail suppression on rainfall. It compared precipitation rates from pre weather modification in the state to the 42-year modified period from 1977-2018. The paper showed a small precipitation increase in McKenzie County when compared to 3 control areas to its west and no change with another control area to its NW.

Bowman county showed no change in precipitation on average but did show a 5% precipitation loss compared to one of the control groups.

When the study looked at Ward County, they found a 3% decrease in precipitation when compared with its control group. This echoes the same results the Wise study showed in 2005. I put numbers to this precipitation decrease to quantify it in the exact same terms and methodology employed by the ARB.

According to ARB literature hail suppression adds \$3.00 per acre to farmers pockets. A 5% increase in rainfall adds another \$9.19 per acre and a 10% increase in rainfall adds \$18.15 per acre. When subtracting out the cost of 40 cents per acre you get total returns of \$11.79 to \$20.75 per acre. However, if the program causes a decrease in precipitation of 3% as both the Wise and latest study shows you have a net loss of \$2.92 per acre for Ward County. The math is as follows:

$\frac{3}{5}$ is equal to 60% of \$9.19 per acre. This gives us a negative \$5.51 per acre in lost rainfall.

We will assume that hail suppression did occur even though there is zero scientifically credible evidence hail can be suppressed so that adds back another \$3.00 per acre.

Finally, we subtract the cost of 40 cents per acre to give us a net negative return per acre in Ward County of \$2.91.

We can take the \$2.91 per acre times the acres of farmland in Ward County which as of 2020 was pegged at 1,153,475 acres. This gives us a cost per year to Ward County farmers of \$3,356,612 dollars. IF we want to take the analysis further over the last 42 years the program has cost ward

5

county farmers over \$141 million dollars. The numbers all double if hail is not suppressed to the degree which is claimed.

Ward County sits on the far eastern end of over 140 miles of cloud seeding. No storm system can hit ward county from the west or southwest without being seeded even though we overwhelmingly voted out of the program. The seeding buffer zone still extends into Ward County 6 miles where planes still seed.

The current weather modification program is unworkable due to conflicting needs of farmers, unaccountable weather authorities and its negative economic impact. The program brings useless conflict to areas it operates in. We non seeding counties deserve to have say over what goes on in neighboring counties that affect our way of life as men and women of agriculture. There are no fences or walls to contain weather modification. The effects travel far outside permitted counties. No one with the power to alter seeding programs will change them so we must thru a statute that gives surrounding counties the ability to protect their interests and rights against these all powerful weather authorities. House Bill 1166 gives us that ability we desperately need. The time has come for the super majority of counties who do not want weather modification to be allowed to protect their skies from weather modification. Please vote yes on House Bill 1166

HB 1166

Thank you for this opportunity to speak to you today.

My name is Jon Wert. I farm with my family near New England in Southwest North Dakota. We raise wheat, corn and canola. My daughter is in the 9th grade and my son is a senior and plans on attending BSC this fall and majoring in agronomy. His plan is to return to the farm and carry on the tradition.

In January of 2017 I had the opportunity to testify at a committee hearing on the water commission budget at the state capital. Much of what I have here today is from my testimony.

I would like to start by saying weather modification is an extremely important issue facing producers in our part of the state. It is a hot button issue because rainfall or lack thereof determines our success, our ability to continue the occupation we love that has been handed down to us from our hard working parents and grandparents. Whether or not we can continue to provide a living for our families and keep the farms and ranches going is largely determined by rainfall.

If one looks at the weather modification page of the water commission website, a case is laid out in support of cloud seeding. However, it reads like an infomercial full of propaganda and hyperbole. If I was on the water commission I would be extremely concerned with the person laying out the case in favor of the project. An honest portrayal instead should be presented.

If you just read the summary, as I'm sure most people do, one could easily be in favor of the system. I however have read the entirety of the studies listed on the webpage that is offered up as proof. Only because I and a majority of the producers in our area believe the claims don't stand to reason, they contradict common sense. What you will hear from most producers is that a storm will be heading our direction from Montana and that when the planes start seeding the clouds the storm dissipates and we receive little or no precipitation. This has been going on for years, even decades.

The website suggests the (Smith et al. 2004) and (Wise,2005) studies show there was an increase in rainfall of 4.2% to 9.2% more than the upwind control areas. But when one actually reads the studies they say something quite different to those paying attention to the detail. The Smith study concludes by saying "This analysis of the climatic rain gage data from the NDCMP target area and upwind control areas in eastern Montana has yielded no significant evidence of an effect of the NDCMP seeding on the summer-season rainfall in the target area." The study when on to say " an analysis of wheat yield data suggested an increase of about 6% in the NDCMP target areas that could be attributed to the seeding activity" . The idea that the wheat yielding 6% higher in my area versus eastern Montana is because of cloud seeding is preposterous, and shows the lack of agronomic knowledge of the author. Soil quality alone would suggest a much larger difference.

damaging hail results. The rain shaft of the storm is broadened by early rainout. Measurable precipitation falls in some areas that otherwise would have remained rain-free. Other areas that would have received locally intense rain and hail receive less intense rain and significantly less hail damage." This is exactly what happens. We will receive the little rain described, usually .05" or .10" instead of the 1.00" we would have received. As any farmer will tell you the .05 or .10 rainfall does not benefit the crop at all. Our daily crop use rates in July are around .20" .So .05" or .10" of rainfall will not even get to the roots. 1.00" however, will feed the crop for 5 days. For every 1.00" additional rainfall equals 5 bushels of wheat.

The Texas Weather Modification Association website is at least honest when they admit: "Thus far, available evidence suggests that seeding for hail suppression, if anything, decreases, rather than increases, rainfall from seeded storms.

Since I testified last January at the capital showing the problems with using these studies to support weather modification the website has been updated with another study. This one is from 1975. It was based on 4 years worth of data (1969-1972). It states in results: "the result of Type 1 days show less rain on seed days than on no-seed days but the results fail to achieve statistical significance. The results for Type 2 days are also in-conclusive." The final type of days Type 3 he states "The pseudo rank-sum result for Type 3 das does not achieve a 10% significance level, although the pseudo chi-square test for number of rainfall event does so. The results can therefore be interpreted as supporting the Rapid Project findings for shower days but not conclusively." Lastly in his conclusions he states; "It is possible that rainfall from some hail- bearing cells is suppressed, but the NDPP results provide no evidence to this effect." Well I have evidence to this effect. The effect that he states is not only possible it is likely.

Knowing that our rainfall has decreased due to cloud seeding I set out to prove it. But I wanted more concrete data to bolster this argument. As the weather is highly variable I decided I needed long term data from many years if not decades to take out the variability. In fact the water commission website under "How do we determine the effects of seeding" states: "These evaluations require long-term relationships to be established between seeded and unseeded areas, and a long period of operations for comparison purposes." Unfortunately the evaluations offered as proof on the website are all short term studies with as little as 4 years worth of data.

I first gathered data from the 30 years prior to cloud seeding (1930-1960). This data was obtained from John Enz former state climatologist. I also gathered data from a book entitled "Climate Of North Dakota" written by North Dakota State Climatologist Ray E. Jensen which also uses data from the same time frame.

The book shows a map of my area (New England) receiving greater than 16 inches of precipitation, while the National Weather Service data from state climatologist John Enz shows

the west. This contradicts the rainfall average prior to cloud seeding and the normal increase as one moves from west to east.

Lastly the website offers a study by NDSU showing the increase in revenue to producers from weather modification. However, all the study does is put an economic value on rainfall increases of 5% and 10%, values given to them by the Atmospheric Resource Board based on studies I showed clearly don't support that result. Just like the CBO they only score what you give them. Under the 10% scenario they came up with a 16 million dollar gain per year from cloud seeding. However based on the data I compiled from the state climatologist we have lost over 10% of our rainfall. This suggests a greater than 16 million dollar loss per year! It is no wonder auction sales in our area are much more prevalent than young people coming back to the farm.

The website also states in the economic analysis the following: "The analysis of hail suppression activities shows the average crop value saved through cloud seeding (Table 6 in the report) is \$3.7 million per year, which equates to \$1.57 per planted acre." Every farmer I know will give up \$1.57 per acre in hail loss to gain \$60 an acre in increased production.

I can buy hail insurance to protect my farm from a loss from hail. But a year after year loss in rainfall cannot be insured unless the yield drops below my crop insurance guarantee of 65-70%. 2016 was a good example. We were short moisture and our yields were 30% below our average. We received no insurance check and paid a big premium showing our bankers a big loss. Many producers are not getting funding to farm another year. This could all be prevented.

I was told by a member of the committee I testified at last January on the water commission budget that it came out of committee with a unanimous vote to not fund the weather modification. However in the end when it went to the whole body the money was block granted allowing the water commission the discretion on how the money could be spent.

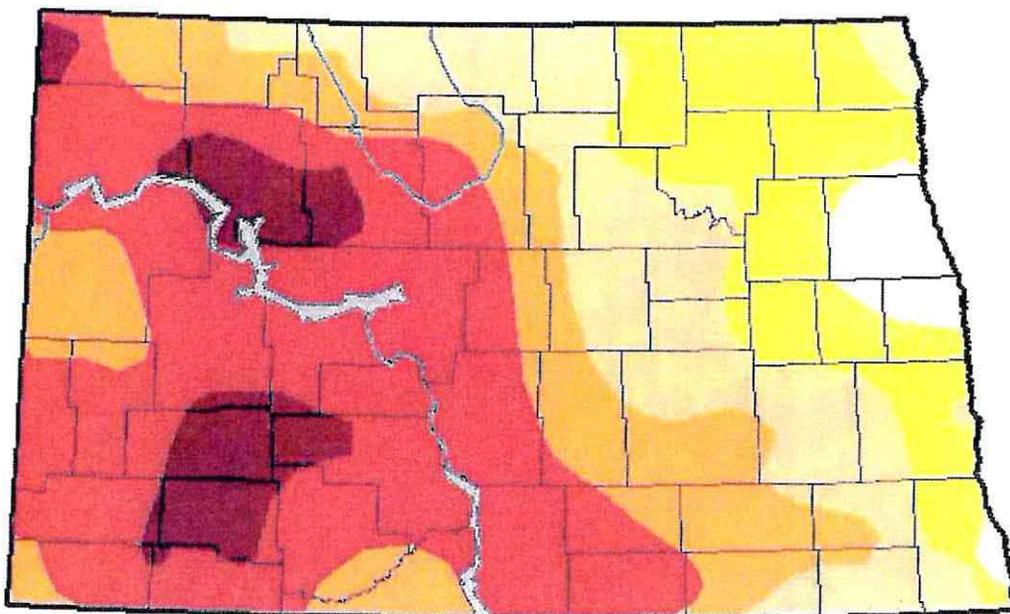
It's time for government to look out for the people.

U.S. Drought Monitor North Dakota

August 1, 2017
(Released Thursday, Aug. 3, 2017)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|-------|-------|-------|-------|-------|------|
| Current | 3.09 | 96.91 | 81.74 | 62.45 | 44.09 | 7.62 |
| Last Week 07-25-2017 | 6.61 | 93.39 | 79.21 | 61.16 | 45.56 | 7.62 |
| 3 Months Ago 05-02-2017 | 91.22 | 8.78 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start of Calendar Year 01-03-2017 | 93.87 | 6.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| Start of Water Year 09-27-2016 | 96.70 | 3.30 | 0.41 | 0.00 | 0.00 | 0.00 |
| One Year Ago 08-02-2016 | 90.05 | 9.95 | 2.98 | 1.20 | 0.00 | 0.00 |



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Deborah Bathke
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

| TOWN | 1971-2000 30 yr avg. | 1981-2010 30 yr avg. | Change | Losers | Gainers |
|-------------------|-------------------------|-------------------------|--------|--------|---------|
| Abercrombie | 21.17 | 23.86 | 2.69 | | 2.69 |
| Adams | 18.73 | 19.68 | 0.95 | | 0.95 |
| Alexander | 14.35 | 14.25 | -0.10 | -0.10 | |
| Almont | 16.64 | 16.87 | 0.23 | | 0.23 |
| Ambrose | 14.59 | 14.15 | -0.44 | -0.44 | |
| Amidon | 14.85 | 14.43 | -0.42 | -0.42 | |
| Ashley | 18.3 | 19.57 | 1.27 | | 1.27 |
| Beach | 15.26 | 15.23 | -0.03 | -0.03 | |
| Belcourt | 17.95 | 18.92 | 0.97 | | 0.97 |
| Berthold | 17.77 | 17.38 | -0.39 | -0.39 | |
| Beulah | 16.59 | 17.02 | 0.43 | | 0.43 |
| Bismarck AP | 16.84 | 17.85 | 1.01 | | 1.01 |
| Bismarck 7NE | 17.88 | 18.51 | 0.63 | | 0.63 |
| Bottineau | 18.45 | 17.97 | -0.48 | -0.48 | |
| Bowbells | 16.77 | 17.06 | 0.29 | | 0.29 |
| Bowman | 15.5 | 15.59 | 0.09 | | 0.09 |
| Butte | 16.65 | 17.65 | 1.00 | | 1.00 |
| Cando | 15.43 | 19.3 | 3.87 | | 3.87 |
| Carrington | 18.73 | 20.15 | 1.42 | | 1.42 |
| Carrington 4N | 19.89 | 20.3 | 0.41 | | 0.41 |
| Carson | 16.7 | 16.92 | 0.22 | | 0.22 |
| Casselton | 21.53 | 23.37 | 1.84 | | 1.84 |
| Cavalier | 18.25 | 19.17 | 0.92 | | 0.92 |
| Center | 17.48 | 18.51 | 1.03 | | 1.03 |
| Chaffee | 20.55 | 21.72 | 1.17 | | 1.17 |
| Colgate | 18.37 | 19.76 | 1.39 | | 1.39 |
| Cooperstown | 20.5 | 21.58 | 1.08 | | 1.08 |
| Courtena | 18.78 | 19.32 | 0.54 | | 0.54 |
| Crosby | 14.94 | 14.92 | -0.02 | -0.02 | |
| Devils Lake | 18.93 | 20.42 | 1.49 | | 1.49 |
| Dickinson Exp Stn | 16.61 | 16.71 | 0.10 | | 0.10 |
| Dickinson Ranch | 15.5 | 16.84 | 1.34 | | 1.34 |
| Drake | 16.36 | 17.34 | 0.98 | | 0.98 |
| Dunn Center | 16.36 | 15.59 | -0.77 | -0.77 | |
| Edgeley | 19.32 | 20.38 | 1.06 | | 1.06 |
| Edmore | 18.16 | 19.47 | 1.31 | | 1.31 |
| Elgin | 17.19 | 18.17 | 0.98 | | 0.98 |
| Ellendale | 21.43 | 22.64 | 1.21 | | 1.21 |
| Enderlin | 19.6 | 22.24 | 2.64 | | 2.64 |
| Fairfield | 14.79 | 14.97 | 0.18 | | 0.18 |
| Fargo AP | 21.19 | 22.58 | 1.39 | | 1.39 |
| Fessenden | 17.07 | 16.92 | -0.15 | -0.15 | |
| Forbes | 19.51 | 20.65 | 1.14 | | 1.14 |
| Forman | 20.58 | 22.12 | 1.54 | | 1.54 |
| Fort Yates | 14.14 | 14.83 | 0.69 | | 0.69 |

| TOWN | 1971-2000 | 1981-2010 | Change | Losers | Gainers |
|---------------------|------------|------------|--------|--------|---------|
| | 30 yr avg. | 30 yr avg. | | | |
| Oakes | 19.55 | 22.35 | 2.80 | | 2.80 |
| Park River | 19.89 | 20.84 | 0.95 | | 0.95 |
| Pembina | 18.58 | 20.65 | 2.07 | | 2.07 |
| Petersburg | 20.06 | 20.22 | 0.16 | | 0.16 |
| Pettibone | 17.45 | 18.51 | 1.06 | | 1.06 |
| Powers Lake | 16.1 | 15.32 | -0.78 | -0.78 | |
| Pretty Rock | 16.92 | 16.24 | -0.68 | -0.68 | |
| Reeder | 16.88 | 16.45 | -0.43 | -0.43 | |
| Reeder 13 N | 16.01 | 15.52 | -0.49 | -0.49 | |
| Richardton | 17.78 | 16.55 | -1.23 | -1.23 | |
| Rolla | 18.58 | 18.65 | 0.07 | | 0.07 |
| Rugby | 18.27 | 19.64 | 1.37 | | 1.37 |
| Sharon | 21.23 | 21.19 | -0.04 | -0.04 | |
| Sherwood | 13.13 | 14.07 | 0.94 | | 0.94 |
| Sheilds | 16.92 | 16.9 | -0.02 | -0.02 | |
| Stanley | 19.73 | 18.69 | -1.04 | -1.04 | |
| Steele | 18.77 | 19.38 | 0.61 | | 0.61 |
| Streeter | 17.09 | 18.4 | 1.31 | | 1.31 |
| Sykeston | 18.9 | 19.8 | 0.90 | | 0.90 |
| Tagus | 17.01 | 16.34 | -0.67 | -0.67 | |
| Tioga | 14.7 | 14.93 | 0.23 | | 0.23 |
| Towner | 16.68 | 17.19 | 0.51 | | 0.51 |
| Trotters | 14.71 | 14.81 | 0.10 | | 0.10 |
| Turtle Lake | 17.62 | 17.55 | -0.07 | -0.07 | |
| Tuttle | 16.83 | 17.35 | 0.52 | | 0.52 |
| Underwood | 17.77 | 16.74 | -1.03 | -1.03 | |
| Upham | 17.72 | 17.91 | 0.19 | | 0.19 |
| Valley City | 18.89 | 20.62 | 1.73 | | 1.73 |
| Velva | 18.1 | 18.81 | 0.71 | | 0.71 |
| Verona | 19.17 | 20.4 | 1.23 | | 1.23 |
| Wahpeton | 21.87 | 22.31 | 0.44 | | 0.44 |
| Walhalla | 19.74 | 20.92 | 1.18 | | 1.18 |
| Washburn | 17.8 | 17.18 | -0.62 | -0.62 | |
| Watford City | 14.41 | 14.67 | 0.26 | | 0.26 |
| Watford City 14 S | 15.49 | 15.75 | 0.26 | | 0.26 |
| Westhope | 17.02 | 17.43 | 0.41 | | 0.41 |
| Wildrose | 14.65 | 15.17 | 0.52 | | 0.52 |
| Williston AP | 14.16 | 14.37 | 0.21 | | 0.21 |
| Williston Exp St | 14.99 | 14.31 | -0.68 | -0.68 | |
| Willow City | 17.17 | 17.83 | 0.66 | | 0.66 |
| Wilton | 18.28 | 19.1 | 0.82 | | 0.82 |
| Wishek | 18.45 | 20.89 | 2.44 | | 2.44 |
| Woodworth | 17.93 | 18.99 | 1.06 | | 1.06 |
| Avg across state | | | 0.68 | -0.48 | 1.00 |
| Number of locations | | | 136 | 31 | 105 |

| | |
|------|-------|
| 1979 | 11.29 |
| 1980 | 11.15 |
| 1981 | 17.78 |
| 1982 | 23.72 |
| 1983 | 13.83 |
| 1984 | 11.67 |
| 1985 | 17.18 |
| 1986 | 17.61 |
| 1987 | 15.6 |
| 1988 | 8.53 |
| 1989 | 15.34 |
| 1990 | 11.87 |
| 1991 | 15.59 |
| 1992 | 12.3 |
| 1993 | 15.54 |
| 1994 | 17.25 |
| 1995 | 19.52 |
| 1996 | 12.7 |
| 1997 | 15.17 |
| 1998 | 18.26 |
| 1999 | 16.69 |
| 2000 | 15.97 |
| 2001 | 14.63 |
| 2002 | 12.13 |
| 2003 | 14.61 |
| 2004 | 13.32 |
| 2005 | 17.55 |
| 2006 | 13.84 |
| 2007 | 15.31 |
| 2008 | 12.4 |
| 2009 | 18.43 |
| 2010 | 14.57 |
| 2011 | 19.3 |
| 2012 | 11.94 |
| 2013 | 15.51 |
| 2014 | 18.55 |
| 2015 | 13.99 |
| 2016 | 12.72 |

16.08

14.38

15.23

15.27

| | |
|--------|-------|
| 1979 | 0.38 |
| 1980 | 3.78 |
| 1981 M | |
| 1982 M | |
| 1983 M | |
| 1984 M | |
| 1985 | 7.61 |
| 1986 | 14.06 |
| 1987 | 13.33 |
| 1988 | 6.82 |
| 1989 | 11.85 |
| 1990 | 9.61 |
| 1991 | 16.32 |
| 1992 | 12.13 |
| 1993 | 22.29 |
| 1994 | 15.95 |
| 1995 | 14.33 |
| 1996 | 17.17 |
| 1997 | 17.98 |
| 1998 | 20.46 |
| 1999 | 20.19 |
| 2000 | 12.92 |
| 2001 | 13.01 |
| 2002 | 10.54 |
| 2003 | 14.91 |
| 2004 | 18.32 |
| 2005 | 21.64 |
| 2006 | 13.69 |
| 2007 | 14.83 |
| 2008 | 13.29 |
| 2009 | 14.95 |
| 2010 | 16.55 |
| 2011 | 14.34 |
| 2012 | 9.6 |
| 2013 | 25.1 |
| 2014 | 15.62 |
| 2015 M | |
| 2016 M | |

M

14.45

16.05

15.96

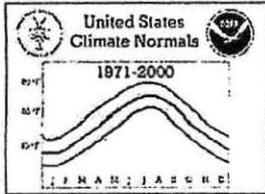
| | |
|--------|-------|
| 1979 | 5.62 |
| 1980 | 9.98 |
| 1981 M | |
| 1982 | 16.36 |
| 1983 | 9.56 |
| 1984 | 10.25 |
| 1985 | 11.59 |
| 1986 | 15.2 |
| 1987 M | |
| 1988 | 8.67 |
| 1989 | 17.62 |
| 1990 | 8.83 |
| 1991 | 22.79 |
| 1992 | 11.87 |
| 1993 | 24.23 |
| 1994 | 13.45 |
| 1995 | 14.49 |
| 1996 | 19.76 |
| 1997 | 17.53 |
| 1998 | 20.4 |
| 1999 | 17.12 |
| 2000 | 17.93 |
| 2001 | 15.45 |
| 2002 | 13.16 |
| 2003 | 16.34 |
| 2004 | 12.37 |
| 2005 | 21.74 |
| 2006 | 13.82 |
| 2007 | 14.15 |

8 yr avg.

10.36

15.92

16.25



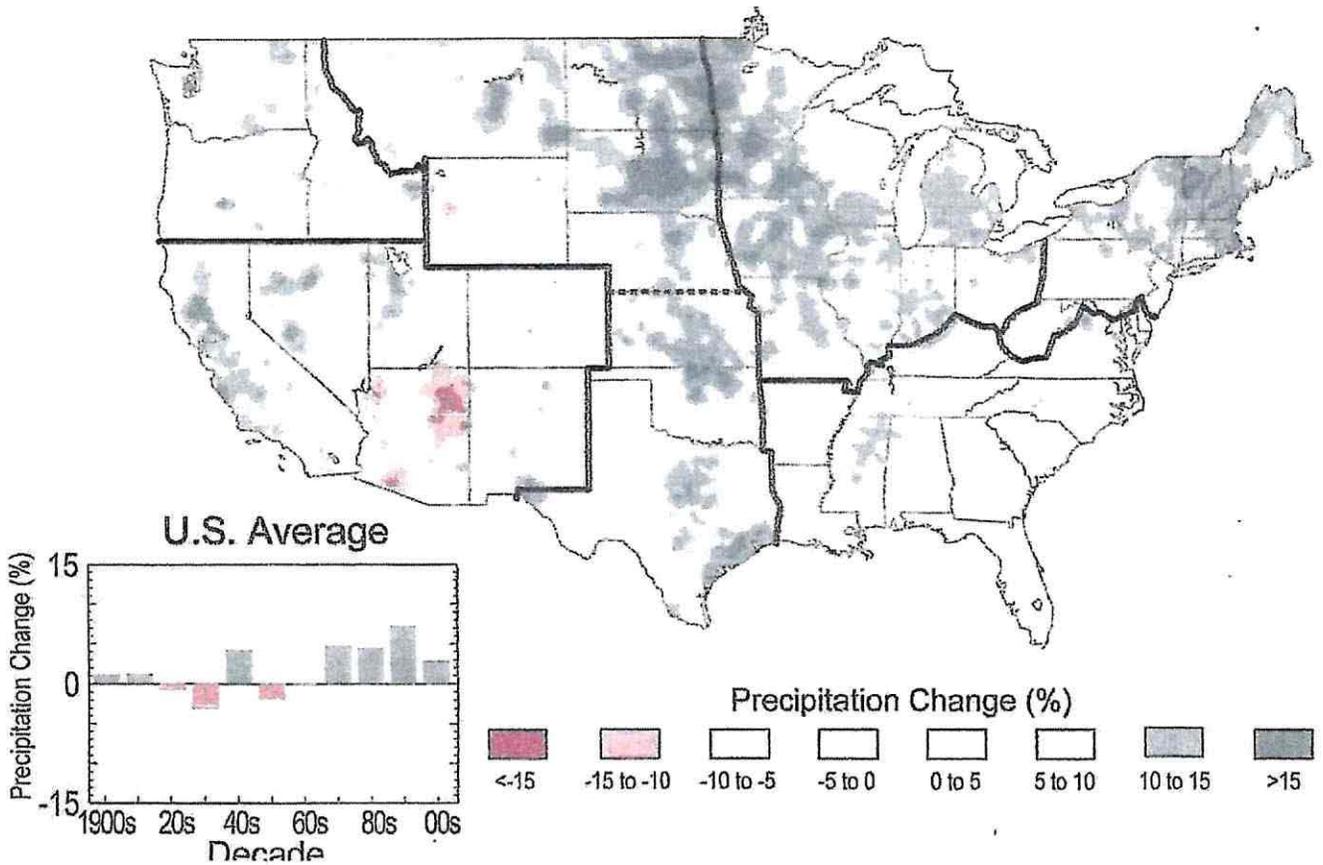
CLIMATOGRAPHY OF THE UNITED STATES NO. 81
 Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days
 1971-2000

NORTH DAKOTA

| No. | Station Name | PRECIPITATION NORMALS (Total in Inches) | | | | | | | | | | | | ANNUAL | |
|-----|------------------------|---|-----|------|------|------|------|------|------|------|------|------|-----|--------|-------|
| | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | | |
| 070 | HEBRON | .26 | .31 | .56 | 1.66 | 2.53 | 3.23 | 2.70 | 1.64 | 1.69 | 1.28 | .58 | .29 | 16.73 | 17.29 |
| 071 | HETTINGER | .30 | .32 | .60 | 1.59 | 2.54 | 2.95 | 2.16 | 1.46 | 1.40 | 1.35 | .53 | .31 | 15.51 | 15.45 |
| 072 | HILLSBORO 3 N | .50 | .55 | .93 | 1.56 | 2.35 | 3.46 | 3.23 | 2.78 | 2.05 | 1.92 | .89 | .48 | 20.70 | 21.62 |
| 073 | HURDSFIELD 8 SW | .49 | .45 | .64 | 1.26 | 2.22 | 3.35 | 2.57 | 1.96 | 1.45 | 1.35 | .69 | .39 | 16.82 | |
| 074 | JAMESTOWN MUNICIPAL AP | .62 | .52 | .85 | 1.36 | 2.21 | 3.05 | 3.22 | 2.33 | 1.74 | 1.40 | .71 | .44 | 18.49 | 18.77 |
| 075 | JAMESTOWN ST HOSPITAL | .50 | .35 | .73 | 1.27 | 2.27 | 3.24 | 3.28 | 2.43 | 2.01 | 1.49 | .63 | .33 | 18.53 | 19.60 |
| 076 | KEENE 3 S | .39 | .37 | .59 | 1.26 | 2.32 | 3.19 | 2.47 | 1.51 | 1.68 | 1.16 | .66 | .40 | 16.00 | 16.71 |
| 077 | KENMARE 1 WSW | .83 | .63 | .90 | 1.26 | 2.07 | 2.66 | 2.67 | 1.80 | 1.92 | 1.19 | .69 | .53 | 17.15 | 18.30 |
| 078 | KILLDEER 8 NW | .44 | .50 | .87 | 1.57 | 2.30 | 3.36 | 2.09 | 1.57 | 1.65 | 1.44 | .66 | .47 | 16.92 | 16.39 |
| 079 | LAKE METIGOSHE ST PK | .68 | .68 | .80 | 1.09 | 2.70 | 3.15 | 3.26 | 2.64 | 2.24 | 1.34 | .95 | .55 | 20.08 | 20.11 |
| 080 | LA MOURE | .78 | .64 | 1.36 | 1.85 | 2.67 | 3.69 | 3.42 | 2.30 | 1.90 | 1.78 | .91 | .45 | 21.75 | 22.77 |
| 081 | LANGDON EXP FARM | .42 | .39 | .61 | 1.00 | 2.36 | 3.33 | 3.18 | 2.73 | 1.66 | 1.38 | .66 | .39 | 18.11 | 19.42 |
| 082 | LARIMORE | .53 | .53 | .97 | 1.25 | 2.24 | 3.57 | 3.45 | 2.91 | 2.05 | 1.55 | .91 | .45 | 20.41 | |
| 083 | LEEDS | .55 | .51 | .83 | 1.28 | 2.08 | 2.98 | 3.17 | 2.07 | 1.61 | 1.53 | .84 | .48 | 17.93 | 19.43 |
| 084 | LINTON | .34 | .37 | .77 | 1.36 | 2.32 | 2.95 | 2.57 | 1.80 | 1.30 | 1.44 | .51 | .39 | 16.12 | 16.90 |
| 085 | LISBON | .63 | .48 | 1.09 | 1.47 | 2.59 | 3.45 | 2.87 | 2.27 | 2.20 | 1.82 | .86 | .45 | 23.18 | 21.13 |
| 086 | LITCHVILLE 2 NW | .65 | .50 | 1.10 | 1.66 | 2.65 | 3.68 | 3.18 | 2.17 | 2.00 | 1.97 | .90 | .44 | 20.90 | 21.73 |
| 087 | MADDOCK | .49 | .45 | .77 | 1.05 | 2.03 | 3.27 | 3.25 | 1.92 | 1.80 | 1.41 | .71 | .43 | 17.58 | 18.45 |
| 088 | MANDAN EXPERIMENT STN | .38 | .37 | .58 | 1.52 | 2.41 | 2.91 | 2.90 | 2.02 | 1.56 | 1.41 | .62 | .36 | 17.04 | 17.95 |
| 089 | MARMARTH | .37 | .40 | .68 | 1.38 | 2.23 | 2.90 | 2.00 | 1.32 | 1.24 | 1.13 | .57 | .36 | 14.58 | 15.48 |
| 090 | MAX | .55 | .43 | .74 | 1.48 | 2.16 | 3.21 | 2.69 | 1.84 | 1.72 | 1.41 | .63 | .44 | 17.30 | 18.08 |
| 091 | MAYVILLE | .72 | .62 | 1.08 | 1.38 | 2.29 | 3.50 | 2.73 | 2.85 | 1.98 | 1.77 | .86 | .60 | 20.38 | 23.92 |
| 092 | MC CLUSKY | .58 | .49 | .71 | 1.49 | 2.13 | 3.41 | 2.61 | 2.06 | 1.61 | 1.39 | .71 | .49 | 17.68 | 17.56 |
| 093 | MC HENRY 3 W | .60 | .48 | .87 | 1.32 | 2.28 | 3.63 | 3.09 | 2.76 | 1.99 | 1.47 | 1.03 | .57 | 20.09 | 21.19 |
| 094 | MC LEOD 3 E | .65 | .51 | 1.01 | 1.30 | 2.63 | 3.39 | 3.54 | 2.32 | 2.05 | 1.78 | .94 | .42 | 20.54 | 23.45 |
| 095 | MC VILLE | .58 | .36 | .88 | 1.09 | 2.26 | 3.39 | 3.23 | 2.54 | 2.16 | 1.38 | .83 | .46 | 19.16 | 21.74 |
| 096 | MEDINA | .46 | .47 | .87 | 1.32 | 2.26 | 3.32 | 3.32 | 2.55 | 1.87 | 1.25 | .61 | .36 | 17.85 | 18.52 |
| 097 | MEDORA | .35 | .36 | .64 | 1.35 | 2.26 | 2.89 | 2.16 | 1.38 | 1.45 | 1.12 | .58 | .37 | 14.91 | 16.04 |
| 098 | MINOT AP | .65 | .53 | 1.05 | 1.55 | 2.31 | 3.15 | 2.70 | 1.95 | 1.74 | 1.32 | .86 | .63 | 18.44 | 17.19 |
| 099 | MINOT EXPERIMENT STN | .77 | .60 | 1.03 | 1.56 | 2.26 | 3.01 | 2.52 | 2.01 | 1.78 | 1.40 | 1.05 | .64 | 18.65 | 18.59 |
| 100 | MOFFIT 3 SE | .29 | .33 | .66 | 1.31 | 2.16 | 3.00 | 2.84 | 2.08 | 1.73 | 1.36 | .50 | .27 | 16.53 | 16.90 |
| 101 | MOHALL | .52 | .42 | .73 | 1.24 | 2.17 | 2.98 | 2.86 | 2.17 | 1.89 | 1.46 | .63 | .39 | 17.46 | 17.17 |
| 102 | MONTPELIER | .59 | .54 | 1.07 | 1.73 | 2.59 | 3.50 | 3.05 | 2.40 | 2.18 | 1.67 | .91 | .41 | 20.64 | 20.48 |
| 103 | MOTT | .41 | .50 | .80 | 1.83 | 2.59 | 3.17 | 2.13 | 1.69 | 1.26 | 1.24 | .55 | .38 | 16.55 | 16.56 |
| 104 | NAPOLEON | .58 | .51 | .98 | 1.64 | 2.48 | 3.20 | 2.88 | 2.19 | 1.77 | 1.55 | .80 | .44 | 19.02 | 19.74 |
| 105 | NEW ENGLAND | .38 | .39 | .69 | 1.62 | 2.46 | 3.38 | 1.93 | 1.73 | 1.44 | 1.37 | .47 | .38 | 16.24 | 15.78 |
| 106 | NEW SALEM 5 NW | .47 | .49 | .81 | 1.88 | 2.42 | 3.17 | 2.76 | 2.11 | 1.53 | 1.38 | .76 | .50 | 19.28 | 17.41 |
| 107 | OAKES 2 S | .60 | .44 | 1.04 | 1.71 | 2.45 | 3.25 | 2.76 | 2.04 | 2.26 | 1.77 | .82 | .41 | 19.55 | 22.35 |
| 108 | PARK RIVER | .66 | .56 | .92 | 1.25 | 2.41 | 3.42 | 3.19 | 2.61 | 1.80 | 1.64 | .88 | .55 | 19.89 | 20.84 |
| 109 | PEMBINA | .44 | .40 | .72 | .99 | 2.09 | 3.41 | 2.95 | 2.68 | 2.12 | 1.48 | .85 | .45 | 18.58 | 20.45 |
| 110 | PETERSBURG 2 N | .66 | .43 | .94 | 1.17 | 2.27 | 3.62 | 3.25 | 2.71 | 2.06 | 1.54 | .90 | .51 | 20.06 | 20.22 |
| 111 | PETTIBONE | .53 | .38 | .69 | 1.34 | 2.14 | 3.32 | 2.81 | 1.86 | 1.80 | 1.44 | .71 | .43 | 17.45 | 18.51 |
| 112 | POWERS LAKE 1 N | .38 | .37 | .72 | 1.27 | 2.12 | 2.74 | 2.90 | 1.94 | 1.71 | 1.07 | .55 | .33 | 16.10 | 15.32 |
| 113 | PRETTY ROCK | .33 | .41 | .86 | 1.89 | 2.64 | 3.02 | 2.34 | 1.76 | 1.40 | 1.34 | .62 | .31 | 16.92 | 16.24 |
| 114 | REEDER | .36 | .36 | .68 | 1.61 | 2.88 | 3.29 | 2.23 | 1.59 | 1.49 | 1.52 | .54 | .33 | 16.88 | 16.45 |
| 115 | REEDER 13 N | .39 | .41 | .82 | 1.61 | 2.51 | 2.94 | 1.97 | 1.58 | 1.51 | 1.41 | .54 | .32 | 16.01 | 15.52 |
| 116 | RICHARDTON ABBEY | .45 | .48 | .85 | 1.75 | 2.49 | 3.39 | 2.27 | 1.88 | 1.60 | 1.41 | .75 | .45 | 17.78 | 16.55 |
| 117 | RIVERDALE | .37 | .29 | .59 | 1.16 | 2.04 | 3.18 | 2.37 | 1.76 | 1.70 | 1.17 | .35 | .26 | 15.09 | |
| 118 | ROLLA 3 NW | .51 | .52 | .76 | 1.13 | 2.30 | 3.41 | 2.87 | 2.55 | 1.95 | 1.25 | .80 | .53 | 18.58 | 18.65 |
| 119 | RUGBY | .51 | .45 | .80 | 1.28 | 2.25 | 3.05 | 3.21 | 2.28 | 1.92 | 1.32 | .70 | .50 | 18.27 | 19.64 |
| 120 | SAN HAVEN | .43 | .58 | .61 | .93 | 1.90 | 2.69 | 2.68 | 2.59 | 1.80 | 1.26 | .43 | .40 | 16.30 | |
| 121 | SHARON | .68 | .54 | 1.12 | 1.33 | 2.65 | 3.55 | 3.45 | 2.67 | 2.05 | 1.67 | .97 | .55 | 21.23 | 21.19 |
| 122 | SHERWOOD 3 N | .16 | .19 | .31 | .80 | 1.77 | 2.65 | 2.57 | 1.82 | 1.44 | .91 | .28 | .23 | 13.13 | 14.07 |
| 123 | SHIELDS | .42 | .42 | .87 | 1.75 | 2.61 | 2.88 | 2.55 | 1.69 | 1.31 | 1.41 | .63 | .38 | 16.92 | 16.90 |
| 124 | STANLEY 3 NNW | .57 | .49 | .87 | 1.59 | 2.58 | 3.88 | 2.94 | 2.13 | 2.15 | 1.23 | .76 | .54 | 19.73 | 18.69 |
| 125 | STEELE 3 N | .48 | .44 | .98 | 1.51 | 2.53 | 3.24 | 2.95 | 2.01 | 1.90 | 1.55 | .74 | .44 | 18.77 | 19.32 |
| 126 | STREETER 7 NW | .31 | .34 | .68 | 1.26 | 1.96 | 3.04 | 3.09 | 2.38 | 1.97 | 1.10 | .69 | .27 | 17.09 | 18.40 |
| 127 | SYKESTON | .57 | .51 | .88 | 1.49 | 2.23 | 3.39 | 2.99 | 2.03 | 1.78 | 1.73 | .83 | .47 | 18.90 | 19.80 |
| 128 | TAGUS | .66 | .54 | .96 | 1.33 | 1.97 | 3.14 | 2.35 | 1.68 | 1.85 | 1.22 | .72 | .59 | 17.01 | 16.34 |
| 129 | TIOGA 1 E | .48 | .36 | .58 | 1.17 | 2.00 | 2.60 | 2.20 | 1.80 | 1.58 | .94 | .59 | .40 | 14.70 | 14.93 |
| 130 | TOWNER 2 NE | .55 | .55 | .72 | 1.21 | 1.93 | 2.67 | 2.69 | 2.06 | 1.83 | 1.30 | .64 | .53 | 16.68 | 17.19 |
| 131 | TROTTERS 3 SSE | .35 | .39 | .58 | 1.23 | 2.09 | 2.90 | 1.89 | 1.50 | 1.61 | 1.16 | .61 | .40 | 14.71 | 14.81 |
| 132 | TURTLE LAKE | .63 | .49 | .85 | 1.44 | 2.19 | 3.32 | 2.67 | 1.96 | 1.50 | 1.32 | .73 | .52 | 17.62 | 17.55 |
| 133 | TUTTLE | .44 | .39 | .62 | 1.38 | 2.29 | 3.14 | 2.81 | 1.77 | 1.76 | 1.28 | .59 | .36 | 16.83 | 17.35 |
| 134 | UNDERWOOD | .54 | .46 | .78 | 1.64 | 2.25 | 3.52 | 2.48 | 1.77 | 1.59 | 1.44 | .77 | .53 | 17.77 | 16.74 |
| 135 | UPHAM 3 N | .57 | .47 | .76 | 1.33 | 2.07 | 3.32 | 2.71 | 2.00 | 1.80 | 1.28 | .85 | .56 | 17.72 | 17.91 |
| 136 | VALLEY CITY 3 NNW | .54 | .46 | .80 | 1.22 | 2.60 | 3.27 | 2.75 | 2.43 | 2.10 | 1.53 | .80 | .39 | 18.89 | 20.62 |
| 137 | VELVA 3 NE | .68 | .50 | .78 | 1.34 | 2.30 | 3.22 | 2.80 | 1.83 | 1.62 | 1.61 | .92 | .50 | 18.10 | 18.81 |
| 138 | VERONA | .39 | .35 | .97 | 1.75 | 2.50 | 3.37 | 3.11 | 2.01 | 2.04 | 1.70 | .72 | .26 | 19.17 | 20.40 |



Observed U.S. Precipitation Change



The colors on the map show annual total precipitation changes for 1991-2012 compared to the 1901-1960 average, and show wetter conditions in most areas. The bars on the graph show average precipitation differences by decade for 1901-2012 (relative to the 1901-1960 average). The far right bar is for 2001-2012. (Figure source: NOAA NCDC / CICS-NC).

22 yrs

The latest study "Precipitation evaluation of the North Dakota Cloud Modification Project using rain gauge observations" authored by Tuftedal, Delene, and Detwiler and was released in Dec, 2021.

The authors state: "NDCMP secondary goal after hail suppression is precipitation enhancement in the target area, not in downwind areas: therefore, the analysis focuses on precipitation changes in the target area only and does not consider downwind regimes."

"Precipitation generally increases from west to east, which corresponds with increasing distance from the Rocky Mountains that is consistent with the climatological precipitation pattern. The Bowman target area is highly correlated with the Carter and Fallon control areas" "In general, target/control correlations are highest with control areas to the southwest of the target area."

M. J. Tuftedal

North Dakota State University

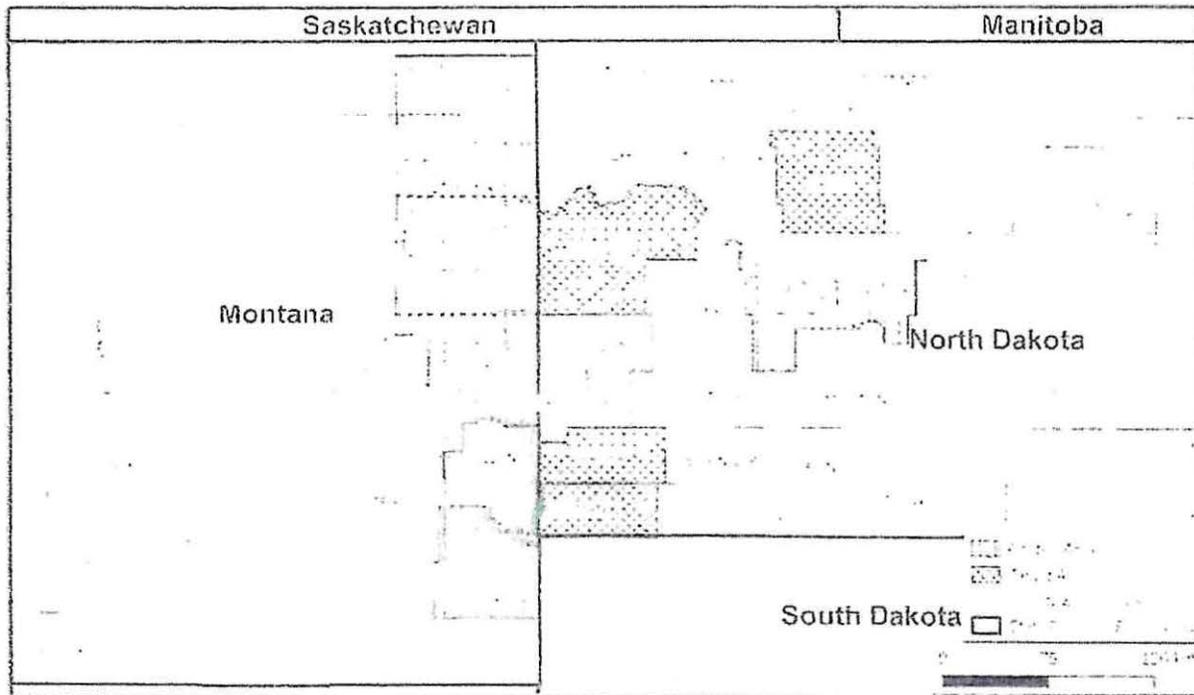


Fig. 2. A political map showing North Dakota and surrounding states that have control areas for the North Dakota Cloud Modification Project (NDCMP) experimental area. Crossed lines highlight the target area and vertical lines highlight the control areas.

Table 1
Monthly and seasonal June, July, and August area-wide precipitation using measurements from National Weather Service (NWS) Cooperative Observer Program (COOP) for 1950-1975, and North Dakota Atmospheric Resource Board Cooperative Observer Network (NDRCON) and NWS COOP for 1977-2018.

| County | June (cm) | | July (cm) | | August (cm) | | Seasonal (cm) | |
|------------|-----------|-----------|-----------|-----------|-------------|-----------|---------------|-----------|
| | 1950-1975 | 1977-2018 | 1950-1975 | 1977-2018 | 1950-1975 | 1977-2018 | 1950-1975 | 1977-2018 |
| Mckenzie | 8.71 | 7.52 | 5.22 | 6.07 | 4.31 | 4.04 | 18.25 | 17.64 |
| Bowman | 9.26 | 7.69 | 5.25 | 5.27 | 3.94 | 4.66 | 18.46 | 16.63 |
| Ward | 8.02 | 8.06 | 5.70 | 6.59 | 5.09 | 4.73 | 19.81 | 19.00 |
| Billsick | 10.29 | 7.52 | 5.47 | 5.60 | 4.66 | 4.50 | 20.42 | 17.62 |
| Mohr | 6.87 | 8.87 | 5.95 | 6.96 | 4.96 | 5.68 | 19.68 | 20.62 |
| Williams | 9.87 | 7.17 | 5.30 | 5.57 | 4.17 | 4.29 | 19.34 | 17.02 |
| Beckham | 7.70 | 6.88 | 4.90 | 5.40 | 4.12 | 3.45 | 16.72 | 15.22 |
| Beauregard | 7.17 | 5.16 | 4.79 | 5.09 | 4.22 | 3.37 | 16.19 | 15.72 |
| Carter | 9.78 | 8.32 | 5.52 | 5.45 | 3.88 | 4.54 | 19.18 | 18.80 |
| Fallon | 7.67 | 6.33 | 4.37 | 4.19 | 3.14 | 3.25 | 15.18 | 13.69 |

-9%

-5%
-10%

23.0099.01006

Sixty-eighth
Legislative Assembly
of North Dakota

HOUSE BILL NO. 1166

Introduced by

Representatives M. Ruby, Beltz, Hagert, D. Johnson, Thomas
Senators Luick, Myrdal

1 A BILL for an Act to create and enact a new section to chapter 61-04.1 of the North Dakota
2 Century Code, relating to requirements to cease cloud seeding; to amend and reenact
3 section subsection 10 of section 61-04.1-03, section 61-04.1-23, subsection 3 of section
4 61-04.1-24, and sections 61-04.1-26, 61-04.1-27, 61-04.1-30, 61-04.1-38, and 61-04.1-39 of the
5 North Dakota Century Code, relating to state funding requirements for county weather
6 modification operations and a prohibition on the use of state funds for weather modification; and
7 to provide a penalty.

8 **BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:**

9 **SECTION 1.** A new section to chapter 61-04.1 of the North Dakota Century Code is created
10 and enacted as follows:

11 **Cloud seeding operations - Requirement to cease.**

12 A weather modification authority conducting cloud seeding on a storm must cease cloud
13 seeding on the storm when the radar reflectivity core of a seeded storm exiting the county
14 operations area crosses the boundary of a township that borders a township of an adjacent
15 county that does not have an active weather modification authority conducting weather
16 modification under this chapter.

17 **SECTION 2. AMENDMENT.** Subsection 10 of section 61-04.1-03 of the North Dakota
18 Century Code is amended and reenacted as follows:

19 10. "Weather modification authority" means the governing body created or extended by a
20 board of county commissioners under section 61-04.1-22.1, 61-04.1-23, 61-04.1-27,
21 61-04.1-29, or 61-04.1-31.

22 **SECTION 3. AMENDMENT.** Section 61-04.1-23 of the North Dakota Century Code is
23 amended and reenacted as follows:

1 **61-04.1-23. Weather modification authority created by petition.**

2 1. A weather modification authority ~~shall~~must be created by resolution and five
3 commissioners appointed ~~thereto~~ to the authority for ten-year terms of office, by the
4 board of county commissioners. A board of county commissioners ~~shall~~may not adopt
5 a resolution creating an authority until ~~the board~~ the board has received a valid petition signed
6 by at least fifty-one percent of the qualified electors of a county, as determined by the
7 vote cast for the office of governor at the last preceding general election. The board of
8 county commissioners shall appoint five residents of the county as weather
9 modification authority commissioners from those names set forth in the petition and
10 designated by the petitioners to be appointed weather modification authority
11 commissioners. ~~In the event~~ If any one of the five candidates named in the petition to
12 be appointed as a weather modification authority commissioner is unable or refuses
13 for any reason to accept appointment as a commissioner, or is disqualified by not
14 meeting residence requirements, as a qualified elector in the county, the board of
15 county commissioners shall name its own appointee for a ten-year term of office in
16 place of any disqualified candidate selected by the petitioners. If any weather
17 modification authority commissioner submits a resignation in writing to the board of
18 county commissioners or becomes unable to serve or disqualified for any reason, after
19 accepting office, the board of county commissioners shall name its appointee as a
20 commissioner to the weather modification authority. All vacancies occurring otherwise
21 than by expiration of term of office ~~shall~~must be filled for the unexpired term.

22 2. Any weather modification authority created pursuant to this section ~~shall expire~~expires
23 ten years after the date of the initial appointment of the commissioners ~~thereto~~ to the
24 authority. Any unexpended funds remaining in the name of the weather modification
25 authority, after all proper bills and expenses have been paid, ~~shall~~must be transferred
26 into the county general fund by the officers of the weather modification authority on or
27 before the ten-year termination date provided by this section. However, all
28 unexpended funds remaining in the name of the weather modification authority, after
29 all proper bills and expenses have been paid, ~~shall~~must remain in the name of the
30 weather modification authority if the board of county commissioners of such county by

1 | resolution ~~creates~~extends a weather modification authority and all its powers in
2 | accordance with section 61-04.1-27.

3 | 3. Nothing in this section ~~shall prevent~~prevents continuation or reinstatement of a
4 | weather modification authority, provided the authority is renewed for another ten years
5 | by petition of the qualified electors in the same manner as the initial weather
6 | modification authority was created by petition of qualified electors as provided for in
7 | this chapter.

8 | 4. In the event more than one petition is filed with the board of county commissioners on
9 | or about the same time, the petition with the highest percentage of the qualified
10 | electors of the county voting for the office of governor at the last preceding general
11 | election ~~shall~~must be selected by the board of county commissioners. However, the
12 | petition with the highest percentage must have the signatures of at least forty percent
13 | of the qualified electors in the county and the sum total of all qualified electors signing
14 | all petitions filed must equal at least sixty percent of the qualified electors in the
15 | county. ~~In no case shall the~~The name of the same qualified elector may not appear on
16 | two or more petitions, ~~but in such event, if the name shall~~of the same qualified elector
17 | appears on two or more petitions, the name must be stricken from both petitions.

18 | **SECTION 4. AMENDMENT.** Subsection 3 of section 61-04.1-24 of the North Dakota
19 | Century Code is amended and reenacted as follows:

20 | 3. The following paragraph: We, the undersigned qualified electors of the (name of
21 | county), state of North Dakota, are notified hereby that the creation of the (name of
22 | county) weather modification authority and the appointment of its commissioners by
23 | the (name of county) board of county commissioners will grant unto the authority by
24 | law the power to certify to the board of county commissioners a mill levy tax not to
25 | exceed seven mills upon the taxable valuation of property in said county for a weather
26 | modification fund, which tax may be levied in excess of the mill levy limit fixed by law
27 | for taxes for general county purposes and that such fund shall be used for weather
28 | modification activities ~~in conjunction~~under contract with the state of North Dakota. We,
29 | the undersigned, understand that the authority requested in this petition expires ten
30 | years after the creation of the weather modification authority, except that the board of
31 | county commissioners may by resolution ~~create~~extend a weather modification

1 authority and all its powers, including the power to certify a tax levy as provided by
2 section 61-04.1-26, for five-year periods in accordance with section 61-04.1-27.

3 **SECTION 5. AMENDMENT.** Section 61-04.1-26 of the North Dakota Century Code is
4 amended and reenacted as follows:

5 **61-04.1-26. Funding for support of weather modification authority.**

6 The weather modification authority may request annually that the board of county
7 commissioners provide funding from revenues derived from its general fund levy for support of
8 the authority and to provide weather modification services. In the year for which the levy is
9 sought, the weather modification authority seeking approval of a property tax levy under this
10 chapter must file with the county auditor, at a time and in a format prescribed by the county
11 auditor, a financial report for the preceding calendar year showing the ending balances of each
12 fund held by the authority during that year. The funding under this section approved by the
13 board of county commissioners must be deposited in the weather modification fund and shall be
14 used only for weather modification activities ~~in conjunction~~under contract with the state of North
15 Dakota.

16 **SECTION 6. AMENDMENT.** Section 61-04.1-27 of the North Dakota Century Code is
17 amended and reenacted as follows:

18 **61-04.1-27. ~~Creation~~Extension of weather modification authority and its powers by**
19 **resolution.**

20 1. When a weather modification authority is about to expire, the board of county
21 commissioners of any such a county may~~shall~~ by resolution place on the ballot, at the
22 next countywide election, the question of whether the board of county commissioners
23 shall authorize the ~~creation~~extension of such~~the existing~~ weather modification
24 authority and all its powers, including the power to certify a tax levy as provided by
25 section 61-04.1-26, for additional five-year periods; provided, the If the majority of the
26 votes cast on the question are in favor of the measure, the weather modification
27 authority is extended for an additional five-year period.

28 2. The resolution authorizing the ~~creation~~extension of such~~the~~ weather modification
29 authority is~~must be~~ adopted by the board of county commissioners before the
30 expiration date prescribed in the preceding resolution for its termination.

1 | 3. Upon passing ~~such a~~ resolution for the ~~creation~~extension of the authority, the board of
2 | county commissioners shall appoint five weather modification authority commissioners
3 | to five-year terms of office, subsequently filling vacancies in the manner prescribed by
4 | section 61-04.1-23. The board of county commissioners may remove any weather
5 | modification commissioner from office whenever it appears, by competent evidence
6 | and after hearing, that the commissioner has been guilty of misconduct, malfeasance,
7 | crime in office, neglect of duty in office, or of habitual drunkenness or gross
8 | incompetency.

9 | **SECTION 7. AMENDMENT.** Section 61-04.1-30 of the North Dakota Century Code is
10 | amended and reenacted as follows:

11 | **61-04.1-30. Abolishment of weather modification authority by election.**

12 | When a petition signed by not less than twenty percent of the qualified electors of the
13 | county, as determined by the vote cast for governor in the last preceding gubernatorial election,
14 | requesting an election upon the abolishment of a weather modification authority as
15 | ~~created~~extended in ~~sections~~section 61-04.1-27 and created in 61-04.1-29 is presented to the
16 | board of county commissioners, not later than sixty days ~~prior to~~before the next countywide
17 | election, the board of county commissioners shall submit the question to the qualified electors
18 | of the county at the next countywide election. Upon approval by a majority of the votes cast on
19 | the question, the board of county commissioners shall abolish the weather modification
20 | authority as of December thirty-first following the election. All unexpended funds remaining in
21 | the name of the weather modification authority, after all proper bills and expenses have been
22 | paid, ~~shall~~must be deposited in the general fund of the county.

23 | **SECTION 8. AMENDMENT.** Section 61-04.1-38 of the North Dakota Century Code is
24 | amended and reenacted as follows:

25 | **61-04.1-38. Board may receive and expend funds.**

26 | The board may receive and accept in the name of the state any funds that are offered or
27 | become available from any federal grant or appropriation, private gift, donation, or bequest,
28 | county funds, or funds from any other source except license and permit fees, and to expend
29 | these funds for the expense of administering this chapter, and, with the exception of county
30 | funds and funds from any other person contracting with the board for weather modification
31 | operations, for the encouragement of research and development in weather modification by any

1 private person, the North Dakota state university, the university of North Dakota, or any other
2 appropriate state, county, or public agency in this state by direct grant, contract, or other means.

3 All federal grants, federal appropriations, private gifts, donations, or bequests, county funds,
4 or funds from any other source except license and permit fees, received by the board must be
5 paid over to the state treasurer, who shall credit this amount to a special fund in the state
6 treasury known as the state weather modification fund. All proceeds deposited by the state
7 treasurer in the state weather modification fund are appropriated to the board and, if expended,
8 must be disbursed by warrant-check prepared by the office of management and budget upon
9 vouchers submitted by the board and must be used for the purpose of paying for the expense of
10 administration of this chapter and, with the exception of county funds or funds from any other
11 person contracting with the board for weather modification operations, for the encouragement of
12 research and development in weather modification by any private person, the North Dakota
13 state university, the university of North Dakota, or any other appropriate state, county, or public
14 agency by direct grant, contract, or other means. The board may use county funds or funds
15 from any other person contracting with the board for weather modification operations. The board
16 may not use state funds for weather modification operations.

17 **SECTION 9. AMENDMENT.** Section 61-04.1-39 of the North Dakota Century Code is
18 amended and reenacted as follows:

19 **61-04.1-39. Payment for weather modification - ~~State to provide funds~~ Use of state**
20 **funds prohibited.**

- 21 1. Any weather modification authority or person that contracted with the board for
22 weather modification operations under this chapter shall ~~appropriate to pay one~~
23 hundred percent of the costs associated with weather modification to the board. The
24 board shall deposit any county funds in the state weather modification fund the
25 amount determined by the board to be necessary to provide that weather modification
26 authority or person with to provide weather modification operations to the contracting
27 party.
- 28 2. The board may expend, from the state weather modification fund, only the funds the
29 board deems necessary to provide are received from the contracting weather
30 modification authority or person with weather modification operations. ~~Before the~~

Sixty-eighth
Legislative Assembly

- 1 ~~board expends these funds, the board shall obtain approval from the board of county~~
2 ~~commissioners in:~~
- 3 ~~a. Each county in which the participating weather modification authority or person~~
4 ~~will conduct weather modification operations; and~~
- 5 ~~b. Each county bordering a county in which the weather modification authority or~~
6 ~~person will conduct weather modification operations.~~

WAYNE OLSON

District # 1
(701) 898-4898

JOAN M

HOLLEKIM
District #2
(701) 629-9669

TRUDY RULAND

District #3
(701) 627-3588

JOHN DEGROOT

District #4
(701) 898-4774

JASON RICE

District #5
(701) 641-0647

Mountrail County Commissioners

Mountrail County Courthouse
101 North Main Street - Box 69
Stanley, North Dakota 58784-0069
Tel. (701) 628-2145 Fax (701) 628-2276

March 13, 2023

HB # 1166 (3/16/2022 Hearing – 10:15 A.M.)

Dear Chair Luick and Honorable Members of the Senate Agriculture & Veterans Affair Committee:

The Mountrail County Commission is respectfully requesting you to support a **“DO NOT PASS”** on House Bill #1166 relating to state funding requirements for county weather modification operations.

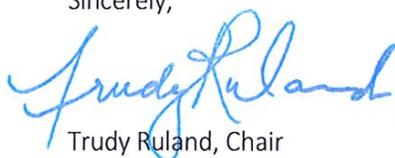
Mountrail County Weather Modification has been in operation since 1970 with the support of State, County and local tax dollars. The bill proposed is not about whether the Mountrail County Commission is in support or not in support of the continuance of weather modification operations, it is about proposed verbiage to eliminate funding from the State for weather modification operations. It appears the State wants counties to carry out and fully fund the objections and purposes of the weather modification program as outlined under Chapter 61.04.1 of the North Dakota Century Code. Participating counties already fund 66% of this “joint” program.

Please take the time to fully read 61-04.1-01 and 61-04.1-02 of the NDCC laying out benefits and purpose of the weather modification program and the fact that the state encourages research and development of this program. It is difficult to meet these goals without participation from the State. When the bill was first introduced, bordering counties wanted “control” as to whether or not weather modification operations exist in a participating county by making State funding dependent on their county’s approval. The bill as amended just flat out eliminates the use of state funds for weather modification operations. This is merely a political and control issue trying to eliminate the program.

Let the voice of the people speak; do not take the rights away from the residents of one county that have elected to participate in weather modification operations. This bill will potentially eliminate weather modification operations state-wide. Also, please consider the significant negative economic impact to not only the producer but also the businesses that benefit from weather modification operations. The elimination would also negatively impact the internship program with the University of North Dakota aviation and meteorology program.

Your consideration and support for a **“DO NOT PASS”** on House Bill #1166 is greatly appreciated.

Sincerely,



Trudy Ruland, Chair

Mountrail County Board of Commissioners

E-mail:

District #2 & #4 Senators

ND Senate Agriculture & Veterans Affairs Committee

Williams, McKenzie & Bowman Boards of County Commissioners

Aaron Skarsgard, Chair Mountrail County Weather Modification

Aaron Birst, Director of NDACo

JoAnne Rademacher
15101 128th Ave. NW
Foxholm, ND 58718
(701) 340-7108
windyedg@srt.com

March 16, 2023

Testimony regarding HB 1166

Dear honorable members of the Ag Committee,

I submit this testimony to you today asking you to support HB 1166. Much as I would love to be there in person, my schedule does not allow.

I was one of a group of citizens in Ward County who did our best to bring facts about this failed project to the attention of our neighbors and friends. As part of that effort, I compiled the Fact Sheet on Weather Modification for publication. I encourage you to look it over. There may be information there you are not already aware of.

The fact that Weather Modification in North Dakota is purported to be the longest running weather modification project in the world, yet cannot prove positive outcomes, only proves that its well-intentioned beginnings have been hijacked by the cartel of special interests that lined up behind it for profit and professional gains. I would ask you to take a good look at the article I've submitted to you titled ***Follow the Money***, describing the many ways companies and individuals outside of the few counties involved are profiting from this foolish expenditure of North Dakota Taxpayer money.

Please note, these documents were prepared for the Ward County weather mod ballot measure so references to the June 2020 primary election remain within. Some of the people in various positions may also have changed. The facts remain important and have not changed since the original writing.

As my interest in the project grew, I began attending Ward County Weather Modification Board meetings. In 25 years on my Township Board, attending numerous meetings at both state and local levels, I had never witnessed such blatant disregard for North Dakota state laws governing taxpayer funded organizations. The arrogance displayed and middle finger attitude toward transparency and other requirements of governance was appalling. I perceived that same attitude at every level of Weather Modification.

Thank you for your attention to my testimony and supporting documentation. I hope you will consider that 85% of Ward County voters in the 2020 Primary voted to end the Weather Modification Cloud Seeding Project there, and there are no other counties in the whole of this beautiful state begging to get into it. What does that say about where your constituents might land on the subject?

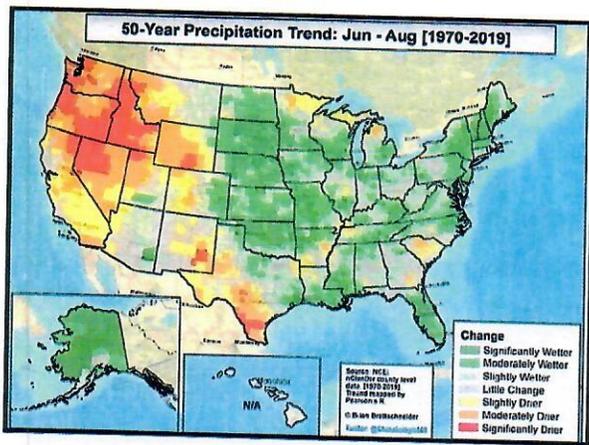
Sincerely,

JoAnne Rademacher

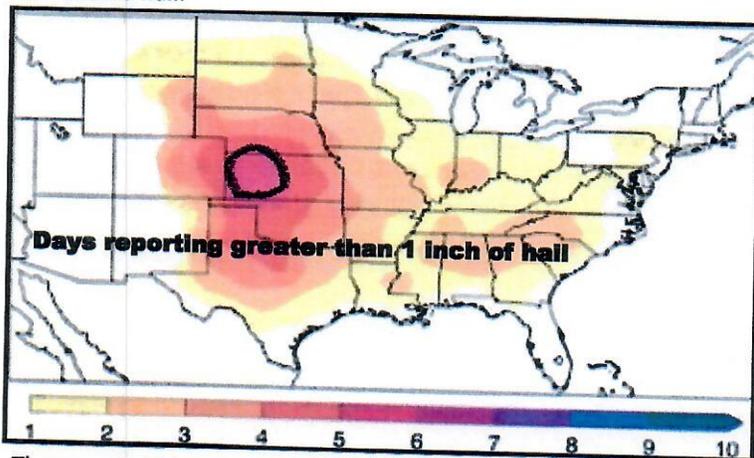
What are the FACTS about Weather Modification?

North Dakota has been attempting weather modification for over 50 years, one of the longest running weather modification programs in the world. Yet, we have no concrete proof that we've accomplished anything positive.

The following map shows June through August changes in precipitation over the last 50 years. The biggest increases in our region are in the counties North, South, and East of us. They are NOT in the Weather Modification Project.



It takes quarter size (1" or larger) hail to be considered severe and able to cause damage to an asphalt roof. As this map shows, all of northern ND, like MT and MN, is in the historically lowest risk area for severe hail.



There are 3,242 counties in the United States. Of those, only five North Dakota counties are continuing Weather Modification practices for hail suppression. ND is currently the ONLY state in the USA who conducts hail suppression even though we have much lower actual hail days than southern states due to our northern location. If it was proven to be so beneficial, wouldn't you expect more counties in other states to be doing it?

Vote NO on Weather Modification June 9th Primary Election Ballot

The June 9th **vote-by-mail** North Dakota primary will include an option for Ward County residents to shut down the Weather Modification Project.

To vote, you must request your ballot through the Ward County auditor. Once you receive your ballot and vote, you must deliver it to the County auditor, postmarked by Monday, June 8th. There will also be some drop boxes in key locations.

www.ndagainstweathermod.com
North Dakotans Against Weather Modification on Facebook

Our neighboring counties of Bottineau, McHenry and Renville have spent zero money on weather modification yet have lower crop hail insurance rates. This contradicts what the program claims is 45% reductions in Hail crop losses in weather modification areas.

Our neighboring states, SD and MT, do not allow Weather Mod planes to cross their borders for cloud seeding. If the practice was as harmless as we are led to believe, those states wouldn't have a problem with it in their airspace.

Reasons to ditch Weather Modification in Ward County

- Weather Modification is wasting taxpayer dollars. It would cost about \$2 million in the next 5 years.
- Ward County is one of only five North Dakota counties that participate in Weather Modification hail suppression. We are the only ones of 3,242 counties in the United States that participate.
- A National Resource Council study concluded "There is no scientific proof that hail can be suppressed."
- Every drop of precipitation that falls when Weather Modification is in practice contains silver iodide.
- Weather Modification in ND only benefits special interest groups providing the service, not the taxpayers who pay for the service.
- Many farmers oppose this project that is supposed to help them.
- There is no oversight on this project. Implementation is completely out of control.
- Ward County has had an average hail loss rate of 3.79% going back to 1916. That number fluctuates yearly but the long-term average has not changed in the years we've had Weather Modification for hail suppression.

Wasting Tax Dollars...

Weather modification is paid for by each of the five North Dakota counties involved. Ward county pays more than the other four. North Dakota kicks in an additional 50%. Since 2006 this has totaled \$4.275 million spent on Weather Modification in Ward County. If this measure succeeds in continuing the program for another five years, it will cost Ward County \$1,326,000. The state of North Dakota will add another \$663,000. That is a total of \$1,989,000 of your tax dollars that should be spent on park improvements, library books, potholes, traffic signs or other road improvements, law enforcement, the county extension service or property tax relief.

NRC Weather Modification Research Study

A National Resource Council Study was published in 2004. They examined all available studies and data created to that point, including those used by Ward County Weather Modification advocates. Nothing has changed since. Conclusions included the following:

“There is no scientifically credible evidence that hail can be suppressed...The science underlying weather modification is replete with uncertainties and knowledge gaps.”

Silver Iodide falling from the sky

North Dakota clouds are seeded with two different types of materials: silver iodide-artificial ice nuclei and frozen carbon dioxide (dry ice). The ND Atmospheric Resource Board claims there are no harmful effects of these chemicals falling from the sky. There are no studies available to back their claims.

Further, not one Environmental Impact Study has been filed with a State or Federal agency regarding this project.

Weather modification only benefits special interest groups providing the service not the taxpayers who pay for the service.

All of the chemicals, airplanes and equipment come from two jointly owned private companies out of Fargo.

Ward County Weather Modification is a classroom for UND aeronautics students. We already pay for UND through state taxes. Why should our Ward County taxes supplement that?

If you already carry hail insurance on your home, you are paying for it again with Weather Modification.

Farmers – pro or con

Most farmers do not see benefits of weather modification while they do see it as wasteful spending of tax dollars. Weather modification began in Ward County to increase rainfall. When that didn't work, they tried hail suppression. For many years now, while farmers have been trying to stop the program because it has failed in its purpose, it has proven almost impossible to get rid of. Powerful special interest groups have taken over its implementation and reap benefits having nothing to do with agriculture.

Government-funded studies claim over 30 to 1 economic returns from weather modification. This has not, and cannot be proven. If the returns were this high, wouldn't every county pursue these programs? The real world numbers equate to less than 1% reduction in hail. Areas undergoing weather modification do not have noticeable increased rainfall or decreased hail, according to meteorological maps and data. However, these areas do have some of the lowest rates of precipitation increases over the last 25 years.

Apples to Oranges

To compare seeding orographic clouds for enhanced snow in mountain ski areas with the convective clouds we see in North Dakota is apples to oranges. Convective clouds have a more highly complex structure and precipitation process making them less likely to respond to seeding in a positive manner.

NO Oversight, NO Transparency

Ward County farmers who are against Weather Modification have tried for years to stop this project. The Governor's office says it is under the control of the county so won't touch it. The ND Atmospheric Resource Board is so tied into the project for their own advancement, they want it to continue. The County Commissioners are divided on the issue and won't exercise oversight of the local board who's chairman blatantly ignores ND Century Code regulating activities of all public boards and commissions. The Ward County State's Attorney witnessed his disregard for ND law and did nothing about it.

The Local Weather Modification Board refuses to release details to the line items on its budget. They also don't release detailed flight information or costs. They refuse to respect the need for transparency while using public funds.

Vote NO on Weather Modification on the June 9th Primary ballot!

North Dakota State Water Commission

Governor Doug Burgum, Chairman
Doug Goehring
Michael Anderson
Katie Hemmer
Richard Johnson
Mark Owan
Matthew Pedersen
Steven Schneider
Jay Volk
Jason Zimmerman

UND John D. Odegard School of Aerospace Sciences

ARB sponsors UND pilot interns in the 5 county Cloud Seeding Project

Weather Modification Association

Members
ND Atmospheric Resource Board
Darin Langerud & Mark Schneider
Ice Crystal Engineering, Charlie Harper
Weather Modification International
Patrick Sweeney

North Dakota Atmospheric Resource Board

ARB Director Darin Langerud

ARB District Members

- I - Mr. Monte Hininger, Williston
- II - Mr. Henry "Hank" Bodmer, Kenmare
- III - Rep. David Monson, Osnabrock
- IV - vacant

V - Mr. Casey Veil, Jamestown

VI - Mr. Tom Tupa, Bismarck

VII - Mr. Thomas Burke, Bowman

Mr. John Paczkowski ND State Water Commission,
Mr. Kyle Wanner Director ND Aeronautics Commission

Dr. Angela Seligman ND Department of Environmental Quality

Weather Modification Inc

Fargo Jet Center

Ice Crystal Engineering

Patrick and James Sweeney, owners

Ward County funding goes to ND Atmospheric Resource Board who, in turn, pays Weather Modification Inc. for a turnkey operation including airplanes and chemicals

North Dakota Weather Modification Association

About 10 members including Lance Gaebe
*information difficult to find with little online presence

North American Weather Modification Council

ARB, Darin Langerud director, full member
ND WMA, Lance Gaebe, assoc. member

Clearwater Communications

Mike Dwyer, a Clearwater owner, agent for Weather Mod Inc

Lance Gaebe, acct. exec.
Managing NDWMA

What began as a small group of farmers working with one cloud seeding researcher, has morphed into a large cartel of special interests, ignoring a large group of farmers.

When and why did this equation tip upside down? Follow the money...

Vote NO on Weather Modification on your June 9th Primary Election Ballot

Ward County

Follow the Money

Spring 2020

Ward County's Weather Modification Program Makes MILLIONS for Some

Pluviculture n. rainmaking; attempts to induce rain artificially

Pluviculture, or rainmaking, began with James Pollard Epsy, the "Storm King", a U.S. meteorologist who proposed burning forests to increase rainfall. His theory was published in 1840 as *The Philosophy of Storms*. His work was the beginning of scientific weather forecasting. In subsequent years, "Rainmakers" came and went, using methods involving explosions, chemicals and eventually airplanes and silver iodide.

In the 1950's, a group of North Dakota Farmers, discouraged by periodic droughts, hired a meteorologist from South Dakota to start cloud seeding to make rain. They raised private funding and proceeded in their attempt to squeeze moisture from the clouds. Somewhere along the line, when goals in rainmaking were not reached, the project was re-imagined to include hail suppression.

At one point, 37 North Dakota counties were involved in the project. As it became apparent to most of them that the project was not cost effective, they dropped out.

The Special Interest Cronyism Ended Almost Everywhere Else

Today, Ward County is one of only five North Dakota counties who continue to use tax dollars for cloud seeding. In fact, this project is only five of 3,242 counties in the whole United States currently cloud seeding for hail suppression. As participation in the project began to shrink, funding grew. How did that happen?

In 1974, the Pilot Internship Program (PIP) was started with a \$274,000 grant from the National Science foundation to UND. It was called an "experimental project for training pilots in weather modification". In 1976 the ND Atmospheric Resource Board (ARB) signed a contract with UND to employ interns in the cloud seeding program.

This appears to be what launched the stream of money and further involvement in the program coming from a broad spectrum of sources outside Ward and the other 4 counties now known as the North Dakota Cloud Modification Project. Even though an exceedingly small group of ND counties was left in the project, the state actually controls it via the ARB.

What is the Atmospheric Resource Board?

The **ARB** is a quasi-judicial, quasi-legislative advisory and rule-making board under the supervision of the **ND State Water Commission** (NDSWC). The SWC has ten members including the governor and ag commissioner. The other eight are appointed by the governor.

The ARB is made up of seven districts covering North Dakota. ARB director is Darin Langerud. He oversees Weather Modification for the state. Ward County is in District II, Henry "Hank" Bodmer being the representative member. Now we have a total of 17 people involved in Ward County's cloud seeding

program, only one of them living in Ward County. We were unable to obtain more than a barebones, line-item budget from the ARB. How's that for transparency?

Tax Dollars Lining Pockets in Fargo

The ARB contracts with **Weather Modification Inc.**, for a turnkey cloud seeding operation. **Weather Modification Inc., Fargo Jet Center, and Ice Crystal Engineering** provide airplanes, chemicals, and pilots. All three of these entities are owned by Patrick and James Sweeney. They are a private company, so we are unable to determine if there are other investors or beneficiaries there.

Interconnected Interests and Lobbying with Tax Dollars

Another big outside interest in Ward County Weather Modification is **UND's John D. Odegard School of Aerospace Sciences**. We 100% support the students in the School of Aerospace Sciences, but do not feel obligated to spend county taxation dollars to provide a supplemental classroom for them.

The Weather Modification machine spreads from there to the professional and political realm via **Weather Modification Association (WMA), North Dakota Weather Modification Association (NDWMA), and North American Weather Modification Council (NAWMC)**.

Enter **Clearwater Communications**, an association management and public relations firm located in Bismarck. Former District 47 State Senator Michael Dwyer is a founder of Clearwater Communications and heavily involved in Weather Modification. He is the representative of Weather Modification Inc. in their business registration with the Secretary of State's office. Dwyer is also Executive Director of **ND Water Education Foundation** and editor of **ND Water Magazine**. The magazine devotes space for an article about cloud seeding in each issue and is distributed to all ND county commissioners and other officials to promote Weather Modification.

Weather Modification Association is basically an information exchange for cloud seeding. Ice Crystal Engineering, LLC, North Dakota Atmospheric Resource Board, and Weather Modification International (Patrick Sweeney) are all members of WMA.

Former N.D. Commissioner of University and School Lands, Lance Gaebe, is an account executive at Clearwater Communications. He, too, is involved in Weather Modification, managing NDWMA. Clearwater Communications, Dwyer Law Office, North Dakota Water, and Natural Resources Trust are all conveniently located in one building.

North Dakota WMA has only about 10 members and flies under the radar with little online presence. A long-standing board member on the Ward County Weather Modification Board, is a member. NDWMA receives an annual donation from the Ward County Board and goes on to lobby the state for more weather modification funding. **Our tax dollars are circling around to lobby for more tax dollars to be spent on weather modification.**

The mission of the North American Weather Modification Council (NAWMC) is to advance the proper use of weather modification technologies through education, promotion, and research. NDARB represented by Darin Langerud and NDWMA represented by Lance Gaebe are members.

Clearly, there is a great deal more money coming into this project than Ward, Mountrail, Williams, Bowman and Slope Counties' tax dollar contributions. (Actually, only a handful of townships in Slope

County are in the project.) For reasons we have been unable to determine, Ward County's contribution is higher than the others.

And what goes out? Weather Modification Inc., of course is a major financial benefactor of Ward County Weather Modification. Beyond that, there is no way to trace individuals who may have investment interests in Weather Modification. Some, of course, benefit by way of salaries and expense accounts in their capacity with Boards, Commissions, and Organizations. They all represent a cartel of special interests invested in Ward County Weather Modification in various ways and having nothing to do with bumping up crop acre profits by increasing rainfall or suppressing hail. It is about their own profits, career advancement, and status within their own professional organizations.

The Ward County Weather Modification Project has become excessive and gone beyond the control of county residents. Weather modification in Ward County has lost its purpose. Clearly, even the Ward County Commissioners could not control it, or it wouldn't be a ballot measure now.

*****March 2023 Note:**

After seeing the facts about weather modification, 85% of Ward County 2020 Primary Election voters ended the project in their county.



Testimony
House Bill 1166
Agriculture and Veterans Affairs | March 16 | 10:15 am

Chairman Luick,

My name is Barry Ramberg and I have been a Williams County Commissioner since 2009. One of my portfolios as Commissioner is Weather Modification. Thank you for accepting this written testimony in opposition of HB 1166 as I am not able to be in Bismarck today.

In November 2000, the citizens of Williams County voted to establish a Weather Modification Authority (WMA) with about 80% of 'yes' votes to 20% 'no' votes. The vote established the WMA for a 10-year period and beyond that, the Williams County Board of County Commissioners (BOCC) has the authority to renew the WMA, by resolution, for additional 5-year periods. We did this in November 2010, November 2015, and November 2020. Five citizens of Williams County serve on the County Weather Modification Authority.

Since 2000, the Williams County WMA has contracted with the ND State Water Commission's Atmospheric Resource Board (ARB) to participate in the North Dakota Cloud Modification Project (NDCMP). This is an operational program that seeds clouds for hail damage reduction and rain enhancement in western North Dakota. The program currently has four participating counties: Bowman, McKenzie, Mountrail, and Williams. Part of Slope County also participates.

The state's operational and funding support has been key to the success of the NDCMP. The state also plays a crucial part in facilitating University of North Dakota aviation and meteorology internships that have a role in the NDCMP.

If passed, as written, HB 1166 would significantly change how the NDCMP operates. The biggest changes – removing state cost share and eliminating the authority of the Board of County Commissioners to renew a WMA – are changes in search of a problem, not problems that need a solution.

Weather modification has been proven to be beneficial for both rain enhancement as well as hail suppression in western North Dakota (<https://www.swc.nd.gov/arb/ndcmp/pdfs/facts.pdf>). A recent study published in 2021 used 30 years of data to quantify the benefits for our farmers (<https://journals.ametsoc.org/view/journals/wcas/13/4/WCAS-D-21-0010.1.xml>). In general, citizens and farmers across the state benefit from the program in terms of increased agricultural productivity and historically lower insurance rates.

A DO NOT PASS for HB 1166 is respectfully encouraged.

Thank you for your consideration,

Barry Ramberg, Williams County Commissioner



North Dakota
Weather Modification Association

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

Testimony on HB 1166
Senate Agriculture Committee
March 16, 2023

Good morning, Mr. Chairman and members of the Senate Agriculture Committee. I am Dani Quissell with the North Dakota Weather Modification Association. I am here in opposition to HB 1166 as it was passed by the House.

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.

Studies done in North Dakota show benefit for North Dakotans due to weather modification. These studies have indicated a 5-10% increase in moisture and a 45% reduction in hail in areas where weather modification activities occur. While these benefits are directly felt by the residents of areas where weather modification activities occur, these benefits have a larger, statewide impact through things like increased agricultural productivity and economic development. In fact, as I believe will be discussed in later testimony, producers in Bowman County today have access to affordable crop insurance products that they did not have access to prior to starting their weather modification program. Access to these important insurance products helps individual producers and local agricultural businesses *and* the overall agricultural economy in North Dakota. Weather modification also supports a number of local businesses. I believe several have contacted you and/or submitted testimony regarding this bill.

Today, five counties have voted to conduct weather modification activities in their counties: Bowman, McKenzie, Williams, Mountrail and part of Slope. The people in those counties provide 66% of the funding for these activities. The State Water Commission, using Resources Trust Fund dollars, not general fund dollars, cost shares with these counties to support weather modification activities in their counties. This is no different than the cost share the State Water Commission provides to other projects that help develop or manage North Dakota's water resources.

In its current form, HB 1166 would prohibit the state from providing cost share for weather modification activities. While the cost share from the state is relatively small, about \$250,000/year total, it is an important part of maintaining the viability of the weather modification program. The 34% cost share provided is also a way the state can recognize and support the overall benefit the state sees due to the decrease in devastating hailstorms and increase in overall precipitation. We would ask that HB 1166 be amended to remove sections 8 and 9, which would prohibit this cost share.

HB 1166 also currently contains problematic language regarding where weather modification activities can occur. The current language could, and likely would given prevailing weather patterns, prevent flights occurring in entire townships that have voted to participate in the program and are paying for most of the program. We believe this is inherently unfair and would support an amendment to section 1 of the bill to clarify that flights can occur in 'project areas', or those areas where weather modification activities have been authorized.

The House-passed version of HB 1166 also requires public votes to reauthorize weather modification programs every five years, potentially requiring counties to hold special elections in some years. We would ask that the bill be amended to move that vote requirement to an even number of years, perhaps every 10 years, at the general election. This would be a change from the current statute, which requires reauthorization of programs to happen by a vote of the county commission.

Without these amendments, we would ask for a 'do not pass' recommendation on HB 1166.

I believe there will be further testimony that will provide additional detail on the technical aspects of weather modification and the current program as well as how HB 1166 in its current form would impact producers and landowners in western North Dakota.

Thank you for your attention this morning. I'd be happy to stand for any questions.



Board of Commissioners

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

March 14, 2023

HB 1166 (Hearing on 3/16/2023)

Dear Chair Luick and Honorable Members of the Senate Agriculture and Veterans Affairs Committee:

The Bowman County Commission is requesting a DO NOT PASS vote on HB 1166 to eliminate state funding for county weather modification programs. Removing state funding could potentially eliminate the weather modification program that in 2016, the people in Bowman County voted to continue by a 70% in favor of and 30% not in favor.

If this bill passes it could have a very negative impact on the local economy. Businesses, local elevators, machinery dealerships, and sales tax are a few examples.

The Atmospheric Resource Board administers the Pilot Internship Program through the University of North Dakota. This is a great program for training pilots, specifically through weather modification on its cloud seeding program. This program could be at risk of being discontinued if funding is eliminated at both the state and local level.

Bowman County Commission appreciates your time and consideration for a DO NOT PASS on HB 1166.

Sincerely,

Rick Braaten, Chairman
Bowman County Board of Commissioners

Tim Johnson
PO Box 296
Stanley, ND 58784
701.629.1584
tcoinc@yahoo.com

March 15, 2023

RE: Testimony in opposition to HB#1166

Dear Chair Luick and Honorable Members of the Senate Agriculture & Veterans Affairs Committee:

As a concerned citizen of Mountrail County and board member of the Mountrail County Weather Modification Authority, I am strongly urging you to vote **"NO"** on House Bill #1166 pertaining to county weather modification operations. At the very least, please consider continued State funding to Mountrail County and other participating counties and/or townships that are part of this program.

The benefits from this program include:

- **Hail Suppression.** A single hailstorm can cost millions of dollars in lost production and property damage.
- **Increased Rainfall.** This is a byproduct of the hail suppression which contributes to:
 - increased yields,
 - better quality grains, and
 - increased revenue for the county as well as the State.
- **Lower Hail Insurance Costs.**
- **University of North Dakota.** The program provides a real-time living classroom for the UND pilot program as well as meteorologists.
- **Operational efficiency.** The newest technology has allowed this program to run extremely efficiently.

Western North Dakota is the most arid region of our State and over the years we have been asked to fund flood projects throughout the State such as in Minot, Bismarck, Fargo and Grand Forks. Millions of dollars of oil and gas monies have been distributed throughout the State. Flooding is not our problem. Lack of rain and severe summer storms are our problem and we ask that you continue to help us with that. There is plenty of data that supports the legitimacy and benefits of weather modification. This is not old data, this is from new recent studies. Please do not ignore the **SCIENCE**.

There is already a process in place to recall or eliminate a program like this. Mountrail County and its people have long supported the weather modification program. We do not need a group from Ward County to dictate to us how to run our County. An additional election is expensive and **NOT** necessary to continue a program that has been successful for over 50 years.

Again your support for a **"DO NOT PASS"** on House Bill #1166 is greatly appreciated.

Sincerely,
TIM JOHNSON



GOOD MORNING CHAIRMAN LUICK AND MEMBERS OF THE SENATE
AGRICULTURE AND VETERANS AFFAIRS COMMITTEE

**FOR THE RECORD, MY NAME JAYE SANDSTROM. I AM FROM NEW
TOWN, ND, MOUNTRAIL COUNTY.**

I thank you, our forefathers and My God for the opportunity to testify in opposition to HB1166.

In my younger days I served on the ND weather Modification Board back in the 1990's and early 2000's. Prior, during and after, I served on the Mountrail County weather board.

First off, I just have to disclose the fact that I very much dislike the title of "weather modification" because the program never has nor was intended to modified the weather. Except in the minds of conspiracy theorists. How and why that name was able to stick baffles me immensely because it sends up an unwarranted red flag for some. It doesn't modify the weather any more than a farmer modifies the township by putting fertilizer or Round-up on his north 40. The program seeds thunderstorm cells that have the potential to produce hail-rain.

Though I've heard the denial from sponsors of HB1166 of the intent to destroy, it is quite well known that it was intended in fact, to destroy, by giving jurisdiction to adjacent non-participating counties which, coincidentally(not) happens to be the very county from which many of the proponents and sponsors reside. I don't believe that is the way a representative government should work. After the first go around of testimony, it was obvious of the tactics, so it was amended in a way that gave the impression to some that it was collaborated between the disagreeing parties. I for one, did not come away with that sense of cooperation much less an effort and that too leaves a disappointing impression on the people and the process. As it stands in its present form, the law change would not only give a minority an unfair upper hand, but it indiscriminately strips other citizens from an opportunity to participate in a cloud seeding program by removing them from the chance of accessing their tax money that they in fact paid in.

I am not sure what drives the proponents of HB1166 except for the hatred of somethings not understood. I do know however, that some of it stems from the thought that the program comes from the dark side commonly known as “the establishment”. This is not the case and I will elaborate in a bit. It certainly is not that the science doesn’t work because even the opposition has voiced concern that the target counties upwind are stealing all the rain and some in the target area claim we seed here and they, the downwind, get the benefit!! So goes the saying, “you can’t please most people ever!” My personal opinion, 10 percent rain enhancement is not that significant and it is somewhat difficult to document but the target effort to reduce hail is a risk management tool that I cannot for the life of me understand why anyone would resist. But here we are!! There is no credible evidence that can remotely be directed to such findings that seeding will reduce rainfall downwind and there is **no way** that anyone, from the comfort of a John Deere tractor, can determine what is happening in any thunderstorm cell without linking into a very elaborate radar system, **for starters**. On the other hand, it is fairly easy to see through the wonders of modern radar of the positive effects regarding mitigation of hail. To insist that they have seen a cloud disappear after seeding is just not factual and surprising to most, it could likely be proven now days, one way or the other, using radar. Point is, there is nothing to be hidden here. Such stories of opinion do not carry any documentable facts and therefore I would hope that people can see through such talk. After the fiascos we have lived through and experiencing now with Covid and such, I hesitate to use a specific phrase, but I do not know how else to convey my thoughts with any other words than to say it straight out, “we need to trust the science!” Rest assured that in this case you **can trust** the science **and** the people behind the science that occupies the ARB office. Cloud seeding does work for the most part but often times, nature throws a fastball when we plan for a slider and we end up missing the ball so to speak. Such is life.

Most, if not all of us, are far enough away from the beginnings of the program’s inception that I think, I’m justified in providing a very scaled down review of the North Dakota Cloud seeding project in hopes of settling the fear that it comes to us from the dark side.

One of the first attempts to seed clouds for effect of reducing hail, if not thee first, was started by World War II veterans who having survived in one piece, returned home to western North Dakota to farm. One man, returned to Bowman County and was hailed out several years in a row. Wilbur Brewer had in his travels, come

across the efforts and effects of using silver iodide for dissipating fog over airfields during the war and from that, further experimentation led to the better understanding of what happens. He accumulated contacts and further study led him to manufacturing equipment to dispense silver iodide into the feeding updrafts of the cells with surplus military airplanes. The details are many and so it is that numerous locals contributed money to continue the effort. As with all ventures man indulges into, there rose the need for more technology and organization. Radar and meteorologists were brought on board to direct operations. Numerous proactive people in the 1950's and 60's (from mostly western counties) inquired and soon the efforts outgrew itself in many ways. Just like all projects such as with water development today, there came a need for fair and efficient organization, regulation, and funding. Eventually Wilbur Brewer built a business and his efforts spread worldwide while many others here at home worked on the establishment of law that eventually made North Dakota statutes dealing with cloud seeding. It has taken many years and thousands of hours of wrangling to get things established. Keep in mind, all done by grassroots, not someone from boogymenville! Initially, oversight was under the umbrella of the ND Aeronautics Commission but was later moved to the halls with other water projects of the Water Commission in the late 80's and 1990's. (if memory hasn't failed me)

Briefly, the law stipulates that ND be divided into districts, (7 if I recall correctly) and a governor's appointee serves each district on an ARB board. County interests must establish a board by one of two ways, 1. Petition to put on county wide ballot or 2. Gather a large number of county citizen signatures(I believe 20 percent of last gubernatorial election) and thereby petition commissioners for authority to participate in a program. The law provides that a program must die by the same process it was created. Very fair, straight forward.

Once established, County authorities, with the oversight of the ARB then plan and participate in a developmental process to establish the summer months project. The law works well. It has been tested over the course of several decades. It is fair and simple. Ward county opted out couple years ago by ballot (just as it was created) giving proof that the existing statutes works. It is fair because it grants equal footing unlike the proposal in HB1166 where it makes it easier for the noisy minority to simply stomp their foot and get their demands.

Pardon me for repeating, but current law works well and has worked well for the past 60 plus years. I see absolutely no reason why it should be changed.

The program works. The science works as it should but now, we have doubters demanding changes in the long established law that places power into the hands of those that can cry the loudest.

In closing, proponents have amended HB1166 out of the idea of allowing one subdivision of government to infringe on another's jurisdiction into a bill that attempts to destroy by taking away another's equal access to tax money that they actually contributed when paying an array of different taxes. Take a look at the latest county participation and tell me they haven't paid in a crazy amount of tax into the ND coffers especially in the last 15 years and are now not entitled to any of it without an extra fight.

Numerous economic studies, over the years, back its value but the only complaint I have about the project is that too often, we can't attack some thunderstorms with adequate treatment. It's no different than fertilizing a crop that needs 100 pounds of nitrogen and you can only afford 40 pounds. We are going to have some disappointing results.

Thank you for the opportunity to testify. I leave you with this; Western North Dakota is native to several species of sage brush and cactus. What would you all rather live downwind from, a desert or an oasis? I would appreciate a **do not pass** HB 1166. Maybe consider increasing the ARB appropriation and expand the oasis would make more sense! 😊

Jaye Sandstrom

New Town, ND

jayms@restel.net

March 14, 2023

Doug Stangeland

Stangeland Farm and Ranch

Williston, ND 58801

Dear Committee Members,

I am writing you in support of this bill HB1166. The weather modification is a very controversial subject in this area, Williams County. The consensus of the people in our area that I have spoken with feel that the weather modification program has detoured any rain fall that we feel we should have had. We also feel that the sodium iodide that is sprayed over our farms isn't healthy for the people, the animals or the land itself which has cancer causing properties.

We thank you for your support in passing this bill in favor of it.

Doug Stangeland

Farmer and Rancher

Williams County



Senate Agriculture Committee - HB 1166

Pete Hanebutt, NDFB Public Policy Director

Meghan Estenson, NDFB Legislative Counsel

March 16, 2023

Chairman Luick and members of the committee,

North Dakota Farm Bureau supports HB 1166.

NDFB is a grassroots organization. Our members bring issues to their county Farm Bureaus, then to their district meetings, and finally to the NDFB Annual Meeting to be voted on by fellow Farm Bureau members. Then these issues are compiled to make up our member driven Farm Bureau Policy Book.

This past fall, the delegates voted to add policy opposing state funding for a weather modification program. – ID #2357/23

NDFB respectfully requests a “Do Pass” recommendation on HB 1166.

Fargo

1101 1st Ave. N. | PO Box 2064, Fargo, ND 58107-2064

Phone: 701-298-2200 | 1-800-367-9668

Bismarck

4900 Ottawa St. | PO Box 2793, Bismarck, ND 58502-2793

Phone: 701-224-0330 | 1-800-932-8869

My name is Tanner Vix and I raise Corn, Soybeans and Spring Wheat in SE Ward County and also SW McHenry County. I am respectfully writing you today in support of ND HB1166. Although I support this bill it does not go far enough. This bill should ban all hail suppression and end all state funding. In addition, funds should be allocated to those harmed by weather modification in the state of ND. The ND Cloud Modification Project's purpose or claim is to seed clouds for hail suppression and rain enhancement. In addition to my skepticism to the effectiveness of the program in regards to its claims, MILLIONS of dollars have been spent on a program that cannot be scientifically proven. I do not have a PHD in meteorology nor do I have a degree in anything weather related to officially disprove or challenge the weather modification project. However, with many years of my own research on the program it is my humble opinion that the program cannot be proven effective, and ironically the program may have possibly had the opposite effect to its claim. I became aware of the cloud seeding project in Ward county about 10 years ago as I noticed planes flying clouds west of our farm, and since then I have researched the program on my own in hopes of making my own conclusions in regards to the program. For nearly a decade I have watched storms generate with great power to the west, break apart, and dissipate within minutes of Weather Modification airplanes seeding these \$million dollar storms. In addition, in October of 2017 I was appointed by the Ward County Commission to fill an open position on the Ward County Weather Modification board and I was shocked, to say the least, of the lack of accountability of budget spending, the lack of concrete evidence supporting the program, and the disregard to authority in regards to parliamentary procedure and violations of open meeting laws of the board chairman. Here are some points and observations I ask you to review and consider in regards to the weather modification program:

- 1) As a producer I can insure myself for hail, but I cannot insure myself for lack of rain besides federal crop insurance. If cloud seeding does dissipate rain clouds instead of increasing rainfall like I've seen, I'd rather have the rain AND the hail. Genetics and hybrids have improved such that even if there is minimal rainfall, typically we get some sort of crop. Unfortunately, sometimes these levels are below break evens and fall right at our crop insurance guarantees. My point is, let's let God decide when it's going to rain and hail, and I will take the rain as it comes and insure myself against hail. The state should not be funding this program blue sky program.
- 2) The weather mod program in Ward County, for example, ceased operations August 1 of each year because proponents say they don't want to cause MORE rainfall during small grains harvest. Small grains make up only 25% of my farm now and small grain acres in general have been reduced on many other Ward County farms as soybean and corn acres have increased. The other 75% of my acres are corn and soybeans. The last half of July thru the first half of August is absolutely critical to the filling of soybeans and corn to increase yield. If the program indeed increases rainfall, then why aren't we continuing to seed clouds through the 15th of August when corn and soybeans need the rain? What state or county authority should be able to make the call whether my soybeans and corn GET rain, or my wheat DOESN'T get rain?
- 3) Analogy in regards to buffer zones, downwind acres and neighboring county approval: As a farmer, I have the freedom to spray herbicides on my fields and can continue doing such as long as the herbicide doesn't drift onto my neighbor's field on the other side of the township road. As a producer in both Ward and neighboring McHenry county to the east, weather mod will not and cannot PROVE to me that what they are doing in Ward county does not affect negatively what is going on downwind in McHenry county to the east. WHAT IF seeding the eastern edge of Ward county results in cloud dissipation and less rainfall in western McHenry county? Why should a McHenry county producer be affected by the governance of a non-proven program in Ward county? Neighboring county approval of this program is a must.
- 4) Observation: I don't think I have ever seen as many people so passionate about a program that cannot be proven. Just because it's been a 45-year old program doesn't warrant the continuation of a program. It also appears from doing my own investigating that pro weather mod individuals and organizations typically have a financial interest in the administering of the program. My findings on my own result in showing that there could be a major conflict of interest between the program and who administers the program. I.E.: A county weather mod board chair with a local airport authority and the UND meteorology and flight programs. UND meteorology needs something to study, flight students need to fly and small muni airports need federal funding. There are other instances in regards to fuel supply and airplane maintenance.
- 5) ARB budget: In recent years ARB budgets, millions of dollars have been line itemed in regards to grants, benefits and claims. Who is the accountability of millions of dollars with that vague of budget item? This is an insult to tax payers and their hard earned tax dollars. Pro weather mod response is this allocation is partly for "studies". I'd like to see some results of these "studies" as I have not been made aware of any recent new findings.
- 6) Weather mod says there is a 43% decrease in hail reduction. How can one possibly quantify this? No two clouds are the same, they are individually unique. And because no two clouds are the same it is impossible to replicate trials to do a factual study. Is this 43% reduction in hail of ALL storm clouds or is it a reduction of just 43% of the clouds that are seeded? Are their results even scientifically relevant?
- 7) If this program is truly effective, why are only 6 counties in ND participating? Why aren't more

states participating? Why did Kansas drop the program? Why aren't Cass, Burleigh and Grand Forks counties participating in the program as they have the highest populations with the most homes and automobiles to protect, in addition to their high value crops? If the program has such a high rate of return, it's my opinion the counties should be left to fund the program on its own. Let the state use its money elsewhere.8) If the program is truly effective why aren't insurance companies funding this program? Insurance companies have a lot of answers, and they collect a lot of data. They know where it rains and they know where it hails. 9) As mentioned earlier, I have witnessed time and time again storms generating to the west and once seeded by this project these storms have dissipated soon after. As an example, producers west of the seeded clouds receive 10" of rain and by the time it gets to my farm in SE Ward county I receive .10", or nothing. This program needs to cease immediately and this bill should extend to the elimination of the project. As a producer who depends on rainfall for financial sustainability, there should be no one more pro weather modification than myself, if it actually worked. If the program could be proven to suppress hail and increase rainfall as they claim, and if the budget dollars can be utilized efficiently, I could justify supporting this program. However, this is not true and has NOT been proven up to present. I offer support of this bill that funding should be ceased, the program eliminated and a fund set up for producers harmed by this program. I challenge you that this program is not the best use of taxpayer funds, and cannot be proven that it actually works. Respectfully, Tanner Vix 701-720-3960 tanner@vixfarms.com

Jon Wert

11191 59th St SW

New England, ND 58647

(701) 290-7909

March 15 ,2023

Chairman Luick and members of the committee,

My name is Jon Wert and I farm with my family in the New England, ND area.

I submit my testimony in favor of HB1166.

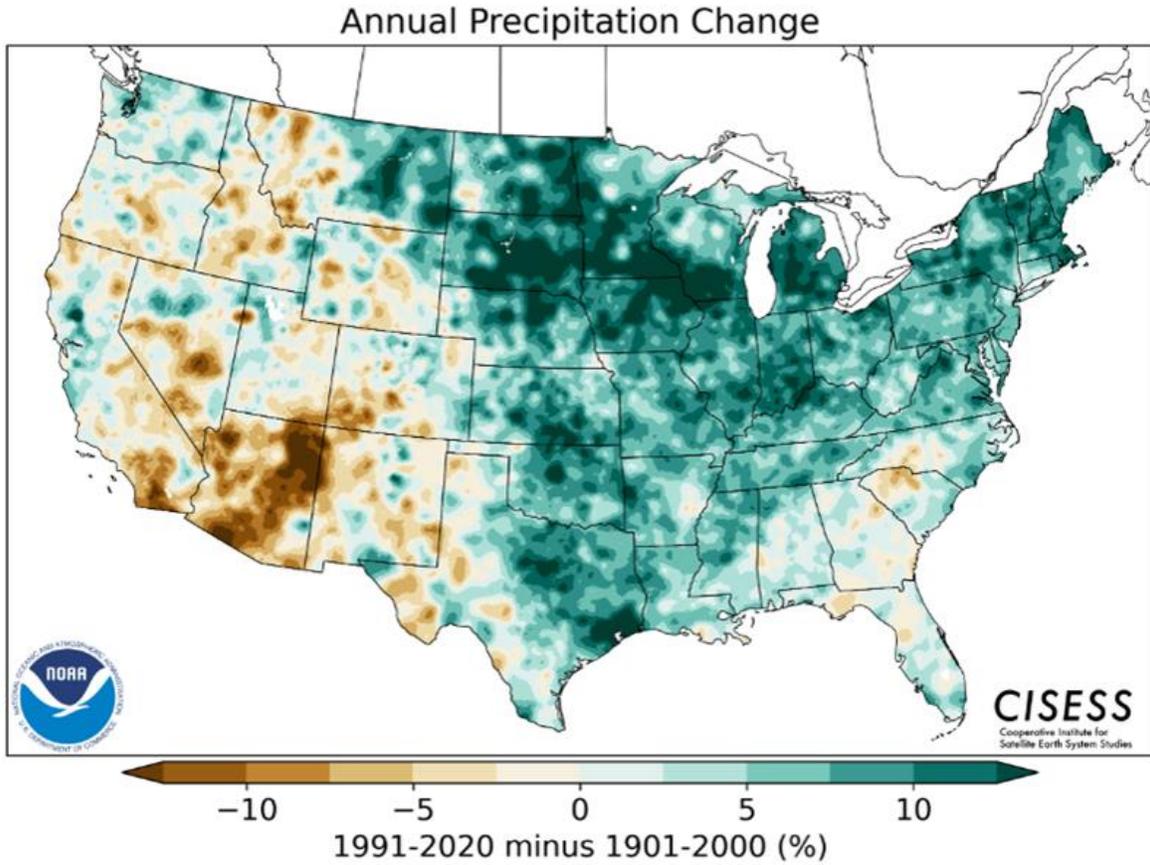
I along with my farming neighbors have been suffering from the “down wind” effects of weather modification for decades. At one point there were as many as 38 counties participating in the program. That number is now only 4 counties and a handful of townships in slope county. Our county (Hettinger) voted to withdraw from the program around 40 years ago because of the ill effects we experienced. Unfortunately, we still feel these effects as the studies show there is a down wind effect up to 90 miles from cloud seeding operations. Unfortunately, none of the studies look at data from downwind counties. However, I gathered precipitation data for all of North Dakota from the state climatologist and it showed up to a 2” loss of precip. in downwind counties compared to the average. Ironically the eastern counties of Montana have had an increase in precipitation as has the eastern 2/3 of North Dakota. The data showing this I submitted in my testimony to the House Ag Committee and can be found there. The newest study by Tuftedal, Delene, and Detwiler released in Dec, 2021 shows that Bowman county which is a participating county lost more rainfall than the upwind control county of Carter county, MT. This begs the question of why it is still practiced in a county when the study shows the program doesn’t work.

Unfortunately, even though we feel the negative effects of the program our tax dollars go to fund a program we believe is harming us.

Thank you for your consideration in this matter.

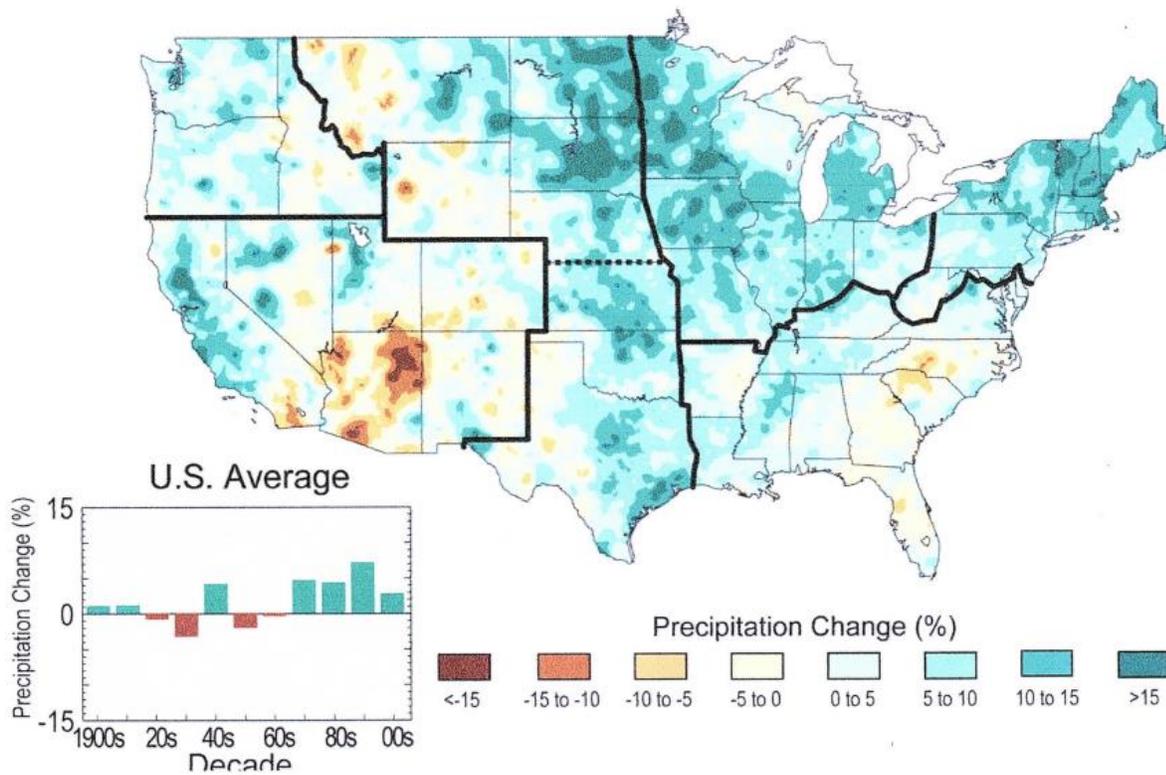
Respectfully submitted, Jon Wert

(The below precipitation maps are all that one needs to see to conclude weather modification has decreased our precipitation. The maps back up the data I compiled in my House testimony. The maps are provided by NOAA.)





Observed U.S. Precipitation Change



The colors on the map show annual total precipitation changes for 1991-2012 compared to the 1901-1960 average, and show wetter conditions in most areas. The bars on the graph show average precipitation differences by decade for 1901-2012 (relative to the 1901-1960 average). The far right bar is for 2001-2012. (Figure source: NOAA NCDC / CICS-NC).

22 yrs



Weather Mod

I have lived in the southwest corner of North Dakota for 3 years and I am appalled that we even have the weather modification. It has not proved anything except it makes farmers and ranchers outside our area suffer. We are a drought area and we have decided to mess with Mother Nature. Weather modification does nothing to help our farmers and ranchers. We need to support all of our farmers and ranchers, if the weather modification continues we will be in serious danger of loosing our farms and ranches. We need to come together and fight this so the next generation can continue on our families legacys. Thank you

Senate Ag Committee Hearing 3/16/23

Chairman Luick and members of the committee I would like to thank you for being given the opportunity to testify in support of HB 1166 today.

My name is Roger Neshem and I farm with my wife and 2 young daughters near Berthold. I helped lead the fight to end the longest continuously operated hail suppression program in the world. Our grassroots campaign won with a 9-1 margin in a 2020 vote to end weather modification in Ward County.

In 2017 I was appointed to the Ward County weather modification authority. I tried to implement changes such as suspending hail suppression operations during times of drought, spending more time seeding for rain enhancement, passing by laws and asking questions about results and how operations and decisions are conducted. We would fill buildings for meetings that use to take up a single small table at a restaurant. In 2017 after listening to concerns of area farmers the Ward County Commission voted 5-0 to suspend all operations until the drought was over, but the seeding continued to take place because the county commission had no power over the weather authority. No one has any power over them. They get to do whatever they want.

My experience with the Atmospheric Resource Board is equally as frustrating. No one ever addresses questions about, abusing buffer zones, excess flights, doing hail suppression while in a D4 drought or seeding out of the project area. When I asked ARB Chairman Tom Tupa about flights seeding eastbound storms in McHenry county, his response was the pilots are not able to see road signs to know where they are, so they sometimes seed out of the area.

Finally, there is the North Dakota weather Modification Association(NDWMA) of which I was a member of as a result of holding my position on the ward county weather authority board. I however never received the communications all other members on all the other boards received because I was asking the tough questions. This association gets its members from the participating counties weather boards who take money from their mill levy that is to only be used for “weather modification activities” as stated in the statute, they then donate it to the NDWMA which in turn lobbies for more funding for the program. The NDWMA is represented by Clearwater Communications, co-owned by Senator Mike Dwyer, head of ND Water Users, editor of ND Water magazine, and as of 2019 Mr. Dwyer himself was also the registered agent for the NDWMA. You have a state senator who votes to fund the program, then in turn charges taxpayers to lobby for the program, thru his communications firm, which he then charges the NDWMA, his own client, for a sponsored article, highlighting the program, in each issue of the state funded ND Water magazine where he also holds sole editorial discretion. This is the way the program gets around using “taxpayer” money to lobby for the program itself.

ND Farm Bureau and the North Dakota Grain Growers both have passed resolutions saying they are against weather modification. These two groups alone have over 40,000 members in the state while the NDWMA at my last count had 9 total members in 2019. Of the 9 4 are county weather authorities using tax dollars to pay membership(\$2500), 1 is the director of the program, 1 is owner of Weather Mod inc the contractor who does the seeding and another is the Williams County Water Resource District(more taxpayer funds!)

Going thru century code in ND every single law passed has favored weather modification and waived the state of any liability. They even state all water or lack thereof from weather modification is to be treated the same as water from natural processes.

Proponents of the program talk about how cheap it is and its high returns. The latest state review of the program claims it costs 40 cents per planted acre and in return it adds \$3.00 for hail suppression, \$9.19 per acre for a 5% rainfall increase and \$18.15 for a 10% rainfall increase. This leads to claims of a 35-53 to 1 return! Over 40% of crop losses in the state are due to drought while less than 12% are due to hail. Inexplicably weather authorities choose hail suppression 80% of the time.

In 2016 the only other hail suppression program in the USA located in Kansas was ended after 12 of its 14 program members voted it out or had it terminated by county commissions. Today there are only 4 counties left conducting hail suppression in the US out of over 3000. All 4 of those counties are in drought plagued ND. ND at one time had 38 counties conducting weather modification however due to poor results that number has dwindled to 4. No county has ever left the weather modification program and returned later.

A new study was published by Tuftedal and others in the May 2022 Atmospheric Research Journal. It attempted to measure the effect of hail suppression on rainfall in ND. It compared precipitation rates from pre weather modification in the state to the 42-year modified period from 1977-2018. The paper showed a small precipitation increase in McKenzie County when compared to 3 control areas to its west and no change with another control area to its NW.

Bowman county showed no change in precipitation on average but did show a 5% precipitation loss compared to one of the control groups.

When the study looked at Ward County, they found a 3-4% decrease in precipitation when compared with its control group. Precipitation losses in August when only hail suppression was conducted were 11% and another 3% loss in July. This was the average over 42 years! I put numbers to this precipitation decrease to quantify it in the exact same terms and methodology employed by the latest state review of the program.

If the program causes a decrease in precipitation of 4% as the latest and most extensive study to date shows you have a net loss of \$7.75 per acre for Ward County. The math is as follows:

$4/5$ is equal to 80% of \$9.19 per acre. This gives us a negative \$7.35 per acre in lost rainfall.

We will assume that hail suppression did occur even though there is zero scientifically credible evidence hail can be suppressed so that adds back another \$3.00 per acre.

Finally, we add the cost of 40 cents per acre to give us a net negative return per acre in Ward County of \$4.75.

Since there is no scientifically credible evidence hail can be suppressed most recently validated by Rivera in 2020. Therefore we can add back that \$3.00 worth of hail suppression and it cost Ward County \$7.75 per acre to have a hail suppression program each year for 44 years.

We can take the \$7.75 per acre times the acres of farmland in Ward County which as of 2020 was pegged at 1,153,475 acres. This gives us a cost per year to Ward County farmers of over \$8.9

million dollars. If we want to take the analysis further over the last 44 years, the program has cost Ward County farmers over \$391 million dollars!

Ward County sits on the far eastern end of over 140 miles of cloud seeding. No storm system can hit ward county from the west or southwest without being seeded even though we overwhelmingly voted out of the program. The seeding buffer zone still extends into Ward County 10 miles where planes still seed. The states own website claims weather modification affects can be measured 90-150 miles down wind! We don't need a 2-township buffer we need a 3-county buffer zone which would back the program right up to the Montana border which, just like SD, has made it illegal to cloud seed. If this program was not harmful why have neighboring states banned it?

The current weather modification program should be discontinued in its entirety. There is no avenue for recourse for people who have felt the negative economic impacts of weather modification. People do not have the resources to carry the high burden of proof needed to find cloud seeders. IF the state were ever found liable for precipitation losses the numbers would be well into the 100s of millions of dollars. The state has to this point not cut any funding to the program nor have they sought to limit its affects. IF a vote were held statewide today to see if the state should have a weather modification program it would be resoundingly voted down. People do not want the government messing with the weather. Non seeding counties deserve to have say over what goes on in neighboring counties that effect our way of life as men and women of agriculture. There are no fences or walls to contain weather modification. A pilot flipping a switch and turning off its burners does not mark an end to the effects of weather modification. They go on for over 100 miles according to the NDCMP. This is grounds for ending the program

alone since their permit does not cover outside the participating counties. The affects travel far outside permitted counties. No one with the power to alter seeding programs will change them so we must thru a statute that gives surrounding counties the ability to protect their interests and property rights against these all-powerful weather authorities. House Bill 1166 gives us some of that ability we desperately need. The time has come for the counties who do not want weather modification to be allowed to protect their skies from weather modification. Please vote yes on House Bill 1166

-All studies used as propoganda to support the program in ND show in some instances either no precip increases and some show decreases. However one must find the studies cited in order to learn this since the NDCMP does not post the negative side effects. (Wise 2005, Johnson 1985, Dennis 1975)

-World Meterological Organization (2017): Still uncertainty in the quantitative effects of cloud seeding to enhance precipitation and even more uncertainty to suppress hail.

Thank you for letting me speak today.

Hello, my name is Damon Mellmer. I am a farmer in Adams County, North Dakota. I am writing this testimony in favor of HB1166.

Before I get into the bill, I am going to write about the reasons I am against weather modification, especially in Bowman County. For the previous years, I have continued to watch Bowman County seed storms consistently all summer long. I do not care what the ridiculous, fairytale studies the weather modification board has posted on their website says, I watch storm after storm disappear. I do not have to go onto the radar and see when or if the planes go up. I simply look into the sky and see the storm splitting and disappearing. I know the planes are seeding, but I check the radar just to be sure. Imagine that, every time I see the storm splitting, the planes are flying. The amount of anger and frustration I see from not only myself, but my fellow farming/ranching neighbors is absolutely sickening. How can we be allowing the government to control our weather and take away our storms? We sit here completely helpless. There is nothing we can do about it. I personally invite each of you to make the drive to Reeder, ND this summer before a storm. We can stand in my driveway and observe the effects of weather modification. Only then do I truly believe you will listen to me. I will even provide you with a home-cooked meal. This may come off as a joke. It is absolutely not. I mean this with 100% sincerity. Please come see for yourselves.

Next, I would like you to look at the hail claims in Bowman and Adams County for crop insurance the past 4 years, especially 3 & 4 years ago. If hail suppression is their claim, how is it possible I lost 4,500 acres of cropland 3 years ago? Not only were we in an awful drought (with some blame easily and definitively put on the weather modification program taking away moisture through cloud seeding), I then have to deal with losing thousands of acres of cropland. So not only do they kill rain clouds, they obviously can't suppress hail either. Why are we wasting millions of dollars for this absolute pathetic program? By the way, I farm 6 miles downwind from the Bowman County line. I am 6 miles from where they stop seeding. That doesn't stop them though. I have proof through the radar as well as my own eyes that have seeded 5 miles into Adams County.

They say they have all this data proving the positive effects of weather mod. Seriously? Who can believe this hoax? What are they comparing it to? They have seeded storms for the last 50 years. Without having data of no weather modification in Bowman County the last 50 years, this simply is a lie. Why do we not stop weather modification for the next 10 years? We then can have some actual data to compare weather mod's positive and negative effects. I assure you that weather modification would be no more. That is why this will never happen. Speaking of weather modification being no more, let's ask this million dollar question. Out of all of the counties in ND that have voted out weather mod, how come it has NEVER been voted back in? Common sense tells us the correct answer. The cons outweigh the pros. It simply is not effective. It causes more harm than good. If it was as good and amazing as they claim to be, these counties would have voted it back in by now. Also, why is someone trying to control our

weather? If I am supposed to get hail, I am going to get hail. If I am supposed to be in a drought, let me be in a drought. LEAVE the weather alone. Do not try to play "God" and control something you have no business trying to control. We are sick of being controlled.

I would also like to point out the fact that silver iodide is being dispersed into these clouds. I want to ask the question of what are the effects of silver iodide on humans? On animals? On land? Do we know? Has this been studied? If so, I cannot find it. We do not know what harm these chemicals can cause. That alone should be illegal.

Now let's get into this bill. First of all, they have admitted that weather modification affects weather downwind. Downwind of Bowman County is Adams County. So what Bowman County does effects my weather, and I have absolutely zero say in this. WE SHOULD BE ABLE TO VOTE ON SOMETHING THAT DIRECTLY AFFECTS OUR LIVELIHOODS. This is absolutely criminal that we (the people of Adam's County) cannot vote on continuing or stopping weather mod since it affects our weather, our families, our jobs, and our livelihoods. This needs to be fixed ASAP. We should have a voice and vote on this topic. Since we cannot vote on this, why should Bowman County get to use ND taxpayer money to continue weather modification when no one else can vote for this? This is completely wrong. They can use their own money to fund this joke of a program. They can waste their own money.

I like the fact that this bill would make them stop spraying on the last township line. This will ensure that they do not come into my county and continue to spray (which they have down countless times before.) This is just common sense.

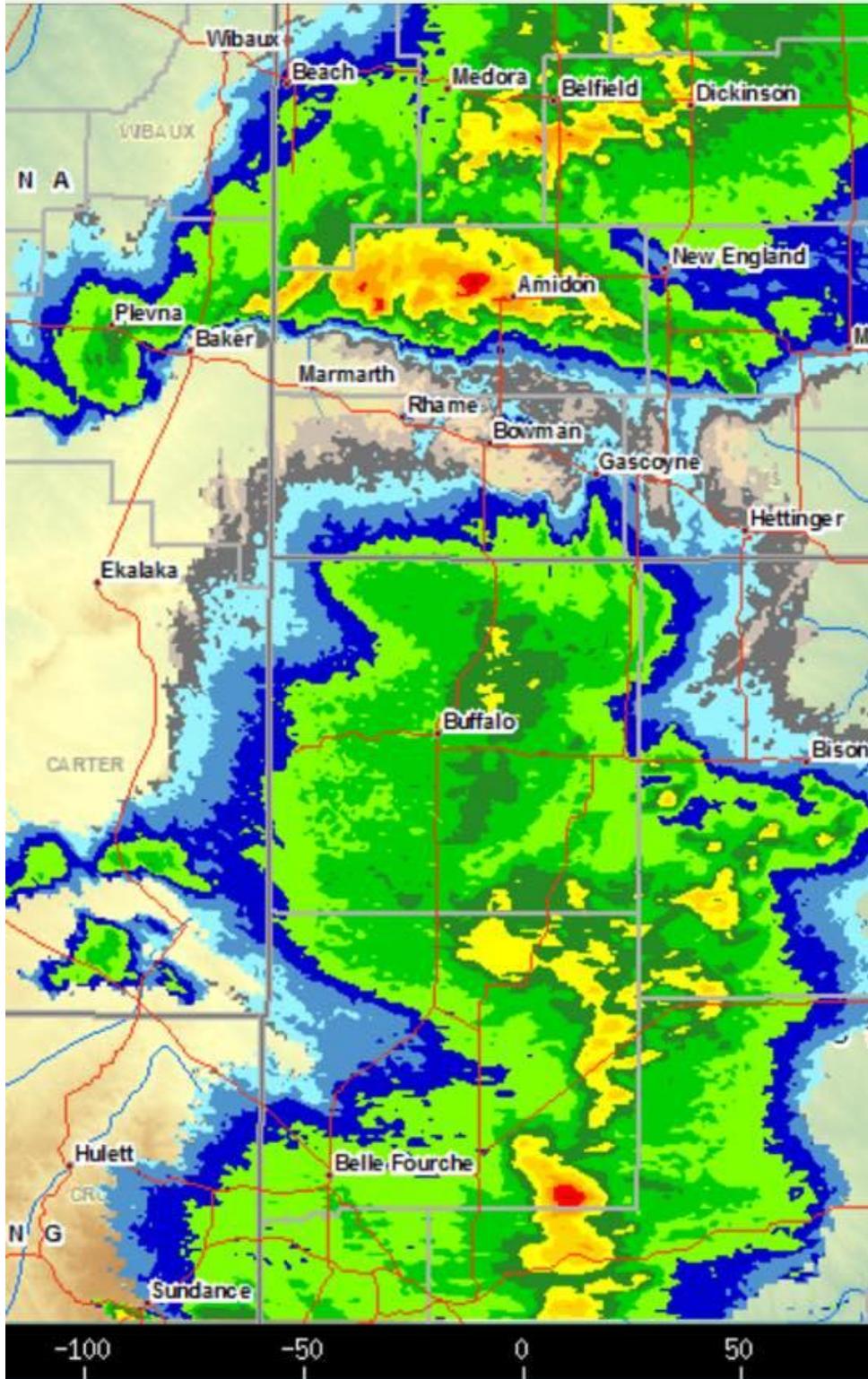
Lastly, I am going to finish with some proof from a Facebook post I made in on July 2, 2017. (See attached photo).

This is a picture of the storm that came across our area today. Before the storm hit Marmarth, the storm was seeded repeatedly north and south. The effects of this are pretty obvious as the storm completely split around us. If you doubt it, watch the radar yourself. The drought we are in is terrible and dangerous, not only for the agriculturalists, but for everyone in the area. Something needs to change.



9:34 PM
swc.nd.gov

35%



PM

Loop Length (hours):

Good Morning
Members of the committee

My name is Jamie Kouba from down in Regent in Hettinger county adjacent from Bowman and Slope counties where the NDCMP is involved.

I am here in full support of this bill asking for a "do pass"

I would like to start with this program at one point had 37 participating counties out of the 53 in the state of which there are essentially 4 left. In just the past few years Burke and Ward have exited the program. 4 remaining of 53 that have to ability to be in the program should be an obvious sign that it doesn't work

What makes this bill important?

Propaganda from the NDCMP website states:

"Evidence suggests a slight increase in precipitation downwind (up to 90 miles in extreme cases) that diminishes with increasing distance from the target area."

Has there been studies that suggests this? The answer is a solid no, the effects are known and not studied for a reason. I'm not new to this and in 2017 the Governor asked for a study to be done after being grilled in Mott by area farmers and ranchers, but it was expected to be in the millions so the cost prohibited it and the NDCMP was able to hide behind the old bogus theory.

So it continues after all of these years this program hides behind the safety net of being called a "project" and with a program so old I assume none of us here today have never even experienced life without cloud seeding going on in this state.

And we still do not have defined answers?

So does that mean this program is a liability to the state? Maybe?

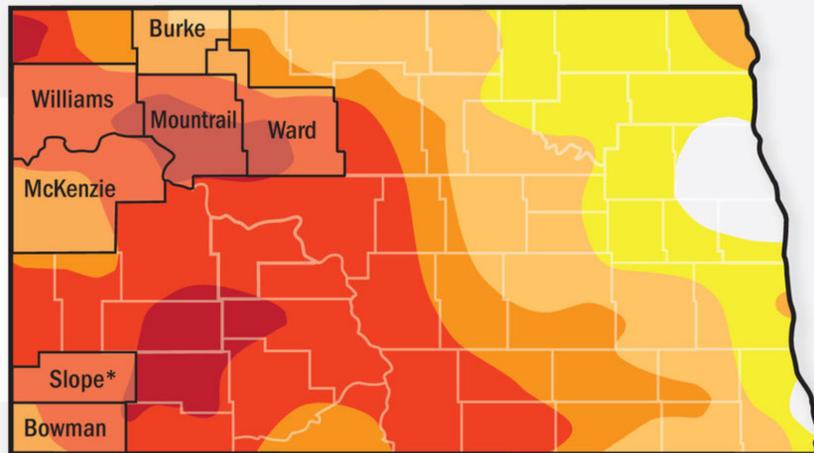
Let's dive in and take a look at this, we are all very familiar with the drought of 2017.

North Dakota's cloud seeding counties

Counties participating in cloud seeding include:
Bowman, Burke, McKenzie, Mountrail, Ward, Williams and parts of Slope.

Drought conditions

- Abnormally dry
- Moderate drought
- Severe drought
- Extreme drought
- Exceptional drought

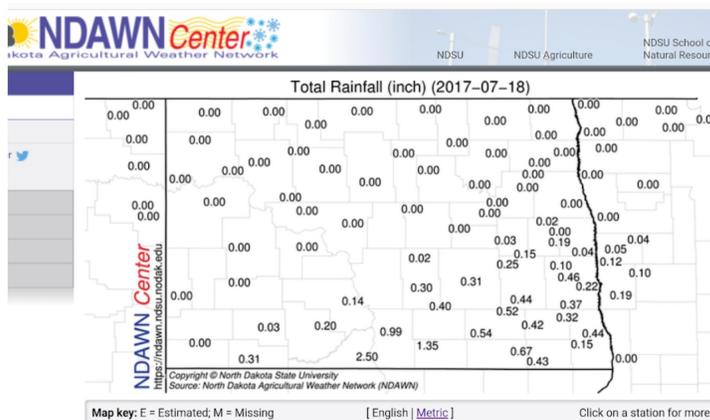


*Only partial areas of Slope County are in the cloud seeding program

(Credit, Bismarck Tribune)

Let's take a look at all of that increased downwind precip, is there a coincidence that approximately 60 miles into cloud seeding is D4 exceptional drought? Doesn't add up does it?

I would like to compare seeded vs. Non seeded on a special day. Late the night before weather had begun to move into Bowman county, the wind came up before the planes could leave the runway, and this is a map of the rain that fell



Take note (Prior to midnight there was 0.00" reported in Bowman and 0.80" reported in Hettinger)

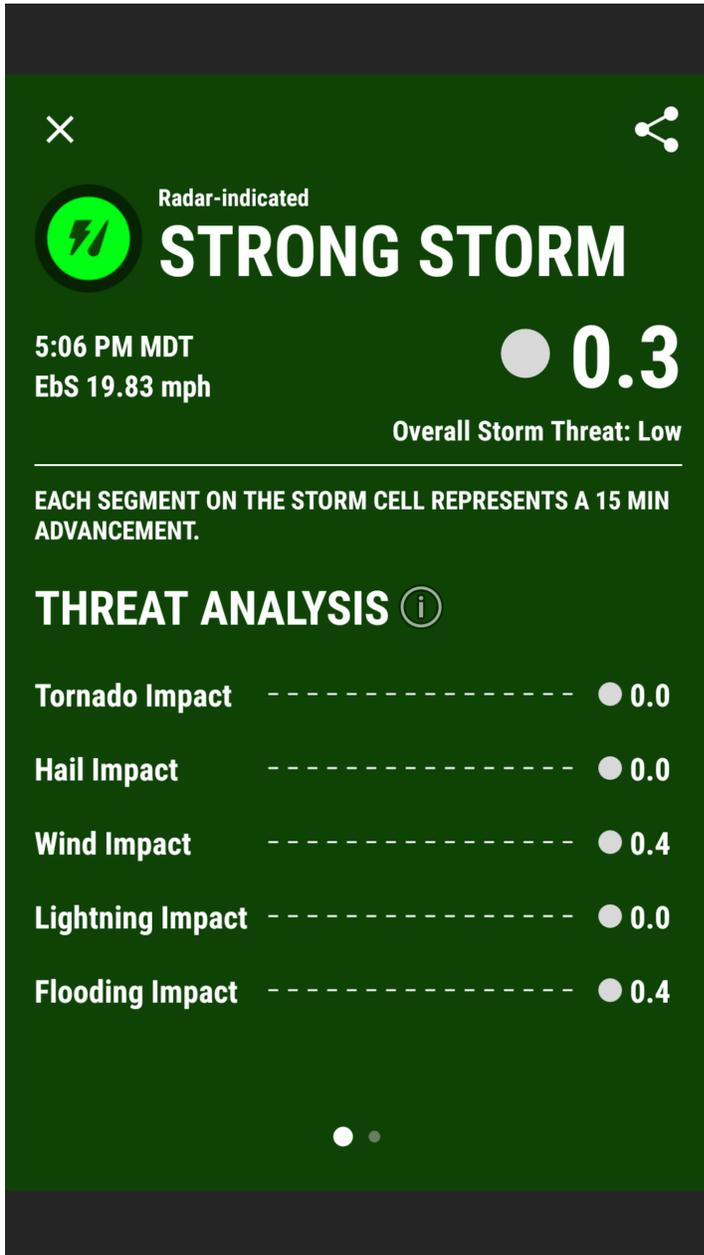
I have attached a video of the radar as the rain passed through that night.

https://youtu.be/CcvEBC3_SaQ

Take special note that this time Bowman was not able to rob Peter (rain that fell from Bowman clear into Minnesota) to water Paul, meaning Bowman.

Also there was no reports of severe weather.

Later on that day while Doug Burgum is meeting with farmers and ranchers about the drought and meanwhile the Ward county commissioners vote to ask the Weather Board in their area to suspend flights for the rest of the season the send a plane down to Bowman's assistance to help fight a harmless storm, not just my opinion but here is the stats



So, let's take a look at the radar, we know it can rain, it did earlier that morning.
<https://youtu.be/5iRcM4SuYRE>

Seeded and hey, it vanished and no one afterwards got so much as a sprinkle.

Now that you have seen two storms separated by only hours did you see increased rainfall as a result of seeding? We never do either.

Why is the consensus always 180 degrees opposite? Follow the money.

So before I end this I want to mention you will hear things of praise for this program as how it helps out Patrick Sweeny and Weather modification Inc, and the hand full of internships for meteorology and pilot students from UND but I want to make sure you are fully aware of the livelihood of the thousands of farmers and ranchers and everyone tied to agriculture in one form another not only in our state but in other adjacent areas.

I would also like to mention this is not about taking a counties rights away, this is about having natural weather downwind of seeding areas.

I ask you put the weather in back in Gods hands

Thank you for your time today.

And with that if you have any questions for me I would be happy to help.

Jamie Kouba

701-209-0155

swfarmservice@gmail.com



**North Dakota Grain Growers Association
Testimony in Support of
HB 1166
Senate Agriculture and Veterans Affairs
Committee
March 16, 2023**

Chairman Luick, members of the Senate Agriculture and Veterans Affairs Committee, for the record my name is Ed Kessel, Executive Director of the North Dakota Grain Growers Association (NDGGA). I own and operate a family farm in the Belfield, North Dakota area; I am also President of the North Dakota Grain Growers Association. I appear in both capacities in support of HB 1166.

The NDGGA membership has adopted the following resolution: “NDGGA does not support weather modification in North Dakota.” That said, if there are counties in North Dakota that support weather modification then the provisions of HB 1166 seem to be a reasonable approach to the operations and funding of weather modification efforts in said counties. These provisions contained in HB 1166 include the legislative changes found in Sections 1 of the bill which discuss the requirements for a county weather modification authority to cease operations, the creation and/or extension of a weather modification authority and the funding of a weather modification authority.

Therefore the North Dakota Grain Growers Association is in support of HB 1166 and would respectfully request that the Senate Agriculture and Veterans Affairs Committee give HB 1166 a Do Pass recommendation and would ask that the full Senate concur.

"You Raise; We Represent"

Phone: 701-282-9361 | Fax: 701-404-5187 | 1002 Main Ave W. #3 West Fargo, N.D. 58078

Using taxpayer money to fund cloud seeding is wasteful spending in my opinion. There is no consensus on whether it is an effective severe weather suppressant nor rain creation process. North Dakota should not support use of taxpayer funds to facilitate what at best mitigates minimal severe weather and at worst is a high cost program that disrupts local weather patterns bringing excess rain to certain areas while suppressing rain in other areas. I can't see how the ND taxpayer has a net return with these programs.

Kevin Buxa

President

Halo Commodity Company, LLC.

Fargo, ND



North Dakota House of Representatives

STATE CAPITOL
600 EAST BOULEVARD
BISMARCK, ND 58505-0360



Representative Matthew Ruby

District 40
1400 Golden Valley Lane
Minot, ND 58703-1192

C: 701-509-8149

mruby@ndlegis.gov

COMMITTEES:

Human Services
Energy and Natural Resources

16MAR23

Good morning Chairman Luick, Vice Chairman Myrdal and committee,

My name is Matt Ruby and I represent district 40 in the House of Representatives. Before you is HB 1166 which deals with weather modification programs in the state and addresses the issue of their effects on the down wind areas that have decline participation. The bill initially gave input to surrounding counties before the state could apply their cost share to the county. The opposition had a lot of issue with that suggestion, but didn't offer a solution. So it became clear that since there isn't a fair way for a county to prevent another county from receiving state dollars to fund this program, even though this program affects many more than just those residents in the host county, the only clear solution is to remove the state cost share. I would request an amendment to make it clear that the pilot intern program and meteorology intern program administered through the Atmospheric Resource Board may be funded by the state. The county can still fund their own program without any input from a surrounding county. But since this does affect more than just that host county, the state shouldn't be funding this. The other two things this does is provide for a two-township setback for when seeding must cease and requires that the county commission must put a measure on the ballot every 5 years. On the Water Commission website its stated that the effects of cloud seeding are seen up to 100 miles down wind so even if a township or county on the border of a county that doesn't participate, doesn't have seeding taking place over their area they will see the effects. As far as the ballot measure, the current practice is that a county commission votes to reauthorize the program. This would put it to the vote of the people. I would suggest a change to make that an even number, I would prefer 4 years and the Weather Modification Association would prefer 6 years but we both prefer the even number and that it would be the general election. The reason for this vote is because the county commission doesn't always know what their constituents want. In the case of Ward county the commissioners were back and forth and decided it should go to the vote of the people. The program was killed with 85% percent of the vote. So you have very passionate people on either side talking in your ear and sometimes its just who talks the most or last or the loudest. By putting it on the ballot it gives everyone a chance to have input on the outcome. I am happy to answer any questions you might have.

Testimony
Engrossed House Bill 1166 – Department of Water Resources
Senate Agriculture and Veterans Affairs Committee
Senator Larry Luick, Chair
March 16, 2023

Chairman Luick, and members of the Senate Agriculture and Veterans Affairs Committee – I am Darin Langerud, Director of the Atmospheric Resource Division of the Department of Water Resources. I am here today to testify in neutral position on Engrossed HB 1166, to provide facts on the scientific benefits of cloud seeding and provide technical expertise on the implications of this bill on weather modification activities within the state.

Engrossed HB 1166 would create and enact a new section under chapter 61-04.1, relating to requirements to cease cloud seeding, amend and reenact several additional sections and subsections of code related to the extension of county weather modification authorities, and prohibit the use of state funding for weather modification operations. These requirements would pose significant impediments to counties choosing to participate in the program by shifting all operating costs to those counties and imposing operational restrictions within the boundaries of the permitted project areas.

Section 1 of HB 1166 would require seeding to cease on a storm exiting the county operations area when the radar reflectivity core of that storm crosses the boundary of a township that borders a township of an adjacent county that does not have an active weather modification program. Longstanding operational guidelines already address the intent of this change, as pilots are instructed to cease seeding storms before they reach the downwind operations boundary. Other variables, such as storm speed, orientation of the radar core, and angular approach to the county boundary are also factors to be considered when making the decision to cease seeding a storm. Employing the township boundary approach in Section 1 would limit operational decision making and seeding effectiveness.

Sections 8 and 9 are related to the State's ability to cost-share with counties participating in the program. The State has long provided cost-share for weather modification operations, with counties paying 66 percent of project costs and the State providing 34 percent. State cost-share for water-related projects is common, and cloud seeding for hail suppression and rain enhancement has been part of that equation for decades. Last year, the State contributed \$250,000 in cost-share toward the project.

Sections 8 and 9 also call into question whether funding for UND student intern pilot training would be allowed. The Atmospheric Resource Board has an MOU with the University of North Dakota for pilot instruction and training, which has placed more than 400 intern pilots on the North Dakota Cloud Modification Project (NDCMP) since 1975. This unique program has launched hundreds of careers in the aviation industry by providing workforce training through classroom instruction and flight experience. Likewise, the Board employs meteorologists and meteorologist interns each summer, with 70 interns trained through the program since 1996. We would support an amendment that would exempt the intern pilots and meteorologists from the state funding ban.

Several independent, scientific evaluations have shown cloud seeding operations in North Dakota increase precipitation in the general range of 5 to 10 percent and reduce crop damage from hail by up to 45 percent. Further, studies show that cloud seeding in upwind operations areas does not reduce downwind precipitation, but enhances it, as seeding effects don't arbitrarily end at county boundaries. This effect is shown to diminish with time and distance downwind.

A recent study by Bangsund and Hodur (2019) at NDSU examined the benefits to the eight most common crops grown in North Dakota. Using long-term estimates of 5-10 percent increases in rainfall and a 45 percent reduction in crop-hail losses, they calculated a direct benefit to agricultural production of \$28.1-\$48.8 million annually.

Estimated state tax revenues gained from the sale of increased crop production ranged from \$576,000 to \$999,000; more than double the amount of state cost-share funds spent on the program. Benefit to cost ratios ranged from 31-53 to 1.

Employing different datasets and methodology, a 2021 study by Michigan State University scientists evaluated the NDCMP and found very similar results. Using 30 (1989-2018) years of insurance data from the USDA Risk Management Agency (RMA) and crop yield data from the National Agricultural Statistics Service (NASS), the study sought to determine if there was any difference in wheat and barley yields and insurance loss ratios for NDCMP counties versus surrounding counties not involved in the program. Their analysis found annual wheat yields in the NDCMP counties were higher by 3.87 bushels per harvested acre, and statistically significant at the 95% confidence level. Moreover, crop insurance loss ratios for wheat were lower for the NDCMP counties. The authors concluded, “Our evaluation indicates that the cloud seeding program had significant positive effects on crop yields and improved loss ratios. The examination offers new evidence about the effectiveness of hail suppression through cloud seeding.” A further analysis of economic benefits yielded a benefit to cost ratio of more than 36 to 1.

According to the World Meteorological Organization, cloud seeding programs are currently operating in more than 50 nations worldwide. Programs are established in ten U.S. western states with new programs or expansions occurring in California, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming. Airborne cloud seeding in North Dakota began out of necessity, when farmers in Bowman County couldn’t afford the high price of hail insurance due to several years of severe hail losses. In the early 1960s, three entrepreneurs took it upon themselves to equip and fly their own aircraft to protect their crops from hail. Today, the company they established (Weather Modification International, Fargo) is the global leader in the application of cloud seeding technologies, having completed operations and research programs in dozens of countries around the world. North Dakota has been a pioneer in the field,

providing advancements to the science and technology of cloud seeding through its operations, research, and development.

Thank you for the opportunity to testify before you today. I would be happy to address any questions you may have.

23.0099.02002
Title.

Prepared by the Legislative Council staff for
Representative M. Ruby
March 15, 2023

PROPOSED AMENDMENTS TO ENGROSSED HOUSE BILL NO. 1166

Page 4, line 2, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 22, replace "countywide" with "general"

Page 4, line 25, overstrike "five-year" and insert immediately thereafter "four-year"

Page 4, line 27, replace "five-year" with "four-year"

Page 4, line 28, overstrike "authorizing" and insert immediately thereafter "to place the question on the ballot at the next general election to authorize"

Page 4, line 30, after the period insert "All weather modification operations may continue to operate and all weather modification authority board members may continue to serve under this chapter until the the next regular meeting of the board of county commissioners immediately following the general election in which the question of extension is voted upon."

Page 5, line 1, overstrike "passing"

Page 5, line 1, remove "a"

Page 5, line 1, overstrike "resolution" and insert immediately thereafter "an affirmative vote under subsection 1"

Page 5, line 3, overstrike "five-year" and insert immediately thereafter "four-year"

Page 6, line 20, after "**prohibited**" insert "**- Exception**"

Page 6, after line 30, insert:

"3. Notwithstanding any provision in this chapter, a pilot intern program and a meteorology intern program administered through the atmospheric resource board may receive state funds for the operation and continuation of the programs.

Re-number accordingly