WEATHER MODIFICATION AND PUBLIC OPINION IN SOUTH DAKOTA, PRELIMINARY FINDINGS 1974

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The South Dakota Weather Modification Program (SDWMP) has become institutionalized in the State of South Dakota. The Program, begun in 1972, has since expanded to include about 60% of the land area of the state at a cost of approximately $1 million a year. The SDWMP has become a standard item in the Governor's budget for presentation to the South Dakota legislature each year.*

Public acceptance of cloud seeding in South Dakota has been carefully monitored since before the Program's inception. Social surveys have been conducted in 20 South Dakota counties, with interviews conducted in early 1972 (T_1), fall 1972 (T_2), fall 1973 (T_3) and fall 1974 (T_4). Data reported in this paper are primarily from T_4. Findings should be considered as preliminary and tentative, pending further data analysis and the final report.**

Variables for which data are reported in this paper include respondent: (1) attitudes toward weather modification, (2) beliefs that it is effective in enhancing precipitation and suppressing hail, (3) perception of the weather during 1974 (4) knowledge about the SDWMP, (5) opinion on wintertime cloud seeding, (6) preferred decision making and funding for the Program, and (7) evaluation of the SDWMP.

The findings reported here are preliminary frequency distributions resulting from the September 1974 round of interviewing. Interpretations presented should be viewed as tentative pending more comprehensive data analysis. This caution is particularly necessary because during 1974 an organized opposition became active in South Dakota. The newly-formed organization, Citizens Against Cloud Seeding, involves members from around the state, some of whom are located in counties included in the sample. Opposition activity has included circulation of petitions, one statewide public information meeting, advertisements in newspapers, and contact with county commissioners and state legislators. The organization's goal is to stop the SDWMP on a state-wide rather than on a county-wide basis. They

*For a description of the SDWMP, cf. Williams (1973).
**Two technical reports on this study have been issued to date: Farhar and Krane (1973), Farhar and Mewes (1974).

have proposed a statewide referendum on the issue. Opponents of the Program feel that cloud seeding efforts are responsible for the drought conditions the area experienced during 1974. Agriculturists in several areas have experienced economic difficulty resulting from weather and market conditions.

As shown in Table 1, favorability to the concept of using weather modification was expressed by 74% of the T_4 sample. Table 2 shows that 40% of the sample still agreed that "cloud seeding probably violates God's plans for man and the weather". Table 3 shows that 51% of the sample rejected the idea that man should find other ways of dealing with the weather than trying to change it. This finding suggests that weather modification has at least a modicum of importance and salience in about half the sample. In fact, 91% of respondents indicated they were interested in the South Dakota Weather Modification Program (see Table 4). Virtually all respondents were interested in receiving a copy of the survey's findings.

Sixty-four percent of the sample believed cloud seeding can actually increase precipitation, while 53% believed it can actually suppress hail (see Table 5). The proportion believing cloud seeding effective in enhancing rainfall has dropped by 10% over the last two operational seasons, while the proportion believing it effective for suppressing hail has increased 14% during the same period.

These findings are probably the result of the unusually dry weather experienced in South Dakota during the 1974 operational season. As shown in Table 6, 84% of respondents thought the weather was unusual during 1974. Of these, 82% indicated that the weather was unusually dry. Of those who thought the weather was unusual during the 1974 operational season, 9% said they thought cloud seeding either caused the weather anomaly or failed to prevent it. It is clear, then, that most of the sample did <u>not</u> blame the dry weather on cloud seeding.

Half the sample thought their local area experienced less hail than usual during the 1974 operational season. About 10% thought they had experienced more hail than usual while 30% thought they had about the same amount as usual. With regard to rain enhancement, 92% of the sample said their area had less rainfall than usual (see Table 7).

By September 1974, 88% of the sample had heard of the South Dakota Weather Modification Program (see Table 8). This is the highest proportion in the study to date. Whether levels of awareness have objectively increased it is impossible to say without further data analysis.

Included in the T_4 interview schedule were two new items pertaining to public opinion on whether cloud seeding should be continued during the winter in South Dakota. The majority of respondents did <u>not</u> think cloud seeding should be continued during the winter months to increase snowfall (see Table 9). About 15% indicated that they thought it should. Most often mentioned reason for opposing wintertime seeding was that there would be no benefit in doing it. Many respondents felt that moisture in snow runs off the frozen ground rather than soaking in. Also mentioned frequently was that snow causes difficulty in transportation and added expense in highway snow removal.

Table 10 shows that 58% of respondents favored the SDWMP, 29% were neutral, and 13% opposed it. About 31% thought their best friends favored the Program, while 37% didn't know their friends' opinions about it. About 38% thought most people in their area favored the Program, while 37% didn't know how most people felt. Thirty percent of the sample felt the SDWMP, since its inception, had been of economic benefit to them, while 5% felt they had been harmed, and 45% said it made no difference to them. Another fifth said they didn't know how it had affected them.

As in the past surveys, the majority of respondents felt that decisions regarding the implementation of cloud seeding should be made at the local level. Opinion about how the SDWMP should be funded provides support for the combination of state and local tax monies, although about 10% felt local agriculturists should pay, while an equal proprotion thought the federal government should fund the Program.

Eleven percent of the sample mentioned that their opinion about the Program had become less favorable over the past year, while 7% indicated their opinion had changed in a positive direction.

Preliminary results, in summary, show the following: favorable attitudes toward the technology continue to be the majority perspective after three seasons of operations. However, a large minority still espouse the religio-natural orientation. Belief in the effectiveness of cloud seeding for suppressing hail has increased while the proportion believing it effective for rain enhancement, the majority, has fallen off 10%. Respondents perceived the weather during the summer of 1974 to be unusually dry; however, most respondents did not associate the drought with the SDWMP.

The majority of the sample indicated they favored the SDWMP, while about a third thought they had derived economic benefit from the Program since its inception in 1972.

Public opinion is not favorable to the implementation of wintertime cloud seeding in South Dakota.

While overall survey results continued to show favorability to the SDWMP over time, during 1974 an actively organized opposition to the Program first occurred. Some of the opposition activity is located in parts of the state not included in this study. Some if it, however is located in counties which are included. The finding of overall favorability is descriptive of the twenty counties as a whole, and is not necessarily descriptive of any one county within the sample. Therefore, majority opinion in one county could well be opposed to the Program, while the overall picture remained one of favorability.

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Table 1

South Dakota state and county officials should feel free to use such things as cloud seeding if it might help farmers avoid crop losses:

	September 1974 %	N
Strongly agree	12	(36)
Agree	62	(181)
Unsure	8	(25)
Disagree	15	(43)
Strongly disagree	3	(8)
	100%	(293)

Table 2

Cloud seeding probably violates God's plans for man and weather:

	September 1974 %	N
Strongly agree	7.5	(22)
Agree	32	(95)
Unsure	11	(32)
Disagree	42	(122)
Strongly disagree	7.5	(22)
	100%	(293)

Table 3

Instead of trying to change the weather, man should find other ways of dealing with it -- for example, improved weather forecasting, cheaper crop insurance:

	September 1974 %	N
Strongly agree	4	(12)
Agree	25	(73)
Unsure	19	(54)
Disagree	49	(143)
Strongly disagree	3	(10)
	100%	(292)
Missing data		(1)
Total		(293)

Table 4

How interested are you in the South Dakota Weather Modificaton Program; that is, how interested are you in what is going on, what its effects are, and so forth?

	September 1974 %	N
Very interested	20	(59)
Interested	42	(122)
Slightly interested	29	(85)
Not at all interested	9	(27)
	100%	(293)

Table 5

Do you think cloud seeding works -- that is, do you think it can actually increase moisture?

	September 1974 %	N
Yes	51	(149)
I think so, but I'm not sure	13	(38)
Don't know	19	(55)
Perhaps, but I doubt it	5	(14)
No	12	(37)
	100%	(293)

Do you think cloud seeding can actually suppress hail?

	September 1974 %	N
Yes	40	(116)
I think so, but I'm not sure	13	(38)
Don't know	29	(84)
Perhaps, but I doubt it	4	(13)
No	14	(42)
	100%	(293)

Table 6

Was the weather around here -- say, within 10 miles -- unusual in any way this summer?

September 1974

	%	N
Yes	84	(247)
Don't know	2	(6)
No	14	(40)
	100%	(293)

Table 7

Compared to the last 5 years, do you think this county had more hail this summer, less hail, or about the same as the previous 5 years?

September 1974

	%	N
Less hail	54	(159)
About the same	30	(87)
More hail	10	(29)
Don't know	6	(17)
	100%	(292)
Missing data		(1)
Total		(293)

How about rainfall? Do you think this county had more rain this summer, less rain, or about the same as the previous 5 years?

September 1974

	%	N
Less rain	92	(269)
About the same	5	(15)
More rain	2	(6)
Don't know	1	(1)
	100%	(291)
Missing data		(2)
Total		(293)

Table 8

Have you ever heard of the Weather Modification Program of the State of South Dakota?

	September 1974	
	%	N
Yes	88	(258)
Don't know	1	(3)
No	11	(32)
	100%	(293)

Table 9

Do you think cloud seeding should be continued during the winter months to increase snowfall?

	September 1974	
	%	N
Yes	15	(43)
Don't know	21	(62)
No	64	(188)
	100%	(293)

Table 9 (Con't)

Why do you feel that way? (First reason mentioned)

Yes	N	No	N
Snow cover helps agriculture	(9)	Against all weather modification	(11)
Snow sinks in -- increases ground water	(18)	Snow causes difficulty in transportation and the expense of highway snow removal	(42)
Snow increases run-off, surface water	(7)	Don't like shoveling show	(21)
Snow adds beneficial chemicals to soil	(2)	Difficulty for livestock	(6)
Snow makes jobs for people	(1)	No benefit can be derived from more snow	(61)
Snow has desirable insulating effects	(1)	Increased costs, fuel	(2)
Other/don't know	(5)	Fear of extreme weather	(2)
		Snow interferes with occupation	(5)
		Other/don't know	(38)
N	(43)	N	(188)

Table 10

Based on your understanding of the South Dakota Weather Modification Program, how do you feel about the Program?

September 1974

	%	N
Strongly favor	17	(50)
Favor	41	(120)
Neutral, undecided	12	(35)
Oppose	8	(23)
Strongly oppose	5	(16)
Insufficient knowledge to judge	17	(49)
	100%	(293)

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