THE PUBLIC VIEW TOWARD WEATHER MODIFICATION IN ILLINOIS:

A SOCIAL ASSESSMENT

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SUMMARY

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3. Although general attitudes toward weather modification in the three states (prior to any seeding program) are comparable, a major difference is that Illinois residents are not as likely to anticipate personal economic benefit from effective cloud seeding programs.
4. Expressions of support for cloud seeding technology:
   a. The majority favor experimentation with cloud seeding to find out if it works (63%). Only one out of five express disagreement with the concept of experimentation.
   b. Nearly three-fourths agree that Illinois state agencies should use such things as cloud seeding if it could help farmers avoid crop losses.
   c. Two-thirds agree that it is appropriate to try to directly control extreme weather conditions by using the mose effectual techniques known.
5. Expressions of concern or doubt about cloud seeding technology:
   a. As many as half agree with the statement, " . . . cloud seeding is very likely to upset the balance of nature." However, when asked specifically if cloud seeding might

damage the ecology of an area, the proportion drops to less than one-third.

b. Nearly one-half (48%) agree that cloud seeding probably violates God's plans for man and the weather.

c. The sample is equally divided on the statement, "Man should take the weather as it comes . . ." (45% agree; 44% disagree). A little more than half agree that alternatives such as cheaper insurance and improved weather forecasting might be preferable to modifying the weather.

6. Belief in the efficacy of cloud seeding:

a. A little more than half (54%) believe that cloud seeding can be effective for increasing moisture; only 15% indicate doubt,

b. With respect to hail suppression the clear majority feel uncertain about the effectiveness of the technology; only one out of five believe it can be efficacious.

7. Anticipated benefit or harm from a local program:

a. Few persons feel they would be economically harmed from effective programs for hail suppression (2%), for increasing rainfall (8%), or for decreasing rainfall (15%).

b. Clearly, more persons anticipate personal benefit from a program which could effectively reduce hailfall (60%) than from programs to manage rainfall, either for increasing moisture (47%) or for decreasing moisture (33%).

8. Relatively few respondents are aware of weather modification efforts in general. However, as many as 43% claim to have heard of programs

which attempt to increase rainfall and 29% claim to be aware of hurricane modification efforts.

9. Only one respondent (of 274) is aware of Illinois' comprehensive weather modification law.

10. The majority are uncertain or doubt that inadvertent weather modification is changing the weather, but as many as 37% feel that this may be the case. Nevertheless, an overwhelming majority feel that unintended cloud seeding should be better understood before undertaking planned modification efforts.

11. Awareness of the Illinois State Water Survey:

    a. A little more than half of the sample claim they were aware of the ISWS prior to this survey.

    b. Among those claiming knowledge of the agency's existence, one-third say the ISWS is responsible for water resources and water control; 18% say the agency collects weather data; 11% feel the agency engages in research related to weather and water.

    c. Only one out of ten know that the ISWS is conducting a hail research project.

    d. About 60% indicate confidence in the agency to conduct experimental cloud seeding, while one-third are uncertain.

    e. Although one-fourth either do not want such a program or don't care whether it is for hail suppression or rainfall management, the most frequently expressed preference is for the program to include both types of experimental cloud seeding.

12. Decision making regarding local cloud seeding programs:

    a. Nearly half indicate that local input should be involved in the decision about a local cloud seeding experiment (32% say local residents, 17% say agriculturists). However, a large proportion feel that the state government or the ISWS should decide (28%).

    b. With respect to who will decide, only one-fifth feel that local input will be considered while more feel that the state (32%) or the ISWS (11%) will make the decision.

    c. The preferred procedure in Illinois for decision-making regarding an operational program is seen as "a referendum submitted to the vote of all citizens in the proposed affected area."

13. Funding regarding local cloud seeding programs:

    a. The most frequent response for both preferred and predicted funding of a local experiment is the "state government." However, more persons feel that local residents will have to contribute (26%) than feel that they should pay for such a program (12%).

    b. The most satisfactory arrangements for financing of an operational program are thought to be "federal taxes" or "voluntary subscription of farmers." This would seem to indicate that for the present most non-farm respondents would not want support for an operational program to come from a local or state tax base.

14. Evaluation (favorableness toward) of proposed local cloud seeding:
    a. More than half (54%) are in favor of a cloud seeding experiment for central Illinois while only one-third favor the notion of an operational program at this time. A large number are undecided about both types of programs, while at least one-fifth indicate opposition.
    b. For those favoring the experiment, most feel that it is desirable to determine if cloud seeding is effective for reducing hail damage. Among those opposing the experiment, the major reason given is fear that negative effects on the weather or nature will occur.
    c. Twenty-nine percent anticipate they might take supportive action for an experimental program, while only 8% feel that they would do anything to oppose an experiment.
    d. If the issue of an experimental program came to a vote, 50% feel they would vote in favor compared to 23% who feel they would vote against the program.
15. Factors contributing to evaluation of a proposed local program:
    a. The best predictors of favorableness toward local cloud seeding experimentation are general attitudes toward weather, weather modification, and science.
    b. Anticipated economic benefit or harm from an effective program predicts moderately well acceptance of an experimental program.
    c. Belief that cloud seeding is efficacious also predicts evaluation of a proposed local program. That is, persons

believing that cloud seeding can be effective for reducing hail and increasing moisture are likely to favor a local experiment. .

d. Knowledge of weather modification activities elsewhere in the country shows weak correlation with favorableness toward a local program.

16. Socio-demographic characteristics and their relationship to evaluation of weather modification:

a. Younger persons are more likely than older persons to be favorable toward the technology and its application; more likely to belief that cloud seeding can be effective; and less likely to feel that adverse side effects might occur from cloud seeding.

b. Males tend to be more favorably inclined than females toward weather modification. They are more knowledgeable of cloud seeding activities, and less skeptical about potentially disruptive effects resulting from the technology.

c. Higher educated respondents are generally more favorable toward weather modification, are more knowledgeable, have greater belief that the technology can produce desired results, and are in favor of local experimentation.

d. Respondents in low income families tend to be opposed to the technology in general and to proposed local programs. Additionally, they do not anticipate personal benefit from the application of cloud seeding, and they are likely to feel that cloud seeding may have adverse side effects.

e. Rural residents are more likely than small town or city residents to perceive economic benefit form effective hail suppression and rainfall management programs. Also, rural residents are the most likely to favor a local experiment at this time, but they are the least likely to favor direct application of the technology (an operational program).

INTRODUCTION AND METHODOLOGY

The Illinois State Water Survey (ISWS) has been involved for several years in studying the prospects for weather modification in Illinois. Under sponsorship from the National Science Foundation, the ISWS is engaged in developing a design for a hail suppression experiment in Illinois. Extensive atmospheric studies are being pursued to ascertain the "feasibility" of rain management as well as hail suppression. Additionally, a series of "desirability studies" have been undertaken to assess the social, economic, legal and ecological implications for future weather modification in Illinois. As part of the social impacts assessment, a survey of public awareness and attitudes toward weather modification was undertaken in the Spring of 1974. This study, designated as the Weather Attitudes Sampling Project (WASP) by the ISWS, is the subject of this report.

The citizen sample used in this study is a random sample selected from telephone directories in a five county area of Central Illinois.* Residents in the following counties were sampled: DeWitt (entire county); Piatt (northern one-half); Macon (northern one-third); Logan (southeast corner); and Champaign (small section on the western edge surrounding Mahomet). A total of 274 interviews were completed by telephone during a two week period in April of 1974. Since there was a total of approximately 15,600 residential listings in the directories, this is a 1.8% sample for the designated area of Central Illinois.

* It should be noted that the sample is biased in favor of telephone subscribers with published listings. As in any sample drawn from telephone directories, it is not possible to estimate the amount of bias introduced. Illinois Bell has provided an estimate of 94% of all households in this region of Illinois which have telephones.

The interview schedule was composed primarily of items used in previous and ongoing field research on public response to weather modification. Most of the items had been pre-tested in face-to-face and telephone interviews in New York, Montana, Utah, Florida, Colorado, and South Dakota. Items which pertained only to the WASP were pre-tested in Illinois.

Interview schedule items were designed to elicit information on the following key variables:

1) Attitudes toward weather, weather modification, and science
2) Belief in the efficacy of cloud seeding technology
3) Awareness of weather modification activity
4) Awareness of the Illinois State Water Survey
5) Evaluation of proposed local programs
6) Preferred decision-making and funding procedures
7) Socio-demographic characteristics

This survey is the first systematic attempt to measure public awareness and attitudes toward weather modification in the central portion of the United States -- a climate regime considerably different from the plains and mountain states where most research on social aspects of weather modification has been undertaken. Additionally, it is important to reiterate that the survey was conducted prior to the start of local cloud seeding. Thus, Illinois residents have not experienced a weather modification program to date.

FINDINGS

A. Attitudes Toward Science, Weather, and Weather Modification

Fifteen items were included in the interview schedule in order to assess local attitudes toward science, weather, and weather modification. These items do not pertain directly to the possibility of a local cloud seeding program, but rather attempt to measure general feelings of Illinois residents about planned programs to alter the weather. The fifteen items can be grouped into several categories. Three of the attitude items should be considered pro-weather modification -- agreement with these statements is indicative of a favorable feeling toward cloud seeding programs. Several other items are anti-weather modification — agreement is an expression of opposition or doubt about the feasibility and/or outcome of cloud seeding. Another three items measure attitudes toward science and scientists, while the remaining items deal with the issues of control, decision making, and funding with respect to weather modification programs. Table 1 presents the findings for these attitude items.

Responses on the three pro-weather modification items suggest considerable support for cloud seeding technology, both on an experimental basis and on an operational basis. A clear majority of respondents agree that experimentation is desirable (Item 1). As many as 63% agree with the statement while only 20% disagree; the remaining 17% are undecided. . Item 5 suggests that "Illinois State Agencies should feel free to use such things as cloud seeding if it might help farmers avoid crop losses." An even larger proportion of the sample agree with this statement (71%). A third item expressing a pro-weather modification sentiment suggests

that control of extreme weather conditions by use of the most effective techniques known is quite appropriate (Item 12). As on the previous two items, about two-thirds of the sample are in agreement while only one-fifth disagree.

The next five attitude items to be discussed are expressions of negative feelings or doubts about the application of cloud seeding technology. While 37% disagree that cloud seeding may be against the will of the Supreme Being, almost half agree (Item 3). Concern about potentially disruptive effects which cloud seeding may have on the balance of nature are evident from Item 6. Although a sizable proportion of the sample are uncertain about cloud seeding disrupting nature's harmony (29%), far more agree with the possibility (50%) than disagree (21%). Two items suggest that it may be best for man to leave the weather alone, or to deal with weather-caused problems in ways other than through cloud seeding. The proportions agreeing and disagreeing "That man should take the weather as it comes..." are equal (45% and 44%, Item 9). With respect to finding other ways of dealing with the weather (Item 13), about half agree that such things as improved weather forecasting and cheaper insurance may be preferable to weather modification, while one-third disagree. Are attempts to modify the weather a worthy expenditure of tax money? Almost two-thirds agree that other problems should be solved before spending more tax money on weather modification (Item 10), suggesting that for the majority of those interviewed, weather-caused problems may not be a salient concern.

Three items indicate that strong positive sentiments toward science and scientists are held by the majority of the sample. Four out of five respondents agree that "Man should use scientific knowledge

to deal with problems whenever and wherever possible" (Item 4), and three-fourths feel that experimentation in general is beneficial to society (Item 8). Clearly, scientists are viewed as concerned citizens, for only one out of eight respondents agree that scientists may have more interest in their experiments than they do for general social conditions (Table 5).

The remaining four attitude items pertain to control and funding of cloud seeding programs. When presented with a choice between state control and federal control for experimental programs, far more persons agree that individual states should be in control (61%) than disagree (23%), (Item 2). The sample is about evenly divided on the statement which suggests that scientists should be in complete control of weather modification programs (Item 11). The fact that as many as 46% of the sample agree that scientists should control such activities is further evidence of favorable attitudes toward scientists in general. However, even though most seem to prefer state control to federal control as well as feel that scientists should have a major role, it is evident from Item 14 that Illinois residents do not want local citizens left out of decision-making procedures. As many as six out of ten respondents indicate that local residents should have a voice in decisions about cloud seeding programs, regardless of the funding source.

One final item considers financing of weather modification. The proportions disagreeing and agreeing that <u>all</u> citizens should be taxed to pay for cloud seeding programs are about the same (44% and 42%). It may well be that many persons are not comfortable with the thought of personally paying something toward weather modification without having experienced benefits from a local program. Data bearing

on perceived benefit from weather modification are discussed in the evaluation section of this report (Section E).

A factor analysis was computed on these fifteen attitude items to determine if some of the items might be combined into scales.* Since the purpose of the analysis was heuristic, results are not presented here. Three of the factors derived had as the highest loading items statements which are intuitively and theoretically consistent. On this basis the high loading items on a factor were combined to form a single scale. Three such scales were formed.**

The first scale is designated as the Weather Modification Scale (WXM) and is composed of Items 1, 5, and 12 which we previously discussed as pro-weather modification items. The higher an individual's score on this scale, the more favorably inclined he is toward cloud seeding technology.

Scale 2 is labelled Religio-Natural Orientation (RN2) and consists of Items 3, 6, and 9. The interpretation of this scale is that man's relationship to the weather is one of balance and harmony, and that deliberate attempts to change the weather will upset this "religio-natural" balance. The higher the scale score for a respondent, the stronger is his orientation to this view of the world.

Scale 3 is comprised of two items which measure favorability to the scientific approach for solving problems. This scale is designated as the Scientific Orientation Scale (SO1). High scores on this scale are indicative of a strong scientific orientation.

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* The analysis used the minimum residual method of factor extraction and Kaiser's varimax method of factor rotation.

** For a detailed description of the scales see Appendix A.

The relationship between these attitude scales and other important variables in the study is reported in Section G.

B. Belief in the Efficacy of Cloud Seeding

It has been hypothesized that belief in the efficacy of cloud seeding is associated with favorable evaluation of a specific cloud seeding program (Haas and Krane, 1973; Farhar and Mewes, 1974). That is, persons who believe cloud seeding can produce more moisture and suppress hail should be favorable toward the operation of a program in their geographical area. Respondents were asked if they believed cloud seeding could increase moisture and if cloud seeding could suppress hail (Table 2).

With respect to augmenting precipitation, a little more than half of the sample believe that cloud seeding may be an effective tool (39% answered "ves". and another 15% answered "I think so"). About one-third are uncertain and the remaining 15% doubt that the technology can work. Belief that cloud seeding is effective for reducing damaging hail is considerably less among the respondents. The majority (62%) claim to be uncertain, while one-fifth say "no" and another one-fifth say "yes".

The fact that such a large proportion of the sample feel cloud seeding can work for rain augmentation is surprising. Except for a few very brief efforts, no cloud seeding has been conducted in Central Illinois --either on an experimental or on an operational basis.* Lacking experience with a successful program of precipitation augmentation, it may be that belief in efficacy derives from knowledge of cloud seeding programs elsewhere in the country. (See Section C, following).

* This is substantiated by the respondents themselves, as only 4% claimed awareness of any past cloud seeding efforts in Illinois.

Belief that cloud seeding is effective for modifying the weather may also be associated with ecological concerns. Respondents were asked, "Do you think that a cloud seeding program might damage the ecology of an area -- that it might prove harmful to plant or animal life, soil or water in any way?" From Table 3 it is apparent that more respondents feel uncertain about potential side effects than feel that such occurrences may or may not develop. Four out of ten are uncertain compared to 28% who feel that cloud seeding might be detrimental to the ecology, and 31% who feel it would not be detrimental. Among those indicating fear of potential side effects, the majority mentioned things such as general adverse weather change, upsetting the balance of nature, the effect of chemicals on plants or animals, and the possibility of excessive moisture or flooding.

C. Awareness of Weather Modification Activity

Another major hypothesis in research on the sociological aspects of weather modification is that knowledgeability and awareness of cloud seeding in general, as well as knowledge about the details of a local program, contribute to favorable program evaluation (Farhar, 1974; Krane and Haas, 1974). Since no cloud seeding programs are currently in operation in Illinois, it is not possible to measure respondent levels of knowledge about a local program. However, we did ask respondents if they had heard of weather modification programs operating elsewhere. Table 4 presents the findings.

Respondents are most aware of weather modification for increasing rainfall, and for hurricane wind suppression. As many as 43% claim to have some knowledge of rainfall enhancement programs and 29% claim to be aware of research efforts on hurricanes, Very few persons indicate having

knowledge of other types of weather modification programs (hail, 13%; fog, 10%; tornado, 15%). In general, the level of knowledge about planned weather modification is relatively low.

Respondents were also asked about inadvertent weather modification (Table 5). More than one-third answered "yes" or "I think so" to the question, "Do you think that unintended (or accidental) cloud seeding is bringing about changes in the weather?" Slightly less than one-third answered "no" or "I doubt it", while the remaining one-third were uncertain. All respondents were then asked if "...accidental weather modification should be better understood before anyone tries to modify the weather intentionally?" An overwhelming majority (87%) say "yes", even though only a minority (37%) had previously indicated that they felt accidental seeding may be affecting the weather.

Although Illinois has a comprehensive weather modification law which was enacted in 1973, only one respondent was aware of the law (Table 6). This is not surprising in light of the recency of the legislation and in the absence of weather modification activity in the state which would bring visibility to the law.

D. Awareness of the Illinois State Hater Survey

The Illinois State Water Survey (ISWS) is a state agency heavily engaged in research related to water resources and weather within the state of Illinois. If an experimental hail suppression program is proposed and conducted in Illinois, it will be under the auspices of the ISWS. Therefore, a number of items were incorporated in the interview schedule to assess public awareness of the agency, of its purpose and activities related to weather phenomena, and to determine the degree of confidence which citizens have in the ISWS to conduct experimental weather modification.

Respondents were asked, "Have you ever heard of the Illinois State Water Survey?" Only 22% claimed to be unaware of the agency's existence while 78% claimed they had heard of the ISWS (Table 7). However, since all respondents had previously received a letter from the ISWS stating that they would be contacted for an interview, we further asked those who claimed awareness to specify whether they knew of the agency prior to this survey, or only as a result of this s.urvey. With this stipulation there were still 52%, or about half of the total sample, who claimed they knew of the organization prior to being contacted.

Knowledgeable respondents were then asked if they know what the ISWS does -- what its purpose is (Table 7). As many as one-fourth had no knowledge of the organization's activities. However, one-third said that the ISWS is in some way responsible for water resources and water control within the state; 18% said the agency collected weather data; and 11% said the agency was engaged in research pertaining to weather, water or the environment.

Very few respondents were aware of the hail research project being operated by the ISWS. Only twenty-nine (11%) claimed knowledge of the project (Table 7).

Table 8 shows the results when respondents were asked if they had confidence that the ISWS could conduct a well designed hail suppression experiment. Six out of ten respondents said "yes", one-third were uncertain, and less than one-tenth said "no". With respect to an experimental program for rainfall management, the results are nearly identical. Table 8 also gives the findings when respondents were asked to state a preference between the two types of experimental programs. The most frequent response was that the program should include both (35%), followed

by preference for rainfall management (23%), and then by preference for hail suppression (18%). A sizable proportion indicated they would not want either type of program, or that they just didn't care (24%).

In general it appears that the ISWS is reasonably well known in the area. Although few persons know specifically of the hail research project, a very sizable number are aware of the agency and of the kind of activities it supports. Additionally, more than half of the sample have confidence in the capability of the agency to conduct an experimental weather modification program.

E. Evaluation of Cloud Seeding Programs

A primary objective of this study is to determine the degree of acceptance or favorableness toward a proposed experimental weather modification program. Additionally, to account for the factors which contribute to citizen evaluation is of considerable importance. The interview schedule contained a number of items to assess citizen evaluation of local cloud seeding prior to the inception of a program in Illinois.

It is hypothesized that perceived personal benefit from a local cloud seeding program is a determinant of favorableness toward the program. Therefore, respondents were asked, "If a cloud seeding program operating in this area were able to suppress hail, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?" Well over half (60%) indicate that an effective hail suppression program would benefit them; almost none (2%) anticipate harm; the remainder feel that such a program would make no difference to them (Table 9). The same question was repeated with respect to an increase in rainfall, and again, with respect to a decrease in rainfall. Clearly, Illinois residents do not perceive as much benefit from rainfall management programs as they do from a hail suppression program (Table 9). Slightly higher proportions

anticipate harm from rainfall management (8% for increase; 15% for decrease). More significant is the shift away from perceived benefit to the position that such programs would make no difference to them. Compared to 60% who anticipate benefit from hail suppression, 47% anticipate benefit from a program which could increase rainfall, and only 33% anticipate benefit from a program which could reduce rainfall.

The principal evaluation item is reported in Table 10. Respondents were asked to use one of five categories (from strongly oppose to strongly favor) in answering the following question: "As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?" One out of five persons claim to be opposed to such a program; one-fourth are undecided or feel they have insufficient knowledge to judge; and a little more than half favor the possibility of an experimental program. The figure for favorability is comparable to the proportion in Colorado and in South Dakota who favored a local cloud seeding program prior to its inception. In fact, the percentage is slightly higher: 54% for Illinois, 52% for Colorado and 46% for South Dakota.* This finding should be somewhat rewarding to proponents of weather modification in Illinois since no organized resistance has developed toward the program in Colorado (after four summers of field operations) nor toward the program in South Dakota (after three operational seasons). One cautionary note: It is also the case that expressed opposition to a local program is somewhat greater in Illinois than it was in the two other states -- 21% in Illinois, 15% in Colorado, and 9% in South Dakota.

Regardless of their expressed position toward an experimental program, respondents were asked "why" they felt that way (Table 11).

* See Appendix B for further comparisons and sources of data.

For those favoring the experiment, the most frequent response was "belief that research is desirable" for determining the effectiveness of cloud seeding (41%); followed by "specific benefit to the area as a whole" (such as reduced damage to crops and property in the. area). Most who oppose the experiment fear that negative effects on the weather or nature will occur (48%). Other stated reasons for opposition include religious beliefs, fear that the program will be wasteful or ineffective, and fear that the program will be expensive to conduct. The clear majority who are undecided simply feel they have insufficient knowledge to judge (87%).

Respondents were asked to indicate what action, if any, they would take if an experimental program were proposed for their area. Table 12 summarizes the findings for this item. Nearly two-thirds feel they would take no action -- either to oppose or to support the program. Less than one in ten say they would actively oppose and the types of action mentioned included "talking against the program", "voting against the program", and "contacting a state official or congressman". For the 29% who claim they might take supportive action, things mentioned included talking, voting, signing petitions, and helping the program financially.

More specifically, we asked, "How likely would you be to sign a petition favoring a hail or rain experiment for Central Illinois?" Close to half (45%) indicate they would "probably" or "definitely" sign a petition if it were presented to them (Table 13). Few persons claim they would sign a petition to oppose an experiment (15%, Table 13). We also asked respondents how they would vote and how they thought most people in their county would vote if the issue were placed on the ballot (Table 14). Exactly half feel they personally would vote in favor; 27% are undecided or feel they wouldn't vote; and 23% say they would vote against the program.

One final evaluation item pertaining to an experimental program was asked: "If any persons were to suffer damages which were a result of a cloud seeding.experiment, do you feel these damages should be compensated?" Table 15 indicates that a total of 84% feel compensation should be made -- 57% who gave an unqualified "yes", and 27% who qualified their response with "if damages can be proven to result from the seeding." This finding differs from the Colorado study where the majority who felt compensation should be made were more likely to qualify their answer (14%, unqualified "yes"; 43%, qualified "yes").* When asked who should pay the compensation, two responses were most frequent: "those doing the seeding" (43%), and "the state government" (30%).

In addition to the evaluation items relating to an experimental cloud seeding program, respondents were asked about the possibility of an operational program. We gave a brief description of the difference between experimental and operational weather modification, and followed this by asking, "How do you feel about the possibility of an operational (non-experimental) program which would seed clouds on all days when hailstorms are in the area?" It is most interesting to compare the results (Table 16) to the item relating to an experimental program (Table 10). Whereas 54% favored the concept of an experiment, only one-third favor an operational program for the area. More respondents are undecided about an operational program (39% compared to 25%), and more are opposed (28% compared to 21%). What accounts for the difference in evaluation of the two types of cloud seeding programs? An examination

* It should be noted that this item was first asked in the Colorado study after respondents had experienced a summer of the National Hail Research Experiment's field activities. This could *very* well account for the difference in proportions (Haas and Krane, 1973).

of Table 17 provides at least a partial answer. Among those opposing an operational program, 22% suggest that it is necessary first to determine the effectiveness of hail suppression through experimentation. And among the "undecided", 12% give this same reason for their position. Although the actual number of respondents who use this basis for evaluating an operational program is small (a total of 27), it certainly contributes to the drop in favorability which was noted for an experimental program. It is also worth noting that the prominant reason given for favorable program evaluation has shifted from "experimentation is desirable" (41%, Table 11) to mention of a specific benefit to the area from hail suppression (43%, Table 17).

The data on program evaluation suggest that Central Illinois residents are rather open to the possibility of an experimental program of hail suppression. The proportion giving favorable evaluation far exceeds the proportion giving a negative evaluation. When asked about taking action toward a proposed experiment, more feel they would engage in supportive activity than in resistive activity. And the lower favorability toward an operational program is partially accounted for -- in the words of many respondents -- by the need for a convincing experimental program. Other variables relating to evaluation are discussed in Section G (following).

F. Decision Making and Funding Regarding Cloud Seeding Programs

An important issue in the application of weather modification technology continues to evolve around decision-making procedures. It has been suggested recently that provision for citizen involvement is not associated with incidence of resistance to projects (Farhar and Mewes, 1974a). Thus, organized public action to oppose a local cloud seeding program

appears to be less likely when opportunities for citizen participation in decision-making are provided.

Illinois residents were asked who will and who should make the decision regarding a local cloud seeding experiment?. The findings are given in Table 18. Clearly, with respect to who will decide, the most likely response is the "state government". One-third of the respondents answer this way and another 11% feel that the ISWS will make the decision. As many as one-fifth feel that there will be local input into the decision (12% say local residents or local government; another 8% say local agriculturists). With respect to who should decide, the response pattern is *very* different. The preference is for the decision to be made at the local level — nearly half indicate that local residents (32%) or local agriculturists (17%) should decide about a local cloud seeding experiment. Only 28% say the state government or the ISWS should decide.

Further evidence of the desire for local involvement comes from a previously discussed attitude item (Item 14, Table 1). As many as 60% of the respondents indicated a preference for local residents to have a voice in decisions about a weather modification program, even if local tax money were not used to finance the program.

Respondents were also asked about predicted and preferred funding regarding an experimental cloud seeding program. When asked who should pay, more indicate the state government (31%) than any other single response (Table 19). Nearly one-fourth say the local residents (12%) or local agriculturists (12%) should pay for an experiment. Additional responses include: the federal government (10%), a combination of state and federal (7%); and a combination of state and local (8%). The pattern of responses when asked who will pay differs only slightly (Table 19). As many as 26% feel that local residents will foot the bill,

compared to 12% who felt they should pay. As was the case on preferred funding, the most frequent response for predicted funding is the state government (35%).

What are the views with respect to control and funding of operational cloud seeding programs? Cumulative data from research on social aspects of weather modification in different parts of the country have consistently shown that the dominant view among citizens is for local involvement in the decision-making process. Therefore, we presented to each respondent in Illinois alternative decision-making procedures which could be used in the future for deciding on appropriate counties for inclusion in an operational program. After allowing time for careful consideration of all the procedures, we then asked each respondent to select the one which was "most satisfactory" and the one which was "least satisfactory". The proportions selecting the various procedures and the rank order of expressed preferences are presented in Table 20.

Clearly, the preferred procedure in Illinois is seen as "a referendum submitted to the vote of all citizens living in the proposed affected area." Leaving the decision in the hands of "the scientists proposing and conducting the program" is seen as the least satisfactory mechanism. All other alternatives lagged far behind in the selection for most and least satisfactory decision-making procedures.

Respondents were also asked to select "most satisfactory" and "least satisfactory" funding procedures for an operational cloud seeding program. Again, we presented a list of five alternatives and asked respondents to consider carefully each one before expressing their views. The list of funding procedures and the results may be seen in Table 21. No single procedure clearly stands out, either as being the most satisfactory or as least satisfactory. "Federal income taxes" and

"voluntary subscription of farmers in the affected area" are viewed more often as the preferred financial arrangements. However, "voluntary subscription of farmers" also ranks first among the least satisfactory procedures, followed closely by "taxes on all property in participating counties." Undoubtedly, many non-farm respondents select voluntary payment by agriculturists as the preferred mechanism while selecting county property taxes as the least agreeable arrangement. On the other hand, most farmers do not select voluntary subscription as their preferred procedure; but do select it as the least satisfactory arrangement.

G. Relationships Among Key Variables

Major hypotheses in sociological research on public response to weather modification suggest that the following variables predict favorableness toward local cloud seeding programs: general attitudes toward weather modification and science; belief in the efficacy of cloud seeding; knowledgeability (awareness) of cloud seeding programs; and perceived benefit or harm from application of the technology. In order to determine the relationship between evaluation of proposed cloud seeding in Illinois (dependent variables) and the predictor variables, intercorrelations among all key variables were calculated using the Pearson product-moment correlation coefficient.

Before examining the relationships between predictor and evaluation variables (Table 22), mention should be made of the scaling procedures used for combining items into single scales.* Quite simply, a number of variables used in the correlation analysis are scales formed by adding for each respondent his score (response code value) on one item to his

* For a detailed description of the scales and statistics computed on the scales, reference should be made to Appendix A.

score on a second item, then a third item, and so forth. For example, the WXM scale in Table 22 is called the Weather Modification Scale and represents the addition of three attitude items into a single variable. Thus, every respondent has a WXM score equivalent to the total of his responses on the three separate items.

Four evaluation variables are of concern here: l) favorableness toward a proposed experimental program (EV2); 2) anticipated action to support or oppose an experimental program (AA1); 3) anticipated vote and petition signing for an experimental program (AA2); and favorableness toward a proposed operational program (EV3).

As has been found in other studies, the best predictors of local program evaluation prior to the inception of the project are general attitudes toward weather, weather modification, and science. Table 22 shows that the Weather Modification Scale (WXM) is the best predictor of program evaluation ($r = .70$ with EV2; $r = .69$ with AA2). The Religio-Natural scale (RN2) also predicts extremely well respondent evaluation of proposed programs ($r = -.62$ with EV2; $r = -.65$ with AA2). That is to say, persons adhering to a religio-natural view of the world are likely to be opposed to a local program, while persons not adhering to this view are likely to favor a local program. The scientific orientation scale predicts program evaluation moderately well. For example, $r = .53$ with AA2, .51 with EV2, and .44 with EV3. Thus, having positive feelings toward science in general leads to favorable evaluation of local programs.

The benefit-harm scales correlate moderately with evaluation. For example, the correlation between BH1 and AA2 results in $r = .47$; between BH1 and EV2, $r = .44$. Respondents anticipating that they would have personal economic benefit from an effective cloud seeding program

are likely to be in favor of a proposed program. Respondents anticipating economic harm from cloud seeding are likely to oppose the program.

Belief that cloud seeding is efficacious also leads to favorable evaluation. Although the correlation coefficients between belief in efficacy variables and evaluation variables are somewhat lower, they still indicate predictive power for belief in efficacy. Belief that cloud seading can effectively reduce hail and increase rainfall (BE1) correlates .42 with anticipated vote and petition signing (AA2); and correlates .36 with evaluation of an experimental program (EV2).

Of all the predictor variables, knowledgeability (KN1) shows the weakest correlation with program evaluation. None of the correlation coefficients exceed a value of .20, indicating very little predictive power for that variable.

The data presented in Table 22 support the findings from other studies. In general, it seems to be the case that prior to the start of a local cloud seeding program the best predictors of program evaluation are general attitudes toward weather, weather modification, and science. Anticipated economic benefit or harm from the proposed program, as well as belief in the effectiveness of the technology, predict less well but nevertheless show moderate correlation with evaluation. And finally, knowledge of weather modification activities shows weak correlation with evaluation.

Studies in South Dakota and Colorado (c.f. Farhar and Mewes, 1974; Haas and Krane, 1973) have found that after several years of program operation belief in efficacy, perceived benefit from the program, and knowledgeability tend to increase. Additionally, the relationships between these variables and the evaluation variables become stronger over time.

In addition to the correlational analysis presented above, extensive analysis was done using the socio-demographic data collected during the interviews. This analysis is fully reported in Appendix C and is only briefly commented on here.

For each of six demographic variables we divided the sample into sub-groups and then compared these sub-groups on their responses to thirty selected items from the interview schedule. In general, a large number of significant relationships were found and a general pattern emerged with respect to each demographic variable (i.e., males vs. females, younger vs. older persons, and so forth).

With respect to age there are clear differences. Within increasing age groups we find less favorability toward cloud seeding technology and its application, less belief that the technology can be effective, and more concern that the technology, if applied, might result in adverse side effects. Older respondents are much more likely than younger ones to adhere to a religio-natural view of the world; thus, they feel it may be best to let nature take its course.

Generally speaking, males tend to be more favorably inclined to weather modification, more knowledgeable of weather modification activities, and less skeptical about potential harm resulting from the application of the technology.

With respect to educational background, the pattern of responses indicates that higher educated respondents are more knowledgeable of cloud seeding efforts, more favorable toward the technology, more favorable to a proposed experimental program, and tend to have a little greater belief that the technology may be effective for increasing rainfall and suppressing hail.

Family income differentiates responses among the sample also, with

most differences occurring between lower income respondents compared to middle and upper income respondents. Briefly, low income persons tend to be unfavorable toward cloud seeding technology, do not believe the technology can be efficacious, do not anticipate much benefit even if the technology were effective, and feel that cloud seeding may have adverse side effects.

Some response differences are found among socio-economic classes as well. Where differences occur, the overall pattern indicates that the higher the socio-economic status, the greater the favorability toward the technology.

With respect to community size, the most noteworthy findings show that rural residents are most likely to perceive economic benefit from effective hail suppression and rainfall management programs, followed by small town residents and then city residents. Also, rural residents are the most likely to favor a local cloud seeding experiment, but are the least likely to favor a local operational program. This would seem to indicate that rural residents, since they are more likely to feel direct benefits from the technology, are realistically more cautious about the application of the technology until its effectiveness has been established.

H. Analysis of Program Evaluation Among Farm Respondents

Since persons who are engaged in agricultural enterprises are most likely to receive direct economic benefits (or disbenefits) from cloud seeding for hail suppression or rainfall management, we decided to do a separate analysis of local program evaluation for this set of respondents. Utilizing demographic items pertaining to farm owners or operators, we subdivided the farm respondents into different groupings and then examined

responses on several of the evaluation items.

Table 23 gives the findings when farm ownership is cross classified by evaluation items. Although the majority of all farmers clearly indicate that they would benefit from an effective hail suppression program, farmers owning all of their land are not as likely to perceive benefits (67%) as are farmers who own only part of the land they tend (71%) or farmers who rent all of the land they tend (83%). However, farmers who "rent all" land are much less likely to take a position toward proposed experimental and operational programs -- either to support or to oppose -- then are the "own all" and "own part/rent part" farmers. Thirty-nine percent claim to be undecided about an experimental program (compared to less than one-fifth of "own all" or "own part" farmers); and exactly half claim to be undecided about an operational program (compared to one-third or less in the ownership groups). Regardless of farm ownership, farmers are more favorable toward experimentation than toward direct application of the technology. Nevertheless, a sizable proportion indicate opposition to either type of program -- one fourth of owners or part owners oppose an experiment while more than one-third oppose the notion of an operational program.

One interview schedule item not heretofore discussed asked farm respondents to indicate how much they personally would be willing to contribute to the cost of an operational hail suppression program. From Table 23 it is clear that for the present, a large number of farmers would not want to contribute anything -- 52% of the "own all" group, 25% of the "own part" group and 33% of the "rent all" group. From one-sixth to one-third, however, feel they might pay up to $1.00/acre for an effective hail suppression program.

Does size of farm operation (Table 24) affect evaluation of

proposed local cloud seeding? Farmers with less than 400 acres are a little more likely than farmers with larger acreages to feel that they would benefit from a hail suppression program (77% compared to 67%). Farmers with medium size operations (between 200 and 400 acres) are less likely to oppose and more likely to favor experimental and operational programs than are farmers with either larger (400 or more acres) or smaller (less than 200 acres) enterprises. Medium size farm owners/ operators are also a little more likely to indicate willingness to share the cost of an operational program.

Length of farm residency indicates some differences in evaluation of proposed programs, as can be seen from Table 25. In general, those who have farmed from 16 to 30 years are more likely to anticipate economic benefit (82%) than are those who have farmed for more than 30 years (63%). Farmers of 16 to 30 years also are more apt to favor both types of cloud seeding programs than are farmers of either shorter or longer duration. The greatest opposition is found among farmers who have been involved in crop production for less than sixteen years -- 30% oppose an experiment and 45% oppose direct application.

We thought that whether or not agriculturists had suffered recent crop loss from hail might influence perspectives on proposed local weather modification. Farmers were asked if they had experienced crop losses to hail in the last five years. Only about one-third indicated such losses (24 of 69, Table 26). When we cross-classify the crop loss item with evaluation items we do note some differences, although relatively minor. For example, farmers with recent losses were a little more likely than those without losses to favor an experimental program (62% compared to 53%), and to favor an operational program (34% compared to 26%). Also, the proportion indicating willingness to contribute to

the cost of an operational program is a little higher for the crop loss group than for the non-loss group (54% compared to 47%); but still, more than one-third of both groups would not be willing to contribute any amount at this time.

In *every* aspect of social life there are individuals and groups who take risks and those who do not, for whatever their reasons may be. Farmers are no exception, for we found that exactly one-third of the farm respondents normally do not purchase crop hail insurance while the other two-thirds are frequent purchasers. Although the differences in evaluation are not as great as one might expect, we do note their existence (Table 27). With respect to position toward an experimental program, the proportion of risk-takers (non-purchasers) favoring the program (56%) equals the proportion of non-riskers (regular purchasers) who favor (57%). However, 35% of non-purchasers indicate opposition while only 15% of purchasers are opposed. In regard to an operational program, more in each group claim to be opposed at this time (48% for non-purchasers and 33% of purchasers). However, a higher percentage of risk-takers compared to non-riskers are favorable toward the concept of an operational program (35% and 26%, respectively). Regular crop hail insurance carriers are more apt to be undecided. These findings would seem to suggest that farmers who are regular insurance purchasers feel the need for substantial evidence that hail suppression can work before they would exchange their insurance coverage for an operational program.

TABLES

Table 1

Attitudes Toward Science, Weather and Weather Modification

Item 1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work -- to see if it does increase moisture, and so forth.

RESPONSE:	%	(N)	
1 = Strongly Disagree	4	(11)	
2 = Disagree	16	(44)	
3 = Unsure	17	(47)	$\bar{x}$ = 3.45
4 = Agree	56	(154)	S.D. = 0.97
5 = Strongly Agree	7	(18)	
Totals	100	(274)	

Item 2. If there are going to be weather modification experiments, such as cloud seeding, individual states rather than the federal government should control and con duct them.

RESPONSE:	%	(N)	
1 = Strongly Disagree	2	(6)	
2 = Disagree	21	(59)	
3 = Unsure	16	(43)	$\bar{x}$ = 3.41
4 = Agree	54	(148)	S.D. = 0.97
5 = Strongly Agree	7	(08)	
Totals	100	(274)	

Item 3. Cloud seeding probably violates God's pl<ans for man and the weather.

RESPONSE:	%	(N)	
1 = Strongly Disagree	4	(12)	
2 = Disagree	33	(92)	
3 = Unsure	15	(40)	$\bar{x}$ = 3.17
4 = Agree	36	(98)	S.D. = 1.15
5 = Strongly Agree	12	(32)	
Totals	100	(274)	

Table 1, continued

Item 4. Man should use scientific knowledge to deal with problems whenever and wherever possible.

RESPONSE:	%	(N)	
1 = Strongly Disagree	1	(3)	
2 = Disagree	10	(27)	
3 = Unsure	9	(24)	$\bar{x}$ = 3.80
4 = Agree	68	(187)	S.D. = 0.81
5 = Strongly Agree	12	(33)	
Totals	100	(274)	

Item 5. Illinois state agencies should feel free to use such things as cloud seeding if it might help farmers avoid crop losses.

RESPONSE:	%	(N)	
1 = Strongly Disagree	3	(9)	
2 = Disagree	15	(42)	
3 = Unsure	11	(29)	$\bar{x}$ = 3.59
4 = Agree	60	(165)	S.D. = 0.98
5 = Strongly Agree	11	(29)	
Totals	100	(274)	

Item 6. Even when carefully controlled, cloud seeding programs are \very likely to upset the balance of nature.

RESPONSE:	%	(N)	
1 = Strongly Disagree	1	(3)	
2 = Disagree	20	(55)	
3 = Unsure	29	(80)	$\bar{x}$ =3.56
4 = Agree	41	(113)	S.D. = 0.93
5 = Strongly Agree	9	(23)	
Totals	100	(274)	

Item 7. If there are going to be weather modification programs, then all citizens should be taxed to pay for them.

RESPONSE:	%	(N)	
1 = Strongly Disagree	12	(33)	
2 = Disagree	32	(87)	
3 = Unsure	14	(39)	$\bar{x}$ = 2.89
4 = Agree	39	(107)	S.D. = 1.14
5 = Strongly Agree	3	(8)	
Totals	100	(274)	

Table 1, continued

Item 8. Scientific experiments in general usually produce useful results — produce things that are helpful to man.

RESPONSE:	%	(N)	
1 = Strongly Disagree	2	(4)	
2 = Disagree	11	(30)	
3 = Unsure	14	(39)	x = 3.63
4 = Agree	70	091)	S.D. = 0.78
5 = Strongly Agree	3	(9)	
Totals	100	(273)	
Missing Data		(1)	

Item 9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.

RESPONSE:	%	(N)	
1 = Strongly Disagree	3	(10)	
2 = Disagree	41	(112)	
3 = Unsure	11	(30)	$\bar{x}$ = 3.10
4 = Agree	31	(84)	S.D. = 1.19
5 = Strongly Agree	14	(38)	
Totals	100	(274)	

Item 10. We should try to solve other problems before spending more tax money on weather modification programs.

RESPONSE:	%	(N)	
1 = Strongly Disagree	1	(3)	
2 = Disagree	22	(60)	
3 = Unsure	13	(34)	$\bar{x}$ = 3.59
4 = Agree	46	(127)	S.D. =1.06
5 = Strongly Agree	18	(50)	
Totals	100	(274)	

Item 11. Since scientists know most about these matters, the control and conduct of weather modi fication programs should be left entirely in their hancis.

RESPONSE:	%	(N)	
1 = Strongly Disagree	12	(34)	
2 = Disagree	31	(86)	
3 = Unsure	11	(29)	$\bar{x}$ = 2.92
4 = Agree	43	(117)	S.D. = l.l6
5 = Strongly Agree	3	(7)	
Totals	100	(273)	
Missing Data		(1)	

Table 1, continued

Item 12. If weather is a problem to farmers, it is appropriate to try to directly control extreme weather conditions by using the most effective techniques known — for example, cloud seeding to increase rain if moisture is needed.

RESPONSE:	%	(N)	
1 = Strongly Disagree	2	(6)	
2 = Disagree	18	(51)	
3 = Unsure	14	(38)	$\bar{x}$ = 3.46
4 = Agree	62	069)	S.D. = 0.91
5 = Strongly Agree	4	00)	
Totals	100	(274)	

Item 13. Instead of trying to change the weather, man should find other ways of dealing with it — for example, improved weather forecasting, cheaper crop insurance and so forth.

RESPONSE:	%	(N)	
1 = Strongly Disagree	2	(4)	
2 = Disagree	29	(80)	
3 = Unsure	17	(46)	$\bar{x}$ = 3.29
4 = Agree	44	(121)	S.D. = l.02
5 = Strongly Agree	8	(23)	
Totals	100	(274)	

Item 14. Local residents should not have a voice in decisions about a weather modification program unless local tax money is used to finance the program.

RESPONSE:	%	(N)	
1 = Strongly Disagree	11	(30)	
2 = Disagree	49	(133)	
3 = Unsure	11	(29)	$\bar{x}$ = 2.61
4 = Agree	27	(75)	S.D. = 1.07
5 = Strongly Agree	2	(6)	
Totals	100	(273)	
Missing Data		(1)	

Item 15. In general, weather scientists are mainly concerned with their experiments and don't recilly care about what happens to other people.

RESPONSE:	%	(N)	
1 = Strongly Disagree	8	(21)	
2 = Disagree	63	070)	
3 = Unsure	13	(37)	$\bar{x}$ = 2.42
4 = Agree	13	(37)	S.D. = 0.92
5 = Strongly Agree	3	(8)	
Totals	100	(273)	
Missing Data		(1)	

Table 2

Belief In The Efficacy Of Cloud Seeding For Rain Augmentation And Hail Suppression

Can cloud seeding actually:	Increase Moisture %	Increase Moisture N	Suppress Hail[2] %	Suppress Hail[2] N
1 = No	12	(32)	14	(38)
2 = Perhaps, but I doubt it	3	(10)	4	(12)
3 = Don't Know	31	(84)	62	(170)
4 = I think so but I'm not sure	15	(41)	7	(18)
5 = Yes	39	(107)	13	(36)
Totals	100	(274)	100	(274)
x =	3.66		3.01	
S.D. =	1.34		1.09	

Questions phrased:

1. "Do you think that cloud seeding work s -- that is, do you think it can actually increase moisture?"
2. "Do you think that cloud seeding can actually suppress hai 1?"

Table 3

Opinions About Potential Side-Effects From Cloud Seeding

1. Do you think cloud seeding might damage the ecology of an area?	%	N	
1 = No	31	(86)	
2 = Uncertain	41	(111)	$\bar{x}$ = 1.97
3 = Yes	28	(77)	S.D. = 0.77
Totals	100	(274)	

2. If yes: how might it prove harmful?	%	N
Don't Know/Just a feeling	10	(8)
Other	10	(8)
Reduction in moisture/Drought	3	(2)
Excessive moisture/Floods	17	(13)
General adverse weather change/ Upset balance of nature	40	(31)
Chemicals might be detrimental to plants, animals, or man	20	(15)
Totals	100	(77)

Table 4

Awareness of Weather Modification Programs

RESPONSE:	Rain[1] %	Hail[2] %	Fog[3] %	Hurricane[4] %	Tornado[5] %
1 = No	53	82	89	66	84
2 = Don't Remember	4	5	1	5	1
3 = Yes	43	13	10	29	15
Total	100	100	100	100	100
N =	(274)	(273)	(274)	(273)	(274)
Missing Data	(0)	(1)	(0)	(1)	(0)
$\bar{X}$ =	1.90	1.31	1.21	1.64	**1.31**
S.D. =	0.98	0.69	0.60	0.91	0.72

IF YES to one or more of the above: "In general, was what you heard about weather modification unfavorable, neutral or favorable?"

RESPONSE:	%	(N)
Unfavorable	16	(26)
Neutral	36	(57)
Favorable	41	(66)
Don't Remember	7	(11)
Totals	100	(160)

Questions phrased as follows:

1. "Have you heard about any weather modification programs which attempt to increase rainfall?"
2. "Have you heard about any weather modification programs which attempt to suppress or decrease hail?"
3. "What about fog? Have you heard anything about attempts to break up fog?"
4. "Are you aware of any programs which attempt to modify hurricanes?"
5. "What about tornadoes? Have you heard anything about weather modification programs which attempt to stop or reduce damage from tornadoes?

Table 5

Opinions About Inadvertent Weather Modification

1. "Do you think that unintended (or accidental) cloud seeding is bringing about changes in the weather?"

RESPONSE:	%	N	
1 = No	24	(66)	
2 = Could be, but I doubt it	6	(16)	
3 = Uncertain/Don't Know	33	(91)	$\bar{x}$ = 3.03
4 = I think so/Seems like it	17	(46)	S.D. = 1.41
5 = Yes	20	(55)	
Totals	100	(274)	

2. "Do you feel that accidental weather modification should be better understood before anyone tries to modify the weather intentionally?"

RESPONSE:	%	N	
1 = No	7	(20)	
2 = Uncertain	6	(17).	$\bar{x}$ = 2.80
3 = Yes	87	(237)	S.D. = 0.55
Totals	100	(274)	

Table 6

Knowledge of Weather Modification Regulation

"As far as you know, does the State of Illinois have any laws regulating planned weather modification activities?"

RESPONSE:	%	N	
1 = No	56	(154)	
2 = Don't Know/Uncertain	44	(119)	$\bar{x}$ = 1.44
3 = Yes	0	(1)	S.D. = 0.50
Totals	100	(274)	

Table 7

Knowledge of Illinois State Water Survey and Hail Research Program of the ISWS

1. "Have you ever heard of the Illinois State Water Survey?"

RESPONSE:	%	N	
1 = No	22	(61)	
2 = Yes, through this interview	26	(70)	$\bar{x}$ = 2.30
3 = Yes, prior to this interview	52	(143)	* S.D. = 0.81
Totals	100	(274)	

2. IF YES: "Could you please tell me the purpose of the ISWS -- what the agency does?"*

RESPONSE:	%	N
Weather control/Rain control	3	(5)
Weather data collection (rainfall, hail fall, wind measurements etc.)	18	(32)
Research (re: weather, water, environment)	11	(20)
"Something" to do with water	6	(00)
Responsible for water control (water supply, waterways, water quality, water table levels, drainage)	36	(63)
Don't Know	26	(47)
Totals	100	(177)

3. "Are you aware of the hail research project being operated by the ISWS?"

RESPONSE:	%	N	
1 = No	89	(245)	$\bar{x}$ = 1.11
2 = Yes	11	(29)	S.D. = 0.31
Totals	100	(274)	

*This item was intended only for respondents who indicated they were aware of the ISWS prior to the interview; but was also asked of 34 of the 70 respondents who indicated awareness of the ISWS only through this study. Thus, the N = 177 rather than 143.

Table 8

Public Confidence in the ISWS to Conduct Experimental Weather Modification

RESPONSE:	For Hail Suppression %	N	For Rainfall Management[2] %	N
1 = No	7	(19)	11	(31)
2 = Uncertain/Don't Know	33	(89)	31	(85)
3 = Yes	60	(163)	58	(157)
Totals	100	(271)	100	(273)
Missing Data		(3)		(1)
$\bar{x}$	2.53		2.46	
S.D. =	0.62		0.61	

"Do you feel such a program should be for hail suppression[1] or rainfall management?"

RESPONSE:	%	N
Hail suppression	18	(48)
Rainfall management	23	(62)
Would prefer it included both	35	(96)
Would not want either one	12	(34)
Don't care/Don't know	12	(32)
Totals	100	(272)
Missing Data		(2)

Questions phrased:

1. "Do you have confidence that the Illinois State Water Survey can conduct a well designed program to test the possibility of suppressing hail?"
2. "How about a program to test the possibility of managing rainfall — either to increase or decrease rainfall? Do you have confidence that the Illinois State Water Survey can conduct an experimental program of rainfall management?"

Table 9

Anticipated Benefit or Harm From Weather Modification

If cloud seeding were able to:	Suppress Hail[1]		Increase Rainfall[2]		Decrease Rainfall[3]	
RESPONSE:	%	N	%	N	%	N
1 = Harmful	2	(6)	8	(21)	15	(40)
2 = Make no difference/Don't Know	38	(103)	45	(123)	52	(142)
3 = Beneficial	60	(165)	47	(130)	33	(92)
Totals	100	(274)	100	(274)	100	(274)
$\bar{x}$ =	2.58		2.40		2.19	
S.D. =	0.54		0.63		0.67	

Questions phrased:

1. "If a cloud seeding program operating in this area were able to suppress hail, reduce damage from hail, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?"
2. "If a cloud seedinq proqram were able to increase rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?"
3. "If a cloud seeding proqram were able to decrease rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?"

Table 10

Position Toward An Experimental Program for Hail Suppression

RESPONSE:	%	N	
1 = Strongly Oppose	5	(15)	
2 = Oppose	16	(43)	
3 = Undecided/Neutral	25	(69)	$\bar{x}$ = 3.33
4 = Favor	48	(131)	S.D. = 0.99
5 = Strongly Favor	6	(16)	
Totals	100	(274)	

Question phrased: "As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of central Illinois?"

Table 11

Reason for Position Toward Experimental Program

A. Favor Experiment Because:	%	N
Research/experimentation is desirable	41	(60)
Perceive general benefit to area/Community	14	(21)
Perceive general benefit to specific group/self	11	(16)
Perceive specific benefit to area/Community	23	(33)
Perceive specific benefit to specific group/self	9	(14)
Other	2	(3)
Totals	100	(147)

B. Oppose Experiment Because:	%	N
Religious beliefs/Against God's will	10	(6)
Wasteful/Ineffective	12	(7)
Not enough hail damage in Illinois	7	(4)
Negative effects on weather/ Balance of nature	48	(28)
Benefits only farmers	4	(2)
Too costly/Too many taxes already	10	(6)
Other	9	(5)
Totals	100	(58)

C. Undecided About Experiment Because:	%	N
Not enough hail damage in Illinois	3	(2)
Negative effects on weather/ Nature	1	(1)
Insufficient knowledge to judge	87	(60)
Too costly/Don't know who will pay	3	(2)
Other	6	(4)
Totals	100	(69)

Table 12

Anticipated Action Toward Proposed Experimental Program

1. "If there is an experimental cloud seeding program proposed for your area, do you think you will do anything to support or oppose it?"

RESPONSE:		%	N	
1 = Yes, oppose		8	(23)	
2 = No, won't do anything or Don't Know		63	(171)	$\bar{x}$ = 2.21 S.D. = 0.58
3 = Yes, support		29	(80)	
	Totals	100	(274)	

2. If "yes, oppose," kinds of action mentioned.

RESPONSE:		%	N
Vote against program		13	(3)
Talk against program to friends/farmers		22	(5)
Contact state official or congressman		22	(5)
Other/Don't Know		43	(10)
	Totals	100	(23)

3. If "yes, support," kinds of action mentioned.

RESPONSE:		%	N
Vote in favor of program		13	(10)
Talk in favor of program		36	(29)
Sign petition in favor		11	(9)
Give money/taxes to support		15	(12)
Spread literature		2.5	(2)
Attend public meetings		2.5	(2)
Other/Don't Know		20	(16)
	Totals	100	(80)

Table 13

Likelihood of Signing Petitions Favoring and Opposing an Experimental Program

1. "How likely would you be to sign a petition favoring a hail or rain experiment for central Illinois?"

RESPONSE:	%	N	
1 = Definitely not sign	14	(38)	
2 = Probably not sign	17	(46)	
3 = Uncertain	24	(67)	$\bar{x}$ = 3.18
4 = Probably sign	27	(74)	S.D. = 1.30
5 = Definitely sign	18	(49)	
Totals	100	(274)	

2. "How likely would you be to sign a petition opposing a hail or rain experiment for central Illinois?"

RESPONSE:	%	N	
1 = Definitely not sign	21	(59)	
2 = Probably not sign	37	(102)	
3 = Uncertain	27	(74)	$\bar{x}$ = 2.40
4 = Probably sign	8	(21)	S.D. = 1.11
5 = Definitely sign	7	(18)	
Totals	100	(274)	

Table 14

Anticipated Vote on an Experimental Program

1. "If residents in this area were to vote on whether an experimental weather modification program should be started, how do you think you would vote?"

RESPONSE:	%	N	
1 = Against experiment	23	(63)	
2 = Uncertain/Probably wouldn't vote	27	(74)	$\bar{x}$ = 2.27 S.D. = 0.81
3 = For experiment	50	(137)	
Totals	100	(274)	

2. "How do you think most people in this county would vote?"

RESPONSE:	%	N	
1 = Against experiment	27	(74)	
2 = Uncertain/Don't Know	38	(105)	$\bar{x}$ = 2.35
3 = 50-50 (about equal for and against)	7	(20)	S.D. = 1.15
4 = For experiment	28	(75)	
Totals	100	(274)	

Table 15

Opinions About Compensation for Uninsured Loss
From Cloud Seeding Experiment

1. "If any persons were to suffer damages which were a result of a cloud seeding experiment, do you feel these damages should be compensated?"

RESPONSE:	%	N	
T = No	7	(18)	
2 = Uncertain/Don't Know	9	(26)	$\bar{x}$ = 3.35
3 = Yes, if proved damages were result of seeding	27	(73)	S.D. = 0.90
4 = Yes (unqualified)	57	(157)	
Totals	100	(274)	

2. IF YES: "Who should pay for this compensation?"

RESPONSE:	%	N
Insurance companies	7	(15)
Those doing the cloud seeding	43	(99)
Those who benefit/Farmers	1	(3)
State government	30	(69)
State and federal government	5	(12)
Federal government	8	(18)
Other	1	(2)
Don't Know	5	(12)
Totals	100	(230)

Table 16

Position toward An Operational Program for Hail Suppression

RESPONSE:	%	N	
1 = Strongly Oppose	9	(25)	
2 = Oppose	19	(51)	
3 = Undecided	39	(108)	$\bar{x}$ = 2.99
4 = Favor	30	(81)	S.D. = 0..99
5 = Strongly Favor	3	(9)	
Totals	100	(274)	

Question phrased:

1. "As a resident of this area, how do you feel about the possibility of an operational (non-experimental) program which would seed clouds on all days when hailstorms are in the area?"

Table 17

Reasons for Position Toward Operational Program

A. Favor Program Because:	%	N
Research/Experimentation/Progress is desireable	14	(12)
Perceive general benefit to area/ community	22	(20)
Perceive general benefit to specific group/self	12	(11)
Perceive specific benefit to area/ community	43	(38)
Perceive specific benefit to specific group/self	3	(3)
Other	6	(5)
Totals	100	(89)
Missing Data		(1)

B. Oppose Program Because:	%	N
Religious beliefs/Against God's Will	8	(6)
Wasteful/Ineffective	6	(4)
Not enough hail damage in Illinois	11	(8)
Negative effects on weather/Balance of nature	32	(23)
Benefits only farmers	3	(2)
Too costly/Too many taxes already	3	(2)
Need to know if cloud seeding works (need experimental program first/ must prove results first)	22	(16)
Other	15	(11)
Totals	100	(72)
Missing Data		(4)

C. Undecided About Program Because:	%	N
Not enough hail damage in Illinois	3	(3)
Negative effects on weather/Nature	2	(2)
Insufficient knowledge to judge	70	(64)
Too costly/Don't know who will pay	1	(1)
Indifferent/Just don't care	3	(3)
Need to know if cloud seeding works (need experimental program first/ must prove results first)	12	(11)
Other	9	(8)
Totals	100	(92)
Missing Data		(16)

Table 18

Predicted and Preferred Decision Making Regarding an Experimental Program

RESPONSE:,	Who Will Decide[1] %	Who Will Decide[1] N	Who Should Decide[2] %	Who Should Decide[2] N
Local residents/Local government	12	(33)	32	(89)
Local agriculturists	8	(23)	17	(46)
Local and state governments (includes local, state and federal)	8	(21)	5	(13)
State government/statewide referendum	32	(89)	20	(55)
State and federal governments	4	(10)	1.5	(4)
Federal government	4	(11)	1.5	(4)
Scientists/Researchers	2	(5)	4	(12)
Illinois State Water Survey	11	(31)	8	(21)
Other	5	(13)	4	(12)
Don't Know	14	(38)	7	(18)
Totals	100	(274)	100	(274)

Questions phrased:

1. "Who do you think will decide whether or not a hail or rain experiment will be started in Illinois?"
2. "Who do you think should make this decision?"

Table 19

Predicted and Preferred Funding Regarding an Experimental Program

RESPONSE:	Who Should Pay[1] %	Who Should Pay[1] N	Who Will Pay[2] %	Who Will Pay[2] N
Local residents/Local government	12	(34)	26	(71)
Local agriculturists	12	(34)	4	(12)
Local and state governments (includes local, state and federal)	8	(21)	8	(23)
State government	31	(84)	35	(95)
State and federal governments	7	(18)	7	(19)
Federal government	10	(28)	8	(22)
Other	9	(26)	0	(0)
Don't know/no opinion	11	(29)	12	(32)
Totals	100	(274)	100	(274)

"Other" category includes: "anyone who wanted it done;" "everyone;" "those who would benefit;" "hail insurance companies;" and "Illinois State Water Survey."

Questions phrased:

1. "Who do you think should pay for an experimental cloud seeding program?"
2. "Who do you think will pay for such a program if it is proposed?"

Table 20

Opinions About Area/County Selection For an Operational Hail Suppression Program

Possible Procedures for Site Selection:	% Selecting For: Most	Least	Ranking of Decision-Making Procedures. Most	Least
Referendum submitted to vote of all citizens in proposed affected area	47	9	1	4
Referendum submitted to vote of owners or operators of agricultural land in proposed affected area	17	11	3	3
Decision by a regional v/eather modification control board elected by citizens	9	2	4	6
Decision by joint agreement between county commissioner and a regional weather modification control board	4	7	5	5
Decision left up to scientists proposing and conducting the program	2	48	6	1
Decision left up to scientists but with assistance of a weather modification advisory board appointed by the Governor of Illinois	19	16	2	2
Other (including combinations)	1	1		
Don't Know	1	6		
	100%	100%		
N =	(274)	(273)		
Missing Data	(0)	(1)		

1. Respondents were asked to select the procedure which they felt was most satisfactory for deciding what counties or areas should participate in an operational hail suppression program; and then they were asked to select the least satisfactory procedure.

Table 21

Opinions About Financing an Operational Hail Suppression Program[1]

Possible Procedures for Financing:	% Selecting For: Most	% Selecting For: Least	Ranking of Financing Procedures: Most	Ranking of Financing Procedures: Least
Federal income taxes	23	15.5	1.5	3.5
Illinois State income taxes	18	15	3	5
County property taxes	15	23	4	2
Property tax on agricultural land only	12	15.5	5	3.5
Voluntary subscription of farmers	23	24	1.5	1
Other (including combinations)	7	3		
Don't Know	2	4		
	100%	100%		
N =	(274)	(271)		
Missing Data	(0)	(3)		

1. Respondents were asked to select the procedure which they felt was most satisfactory for financing an operational hail suppression program; and then they were asked to select the least satisfactory procedure.

Table 22

Intercorrelations for Key Variables (Scali2s)[1]

	WXM	RN2	SO1	KNl	BE1	BE2	BE3	BH1	BH3	AA1	AA2	EV1	EV2.	EV3
WXM		-.64	.58	.07	.39	.35	.35	.45	.39	.47	.69	.35	.70	.57
RN2	-.64		-.48	•-.15	-.35	-.35	-.30	-.41	-.30	-.49	-.65	-.34	-.62	-.47
SO1	.58	-.48		.08	.27	.25	.23	.33	.31	.42	.53	.24	.51	.44
KNl	.07	-.15	.08		.18	.17	.15	.13	.08	.19	.20	.24	.16	.00
BE1	.39	-.35	.27	.18		.91	.87	.19	.13	.24	.42	.26	.36	.32
BE2	.35	-.35	.25	.17	.91		.60	.17	.14	.20	.38	.26	.32	.26
BE3	.35	-.30	.23	.15	.87	.60		.17	.09	.24	.36	.21	.34	.31
BH1	.45	-.41	.33	.13	.19	.17	.17		.66	.38	.47	.23	.44	.31
BH3	.39	-.30	.31	.08	.13	.14	.09	.66		.29	.40	.20	.35	.23
AA1	.47	-.49	.42	.19	.24	.20	.24	.38	.29		.71	.33	.63	.49
AA2	.69	-.65	.53	.20	.42	.38	.36	.47	.40	.71		.38	.83	.63
EV1	.35	-.34	.24	.24	.26	.26	.21	.23	.20	.33	.38		.33	.20
EV2	.70	-.62	.51	.16	.36	.32	.34	.44	.35	.63	.83	.33		.58
EV3	.57	-.47	.44	.00	.32	.26	.31	.31	.23	.49	.63	.20	.58	

N = 274

1 See Appendix A for identificaition of variable symbols, a description of the items comprising the scales, and a presentation of scale statistics.

Table 23

Farm Ownership by Selected Evaluation Items

Perceived Economic Benefit or Harm from Hail Suppression	Farm Ownership (land)					
	Own All		Own Part/Rent Part		Rent All	
	%	(N)	%	(N)	%	(N)
Harm	7	(2)	0	0	0	(0)
No Difference	26	(7)	29	(7)	17	(3)
Benefit	67	(18	71	(17)	83	(15)
Totals	100%	(27)	100%	(24)	100%	(18)
Position Toward Experimental Hail Suppression Program						
Strongly oppose			8	(2)	0	(0)
Oppose	15	(4)	17	(4)	11	(2)
Undecided/Neutral	19	(5)	13	(3)	39	(7)
Favor	44	(12)	62	(15)	44	(8)
Strongly Favor	11	(3)	0	(0)	6	(1)
Totals	100%	(27)	100%	(24)	100%	(18)
Position Toward Operational Hail Suppression Program						
Strongly Oppose	19	(5)	4	(1)	0	(0)
Oppose	22	(6)	33	(8)	33	(6)
Undecided/Neutral	33	(9)	21	(5)	50	(9)
Favor	11	(3)	38	(9)	17	(3)
Strongly Favor	15	(4)	4	(1)	0	(0)
Totals	100%	(27)	100%	(24)	100%	(18)
Willingness to Pay Share of Cost for Operational Program						
Would Pay: Nothing	52	(14)	25	(6)	33	(6)
Up to 15/acre	4	(1)	41	(10)	28	(5)
Up to $1.00/acre	29	(8)	17	(4)	33	(6)
Undecided/Don't Know	15	(4)	17	(4)	6	(1)
Totals	100%	(27)	100%	(24)	100%	(18)

Table 24

Farm Size by Selected Evaluation Items

Perceived Economic Benefit or Harm from Hail Suppression	Farm Size (acreage) Less than 200 %	(N)	200-399 %	(N)	400 or more %	(N)
Harm	5	(1)	0	(0)	5	(1)
No Difference	19	(4)	23	(6)	28	(6)
Benefit	76	(16)	77	(20)	67	(14)
Totals	100%	(21)	100%	(26)	100%	(21)
Position Toward Experimental Hail Suppression Program						
Strongly Oppose	10	(2)	0	(0)	14	(3)
Oppose	14	(3)	8	(2)	19	(4)
Undecided/Neutral	24	(5)	23	(6)	19	(4)
Favor	52	(11)	58	(15)	43	(9)
Strongly Favor	0	(0)	11	(3)	5	(1)
Totals	100%	(21)	100%	(26)	100%	(21)
Position Toward Operational . Hail Suppression Program						
Strongly Oppose	14	(3)	4	(1)	9.5	(2)
Oppose	33	(7)	19	(5)	33	(7)
Undecided/Neutral	43	(9)	35	(9)	24	(5)
Favor	5	(1)	35	(9)	24	(5)
Strongly Favor	5	(1)	7	(2)	9.5	(2)
Totals	100%	(21)	100%	(26)	100%	(21)
Willingness to Pay Share of Cost for Operational Program						
Would Pay: Nothing	38	(8)	38	(10)	33	(7)
Up to 15/acre	5	(1)	27	(7)	38	(8)
Up to $1.00/acre	38	(8)	31	(8)	10	(2)
Undecided/Don't know	19	(4)	4	(1)	19	(4)
Totals	100%	(21)	100%	(26)	100%	(21)

Table 25

Length of Residence As a Farmer By Selected Evaluation Items

Perceived Economic Benefit or Harm from Hafl Suppression	Length of Residence as a Farmer (years) 15 or less %	(N)	16 to 30 %	(N)	more than 30 %	(N)
Harm	5	(1)	4	(1)	0	(0)
No Difference	20	(4)	14	(3)	37	(9)
Benefit	75	(15)	82	(18)	63	(15)
Totals	100%	(20)	100%	(22)	100%	(24)
Position Toward Experimental Hail Suppression Program						
Strongly Oppose	15	(3)	4	(1)	4	(1)
Oppose	15	(3)	9	(2)	21	(5)
Undecided/Neutral	15	(3)	18	(4)	25	(6)
Favor	50	(10)	55	(12)	50	(12)
Strongly Favor	5	(1)	14	(3)	0	(0)
Totals	1.00%	(20)	100%	(22)	100%	(24)
Position Toward Operational Hail Suppression Program						
Strongly Oppose	15	(3)	4	(1)	4	(1)
Oppose	30	(6)	32	(7)	29	(7)
Undecided/Neutral	30	(6)	27	(6)	38	(9)
Favor	20	(4)	23	(5)	25	(6)
Strongly Favor	5	(1)	14		4	(1)
Totals	100%	(20)	100%	(22)	100%	(24)
Willingness to Pay Share of Cost for Operational Program						
Would Pay: Nothing	45	(9)	46	(10)	25	(6)
Up to 15/acre	20	(4)	27	(6)	25	(6)
Up to $1.00/acre	30	(6)	18	(4)	33	(8)
Undecided/Don't Know	5	(1)	9	(2)	17	(4)
Totals	100%	(20)	100%	(22)	100%	(24)

Table 26

Recent Crop Loss from Hail By Selected Evaluation Items

	Recent Crop Loss From Hail			
Perceived Economic Benefit or Harm from Hail Suppression	No		Yes	
	%	(N)	%	(N)
Harm	2	(1)	4	(1)
No Difference	27	(12)	21	(5)
Benefit	71	32	75	(18)
Totals	100%	(45)	100%	(24)
Position Toward Experimental Hail Suppression Program				
Strongly Oppose	4	(2)	13	(3)
Oppose	18	(8)	8	(2)
Undecided/Neutral	25	(11)	17	(4)
Favor	49	(22)	54	(13)
Strongly Favor	4	(2)	8	(2)
Totals	100%	(45)	100%	(24)
Position Toward Operational Hail Suppression Program				
Strongly Oppose	7	(3)	12.5	(3)
Oppose	33.5	(15)	21	(5)
Undecided/Neutral	33.5	(15)	33	((8)
Favor	22	(10)	21	(5)
Strongly Favor	4	(2)	12.5	(3)
Totals	100%	(45)	100%	(24)
Willingness to Pay Share of Cost for Operational Program				
Would Pay: Nothing	38	(17)	38	(9)
Up to 15/acre	20	(9)	29	(7)
Up to $1.00/acre	27	(12)	25	(6)
Undecided/Don't Know	15	(7)	8	(2)
Totals	100%	(45)	100%	(24)

Question asked of farmers only, "Have you had recent crop losses due to hail, say in the last five years?"

Table 27

Crop Hail Insurance Coveragle by Selected Evaluation Items

Perceived Economic Benefit or Harm from Hail Suppression	Crop Hail Insurance Coverage: No/Sometimes %	(N)	Yes/Always %	(N)
Harm	0	(0)	4	(2)
No Difference	26	(6)	24	(11)
Benefit	74	(17)	72	(33)
Totals	100%	(23)	100%	(46)
Position Toward Experimental Hail Suppression Program				
Strongly Oppose	9	(2)	7	(3)
Oppose	26	(6)	8	(4)
Undecided/Neutral	9	(2)	28	(13)
Favor	52	(12)	50	(23)
Strongly Favor	4	(1)	7	(3)
Totals	100%	(23)	100%	(46)
Position Toward Operational Hail Suppression Program				
Strongly Oppose	13	(3)	7	(3)
Oppose	35	(8)	26	(12)
Undecided/Neutral	17	(4)	41	(19)
Favor	31	(7)	17	(8)
Strongly Favor	4	(1)	9	(4)
Totals	100%	(23)	100%	(46)
Willingness to Pay Share of Cost for Operational Program				
Would Pay: Nothing	43	(10)	35	(16)
Up to 15/acre	17	(4)	26	(12)
Up to $1.00/acre	31	(7)	24	(11)
Undecided/Don't Know	9	(2)	15	(7)
Totals	100%	(23)	100%	(46)

Question asked of farmers only: "Do you normally <:arry crop hail insurance?"

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APPENDICES

APPENDIX A*

Detailed Description of Scales Used in the Report**

*A11 item numbers given in this appendix refer to the items as numbered in the interview schedule.

**For a description of the various scale statistics, see Scott, W.A., "Attitude Measurement," in G. Linzey and E. Aronson (Eds.), Handbook of Social Psychology, Vol. 2, Reading, Mass.: Addison-Wesley, 1968, pp. 204-273.

ATTITUDE SCALES STATISTICS

WXM - Weather Modification Scale: Items 1, 5, 12

Coefficient of internal consistency = .820
Homogeneity ratio = .603
Item to total correlations:

Item	r(IT)
1	.67
5	.63
12	.72

Possibe range of individual scale scores = 3 - 1 5
X Scale score =10.51
Standard deviation =2.45

RN2 - Religio Natural Orientation Scale: Items 3, 6, 9

Coefficient of internal consistency = .785
Homogeneity ratio = .558
Item to total correlations:

Item	r(IT)
3	.68
6	.55
9	.67

Possible range of individual scale scores = 3 - 1 5
X Scale score = 9.63
Standard deviation = 2.74

SOl - Scientific Orientation Scale: Items 4, 8

Coefficient of internal consistency = .435 .
Homogeneity ratio = .278
Item to total correlations:

Item	r(IT)
4	.81
8	.78

Possible range of individual scale scores = 2 - 1 0
X Scale score = 7.43
Standard deviation =1.27

ITEMS FOR ATTITUDE SCALES*

1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work – to see if it does increase moisture, etc.

3. Cloud seeding probably violates God's plans for man and the weather.

4. Man should use scientific knowledge to deal with problems whenever and wherever possible.

5. Illinois State agencies should feel free to use such things as cloud seeding if it might help farmers avoid crop losses.

6. Even when carefully controlled, cloud seeding programs are very likely to upset the balance of nature.

8. Scientific experiments in general usually produce useful results – produce things that are helpful to man.

9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.

12. If weather is a problem to farmers, it is appropriate to try to directly control extreme weather conditions by using the most effective techniques known -- for example, cloud seeding to increase rain if moisture is needed, etc.

*A11 items coded: 1 = Strongly disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly agree

KNOWLEDGEABILITY (AWARENESS) SCALE STATISTICS

KNl - Awareness of Weather Modification Efforts: Items 16, 17, 18, 19

Coefficient of internal consistency = .559
Homogeneity ratio = .253
Item to total correlation:

Item	r(IT)
16	.36
17	.32
18	.34
19	.38

Possible range of individual scale scores = 4 - 1 2
X Scale score =6.05
Standard deviation =2.11

ITEMS FOR KNOWLEDGEABILITY (AWARENESS) SCALE

Item #		Code
16.	Have you heard about any weather modification programs which attempt to increase rainfall?	1 = No 2 = Don't remember/ uncertain 3 = Yes
17.	Have you heard about any weather modification programs which attempt to suppress or decrease hail?	1 = No 2 = Don't remember/ uncertain 3 = Yes
18.	What about fog? Have you heard anything about attempts to break up fogs?	1 = No 2 = Don't remember/ uncertain 3 = Yes
19.	Are you aware of any programs which attempt to modify hurricanes?	1 = No 2 = Don't remember/ uncertain 3 = Yes
20.	What about tornadoes? Have you heard anything about weather modification programs which attempt to stop or reduce damage from tornadoes?	1 = No 2 = Don't remember/ uncertain 3 = Yes

BELIEF IN EFFICACY SCALES STATISTICS*

BEl - Belief in Efficacy of Cloud Seeding Scale: Items 22, 23

Coefficient of internal consistency = .738
Homogeneity ratio = .596
Item to total correlation:

Item	r(IT)
22	.60
23	.60

Possible range of individual scale scores = 2 - 1 0
$\bar{X}$ Scale score =6.67
Standard deviation =2.17

BE2 - Belief in Efficacy for Precipitation Augmentation Scale: Item 22

Possible range of individual scale scores = 1 - 5
$\bar{X}$ Scale score = 3.66
Standard deviation = 1.33

BE3 - Belief in Efficacy for Hail Suppression Scale: Item 23

Possible range of individual scale scores = 1 - 5
$\bar{X}$ Scale score =3.01
Standard deviation =1.09

*For single item scales, the coefficient of internal consistency, the homogeneity ratio, and the item to total correlations are not calculable.

ITEMS FOR BELIEF IN EFFICACY SCALES

Item #		Code
22.	Do you think that cloud seeding works — that is, do you think it can actually increase moisture?	1 = No 2 = Perhaps, but I doubt it 3 = Don't know 4=I think so, but I'm not sure 5 = Yes
23.	Do you think that cloud seeding can actually suppress hail?	1 = No 2 = Perhaps, but I doubt it 3 = Don't know 4 = I think so, but I'm not sure 5 = Yes

BENEFIT/HARM SCALES STATISTICS*

BHl - Benefit/Harm from Cloud Seeding Scale: Items 25, 26, 27

Coefficient of internal consistency = .590
Homogeneity ratio = .328
Item to to total correlation:

Item	r(IT)
25	.34
26	.45
27	.42

Possible range of individual scale scores = 3 - 9
$\bar{X}$ Scale score =7.17
Standard deviation = 1.36

BH3 - Benefit/Harm from Hail Suppression Scale: Item 25

Possible range of individual scale scores = 1 - 3
$\bar{X}$ Scale score = 2.58
Standard deviation = .54

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*For single item scales, the coefficient of internal consistency, the homogeneity ratio, and the item to total correlations are not calculable.

ITEMS FOR BENEFIT/HARM SCALES

Item %	Code
25. If a cloud seeding program operating in this area were able to suppress hail, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	1 = Harmful 2 = Would make no difference/DK 3 = Benefit
26. If a cloud seeding program were able to increase rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	1 = Harmful 2 = Would make no difference/DK 3 = Benefit
27. If a cloud seeding program were able to decrease rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	1 = Harmful 2 = Would make no difference/DK 3 = Benefit

ANTICIPATED ACTION SCALE STATISTICS*

AAl - Anticipated Action to Oppose or Support Scale: Item 35

Possible range of individual scale scores = 1 - 3
X scale score = 2.21
Standard deviation = .58

AA2 - Anticipated Action through Vote and Petitions Scale: Items 38, 39**, 40

Coefficient of internal consistency = .845
Homogeneity ratio = .679
Item to total correlation:

Item	r(IT)
38	.79
39	.66
40	.78

Possible range of individual scale scores = 3 - 1 3
X Scale score = 9.05
Standard deviation = 2.85

*For single item scales, the coefficient of internal consistency, the homogeneity ratio, and the item to total correlations are not calculable.

**Item 39 was reverse scored for inclusion in this scale.

ITEMS FOR ANTICIPATED ACTION SCALES

Item #	Code
35. If there is an experimental cloud seeding program proposed for your area, do you think you will do anything to support or oppose it?	1 = Yes - oppose 2 = No, won't do anything/DK 3 = Yes - support
38. How likely would you be to sign a petition favoring a hail or rain experiment for Central Illinois?	1 = Definitely not sign 2 = Probably not sign 3 = Uncertain 4 = Probably sign 5 = Definitely sign
39. How likely would you be to sign a petition opposing a hail or rain experiment for Central Illinois?	1 = Definitely not sign 2 = Probably not sign 3 = Uncertain 4 = Probably sign 5 = Definitely sign
40. If residents in this area were to vote on whether an experimental weather modification program should be started, how do you think you would vote?	1 = Against experiment 2 = Uncertain; probably wouldn't vote 3 = For experiment

EVALUATION SCALE STATISTICS*

EVl - Evaluation of Weather Modification Efforts Scale: Item 21

Possible range of individual scale scores = 1 - 3
$\bar{X}$ Scale score =2.15
Standard deviation = .56

EV2 - Position toward Experimental Hail Suppression Scale: Item 34

Possible range of individual scale scores = 1 - 5
$\bar{X}$ Scale score =3.33
Standard deviation = .99

EV3 - Position toward Operational Hail Suppression Scale: Item 48

Possible range of individual scale scores = 1 - 5
$\bar{X}$ Scale score =2.99
Standard deviation = .99

*For single item scales, the coefficient of internal consistency, the homogeneity ratio, and the item to total correlations are not calculable.

ITEMS FOR EVALUATION SCALES

Item #	Code
21. (This item asked only if respondent answered "yes" to one or more of items 16 - 20). In general, was what you heard about weather modification unfavorable, neutral, or favorable?	1 = Unfavorable 2 = Neutral/don't remember/ don't know/ not applicable 3 = Favorable
34. As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?	1 = Strongly oppose 2 = Oppose 3 = Undecided/ neutral/ insufficient knowledge to judge 4 = Favor 5 = Strongly favor
48. As a resident of this area, how do you feel about the possibility of an operational (non-experimental) hail suppression program which would seed clouds on all days when hailstorms ave in the area?	1 = Strongly oppose 2 = Oppose 3 = Undecided 4 = Favor 5 = Strongly favor

APPENDIX B

Comparisons Among Illinois, Colorado, and South Dakota: Citizen Views Toward Cloud Seeding Prior to Start of Local Program *

* Sources of data:

Farhar, Barbara C. and Julia Mewes. "Weather Modification and Public Opinion, South Dakota, 1973 — Interim Report II." Boulder, Colorado: Institute of Behavioral Science, University of Colorado, March, 1974.

Haas, J. Eugene and Donald Pfost. "Social Implications of the National Hail Research Experiment -- 1971 Final Report." Loveland, Colorado: Human Ecology Research Services, Inc., February 5, 1973.

1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work.

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
Agree	63	75	86
Undecided	17	8	5
Disagree	20	17	9

2. (Illinois, Colorado, South Dakota) state agencies should feel free to use such things as cloud seeding if it might help farmers avoid crop losses.

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
Agree	71	73	74
Undecided	11	9	8
Disagree	18	18	18

3. If weather is a problem to farmers it is appropriate to try to control extreme weather conditions by using the most effective techniques known.

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
Agree	66	60	69
Undecided	14	13	11
Disagree	20	27	20

4. Cloud seeding-probably violates God's plans for man and the weather.

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
Agree	48	46	43
Undecided	15	9	14
Disagree	37	45	43

5. Even when carefully controlled, cloud seeding programs are very likely to upset the balance of nature.

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 435)
Agree	50	54	42
Undecided	29	19	21
Disagree	21	27	37

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

Per cent saying:	Illinois (N = 274)	Colorado (not asked)	South Dakota (N = 435)
No	15		13
Don't know	31		39
Yes	54		48

7. Do you think cloud seeding can actually suppress hail?

Per cent saying:	Illinois (N = 274)	Colorado (not asked)	South Dakota (N = 435)
No	18		14
Don't know	62		67
Yes	20		19

8. If a cloud seediing program operating in this area were able to suppress hail -- reduce damage from hail, would you say it would probably be of economical benefit to you, harmful to you, or make no difference to you?

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N - 436)
Harmful	2	3	1
No difference/ don't know	38	15	23
Beneficial	60	82	76

9. If a cloud seeding program were able to increase rainfall (moisture), would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?

Per cent saying:	Illinois (N = 274)	Colorado (not asked)	South Dakota (N = 436)
Harmful	8		2
No difference/ don't know	45		26
Beneficial	47		72

10. Do you think that cloud seedling might damage the ecology of an area -- that it might prove harmful to plant or animal life, soil or water, in any way?*

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
No	31	42	51
Uncertain/ don't know	41	42	18
Yes	28	16	31

11. Based on your understanding of the hail experiment, how do you feel about the project?**

Per cent saying:	Illinois (N = 274)	Colorado (N = 168)	South Dakota (N = 436)
Oppose	21	15	9
Undecided/neutral/ insufficient knowledge	25	33	45
Favor.	54	52	46

12. If residents in this area were to vote on whether an experimental weather modification program should be started (permitted), how do you think you would vote?

Per cent saying:	Illinois (N = 274)	Colorado (N = 166)	South Dakota (not asked)
Against experiment	23	14	
Uncertain/prob- ably wouldn't vote"	27	26	
For experiment	50	60	

*In South Dakota, question phrased:: "Do you have any particular thoughts about possible side effects from cloud seeding?

**In Illinois, question phrased: "As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?" In South Dakota, question phrased: "Based on your understanding of the South Dakota Weather Modification Program, how do you feel about the program?"

13. If there is an experimental cloud seeding program proposed for your area, do you think you will do any thing to support: or oppose it?*

Per cent saying:	Illinois (N = 274)	Colorado (not asked)	Soutfi Dakota (N == 419)
Yes, oppose	8		2
No/don't know	63		74
Yes, support	29		24

14. Citizen views of <u>who should and who will m</u>ake the decision regarding a local cloud seeding program

Per cent saying:	Illinois (N = 274)		Colorado (N = 168)		South Dakota (N = 436)	
	Should	Will	Should	Will	Should	Will
Local residents/ local government	49	20	62	18	47	20
County and State government	5	8	**	**	11	11
State government	20	32	8	14	7	18
State and federal government	1.5	4	7	15	4	5
Federal government	1.5	4	7	18	2	10
Scientists	4	2	7	13	6	3
Ill. State Water Survey	8	11	**	**	**	**
Other, including combinations	4	5	5	8	17	10
Don't know	7	14	4	14	6	23

*In South Dakota, question phrased: "If there is a cloud seeding program proposed for your area this «>ummer, do you thlink you will do anything to support or oppose it?

**Not included as a response category.

APPENDIX C

Socio - Demographic Analysis

Significant Relationships In a Comparison of 6 Demographic and 30 Selected Variables*

Item**	Age	Sex	Education	Family Income	Social Class	Size of Community
1 Good idea to exper.	.001	.10	.05	.10	.05	
2 State control for C.S.			.02			
3 C.S. viol. God's plans	.02	.10	.001	.05	.001	
4 Use sci. knowledge	.05					.05
5 Ill. agencies feel free						
6 C.S. upsets nature	.02	.01				
7 Tax all citizens			.05			
8 Sci. exper. are O.K.						
9 Leave weather alone	.001	.05	.01	.001	.10	
10 Solve other problems	.01	.05		.02	.10	
11 Scientists control	.01	.01				
12 OK to control weather	.001	.01	.01	.05	.10	
13 Find other ways	.01	.10				
14 Local res. no voice				.10		
15 Scientists don't care	.001	.05	.01	.01	.01	
16 Kn. of wx mod:incr rain			.05			
17 Kn. of wx mod: sup. hail		.05				
18 Kn. of wx mod: Fog		.05	.05		.10	
19 Kn. of wx mod: Hurr.		.05	.05		.02	.10
20 Kn. of wx mod: Tornado			.05			.05
22 Bel in Eff: Incr Rain	.001	.01	.05	.001		
23 Bel in Eff: Sup. Hail	.001		.02	.01		
24 Damage the ecology	.02	.05				
25 Ben/Harm: Hail Supp.						.10
26 Ben/Harm: Incr Rain				.05	.05	.10
27 Ben/Harm: Decr Rain			.10	.02		.05
34 Eval. of Exper. Prog.	.10		.01			.05
35 Anticipated Action				.10		.10
40 Vote	.001			.05		
48 Eval. of Oper. Program						.01
Total Number of Significant Relationships with	15	14	15	13	9	9

* Figures presented in the table are levels of significance (X) obtained by using the Chi Square Test (X^2)

** Item numbers correspond to items as numbered in the interview schedule.

Age* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work-to see if it does increase moisture.	30.26 (10)	.001	Favorability decreases with age. As many as 86% in the youngest group agree, with the proportion decreasing in each older group to a low of 40% agreeing in the over 65 category.
3. Cloud seeding probably violates God's plans for man and the weather.	22.49 (10)	.02	Clear trend. YoUng are more likely to disagree (62%) than agree (19%). Older persons are more likely to agree (67%) than disagree. Other age groups show a pattern between these extremes.
4. Man should use scientific knowledge to deal with problems whenever and wherever possible.	20.85 (10)	.05	Pattern is not as clear here. Majority in all age groups agree, with three younger groups agreeing somewhat more than three older groups.
6. Even when carefully controlled, cloud seeding programs are \/ery likely to upset the balance of nature.	22.84 (10)	.02	Definite trend is evident here, with older persons more apt to agree (as many as 2/3.) and younger persons being more undecided or disagreeing.
9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.	48.80 (10)	.001	Definite pattern emerges with youngest dis-agreeing (62%) and oldest agreeing (69%). Other groups show patterned differences between these extremes.
10. We should try to solve other problems before spending more tax money on weather modification programs.	27.17 (10)	.01	About half in the three younger age groups agree compared to three-fourths who agree in the three older age groups.
11. Since scientists know most about these matters, the control and conduct of weather modification programs should be left entirely in their hands.	23.83 (10)	.01	Pattern is not as clear but shows the old and young more likely to agree than disagree, while the two middle age groups are more likely to disagree. The item as a whole shows equal proportion agreeing (43%) and disagreeing (46%).

* Categories on the Demographic Variable: Under 26/ 26 to 35/ 36 to 45/ 46 to 55/ 56 to 65/ Over 65

Age* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
12. If weather is a problem to farmers, it is appropriate to try to control extreme weather conditions by using the most effective techniques known-- for example, cloud seeding to increase rain if moisture is needed, etc.	32.84 (10)	.001	Clear trend with at least three-fourths in the three younger groups agreeing, two-thirds in the 46 to 55 group agreeing, and less than half in the two older groups agreeing.
13. Instead of trying to change the weather, man should find other ways of dealing with it, for example, improved weather forecasting, cheaper crop insurance, etc.	28.33 (10)	.01	The youngest are least likely to agree (29%) and most likely to be undecided (43%). The tendency to agree increases with age (as many as 70% in the 56 to 65 group agree).
15. In general, weather scientists are mainly concerned with their experiments and don't really care about what happens to other people.	33.65 (10)	.001	The clear majority in all age groups except the oldest disagree. However, the proportion agreeing increases with age from a low of 0% in the Under 26 group to a high of 33% in the Over 65 group.
22. Do you think that cloud seeding works -- that is, do you think it can actually increase moisture?	48.48 (20)	.001	Belief in Efficacy is about the same in the four younger groups, with close to two-thirds feeling that moisture can be increased. In the two older groups less than half feel this way with as many as 40% feeling that cloud seeding can't work to increase moisture.
23. Do you think that cloud seeding can actually suppress hail?	51.80 (20)	.001	Majority in all age groups are undecided. Middle age persons have a little higher belief in efficacy than do the young or the old. Old indicate the least belief that hail can be reduced, and the most disbelief.

* Categories on the Demographic Variable: Under 26/ 26 to 35/ 36 to 45/ 46 to 55/ 56 to 65/ Over 65

Age* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
24. Do you think that a cloud seeding program might damage the ecology of an area – that it might prove harmful to plant or animal life, soil or water in any way?	21.78 (10)	.02	Clear difference. Although a large proportion in all age groups are undecided, less than one-fifth in the three younger groups compared to about 40% in 'the three older groups feel that cloud seeding might damage the ecology in some way.
34. As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?	31.01 (20)	.10	Generally, more favorability among the young than among the old. More opposition among the older - from 29% (46 to 55 group) to 35% (56 to 65 group).
40. If residents in this area were to vote on whether an experimental weather modification program should be started, how do you think you would vote?	29.69 (10)	.001	Very clear trend. Youngest most apt to claim they would vote in favor (76%) while older persons more likely to feel they wouldn't vote or would vote against an experiment. Only one-fourth in the 56 to 65 group would vote in favor.

* Categories on the Demographic Variable: Under 26/ 26 to 35/ 36 to 45/ 46 to 55/ 56 to 65/ Over 65

Sex* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work- to see if it does increase moisture.	5.06 (2)	.10	Males a little more likely than females to agree (67% compared to .59%).
3. Cloud seeding probably violates God's plans for man and the v/eather.	4.86 (2)	.10	The proportion agreeing for both sexes 50% male, 45% female) is greater than the proportion disagreeing (40% male, 36% female). Females are a little more inclined than males to be undecided (20% compared to 10%).
6. Even when carefully controlled, •cloud seeding programs are very likely to upset the balance of nature.	13.75 (2)	.01	Males more likely to agree (56%) than females (43%). Females are much more likely to be undecided (40%) than males (19%).
9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.	6.61 (2)	.05	Males more apt to disagree (51%) than to agree (42%). Females more apt to agree (47%) than to disagree (38%).
10. We should try to solve other problems before spending more tax money on weather modification programs.	6.39 (2)	.05	A majority of both sexes agree, but females a little more likely to do so (67% compared to 62%). Males more likely to disagree than females (29% compared to 17%).
11. Since scientists know most about these matters, the control and conduct of weather modification programs should be left entirely in their hands.	9.45 (2)	.01	For both sexes, agreement occurs as often as disagreement. Females are more likely than males to be undecided. (17% compared to 5%).

* Categories on the Demographic Variable: Male/Female

Sex* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
12. If weather is a problem to farmers, it is appropriate to try to control extreme weather conditions by using the most effective techniques known -- for example, cloud seeding to increase , rain if moisture is needed, etc.	11.02 (2)	.01	Although about the same proportion of both sexes disagree (21%), males are more apt to agree (72%) than are females (59%).
13. Instead of trying to change the weather, man should find other ways of dealing with it – for example, improved weather forecasting, cheaper crop insurance, etc.	5.09 (2)	.10	Slightly more than half agree (true for both males and females). Females less likely than males to disagree (25% compared to 36%).
15. In general, weather scientists are mainly concerned with their experiments and don't really care about what happens to other people.	7.16 (2)	.05	Most disagree, but females (74%) more than males (66%). Although few agree, males are likely than females to do so (22% male, 10% female.
17. Have you heard about any weather modification programs which attempt to suppress or decrease hail?	7.64 (2)	.05	Clearly, few persons are aware of programs for hail suppression. However, male's are more apt to claim awareness (18%) than females (8%).
18. Have you heard anything about attempts to break up fog?	6.61 (2)	.05	Males more likely than females (14% and 5%) to claim awareness.
19. Are you aware of any programs which attempt to modify hurricanes?	6.81 (2)	.05	Both sexes claim to be more aware of hurricane modification than of other types of weather modification. (36% among the males, 22% among the females).

* Categories on the Demographic Variable: Male/Female

Sex* By Selected Variables: Significant Findings

Item	Obtained X^2* (degrees of freedom)	Level of Signifii:ance	Interpretation/Direction of Difference
22., Do you think that cloud seeding works – that is, do you think it can actually increase moisture?	17.68 (4)	.01	Males have greater belief in efficacy than do females. One-half of the males and one-fourth of the females said "yes"..
24. Do you think that a cloud seeding program might damage the ecology of an area -- that it might prove harmful to plant or animal life, soil or water, in any way?	7.30 (2)	.05	About 40% of each sex claim to be "unsure", about possible side effects. Females are more likely than males to feel that damage to the ecology might occur. (one-third compared to one-fourth)

* Categories on the Demographic Variable: Male/Female

Education* By Selected Var iables: Significant Findings

Item	Obtained "X? (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work- to see if it does increase moisture.	12.64 (6)	.05	Clear pattern is evident: those having the most education are most apt to agree (84%), while those with the least education are least apt to agree (52%). The other two groups fall systematically inbetween.
2. If there are going to be weather modification experiments, such as cloud seeding, individual states rather than the federal government should control and conduct them.	15.56 (6).	.02	40% of college educated agree compared to almost two-thirds of all others. College educated are more likely than others to disagree or be undecided.
3. Cloud seeding probably violates God's plans for man and the v/eather.	23.83 (6)	.001	The differences among educational levels are very significant. From highest to lowest educational levels, the proportions disagreeing are: 62%, 52%, 37% and 21%. The reverse pattern is found for agreement.
7. If there are going to be weather modification programs, then all citi- zens should be taxed to pay for them.	13.87 (6)	.05	Except for the high school graduate group (32%), half or more agree. Half of the high school graduate group disagree com- pared to about one-third in the other three groups.
9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.	20.41 (6)	.01.	Again, the pattern found here is very systematic with agreement most likely among the lower educational levels and disagree- ment most likely among the higher educa- tional levels.
12. If weather is a problem to farmers, it is appropriate to try to control extreme weather conditions by using the most effective techniques known— for example, cloud seeding to increase rain if moisture is needed, etc.	17.31 (6)	.01	The majority at all educational levels agree, but this is most common for college educated (81%), and least common for those with less than a high school diploma (58%).

* Categories on the Demographic Variable:: College grad. or above/ Some college or business school
High school grad./ Less than high school grad.

Education* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
15. In general, weather scientists are mainly concerned with their experiments and don't really care about what happens to other people.	19.46 (6)	.01	Clear pattern exists. Higher educated are much more likely to disagree than are less well educated.
16. Have you heard about any weather modification programs which attempt' to increase rainfall?	12.65 (6)	.05	College educated are most aware of cloud seeding efforts to increase rainfall (67%), compared to 40% or less in the other three groups.
18. Have you heard anything about attempts to break up fog?	13.10 (6)	.05	Few at any educational level are aware of fog dissipation programs, but higher educated are more aware than lower educated.
19. Are you aware of any programs which attempt to modify hurricanes?	13.05 (6)	.05	A clear pattern is found with respect to awareness of hurricane modification: from highest to lowest educational levels 43%, 38%, 28% and 17% claim to have heard something.
20. Have you heard anything about weather modification programs which attempt to stop or reduce damage from tornadoes?	13.74 (6)	.05	About one out of four in the two higher educational groups compared to one out of seven in the two lower educational groups claim to have heard something with regard to tornado modification efforts.
22. Do you think that cloud seeding works -- that is, do you think it can actually increase moisture?	23.04 02)	.05	Slightly greater belief in efficacy among hiaher educated than among lower educated. More "unsures" among higher educated; more disbelievers among lower educated.

* Categories on the Demographic Variable: College grad . or above/ Some college or business school
High school grad./ Less than high school grad.

Education* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
23. Do you think that cloud seeding can actually suppress hail?	24.11 (12)	.02	The majority at all educational levels are "unsure". More disbelief among those in the less well-educated group (as many as one-third).
27. If a cloud seeding program were able to decrease rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	11.44 (6)	.10	More at all educational levels perceive "no difference to themselves" than forsee either benefit or harm. This is most true among the lowest educational group. One third or more in the other three groups feel they would benefit from such a program.
34. As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?	26.65 (12)	.01	Most favorability among the college educated (70%), followed by those with some college (57%), high school graduates (49%), and less than high school graduates (49%). Greatest opposition occurs at the lowest educational level (32%).

* Categories on the Demographic Variable: College grad. or above/ Some college or business school
High school grad./ Less than high school grad.

Family Income* By Selected Variables : Significant Findings

Item	Obtained "Xl^2- (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does increase moisture, etc.	14.41 (8)	.10	Lowest income group is much less likely to agree (36%) than the other groups (about 70% at all other income levels agree).
3. Cloud seeding probably violates God's plan for man and the weather.	17.09 (8)	.05	As many as two - thirds at the lowest income level agree, while about 60% at the top income level disagree. The pro- . portions agreeing and disagreeing in the other income groups fall in-between.
9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.	26.15 (8)	.001	There is a clear pattern from low income having the greatest agreement to high income having the greatest disagreement. The single exception is that over $20,000 group falls in the middle of the dis- tribution.
10. We should try to solve other prob- lems before spending more tax money on weather modification programs.	18.47 (8)	.02	A clear majority in lowest income group agree (80%). From half to two-thirds at other income levels agree. There is little more disagreement in the middle income levels that at either income extreme.
12. If weather is a problem to farmers, it is appropriate to try to directly control extreme weather conditions by using the most effective techniques known -- for example, cloud seeding to increase rain if moisture is needed, etc.	18.07 (8)	.05	As on item one, the major difference is that lowest income group is much less likely to agree than middle and upper income groups. As many as three-fourths at all but the lowest level are in agree- ment, while only one third of the under $5,000 qroup agree.
14. Local residents should not have a voice in decisions about a weather modification program unless local tax money is used to finance the proqram.	14.64 (8)	.10	The majority at all levels disagree. Mid-range levels show a little higher disagreement.

Categories on the Demographic Variable: Under $5,000/$5,000-8,999/$9,000-12,999/$l3,000-20,000/Over $20,000

Family Income* By Selected Variables: Significant; Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
15. In general, weather scientists are mainly concerned with their experiments and don't really care about what happens to other people.	21.33 (8)	.01	More disagreement in middle and upper income levels than in two lower levels. About one third at the lowest level agree compared to only one-sixth at other income levels who agree.
22. Do you think that cloud seeding works -- that is, do you think it can actually increase moisture?	51.86 (16)	.001	The greatest belief in efficacy occurs in the middle income levels; the least belief at the lowest level. At least one-fourth in all income categories are "unsure", but more than one-third at the lowest income level do not believe cloud seeding can be effective.
23. Do you think that cloud seeding can actually suppress hail?	38.28 (16).	.01	The majority at all income levels are "unsure" (from 52% to 71%). There is highest belief in efficacy at the two top income categories, but at least one-fourth at the top level and one-third at the lowest level do not believe cloud seeding can work for reducing hail.
26. If a cloud seeding program were able to increase rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	15.76 . (8)	.05	The responses vary systematically by income level. From 20% at the lowest level to 62% at the highest level perceived personal benefit. From 24% in the top income group to 68% in the bottom see "no difference". Very few at any level perceive harm.
27. If a cloud seeding program were able to decrease rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	18.85 (8)	.02	About the same proportion at all levels see benefit (41%) The sole exception is that only 4% in the lowest income category perceive benefit. Low income persons are most likely to say "no difference" (80%) and high income persons are least likely (31%).

*Categories on the Demographic Variable: Under $5,000/$5,000-8,999/$9,000-12,999/$13,000-$20,000/ Over $20,000

Family Income* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
35. If there is an experimental cloud seeding program proposed for your area, do you think you will do anything to support or oppose it?	13.36 (8)	.10	Few at any level would take action to oppose. From 12% at the lowest level to 48% at the top level feel they might take supportive action. However, a large proportion at all levels (from 76%, lowest to 41%, highest) feel they would take no action.
40. If residents in this area were to vote on whether an experimental weather modification program should be started, how do you think you would vote?	15.96 (8)	.05	Only 20% of lowest income persons say they would vote in favor', compared to more than half at all other income levels. More than one-third at the lowest level claim they would vote against the program compared to one-fourth or less at other income levels.

* Categories on the Demographic Variable: Under $5,000/$5,000-8,999/$9,000-12,999/$13,000-20,000/ Over $20,000

Socio-economic Class* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
1. It is a good idea for scientists to experiment with cloud seeding so that we can find out if it really does work- to see if it does increase moisture.	13.54 (6)	.05	The higher the socio-economic status (SES), the greater the agreement. Proportions agreeing from highest to lowest class are 75%, 70%, 58%, and 41%.
3. Cloud seeding probably violates God's plans for man and the weather.	29.78 (6)	.001	Very clear differences. High SES is associated with disagreement; low SES with agreement. As many as 70% in the Lower class agree compared to only 15% in the Upper Middle Class who agree.
9. Man should take the weather as it comes and not try to change it to suit his needs or wishes.	10.72 (6)	.10	The same pattern of responses emerges. Upper Middle Class person are more likely to disagree, Lower class persons are more likely to agree, and the other two classes fall systematically in between.
10. We should try to solve other problems before spending more tax money on weather modification programs.	10.65 (6)	.10	Proportions agreeing vary consistently by class - from 81% in the lowest to 47% in the highest class.
12. If weather is a problem to farmers, it is appropriate to try to directly control extreme weather conditions by using the most effective techniques known --for example, cloud seeding to increase rain if moisture is needed, etc.	11.64 (6)	.10	The majority in all classes agree, but agreement is more evident in each ascending class: 59%, 61%, 68%, 78%.
15. In general, weather scientists are mainly concerned with their experiments and don't really care about what happens to other people.	18.31 (6)	.01	Although most disagree, this is much more the case for high SES than for low SES. Lower class persons are about as likely to agree as to disagree.

Categories on the Demographic Variable: Upper Middle Class/Middle Class/Working Class/ Lower Class

Socio-economic Class* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
18. What about fog? Have you heard anything about attempts to break up fog?	12.50 (6)	.10	The majority in all classes are unaware, but this is most true in the Lower Class. (96%). None in the Lower Class claim awareness, while 10 -12% in the other three classes said they were aware of such programs.
19. Are you aware of any programs which attempt to modify hurricanes?	15.19 (6)	.02	A clear pattern emerges -here. From Lower to Upper Middle, knowledge of hurricane modification increases: 19%, 26%, 32%, 43%.
26. If a cloud seeding program were able to increase rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	13.69 (6)	.05	Responses vary systematically by class - from a low of 30% in the Lower Class who perceive benefit to..a high of 63% in the Upper Middle Class. The greatest amount of harm is expressed by working class persons (12%).

*Categories on the Demographic Variable: Upper Middle Class/ Middle Class/ Working Class/ Lower Class

Size of Community* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
4. Man should use scientific knowledge to deal with problems whenever and wherever possible.	9.82 (4)	.05	Rural and small town residents most apt to agree (83% and 80%), while half of the city dwellers agree. As many as 40% of city dwellers disagree compared to only 10% in the other two groups.
19. Are you aware of any programs which attempt to modify hurricanes?	8.71 (4)	.10	City residents claim to be most aware (44%), followed by rural residents (38%) and then small town residents (24%).
20. Have you heard anything about weather modification programs which attempt to stop or reduce damage from tornadoes?	11.03 (4)	.05	City and rural residents claim to be most aware (about one out of five), and then small town residents (11%).
25. If a cloud seeding program operating in this area were able to suppress hail, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	7.70 (4)	.10	As many as two-thirds of rural residents feel they would personally benefit. About 60% of small town residents and less than one-third of the city dwellers feel they would benefit.
26. If a cloud seeding program were able to increase rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	8.21 (4)	.10	Again, the differences are in the same direction. 58% of rural, 43% of small town and 40% of city residents feel they would personally benefit from cloud seeding which could increase rainfall.
27. If a cloud seeding program were able to decrease rainfall, would you say it would probably be of economic benefit to you, harmful to you, or make no difference to you?	10.29 (4)	.05	More in all three groups feel that such a program would make no difference to them than feel that they would be benefitted or harmed. Still, rural residents are more likely than others to perceive benefit (43%), and city residents least likely (10%).

* Categories on the Demographic Variable: Rural area/ Small town/ City

Size of Community* By Selected Variables: Significant Findings

Item	Obtained X^2 (degrees of freedom)	Level of Significance	Interpretation/Direction of Difference
34. As a resident of this area, how do you feel about an experimental program of hail suppression which may be proposed for this part of Central Illinois?	17.85 (8)	.05	Rural persons are most likely to favor an experiment (60%); city persons least likely (40%). However, as many as one-fourth of rural persons express opposition, compared to one-fifth for small town and 40% for the city.
35. If there is an experimental cloud seeding program proposed for your area, do you think you will do anything to support or oppose it?	9.05 (4)	.10	Very few persons' in the rural and small town groups said they would do anything to oppose (10% or less), compared to 30% in the city group. About one-third in each group said they might take action to support an experi- - mental program.
48. As a resident of this area, how do you feel about the possibility of an operational (non-experimental) hail suppression program which would seed clouds on all days when hailstorms are in the area?	25.68 (8)	.01	Interestingly, rural residents are least likely to express favor toward an operational program (31%), while city residents are most likely (40%). The proportion in each group being opposed is greatest for the city (50%) and least for small town (22%).

* Categories on the Demographic Variable: Rural area/ Small town/ City