

DROUGHT CONTINGENCY PLANNING

SPECIAL REPORT NO. 3

OF THE

ILLINOIS STATE WATER PLAN TASK FORCE

Printed By
Illinois Division of Water Resources
Department of Transportation
Springfield, Illinois

June 1983

Table of Contents

	<u>Page No.</u>
Statement of the Problem.....	1-3
The Effects of Droughts.....	4-6
Drought Importance and Response.....	6-7
Ongoing Programs.....	7-12
Options for Policy and Programs.....	12
1. Drought Response Framework.....	13-19
2. Public Education.....	20
3. Weather Modification.....	21-23
Additional Research Needs.....	23-25
Proposed Drought Contingency Programs and Options.....	26-31

Statement of the Problem

Droughts are not a unique phenomenon in Illinois. Over the past 100 years, serious droughts have occurred on the average of every 22 years. The State Water Survey Division of the Illinois Department of Energy and Natural Resources prepared an illustration showing the timing of all droughts of consequence from 1906 to the present (See Figure 1.). In this figure droughts are defined by precipitation deficiencies for various time periods ranging from 3 months up to 5 years. Also shown for each drought is its ranking, based on the statewide percentage of normal precipitation in the worst part of each drought. Thus, one notes that the worst (driest) 6-month period in the 1980-81 drought (October, 1980-March, 1981) ranked as the 16th worst 6-month drought in the 1906-1981 period. The driest 12-month period (April, 1980-March, 1981) ranked as the 15th worst.

One also sees that the 1980-81 drought was far from an extreme event. The illustration also depicts several other interesting facts:

1. There was a general lack of drought between 1956 and 1975 (only a minor one in 1962-63);
2. The figure suggests that droughts may be beginning to occur more often (two in the past 6 years and both in the southern half of the state; and

TIME SCALE FOR PEAK PERIODS OF DROUGHTS

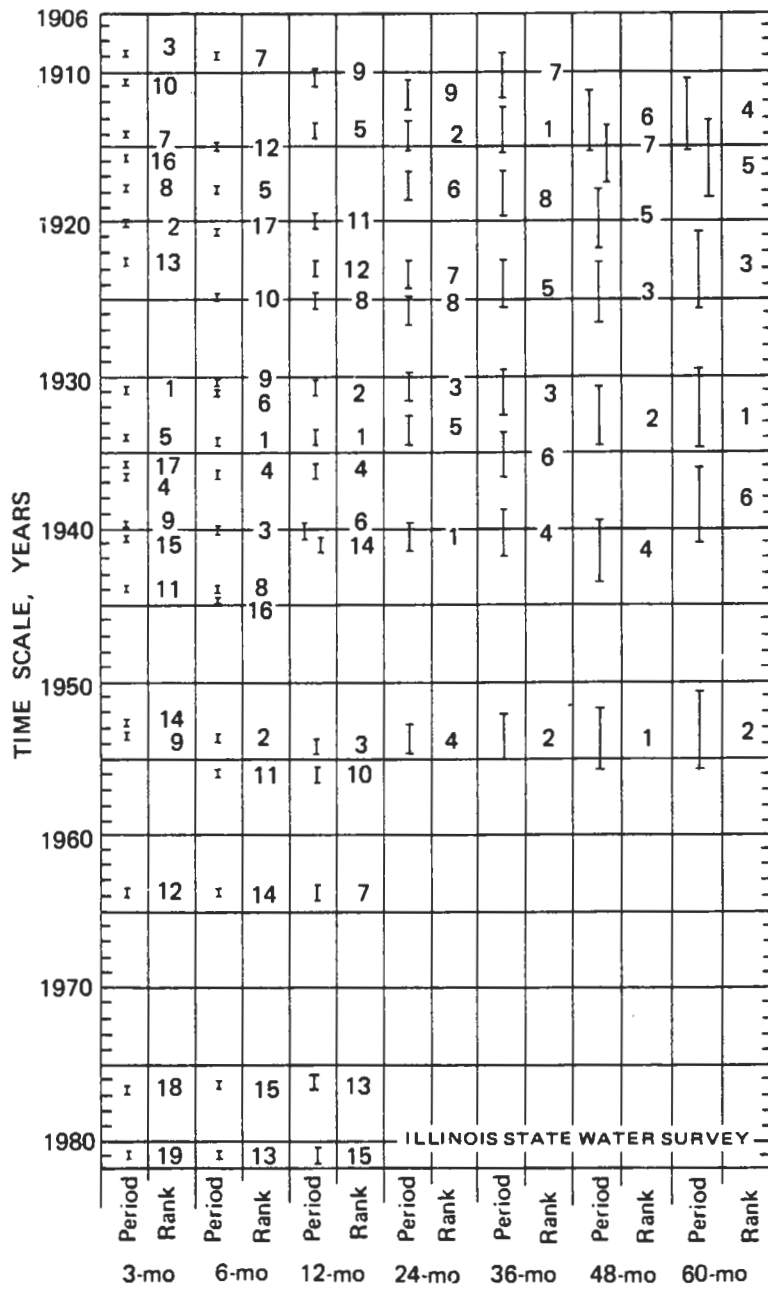


Figure 1
Illinois droughts in the 1906 - 1982 period

3. Many of the more severe droughts of the 1920s, 1930s and 1950s were composed of two 12-month droughts separated by a few months of semi-normal rainfall.

If, as the figure suggests, droughts are beginning to occur more often, it is likely that the negative short and long term effects of drought will tend to increase as well.

Stanley A. Changnon, Jr., Chief of the Illinois State Water Survey, says that "Basically, a drought is composed of two things: a natural period of below normal rainfall, and ensuing water deficiencies as defined for various specific, human activities and needs for water. That is, there is a physical aspect of drought and a human aspect as well." Changnon cites the following as an illustrative example:

The lake supplying water for Centralia is quite low with a water alert in effect; whereas 25 miles away, Mt. Vernon has no water shortage because its lake source (Rend lake) is much larger. Hence, although rainfall in both areas was deficient, there was a drought at Centralia but none at Mt. Vernon, if one uses shortages of urban water supplies to define drought. This illustrates that there are different kinds of drought, defined in varying ways as to placement and as to magnitude. Action to address them must recognize these different natural and man-made influences, needs, and sources of water.

The Effects of Drought

The last State Task Force on Drought prepared a report for the Governor in 1977 that outlined the causes and results of drought. The report noted that the basic cause of drought is a deficiency of rainfall - which is something that man currently can not do much about short of the employment of extensive weather modification programs. Practical weather modification may be available in the near future. In the meantime, as the Drought Task Force pointed out in 1977, droughts have the following impacts on those areas indicated:

RURAL HOUSEHOLDS

Such households are often effected first by droughts due to their reliance on shallow wells, which are sensitive to relatively small lowerings of the water level. While many rural households have double and even triple sources of supply, many still have to haul water for various purposes. In January, 1977, in the 49 counties in Illinois considered to have potential disaster status by USDA standards, members of 24,123 households were hauling water from public supplies. The average monthly consumption was 3,408 gallons. To have hauled this water commercially, the average cost per farmer would have been \$40.84. The total cost, excluding the cost of gasoline, would be \$985,055.

PUBLIC WATER SUPPLIES

In 1977, the Illinois Environmental Protection Agency compiled a partial list of communities that have drought connected water supply problems. The communities were in 34 counties in central and southern Illinois. If water conservation measures or temporary assistance fails to carry a community through an extended drought, serious economic, sanitation and fire protection problems could result.

LIVESTOCK

Due to the daily water requirements of cattle and swine, the maintenance of even a modest size herd might require the daily hauling of water during a water shortage. The present cost of hauling 1,000 gallons of water to a farm averages \$12.00. The extra daily cost of 20¢ to 40¢ per animal could make many operations unprofitable. Since the livestock industry is basic to the Illinois economy, adverse affects from drought could result in a long term detriment to the state.

CROPS

In any extended drought period, the greatest loss is likely to be the damage to crops. If there is insufficient soil moisture to germinate seeds, Illinois could face severe losses in terms of crop yields. In addition, herbicides, insecticides and fertilizers are applied in a water solution (20 gallons per acre). A continuing drought require extensive and costly water hauling.

HYDROELECTRIC POWER

Since Illinois is not a water power state, drought conditions would have little effect on hydroelectric power - unless changing future economic and environmental considerations support some growth in water power.

STRUCTURAL FAILURES

Many Illinois structures that previously had stable foundation systems have developed cracks and suffered conspicuous settlement during recent drought periods.

ENVIRONMENT

Generally, water quality is greatly reduced during drought conditions. This causes problems with the composition of fish communities and other aquatic organisms, a well as restricting human contract sports such as swimming and water-skiing. Drought conditions increase the probability of wildland fires, may make forest trees susceptible to damage from insects and disease; causes problems for wildlife (especially muskrats), and affects the migratory behavior of water fowl.

NAVIGATION

Drought lowers water levels in navigable rivers and greatly increases the unit cost of transportation.

Drought Importance and Response

As indicated above, droughts have caused and can cause serious problems with respect to the state's economy, environment and its citizens in general. Yet in the fall of 1980, those attending a series of public forums on water resource issues ranked drought 11th in terms of overall priority out of 18 critical water related issues. This may be, in part, due to the fact that farmers, who are often the first and most seriously affected, tend to face such hardships stoically and are accustomed to taking whatever measures necessary themselves to deal with drought problems. It may also be a function of the fact that a drought does not generally affect all parts of the state in an equally severe fashion; or it could just be due to the public's belief that it is difficult to affect or change the causes of drought. Whatever the reasons, there is much that needs to be done to raise the level of public concern with respect to drought related issues.

Since droughts in Illinois are not uncommon, more attention should be given also to remedies that will be most effective in minimizing the chances of a drought induced water shortage at a later time. The areas in the state that have developed large impoundments of water, for instance, are the ones that experience the fewest problems when droughts do occur.

In addition to the steps that have already been taken or are being taken by the state to deal with drought, the public needs to become much more concerned about water conservation in general. With respect to this concern, this State Water Plan component relates closely to the Water Plan issue of "Water Conservation."

Also, the state needs to codify its drought contingency related programs in order that all appropriate officials and groups are aware of the actions to be taken by the state in its response to drought. Hopefully, this special report will lay the groundwork for such an organized response.

ONGOING PROGRAMS

The State of Illinois has several ongoing programs which pertain to drought and drought contingency efforts. Also, the federal government, through its Department of Agriculture, and National Weather service has programs which are useful to the state's drought contingency programming activities. These existing programs are outlined briefly herein:

ILLINOIS EMERGENCY SERVICES AND DISASTER AGENCY (ESDA)

The Illinois Emergency Services and Disaster Agency (ESDA) is concerned with the emergency and short-term effects of a drought. The State ESDA is the State coordinating agency in the event of any kind of disaster, coordinating the responses of all State

agencies. ESDA also works with over 500 local ESDA units. A limited supply of pipe and pumps are available for short-term loan to communities. ESDA has the further responsibility of serving as the State coordinator for all federal disaster assistance programs.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY (IEPA)

The State Environmental Protection Agency continuously monitors public water supplies and maintains contact with the communities involved. The staff of the agency offers technical assistance and works with other state agencies in attempting to resolve water shortage problems. The State EPA has also prepared a list of sewage treatment plans with discharge effluent of sufficient quality to permit its use by farmers for stock watering in drought pressed areas.

STATE GEOLOGICAL SURVEY,
ILLINOIS DEPARTMENT OF ENERGY
AND NATURAL RESOURCES

The State Geological Survey Division maintains information on the location of the more highly producing aquifers and assists with the exploration and mapping of smaller aquifers locations.

STATE WATER SURVEY DIVISION,
ILLINOIS DEPARTMENT OF ENERGY
AND NATURAL RESOURCES

The Illinois State Water Survey conducts scientific studies into measurement, utilization, and conservation of water. The emphasis of the Survey's hydrological research is on surface supplies and precipitation. In turn, this research is used in the Survey's developmental projects to improve the quality and quantity of Illinois' water.

The resulting information and services provided by the Water Survey division are used by other state and federal agencies, municipalities, industries, professional groups, well drillers and others. The Water Survey Division continually monitors water conditions in the State and issues detailed monthly reports continuing information on surface water conditions, soil moisture, groundwater conditions and precipitation. Of critical importance to drought contingency planning are the long range monthly and seasonal precipitation outlooks issued by the Survey for those parts of the state with water shortage problems.

ILLINOIS DEPARTMENT OF
COMMERCE AND COMMUNITY
AFFAIRS

The Department of Commerce and Community Affairs provides a variety of technical services to local governments. In the area of water resources and water shortage situations, the department's services may include the following:

1. Workshops involving several state agencies to provide information about local actions which may be undertaken to deal with depleted or rapidly declining water supplies.
2. Aiding local officials in obtaining the specialized services of other state agencies.
3. Publications related to conservation and bringing together information from other agencies.
4. Information and guidance on rate structures.
5. Providing information about the use of bonds (revenue and general obligation in the improvement of water systems).

6. Identification of federal aid programs for water system improvements.
7. Guidance in preparing ordinances which prohibit nonessential uses of water.
8. Providing information about budgetary actions required to respond to water emergencies.

ILLINOIS DEPARTMENT OF
PUBLIC HEALTH

The Department of Public Health assesses the potability of water derived from privately owned sources and from sources shared by ten or less housing units. Water from these sources can be tested, at no cost, for potability by the Department.

DIVISION OF WATER RESOURCES
ILLINOIS DEPARTMENT OF
TRANSPORTATION

The Division of Water Resources concerns itself with water supply issues, as well as technical assistance in planning and water system design, special district organization, or the search for funding alternatives. The Division sells state owned water supply at Kincaid, Shelbyville, Carlyle and Rends Lakes, and allocates Lake Michigan waters as a part of an ongoing program. Data and recommendations of the Inventory and Assessment Activity are provided to communities with water problems, and may result in state assistance for development of new supplies for sale in deficient areas. The Division also promotes the siting of major consumptive users in water abundant areas.

ILLINOIS DEPARTMENT OF
AGRICULTURE

The Illinois Department of Agriculture assists farmers in water-short areas in obtaining water for livestock and performs other related supporting roles.

Federal agency programs relevant to droughts in Illinois are found in three agencies.

UNITED STATES DEPARTMENT OF AGRICULTURE

The U.S. Department of Agriculture administers several programs that can be brought to bear on water shortage issues. The regular Agricultural Conservation Program (ACP) has the pond and well development program available for cost sharing with eligible agricultural producers, but funds are limited. Under the Emergency Conservation Measures (ECM) Program, a program is available for deepening wells, constructing ponds, and providing pipes for springs and seeps, primarily for livestock on pasture. County ASCS Committees may fund such programs as 80% cost sharing. The Farmers Home Administration's low cost loan funds can be used to assist farmers in digging wells and other structural projects if credit has been denied by local lending institutions.

NATIONAL WEATHER SERVICE

The National Weather Service monitors and evaluates the nation's weather. The information processed by the Service is used four times daily to make weather "forecasts" and twice a month to make 30 day weather "outlooks" on precipitation and temperature.

NATIONAL WEATHER SERVICE

The weather records at the National Weather Service are accessible to the public, and the Service will provide an evaluation of requested weather records. The Services has 100 years of weather records for

most of Illinois, which serve the Agency as a reference for determining the "outlook" of this state.

With respect to weather modification programs, the state needs to keep abreast of similar efforts in other surrounding states, as well as national developments in this area.

Since the Water Survey Division of INR appears to have a sound data basis relative to drought trends, ground and surface water conditions, etc., there does not seem to be any problem with lack of data at this time. As with the water conservation issue in general, the major topics that need to be addressed are more in the area of organization and public education.

OPTIONS FOR POLICY AND PROGRAMS

Basically, there are three policy and program areas where the State should concentrate its drought related efforts. In most cases, the programs proposed can build on the solid foundation already established by various State agencies and the State Drought Task Force. The three policy/program areas are:

1. A well defined drought response framework
2. Public education
3. Weather modification

These three program areas are discussed in more detail as follows. In addition, a matrix will be presented that will show for each program area: roles for various sectors, lead

agencies, principal beneficiaries, expected conflicts, possible methods of conflict resolution, nature of public participation/education required, duration, costs and expected results.

1. Drought Response Framework

A drought response framework begins with the identification of the onset of drought, moves on through the monitoring of conditions, the organization of the response to the needs generated by the drought, and, if the problems are serious enough, concludes with the seeking of federal disaster assistance. The steps involved in the framework are discussed briefly herein;

a. Identification of the onset of drought

Determining the onset and accurately predicting the end of a drought are often difficult actions that can present serious political and professional problems. Except in rare cases, where the onset of drought is obvious to a wide sector of the population, neither elected officials or professionals like to issue a warning to the public or call for drastic measures to deal with drought conditions. The risks in sounding alarms prematurely are often seen as outweighing the potential benefits even if a drought should continue on to a severe stage. However, the State must be prepared to take this initial step and, based on historical data, should be able to at least determine the possibilities that a drought has begun.

The impact of any pronouncements concerning the onset of drought can be blunted somewhat if they occur within the context of ongoing monthly reports from the State Water Survey Division. Since droughts appear to be occurring at more frequent intervals, it would seem desirable for the Water Survey Division to keep publishing its water condition reports even when water conditions throughout the State are favorable. In this manner, public officials can monitor water conditions regularly and can take steps to prepare for problems when trends seem to point to their future occurrence.

b. Determination of extent and severity of drought and prediction of duration of condition

Here again the Water Survey Division of the Department of Energy and Natural Resources can utilize data from past droughts, information from crop reporting districts and other sources to generate statistical calculations concerning the extent, severity and possible duration of the drought, along with probabilities with respect to the outlook for rain in various areas of the state. The results of such studies can be published in the monthly Water Conditions report.

c. Convening Drought Response Task Force

As in past droughts, the Drought Response Task Force should be convened by the Governor, or by the Director of the Division of Water Resources, Illinois Department of Transportation. The Drought Response Task Force should be co-chaired by the Director of the Division of Water Resources and the Head of the Public Water Supply Section of the Illinois Environmental Protection Agency. Representatives from the following State agencies should be included on the Task Force:

Division of Water Resources

Illinois Environmental Protection Agency

Department of Agriculture

Department of Commerce and Community Affairs

Emergency Services and Disaster Agency

State Water Survey

Each Task Force agency has technical expertise and capabilities in specific areas of drought management. Their capabilities include indepth knowledge of evaluating alternate water supply sources for both emergency and long-range; the installation of emergency pumping and piping equipment; water sanitation and quality considerations; graduated water conservation practices; and methods of financing.

- d. Development of appropriate level and intensity of public notice about the situation

Based on the analytical studies undertaken by the State Water Survey Division, as well as its monthly Water Conditions report, the Task Force can develop an appropriate public notice concerning the drought situation and future prospects. The notice, along with a packet of useful materials, can be sent to those communities that are expected to be hardest hit by the drought.

- e. Establishment of a schedule for regular reporting of conditions

If the monthly water conditions reports of the State Water Survey Division continue to be published on a regular basis, there will be no need to establish a new schedule for reporting water conditions. These reports should adequately serve the needs of public officials, farmers and others in determining the measures that need to be taken to ameliorate the impact of the drought.

- f. Reassessment of the situation by the Task Force based on the water condition reports

Following the initial assessment of conditions and subsequent public notification, the Drought Task Force should reassess the drought situation before taking the steps necessary to encourage appropriate responses by various officials and groups. At the point of reassessment, the Task Force can determine if there have been any basic changes in the water conditions at various locations or in expected rainfall.

- g. Encouragement of appropriate responses by all sectors feeling the impact of drought, thus insuring the avoidance of rash actions

In order that local public officials and others do not take actions which might cause more harm than good, the State Drought Task Force needs to work with all sectors impacted by drought to help them in interpreting the water conditions reports and in shaping responses tailored to specific drought situations at various locations throughout the State. Techniques might include a drought hot line, workshops, and special bulletins oriented to specific regions of the State.

- h. Offering coordinated assistance of state agencies

Once the State's drought contingency program has been set in motion, member agencies of the Drought Task Force can begin to offer coordinated assistance to

communities and individuals in areas of greatest need. Assistance can be provided with respect to emergency water supply sources, installation of emergency pumping, piping, and chlorination equipment, water conservation measures and other related areas of concern. The Drought Task Force co-chairman can serve as the focal point for receiving and channeling requests to the proper agency.

i. Requesting rate adjustments from the Illinois Commerce Commission for proprietary water systems

One special problem that exists in drought periods is the demand placed on proprietary water systems. Such systems are regulated by the Illinois Commerce Commission. While unique demands are often placed on proprietary water systems during a drought, the managers of these systems are presently not allowed to make any rate adjustments to generate revenues needed to compensate the systems for the increased work load involved. This is an issue that should be addressed by the Illinois Commerce Commission.

j. Seeking disaster declaration from the Governor

If the drought is considered to be of a serious nature by the Drought Task Force, a disaster declaration can be sought from the Governor. Once this declaration is issued funding may be released from the State Disaster Relief Fund through the Illinois Emergency Services and Disaster Agency.

Such funds may be released by the Governor "to furnish in a disaster area emergency services directly related to or required by a disaster and existing funds are insufficient to provide such services." Such funds may not be used to provide private relief to persons or to provide capital improvements.

k. Seeking Federal disaster assistance

While there are not automatic assurances of relief during drought related disasters, disaster assistance has been obtained in some states under the provisions of PL 93-280, the Federal Disaster Relief Act of 1974. In addition the Federal Small Business Administration and the Farmers Home Administration can declare portions of the state as Emergency Loan Areas. On October 29, 1976, fifty Illinois counties were declared Disaster Loan Areas. Farmers and businesses were then allowed to submit applications for emergency loans relating to the drought.

l. Seeking supplemental funding for the State disaster fund

Up to \$.5 million are generally appropriated to the Illinois Emergency Services and Disaster Agency by the State Legislature. Once these funds are exhausted, it may be necessary for the Drought Task Force to seek supplemental funding to help ease drought related emergencies.

2. Public Education

As noted earlier in the discussion of this issue, drought was ranked 11th in overall priority out of 18 critical water related issues by those attending a series of public forums on water resources issues. In the special report on water conservation, steps were outlined with respect to long-term educational efforts on water conservation. A concerted educational program along those lines would be helpful in terms of educating the public with respect to drought as well.

In addition, more attention should be given to a continuing use of the media to sensitize the public concerning the possibilities of future droughts and the steps that need to be taken to prepare for their impact. The video tape film prepared by the Department of Commerce and Community Affairs, in conjunction with the Illinois Information Service, on one community's (Eldorado) response to drought is a start in the right direction. An ongoing effort by DOWR and IEPA with other appropriate state agencies should be made to keep drought related issues before the public. Use of radio and television talk shows, newspaper supplements, and magazine articles are just a few of the approaches that can be employed.

3. Weather Modification*

According to the Illinois State Water Survey, Illinois farmers and agri-businesses spent \$0.5 million during the period 1975-1980 to support cloud seeding projects to increase rainfall in various parts of central and southern Illinois. Planned enhancement of precipitation in the State is one emerging technology for increasing water supplies, but it is still with scientific uncertainties. Research has been adequate to illustrate that if it could be done, sizeable economic and environmental benefits would accrue in most years but not in severe droughts or in extreme wet periods. Basically, two major issues must be addressed if Illinois is to move sensibly towards rainfall modification.

*The material in this section is drawn from a paper called "Atmospheric controls" by Stanley A. Changnon and Richard G. Simonin, Illinois State Water Survey, March, 1981.

On the one hand is the need to perform the complex scientific research required to prove whether and how precipitation can be increased, and by how much in various seasons. This calls for a major national experiment. It has been marginally launched in 1980 as a 4-state effort (Illinois, Indiana, Michigan and Ohio) with federal funding; but future support is now questionable. This effort will need multi-million dollar support for up to 10 years to obtain deserved answers. At this time, the effect of various cloud seeding materials on the state's rain and surface water quality is also unknown.

The other major issue of concern is the evolution of the ongoing and future cloud seeding projects. These are non-experimental in nature and based on the user's belief that seeding will increase rain, ignoring the possibilities it might do nothing or even decrease rain. These locally-supported projects represent both institutional and scientific opportunities and also create key policy issues for the state to consider. Such projects are now regulated by a model state law. This control of weather modification efforts needs to be sustained for public safety and welfare. Supporters of cloud seeding are now calling for ways to obtain local and/or state financial support of projects. This could evolve into state costs of \$1 million annually. Other options include the formation of weather modification districts based on local referendums with the power to raise funds for projects.

These operational projects also need to be evaluated as to the changes in rainfall that result, which is a difficult but important task that can inform both the supporters and the state as to its general effectiveness, as well as providing useful scientific information. In addition to the results of the ongoing research, the evolving major national experiment, and operational projects, if properly instrumented with certain weather equipment, could provide considerable useful scientific information as to the approach and utility of cloud seeding. Support, either from the state or from fees assessed to these projects, could also be used to perform needed scientific statistical evaluations.

Additional Research Needs

In addition to the ongoing research in the area of weather modification, certain other areas of research could be pursued. While no specific assignments or timetables are presented in this plan component, it is hoped that the State Water Survey and Division of Water Resources could examine the following kinds of issues:

1. The development of different ways to define or determine the onset of drought. For example, the Water Survey staff have defined drought as 50% or less of the normal rainfall for farmers. Yet, barge operations may well be

interested in defining drought as a percentage of normal flow. Other sectors such as water operators may wish to define it in some higher percentage or normal rainfall. Such various intensities of drought need to be defined in a logical and rational fashion.

2. The updated assessment of surface water supplies and development of drought planning models for Illinois communities.

There are a number of towns in central and southern Illinois which depend on streams and rivers for their water supply by virtue of on-river or side-channel reservoirs. Depending on the streamflow and reservoir storage characteristics, the storage in these reservoirs can become inadequate to meet the demands satisfactorily at varying drought severity. The existing water supply reservoirs need to be analyzed at length to determine the drought frequency that can be associated with their inadequacy in future years, considering the increase in demand with time.

Satisfactory planning for the drought depends on a systematic and scientific understanding of the various interacting factors that constitute a drought. Though perception of drought differs from reservoir-storage users to farmers, the interrelationships between rainfall deficits, low streamflows,

seasonal temperature and evapotranspiration conditions and soil moisture variations need to be extensively investigated to develop drought prediction models dealing with the question of severity, duration and frequency of a drought.

The scope of work under such a program will comprise the following:

1. Evaluation of existing public surface water supplies and their susceptibility to droughts.
2. Identification of problem supplies and evaluation of long-term and short-term solutions.
3. Development of drought prediction models and their use in assessment of drought impacts on water supplies (and in feasibility studies of supplemental irrigation).

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS

PROGRAM AREAS & OPTIONS	SECTORS INVOLVED		LEAD AGENCY	SUPPORT AGENCIES	PRINCIPAL BENEFICIARIES	EXPECTED CONFLICTS AND POSSIBLE WAYS TO RESOLVE THEM	NATURE OF PUBLIC EDUCATION NEEDED
	S	L					
1. A Drought Response Framework							
a. Identification of onset of drought	x		SWS* (DENR)	DA	Public officials, communities, farmers, private water supply companies in areas hardest hit by drought.	Fear of local officials that alarm may be sounded prematurely. If water conditions reports are continuously published, there should be few surprises on part of anyone.	Public needs to be made aware of the work of the Water Survey & its water conditions reporting procedures, as well as work of State Drought Task Force.
b. Determination of extent and severity/duration of drought.	x		SWS	--	Same as above.	There could possibly be some disagreement in some quarters regarding SWS' assessment. Resolution can be sought through Drought Task Force, etc.	See above.
c. Convening Drought Task Force	x		DWR (IDOT) DWR	IEPA	Same as above.	None expected.	See above.
d. Development of appropriate public notice about the situation	x		SWS	Other members of Drought Task Force.	Same as above.	None expected.	See above.
e. Establishment of the reporting schedule	x		SWS	Other members of Drought Task Force.	Same as above.	None expected.	--
f. Reassessment of the situation by Drought Task Force	x		DWR-IEPA	Other members of Drought Task Force.	Same as above.	None expected.	--
g. Encouragement of appropriate responses by all sectors feeling the impact of the drought	x		DWR-IEPA	Other members of Drought Task Force.	Same as above	Some public officials and individuals may take inappropriate action regardless of the state's efforts. However, every effort must be made to provide proper information.	All forms of the media should be used to encourage appropriate responses. Workshop should also be scheduled.

*See key on Page 29

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS

PROGRAM AREAS & OPTIONS	SECTORS INVOLVED		LEAD AGENCY	SUPPORT AGENCIES	PRINCIPAL BENEFICIARIES	EXPECTED CONFLICTS AND POSSIBLE WAYS TO RESOLVE THEM	NATURE OF PUBLIC EDUCATION NEEDED
	S	L P					
h. Offering coordinated assistance of state agencies	x		DMR	Other members of Drought Task Force.	Same as above.	There should be little conflict since each member agency of the Drought Task Force has a distinct role to play. None expected.	All forms of the media should be used to make localities aware of the potential assistance available. N/A
i. Requesting rate adjustments from the Illinois Commerce Commission for proprietary water systems	x		DMR-IEPA	Other members of Drought Task Force.	Local governments, proprietary water systems.	None expected.	--
j. Seeking disaster declaration from the Governor	x		ESDA-DMR	Other members of Drought Task Force.	Same as above.	None expected.	--
k. Seeking federal disaster assistance	x		Governor	Drought Task Force	Same as above.	A federal declaration of disaster is sometimes difficult to obtain. If Illinois can involve other states in the request, its case could be strengthened. The support of the public and appropriate legislators would likely be needed.	--
l. Seeking supplemental funding for State Disaster Fund	x		DMR-ESDA	Other members of Drought Task Force.	Same as above.	None expected.	N/A
2. Public Education a. Continued promotion of drought & drought contingency (including weather modification) concerns through newspapers & radio/t.v. talk shows	x		SWS	DMR	Community officials, citizens farmers, etc.	None expected.	N/A

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS

PROGRAM AREAS & OPTIONS	SECTORS INVOLVED			LEAD AGENCY	SUPPORT AGENCIES	PRINCIPAL BENEFICIARIES	EXPECTED CONFLICTS AND POSSIBLE WAYS TO RESOLVE THEM	NATURE OF PUBLIC EDUCATION NEEDED
	S	L	P					
b. Development of one or more video tapes on the subject of drought and weather talk shows. c. Development of articles & papers for inclusion in magazines & journals Also see section on Public Education in unit on Water Conservation.	x			SWS	DWR	Community officials, citizens, farmers, etc.	None expected.	N/A.
3. <u>Weather Modification</u> a. Continuation of support of 4-state experimental research on how precipitation can be increased, etc.	x			SWS	Other members of the Drought Task Force	Same as above.	None expected.	N/A.
b. Continued regulation of cloud seeding projects through model state law	x			SWS	Other members of Drought Task Force.	State & local governments, farmers, citizens in general.	It will be difficult to obtain ongoing funding from the federal government. Lobbying efforts need to be intensified and state funding support sought. The model state law was up for sunset in 1981. Efforts need to be made to insure that the law is kept on the books.	The public needs to be aware of the importance of the research through all forms of the media.
c. Formation of pilot weather modification district(s) (based on local references) with the power to raise funds for projects	x			SWS-DCCA	Other members of Drought Task Force.	Same as above.	Community & regional conflicts can develop over impacts of altered rainfall. Attitudinal surveys need to be taken in areas where potential districts are being considered to determine what the issues are.	The public should be informed through the press of the importance of the law and urged to write their legislators concerning its continuance. A series of workshops should be held on the areas where weather modification districts would be useful.

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS

PROGRAM AREAS & OPTIONS	SECTORS INVOLVED			LEAD AGENCY	SUPPORT AGENCIES	PRINCIPAL BENEFICIARIES	EXPECTED CONFLICTS AND POSSIBLE WAYS TO RESOLVE THEM	NATURE OF PUBLIC EDUCATION NEEDED
	S	L	P					
d. Instrumentation of cloud seeding projects with weather equipment in a piggyback approach.	x			SWS		Same as above.	It could be difficult to obtain the cooperation of those managing cloud seeding projects in some cases. Incentives may have to be provided.	Workshops should be held for those that have undertaken or that are considering cloud seeding projects.
e. Evaluation of cloud seeding projects as to their likely effect on changes of rainfall.	x			SWS		Same as above.	It may be difficult to obtain the funding needed to support such evaluation efforts.	See above.

KEY TO ABBREVIATIONS

- S - State
- L - Local
- P - Private
- SWS - State Water Survey
- DENR - Department of Energy and Natural Resources
- DMR - Division of Water Resources
- IDOT - Illinois Department of Transportation
- IEPA - Illinois Environmental Protection Agency
- ESDA - Emergency Services and Disaster Agency
- DCCA - Department of Commerce and Community Affairs

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS
DURATION, COSTS, ETC.

PROGRAM ELEMENTS & OPTIONS	ESTIMATED DURATION OF OPTION	ESTIMATED COST	EXPECTED RESULTS
1. A Drought Response Framework a. Identification of onset of drought	Carried out as a part of ongoing water conditions reporting. Periodically as needed. As required.	\$20,000/yr.	Well informed Drought Task Force, local officials and others affected by drought.
b. Determination of extent and severity/duration of drought	As required.	Included in above. N/A	Information on which to base drought response efforts by Drought Task Force.
c. Convening Drought Task Force	One month at the point required.	\$500/per occurrence	A forum for decisions on state actions needed in a drought response program.
d. Development of appropriate public notice about the situation.	--	--	A set of materials in the hands of those needing information on which to base drought response efforts.
e. Establishment of schedule for regular reporting of conditions	--	--	An institutionalized system of reporting on water conditions.
f. Reassessment of the situation by Drought Task Force.	--	--	Affirmation or adjustment of prior determination concerning drought situation.
g. Encouragement of appropriate response by all sectors feeling the impact of drought.	Six weeks at the point required.	\$21,000	Minimization of inappropriate responses to drought conditions.
h. Offering coordinated assistance of state agencies.	Throughout period of drought.	Funding through normal agency budgets.	An adequate level of state assistance to those communities and individuals facing problems due to drought conditions.
i. Requesting rate adjustments from Illinois Commerce Commission for proprietary water systems.	As needed.	--	Easing of proprietary water system problems in providing water needed during droughts.
j. Seeking disaster declaration from the Governor.	As required.	--	A State disaster declaration that will enable expenditures to be made from the State Disaster Fund.
k. Seeking federal disaster assistance.	As required.	--	A federal disaster declaration that will enable appropriate federal assistance to be brought on drought areas most seriously affected.

PROPOSED DROUGHT CONTINGENCY PROGRAMS AND OPTIONS
DURATION, COSTS, ETC.

PROGRAM ELEMENTS & OPTIONS	ESTIMATED DURATION OF OPTION	ESTIMATED COST	EXPECTED RESULTS
<p>1 Seeking supplemental funding for State Disaster Fund.</p> <p>2. Public Education</p> <p>a. Continued promotion of drought and drought contingency concerns (including weather modification) through newspapers, and radio/t.v. talk shows.</p> <p>b. Development of one or more video tapes on the subject of drought and weather modification.</p> <p>c. Development of articles and papers for inclusion in magazines and journals</p> <p>3. Weather Modification</p> <p>a. Continuation of support of 4-state experimental research on how precipitation can be increased.</p> <p>b. Continued regulation of cloud seeding projects through model state law.</p> <p>c. Formation of pilot weather modification district(s) (based on local referenda) with the power to raise funds for projects.</p> <p>d. Instrumentation of cloud seeding projects with weather equipment in a piggyback approach.</p> <p>e. Evaluation of cloud seeding projects as to their likely effects on changes of rainfall.</p>	<p>As required.</p> <p>2 years</p> <p>6 mos.-1 yr.</p> <p>2 years</p> <p>10 years</p> <p>Indefinitely</p> <p>Next two years</p> <p>5 years</p> <p>5-10 years</p>	<p>--</p> <p>\$20,000/yr.</p> <p>\$ 2,500</p> <p>Included in cost of a.</p> <p>\$1 million/yr. (Fed. funded)</p> <p>Costs assumed as part of regular agency budget. \$5,000/dist.</p> <p>\$25,000/yr.</p> <p>\$10,000/yr.</p>	<p>Additional funding for State Disaster Fund if needed.</p> <p>A public better informed concerning drought issues including weather modification.</p> <p>Same as above.</p> <p>Same as above.</p> <p>Answers as to whether and how precipitation can be increased, and by how much, in various seasons.</p> <p>Increased public safety and welfare.</p> <p>Funding for local cloud seeding projects.</p> <p>Use of proposed, non-experimental cloud seeding efforts to obtain needed research data.</p> <p>Generation of information needed to determine the effectiveness of cloud seeding activities.</p>