

PLANNED WEATHER MODIFICATION

Statement of the Problem

Planned weather modification offers a means to increase water supplies in Illinois. The era of modern weather modification was initiated in the mid 1940's. Modification normally involves the controlled release of chemicals, such as dry ice or silver iodide, into the atmosphere using airplanes or ground-based generators. Main types of weather modification tested are fog dispersal, precipitation augmentation (rain and snow), and hail suppression. Largely due to the field's relative youth and science's incomplete knowledge of the physics of weather, the effectiveness of most forms of weather modification have not been established within scientifically acceptable limits of certainty. Only cold fog dispersal and snow augmentation in the mountains are considered technically ready for routine application. In short, weather modification is an emerging technology that can increase water resources.

Illinois farmers and agribusinesses have spent \$0.5 million in the past 5 summers to support cloud seeding projects with hopes of increasing rainfall in parts of central and southern Illinois. Federal agencies have financed \$7.8 million for research on weather modification in Illinois in recent years.

Planned enhancement of precipitation in Illinois is viewed by some as a functioning technology for increasing water. However, rain modification still has major scientific uncertainties and complex societal implications. Research has been adequate to illustrate that if rain could be increased, sizable agricultural benefits would accrue in most years but not during severe droughts nor in extreme wet periods. The social and environmental complexities, and the potential for controversy, mean that the use of weather modification must be carefully managed and controlled.

Planned rainfall enhancement, if it works, has decided cost advantages over irrigation. Rainfall modification, done at the best scientific level, cost approximately \$0.25 per planted acre in 1980, as compared to \$100 for irrigation. However, weather modification is not a certain technology. Moreover, even if the expected rain increases of 15% to 30% could be achieved during summer, the increase still would not satisfy needs in certain very dry years. However, irrigation has other limitations in addition to its high costs. The best estimates reveal that only 20% to 25% of Illinois' agricultural lands could be irrigated, based on limitations set by slopes, soil types, and available water supplies. Hence, irrigation may not be the technology of widespread utility that weather modification could be in Illinois. More definitive study needs to be performed on both alternatives, but the spatial limitations of irrigation and its high costs suggest there would be great value from a rain enhancement technology, particularly in the southern half of Illinois.

Basically, three major issues must be addressed if Illinois is to move sensibly towards widespread use of rainfall modification.

One is the resolution of the technology to enhance rainfall.

Second, the actions needed to manage and institutionalize on-going, non-research (operational) projects.

Third is the public information and user assistance effort.

Ongoing Programs

The complex scientific research required to prove whether and how precipitation can be increased, and by how much, is partially complete. A major midwestern rain change experiment, designed by ISWS, is needed to complete the on-going research effort. The Precipitation Augmentation for Crops Experiment (PACE) was marginally launched in 1978 as a 4-state effort involving Illinois, Indiana, Michigan, and Ohio with federal funding, but future federal support seems doubtful.

The second major on-going activity concerns management, assessment, and regulation of non-experimental (operational) cloud seeding projects. These are rooted in the user's belief that cloud seeding will increase summer rain for agriculture. These locally-supported projects represent opportunities for research and also create policy questions for the

state. Currently, there are two legislative acts. Such projects are regulated by a model state law that ensures the public safety and welfare. Secondly, supporters of cloud seeding have obtained 1981 legislation that allows voters to form weather modification districts and levy taxes for the financial support of these projects. Past operational projects have been evaluated by the ISWS to discern possible changes in rainfall, a difficult but important task that can inform both the supporters and the state as to the general effectiveness of current techniques. Support, largely from federal research grants, allowed statistical evaluations of several projects.

State functions in planned weather modification currently include:

1. Research being done by the ISWS largely with federal support.
2. Public information being supplied largely by ISWS with assistance from Cooperative Extension Service and totally state funded.
3. Evaluation of operational projects being done largely by ISWS and largely funded by federal grants.
4. Regulation being done by DENR with state support.
5. Guidance-assistance to projects done by ISWS, with future assistance to come from newly formed districts.

Illinois has the best state effort in planned weather modification in the nation. Nevertheless, the heavy dependence on federal funds in two areas, research and project evaluation, makes the state program very vulnerable, particularly for developing a more certain technology for increasing water resources.

Options and Recommendations for Policy and Programs

The goal of state policy is to develop a rainfall enhancement capability within a societal and environmentally sound framework. Study of the impacts of a capability to enhance rainfall has revealed sizable benefits to water supplies and particularly to agricultural water needs. The changing of weather over hundreds of square miles will have an immense impact on the public's welfare. Because of its influence over wide areas, a weather modification effort has a great potential for benefit; but if failure occurs, it has the potential for real or perceived damages. A potential for community conflicts exists. The five action options follow.

Research and Development - After years of preparatory research at the ISWS, scientific progress has reached the point where a definitive summer experiment is the critical and final research and development step. The results of such an experiment will indicate how, where, and when one can increase rainfall in Illinois in a predictable fashion. If a capability cannot be developed, we need to know this. The primary beneficiaries of

working technology will be Illinois farmers and agribusinesses (and state government due to a greater income), with secondary values to cities and industries dependent upon surface water supplies, river transportation and water recreation. The pervasiveness of the benefits of a capability leads to the conclusion that the federal and state government should support R & D costs. From its acknowledged position of scientific leadership, Illinois needs to actively pursue and seek federal interest and support for this experimentation.

Evaluation of Operational Projects - Evaluation of operational projects concerns both statistical and physical studies of data collected during locally-sponsored projects. The lack of evaluation by skilled scientists makes it impossible to ascertain the degree of change produced. Evaluation can also provide useful scientific information. The possibility of "piggy-backing" scientific measurements on locally-supported projects offers a unique way to gain useful knowledge at lower costs. To be effective and to attract federal support, an operational project would have to persist for at least 3 years to provide a sufficient sample size.

The primary beneficiaries of evaluations of operational projects are the public and the potential users of a fully developed capability, the user-payers of the projects, and the state agencies concerned with water supplies. The state is a major beneficiary and should support the

effort. The R & D by product values suggest that the federal government should also be its supporter. Finally, the user-payers of the projects also benefit and should be contributors to the funding.

Regulation - It is important that illinois continue to regulate this activity. The public cannot afford the risk associated with unregulated weather modification. The existing regulatory act has provided for the orderly performance of weather modification projects in Illinois over the past 6 years including 8 projects. Since everyone benefits, the state should pay for this activity.

Information Program - Development and use of a new and complex technology requires broad dissemination of information. The potentially controversial nature of weather modification also necessitates a balanced presentation of the facts and uncertainties. Information on all aspects is currently being collected under the leadership of the ISWS with assistance from the Cooperative Extension Service, the Illinois Agricultural Association, and user groups.

Organizational Assistance - Development and sustainment of operational projects have been difficult with locally pledged funds. Basically too few area residents paid. New legislation will remedy this situation by allowing people in discrete areas to vote for the formation of weather modification districts with project funds raised through local taxes. The option for forming districts within adjoining counties will lead to

the need for guidance and assistance in contracting for weather modification firms and project evaluation. Such assistance will make large area projects more feasible, easier to operate, and more cost effective. The major beneficiaries will be to those in the districts. Since these projects will be scattered across the state, this advisory-organizational assistance will likely fall to the state government.

Areas of Conflict - Law suits in the United States to get weather-induced losses paid by cloud seeders, or to stop projects, have failed because of an inability to prove that seeding at a given time produces a specific and harmful weather change.

The Illinois Regulatory Act removes the state from liability in such situations. The new districts could be targets for such law suits.

Another conflict that could arise would be interstate in nature. The conduct of operational and experimental projects in Illinois could bring claims from adjacent states that Illinois is detrimentally affecting their weather. The Illinois Regulatory Act assigns to DENR the role of interstate communication on weather modification issues, and information exchanges are seen as primary means for negating interstate conflicts.

Work Plan for 1981 and Beyond

The existing regulatory, informational, and assistance activities will be

pursued at current levels in the foreseeable future. A major effort to promote federal and state support for weather modification experimentation, and/or the piggyback research of operational projects will be pursued in 1981-1983. The piggyback project seems a likely option in view of the current reduced federal government funding stance. However, it requires that a local district make a long-term commitment for a multi-year effort, and then federal and state support for the scientific effort must be secured. Another activity will include implementation of approaches to secure additional funding for costs of evaluating operational projects. Taxing and permit fee options will be investigated.

SUMMARY OR RECOMMENDATIONS FOR ATMOSPHERIC CHANGES AND MANAGEMENT ISSUES

The Task Force Recommends:

Climate Change and Prediction

- That the State create an awareness of climate change and its importance through a program of social impact research and information dissemination.
- In cooperation with the federal government monitor climate trends and maintain a research program on the causes of climate changes.
- Maintain the Climate Information Center with direct user access to climate data and predictions.

- Through creation of a Climate Detection and Assistance Board develop contingency plans for dealing with climate extremes such as droughts and floods, and devise a warning dissemination means.

Inadvertent Weather and Climate Modification

- That the State establish policy positions and regulations regarding unfavorable weather and climate modification.
- That a research program be maintained for refined understanding of such man-made effects as increased carbon dioxide, acid rain, and jet contrails.
- That a public and institutional awareness of inadvertent climate modification be created, particularly in our major metropolitan areas.

Planned Weather Modification

- A State policy to develop a rainfall enhancement capability within a societal and environmentally sound framework.
- A major and definitive field experiment in cooperation with the federal government to determine how, where, and when rainfall can be increased in Illinois in a predictable fashion.
- That the State cooperate with local weather modification districts in evaluating operational cloud seeding.
- That Illinois continue to regulate weather modification activity.
- That an information program be maintained for the balanced presentation of the facts and uncertainties regarding planned weather modification.

DROUGHT CONTINGENCY PLANNING

Statement of the Problem

Observations over the past 100 years document the recurrence of droughts in Illinois. The State Water Survey Division (SWS) of the Illinois Department of Energy and Natural Resources recently prepared an analysis showing the timing of all droughts of consequence from 1906 to the present time. The droughts are defined by precipitation deficiencies for various fixed 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 recent 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 thus sees that the 1980-81 drought was far from an extreme event. The analysis also reveals several other interesting facts:

1. There was a general lack of drought between 1956 and 1975 (only a minor one in 1962-63);

2. Droughts may be beginning to occur more often (two in the past 6 years and both in the southern half of the state; and,
3. Many of the more severe droughts of the 1920's, 1930's and 1950's were composed of two 12-month droughts separated by a few months of semi-normal rainfall.

If, after a 20-year period free of droughts, they are beginning to occur more often, it follows that the negative short and long-term effects of drought will tend to increase as well.

Stanley A. Changnon, Chief of the SWS, states that, "Basically, a drought is composed of two things: a nature-caused 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 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 is similar, there is 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 man-made influences, needs, and sources of water.

The State Task Force on Drought prepared a report for the Governor in 1977 that outlined the causes and results of drought. As to causes, 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. Regarding results, the State Task Force pointed out that droughts have the following impacts on those areas indicated:

Rural Households - Such households are often affected 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 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 per household. 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. At today's prices, the extra daily cost of 20¢ to 40¢ per animal will make almost any operation unprofitable. Since the livestock industry is so 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 catastrophic 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 would require extensive and costly water hauling.

Hydroelectric Power - Since Illinois is not a water power state, drought conditions would presently have little effect on hydroelectric 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, as well as restricting human contact 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, and affects the migratory behavior of waterfowl.

Navigation - Drought lowers water levels in navigable rivers and greatly increases the unit cost of transportation. Factors such as the refusal to permit temporary increase of diversion from Lake Michigan when necessary, and refusal to permit the discharge of hot water from industrial cooling operations during a winter navigation stoppage - make the impact of droughts on rivers more difficult than necessary.

As indicated above, droughts have caused and can cause serious problems with respect to the state's economy, environment, and its people 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 relatively low ranking may have been because of the absence of any recent 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 to remedial actions that will be most effective in minimizing the risk and impact of future droughts. 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 plan component will lay the groundwork for such an organized response.

Ongoing Programs

The State of Illinois has several ongoing programs which pertain to droughts 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. 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 IEPA has also prepared a list of sewage treatment plants with discharge effluents of sufficient quality to permit their 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 productive aquifers and assists with the exploration and mapping of smaller aquifer locations.

State Water Survey Division, Illinois Department of Energy and Natural Resources - The Illinois State Water Survey conducts scientific studies into the measurement, utilization, and conservation of water. In turn, this research is used in the Survey's developmental projects to improve the quality and quantity of Illinois' water. The 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 and soil moisture in the State, and prepares detailed monthly reports containing information on surface water conditions, shallow groundwater conditions, soil moisture,

and precipitation outlooks for months and seasons ahead for those parts of the state with water shortage problems. The Survey possesses the detailed historical data on water and weather relevant to all past Illinois droughts, as it serves as the Illinois Climate Center. The Survey offers advice and information on remedial measures for droughts like drilling new wells, use of weather modification, and use of evaporation suppressants for ponds and lakes.

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 on "reverse" 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.

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 or water system design, special district organization, or the search for funding alternatives. The division sells available waters at Kincaid, Shelbyville, and Carlyle 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 uses 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.

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 practice available for cost sharing with eligible agricultural producers, but funds are limited. Under the Emergency Conservation Measures (ECM) Program, a practice 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 at 80% cost sharing.

The Farmers Home Administration's 5% loan funds can be used to assist farmers in digging wells and other structural projects if credit has been denied by local lending institutions. To make counties eligible for this program, the governor must make a request to the President for counties designation of drought emergency.

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.

The weather records at the National Weather Service are assessible at a cost to the public in Asheville, North Carolina, and the Service will provide an evaluation of requested weather records for cost.

Since the Water Survey has the State's climatic data base relative to drought trends, ground and surface water conditions, etc., there does not seem to be any problem with lack of data.

Options and Recommendations for Policy and Programs

Basically, there are two policy/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 two policy/program areas are:

- 1) A well defined drought planning and response framework,
- 2) Public education.

These program areas are discussed in more detail below. In addition, a matrix has been prepared but is not included in this report, which outlines 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 in the following:

- a. Identification of the Onset of Drought - Determining the onset and accurately predicting the end of a drought are often difficult issues and 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 probabilities 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 is desirable for the Water Survey Division to continue publishing its monthly water condition reports even when water conditions throughout the State are favorable. In this manner, public officials can more or less monitor water conditions regularly and can take steps to prepare for problems when trends seem to point to their future occurrence. The decision to identify drought onset would be performed by the Climate Detection and Assistance Board.

- b. Determination of Extent and Severity of Drought and Prediction of Duration of Condition - Here again the Water Survey 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. Development of Appropriate Level and Intensity of Public Notice about the Situation - Based on the analytical studies undertaken by the Water Survey, as well as its monthly Water Conditions reports, the Climate Detection and Advisory Board 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 most severely impacted by the drought.
- d. 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 Climate Detection and Advisory Board 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 CDAB can determine if there have been any basic changes in the water conditions at various locations or in expected rainfall.

- e. 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 CDAB 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, as well as special bulletins oriented to specific regions of the State.
- f. Offering Coordinated Assistance of State Agencies - Once the State's drought contingency effort has been set in motion, member agencies of the CDAB 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 CDAB chairman can serve as the focal point for receiving and channeling requests to the proper agency.
- g. 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 investor-owned water systems. Such systems are regulated by the Illinois Commerce Commission. While unique demands are often placed on these 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 or to provide incentive for user conservation. This is an issue that should be addressed by the Illinois Commerce Commission.

- h. Seeking Disaster Declaration from the Governor - If the drought is considered to be of a serious nature by the CDAB, a disaster declaration can be sought from the Governor. Once this 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 emergency services directly related to or required by a disaster, and when 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.

- i. Seeking Federal Disaster Assistance - While there are no 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.

j. 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 CDAB to seek supplemental funding to help ease drought related emergencies.

- 2) Public Education - As noted earlier in this plan component, drought was ranked 11th in overall priority out of 18 critical water related issues by those attending a series of public forums on water resource issues. In another section of this 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, depicting the community of Eldorado's response to drought is a start in the right direction. An ongoing effort by DCCA and 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.

SUMMARY OF RECOMMENDATIONS FOR DROUGHT CONTINGENCY PLANNING

The Task Force Recommends:

- The continuation and refinement of the drought planning and response framework. This step-wise procedure for identification of the onset of drought, its severity and prediction of duration, public notice and response, and assistance by State and federal agencies is largely in place.
- That various media be employed to maintain a sustained educational program regarding possible future droughts, steps that can be taken, and the impacts of droughts.

Work Plan for 1981 and Beyond

In the light of the considerable accomplishment in the area of Drought Contingency Planning, it is recommended that the Climate Detection and Advisory Board be established as a continuing interagency function. It can organize during 1981 and before June 30, 1982 have completed instituting and publicizing the step procedures outlined in the preceding section on "Options and Recommendations for Policy and Programs".

Opportunities for refinement will remain, and these should be the responsibility of the respective agencies with guidance and coordination by the CDAB. For example, the evaluation of existing public water supplies for their susceptibility to droughts should be refined and maintained current. The development of drought prediction models and their use in assessing drought impacts is encouraged. These and other improvements in the system should continue as on-going activities.

ILLINOIS WATER USE LAW

Statement of the Problem

Water use in Illinois has been, and still is, governed by two sets of law or doctrine. One of these is the commonly referenced "judicial" doctrine or rules of common law promulgated by the state's Supreme and Appellate Courts. The other set is the legislative doctrine or that body of statutory law found in statutes of the General Assembly and predecessor territorial assemblies.

These two basic sets of law or doctrines are in many cases in conflict with each other and water use rights are further affected by federal legislation; federal court decisions; rules, orders and regulations of state and federal agencies; laws and ordinances of local governmental units and special-purpose districts, interstate compacts, and local court decisions regarding particular water-usage rights that have not been overruled by the Supreme or Appellate Courts.

The "judicial" doctrine also further complicates the problem of water use rights by creating in this body of law an inaccurate and artificial distinction among three kinds of water called diffused surface water, groundwater, and natural water courses. It is well understood that these three classes of water do not reflect the scientific realities of the hydrologic cycle.

Further, the "judicial" doctrine relating to surface water is covered by a number of decisions based on the common-law concept of riparian rights which ties water rights to ownership of adjoining land. The courts have stated that a riparian must make a "reasonable use" of the water correlative to the rights of other riparians. The actual dimensions of these rights are subject to constant change as the courts seek to accommodate the co-equal rights of other riparians. This invests the water right with what may be its most important characteristic from the users viewpoint which is uncertainty. This uncertainty is even greater with groundwater since an absolute right to withdraw water is available and the potential exists that this right could become concentrated in a single user.

A review of the "legislative" doctrine shows that the state through interpretation of the Rivers and Lakes Act has full and complete jurisdiction over the public waters of the state. The state, therefore, has as a management tool a law that gives authority to adjudicate water rights issues in public waters. Although the "riparian-reasonable use doctrine" is a recognized legal right, the state is given all powers necessary to protect the public's rights and interests in public waters.

Although the law is quite clear regarding state powers and authorities in public waters, the "legislative" doctrine and "judicial" doctrine have some of their greater conflicts and discrepancies in defining clearly the meaning of "public waters". Only a detailed investigation enhanced by

historical documents, court decisions, observable facts and expert opinions can lead to an administrative decision regarding where a "water" is indeed a "public water". This is by no means an easy task and has not yet been undertaken.

Numerous investigations and reports have been published by legal scholars which have attempted to describe "Illinois Water Rights" through detailed evaluation of existing "judicial" and legislative doctrines. These publications, in general, have often not attempted to fully interpret the potential breath of existing legislative law, but rather stressed the "common law" point of an individual's water rights.

What is, therefore, clearly lacking in almost all literature relating to water use law is an evaluation of judicial doctrines and legislative statutes not from the standpoint of defining individual rights, but rather from the standpoint of defining what tools are available to all agencies and instrumentalities of the state to develop, conserve, protect public rights, and regulate the use of the state's water resources. An investigation such as this would clearly define the true scale and tools available for comprehensive "state water management". Under such an evaluation, it would be important to distinguish the level of management control presently exerted under current statutes from the full extent of state and plenary powers which have not yet been used.

Ongoing Programs

There is currently no major thrust or activity which is directing itself towards a modification of existing water laws. Although this is not to say, that the "judicial" and "legislative" doctrines are not changing. Every year new court cases are heard and new legislation is introduced which can modify, clarify or further conflict with existing water use doctrines.

Furthermore, actions in other states are modifying the management posture states in general take relating to state waters and their uses. For example, states such as Mississippi, Iowa, Minnesota, Indiana, Wisconsin, Maryland, New Jersey, and Florida have all enacted water laws or codes which depart significantly from common law riparianism according to a 1974 Economic and Fiscal Commission report. Some other states have begun to recognize the need to patch certain gaps in their common law riparianism through various statutes which allow reasonable non-riparian use of waters or the establishment of a preferred status for domestic and municipal uses against others in times of supply shortages.

It must be recognized that although water use law in general is inadequate in Illinois to allocate supplies in times of drought or balance supplies with demands on a statewide basis, over one half of the state's population is under an allocated system of water supply. The regional allocation of water from Lake Michigan is an ongoing program of the Division of Water Resources which is carried out pursuant to a 1967 Supreme Court Decree.

Options and Recommendations for Policy and Programs

The current State Water Plan of Study states that any revision of existing water law will not be an early objective of the State Water Planning effort. In addition, the previous section describing the "Competition for Water" issue indicates that "Water Use Law" and its modification is one potential solution to regional competition situations where supplies are not sufficient to match demands. It follows then that options for addressing problems in Illinois Water Use Law would be defined based on the resultant evaluation of the Competition for Water Issue.

Some possible options could be similar to various approaches which have been taken by other states in attempts to rationalize their water rights law. Some of these approaches are as follows:

- 1) Codification of the common law.
- 2) Common Law Adoption Statute
- 3) Use of "full" authority over navigable waters.
- 4) Regulation under general police power.
- 5) Adoption of the "appropriation" system.
- 6) A water use permit system.

- 7) Permit system for problem areas only.

A further explanation of the above options can be found in the 1974 report of the Illinois Economic and Fiscal Commission entitled "Water Resources Management in Illinois".

Work Plan for 1981 and Beyond

Although final resolution of "Illinois Water Use Law" is not presently scheduled in the near term of the State Water Planning process, it is believed that a first cut evaluation of this issue should not be delayed. Therefore, an initial iteration of study effort will be conducted in the upcoming year and a half to help better define the scope of this issue.

This first iteration of study effort includes the following steps:

- 1) Selection of Scenarios. In the first step, various potential scenarios of regional water supply deficits will be selected for further evaluation. These scenarios will include both surface and groundwater supply problems.
- 2) Evaluation of Existing Law. Existing statutory and common law now in existence in Illinois will be reviewed in detail to determine the applicability of such law to resolving or mitigating the conflicts defined in the above scenarios.

- 3) Review Laws of Other States. Current statutory law of other states will be reviewed to determine the applicability of such laws to the selected scenarios.
- 4) Define Inadequacy of Current Law. Following the evaluation of current Illinois law a clear definition of the nature of the shortcomings of current law will be specified.
- 5) Select Range of Modifications to Current Law. Following the completion of steps three and four, a complete range of alternative modifications to Illinois Law and the impacts of such modifications will be defined.

The results of this process will be compared with actual demand-supply scenarios as developed within the competition for water issue. Once this comparison can be made, a true evaluation of the need of various modifications to current water use law can be accomplished.

SUMMARY OF RECOMMENDATIONS FOR ILLINOIS WATER USE LAW

The Task Force Recommends

- An initial study effort in which various reasonable scenarios of regional water supply deficits be tested to determine the applicability of present law, the laws of other states, or a range of modifications in present law for resolving conflicts.

CONFLICT RESOLUTION

Statement of the Problem

There is always the opportunity for conflict among individuals and the institutions through which they function. This is true within the field of water resources, although Illinois has been remarkably free of water disputes because of its generally ample supplies of this resource. A major exception to the general experience has concerned the allocation of Lake Michigan water in northeastern Illinois. This complex problem has involved over-development of a deep ground-water supply, regional competition, the interests of other states bordering on the Great Lakes, decrees of the U.S. Supreme Court, and Lake Michigan water allocation by the State of Illinois.

Thus, the Water Plan Task Force has identified this topic as one of possible future importance, and has maintained a continuing discussion of the subject. However, it is not considered in the same category as the preceding 10 issues. Along with meaningful public participation, it is considered a cross-cutting topic which is not assigned a priority position, but rather, will receive continuing attention throughout the planning process.

Conflicts which have arisen in the past have been resolved under existing laws and programs, or by public works which increased supplies and mitigated damages, by accommodation between the parties at issue, and in rare cases, by the courts.

This near absence of serious conflicts cannot necessarily be expected to continue. Water withdrawal in the State is now in the same order of magnitude as average supply. This can be expected to lead to conflicts during times of limited supplies. Uncertainties in our present laws and overlapping authorities are also recognized, and these may require attention.

It should be noted that regional advisory committees desire some permanent mechanisms for conflict resolution with local input.

Ongoing Programs

It is probably correct to say that little attention is currently being directed to methods of conflict resolution in water resources other than the consideration being given to it by the Water Plan Task Force. It is possible that under the issue "Competition for Water" discussed in this report, potential future conflicts will be identified.

Options and Recommendations for Policy and Programs and Work Plan for 1981 and Beyond

In the course of its discussions, the Water Plan Task Force has developed

the outline below for the identification and resolution of water conflicts. This is the framework which will remain visible to be utilized or amended as the Water Plan process continues.

A. Identification of Conflicts

1. Resource conflicts

- a. Local or regional
- b. State-wide
- c. Inter-state

2. Policy and Program conflicts

3. Organization conflicts

4. Intergovernmental conflicts

(Local, state, inter-state, and federal)

B. Resolution of Conflicts

1. Consultation, compromise and arbitration

2. Interagency cooperation

- (a) formal agreements
- (b) Subcabinet

3. The State Water Plan
4. Reorganization
5. Revision of substantive law, legal opinions, the courts.

SUMMARY OF RECOMMENDATIONS FOR CONFLICT RESOLUTION

The Task Force Recommends:

- That during the dynamic Water Plan process, those involved remain alert to possible future water resources conflicts, and consider whether adequate mechanisms are available for their resolution.

MEANINGFUL PUBLIC PARTICIPATION

Statement of the Problem

The workings of government have become a much more open process than was the case when the earlier water plan "Water for Illinois, A Plan for Action" was published in 1967. That effort was conducted by an interagency task force of State agencies without any effort to involve public participation at any level. Although the 1967 effort was widely admired, few of its recommendations were implemented. This may reflect the fact that the public was little informed or involved. In any case, the report did not reflect a public groundswell for action, but was the work of informed, state government experts.

The political climate in 1981 is greatly changed, and not only does the public wish to be involved in decision making such as in the preparation of the State Water Plan, but without the widespread public involvement and support, little is likely to happen in the present fierce competition for public monies.

The Task Force is aware of the above relations with Illinois citizens. It resolved from the start not only to meet such public wishes, but to utilize informed opinion to lead to a better Water Plan. The questions then become those of who are the various publics and their roles, to what extent are information and education required about the Water Plan, and

to what extent will outside advice be sought in the actual plan preparation.

Ongoing Programs

Ongoing programs consist in part of those traditional or expanded public relations activities of the agencies involved in the Water Plan. In varying levels of intensity, these include outside advisory committees, and staff which prepare news releases, publish feature materials for public release, conduct short courses, and in other ways communicate with an interested constituency. These existing mechanisms have been employed to report upon Water Plan issues and progress. Current events such as floods and droughts which may be the subjects of interviews or reports are regularly placed in the context of a problem which the Task Force is addressing, and about which public interest and support is welcomed.

Beyond these individual agency activities, the Task Force has established mechanisms for communicating with various publics. These include the Federal Agency Advisory Group, the Future Development Advisory Group, and the five Regional Advisory Committees, which are considered representative of agency, special interests, or regional expertise. Close communication is maintained with these groups through meetings and correspondence to seek both forward guidance and critical review of progress reports before they are given wider visibility to the public. These advisory groups and committees were used to the advantage and improvement of the Plan of Study and for guidance in preparation of the present report.

A wider audience was sought in the fall of 1980 to review the Plan of Study, and by the use of public forums or hearings will be continued. Two issues of the Water Plan newsletter "Illinois Water" have been distributed widely. Task Force members have also been available to speak to interest groups on request.

Options and Recommendations for Policy and Programs

A pattern for advances in the Water Plan has included early review by advisory groups and regional advisory committees. This is followed by state-wide public meetings to measure acceptance by a broader spectrum of citizens. The Water Plan has also been reported in the newsletter "Illinois Water", through agency periodicals, and in various media. There may be other and better means to communicate with the public which should be explored.

Although education is a feature of several issues and topics under the Water Plan, the Plan itself has not been the subject of an educational program. Nor have we addressed the more basic question of whether an educational program is needed for water resources.

Work Plan for 1981 and Beyond

With any needed adjustments which experience indicates, the ongoing activities outlined above will be continued in 1981 and beyond.

After initial consideration by the Task Force, a review draft of the present report was distributed to the several advisory groups and committees. Each of these were convened during October or November of 1981 for a detailed and critical review. These comments were considered by the Task Force before preparing a final report.

A summary report was prepared for widespread public dissemination.

During February and March of 1982, a series of public hearings will be scheduled throughout the State under the auspices of the Water Resources Commission. These will be directed toward widespread public information, comment, and future direction.

Opportunities for interviews, and public appearances and feature articles by Water Plan participants and their agencies will be sought. The newsletter "Illinois Water" will be continued.

SUMMARY OF RECOMMENDATIONS FOR MEANINGFUL PUBLIC PARTICIPATION

The Task Force Recommends:

- That after the advisory groups, regional committees, and public hearings presently scheduled are completed, public participation be continued with any needed adjustments. It is particularly intended that the question of education be examined.

APPENDIX A
MISSIONS AND PROGRAMS
OF
ILLINOIS STATE AGENCIES
PARTICIPATING IN THE
STATE WATER PLAN DEVELOPMENT

OFFICE OF THE GOVERNOR

The Governor of Illinois is the Chief Executive of the State, and is responsible for the administration of the government exclusive of other constitutional officers such as the Secretary of State, Comptroller, Attorney General, and Treasurer. With the concurrence of the State Senate, the Governor appoints the heads of 23 major state departments as well as numerous boards and commissions. He must report to the General Assembly each year on the "Condition of the State" and must also submit to the legislature a budget for each fiscal year. He may call special sessions of the General Assembly, specifying the subject matter to be considered. The Governor may also veto legislation passed by the General Assembly and grant pardons and reprieves.

Role in the State Water Plan

The State Water Plan Task Force was appointed by Governor James R. Thompson in 1980 to identify emergency policy issues in the management of the State's water resources. The Task Force will ultimately make recommendations for the Governor's action. The Office of the Governor is represented on the Water Plan Task Force, and is the lead agency for the issues or topics "Competition for Water" and "Conflict Resolution".

BUREAU OF THE BUDGET

The Bureau of the Budget was established in 1969 for the following purposes. First, to assist the Governor in submitting a recommended budget. Second, to make detailed studies of State agencies to enable the Governor to determine what changes should be made in existing organization, activities and methods of business so as to strengthen the State's management process and bring more efficient and economical conduct to state services. Third, to evaluate programs proposed by State agencies in terms of goals, costs and relative priorities, to keep the Governor informed of the programs and accomplishment of activities of State agencies, and to coordinate the development and implementation of State programs, to the end that the monies appropriated by the Legislature may be expended in the most economical manner possible with the least possible overlapping and duplication of effort. Finally, to advise and assist the Governor in the developing of policies, plans and programs for improving intergovernmental cooperation and coordinating Federal, State and local fiscal relationships.

Role in the State Water Plan

The Bureau of the Budget shall apply the above mandate to water resource programs and to the State Water Plan. The Bureau is represented on the Water Plan Task Force.

ILLINOIS WATER RESOURCES COMMISSION

Creation

The Water Resources Commission (IWRC) was created by Public Act 79-663, approved and effective August 29, 1975. This Act repealed the existing Water Pollution and Water Resources Commission which had been in existence since 1965.

Membership - Terms - Chairman

The Commission consists of a total of 18 members (10 legislative and 8 public). Legislative members are appointed as follows: 5 members of the Senate, 3 by the President and 2 by the Minority Leader; 5 members of the House of Representatives, 3 by the Speaker and 2 by the Minority Leader. The public members are appointed as follows: 2 each by the President of the senate and Speaker of the House of Representatives, and 2 each by the Minority Leaders of the Senate and the House of Representatives.

The Commissioners select from its General Assembly membership a chairman, vice-chairman and other such officers as it deems necessary.

Staff - Advisors

The Commission may employ or establish compensation of any necessary professional, technical and secretarial staff which may be hired by the Commission on a salaried basis or retained pursuant to contract. The staff shall carry out the duties as assigned by the Commission. At the present time, IWRC has two employees - an Executive Secretary and a Staff Member who serves as Legislative Liaison. The Executive Secretary works in the Springfield Office and performs secretarial functions consistent with the

total operation of the IWRC office. The Staff Member (Legislative Liaison) prepares through the Illinois Legislative Council and the Council On State Government research papers pertinent to legislation introduced by the Water Resources Commission. The staff also arranges all out of Springfield Commission meetings, while coordinating with district legislators on the Commission for the agenda and keeping in close communication with the Chairman. Advisors are chosen by the Commissioners for use of their expertise in water related fields. They participate in meetings along with the Commissioners.

Duties

The Commission studies the progress and problems of the State government and of counties, municipalities and other political subdivisions of the State in regard to waterways, drainage, flood control, water pollution and water resources.

IWRC monitors the interrelationship between the various units of government in the administration of their respective water programs and projects, and the necessity and feasibility of developing general comprehensive plans among such units of government to more effectively deal with such problems.

The cost of administering the various projects and programs and sources of revenue of the various units of government with such programs or projects are examined by IWRC.

Another mandate of IWRC is to study the desirability and feasibility of the State government establishing grants in aid to such counties, municipalities and other political subdivisions for water resources programs.

IWRC studies the laws of the State, and ordinances and zoning codes of the municipalities and counties in relation to waterways, drainage, flood control, water pollution and water resources, to determine the needs for revision, uniformity or codification in these areas.

The Commission also includes in its operation the review and research of air pollution as related to airborne pollutants contaminating the natural water systems of the state.

Meetings

The Commission attempts to hold at least one meeting each month and such additional meetings as it deems necessary.

Public Hearings

IWRC conducts public hearings at such times and places as determined by the Chairman. Notice of the hearing is given to municipalities, counties or other units of local government having jurisdiction over flood control and water resources that might be affected by the recommendations of the Commission. Any other interested person has the right to participate in such a hearing and may submit written statements, subject to the power of the Commission to promulgate rules governing the extent of such participation. All such hearings are open to the public and all testimony taken before the Commission is recorded.

Assistance From Units of Local Government - Cooperation With State

IWRC may request and receive from any State Officer, department or agency, and from the officers of any county, municipality or other unit of local

government such data and reasonable assistance which may help the Commission in its study.

The Commission consults and cooperates with the Department of Transportation, Division of Water Resources; Environmental Protection Agency; Department of Energy and Natural Resources; Department of Commerce and Community Affairs; Office of Resource Conservation; Department of Conservation; Department of Agriculture, Division of Natural Resources; or any other State agency in the course of its studies.

Funding

The Commission receives its funding from an appropriation each year from the General Assembly.

Gifts, Grants, Services or Facilities

IWRC may receive or participate in any gift or grant of funds, services or facilities from any Federal, State or private agency or corporation made for the purposes of assisting the Commission in carrying out its duties.

Report of Findings and Conclusions

The Water Resources Commission makes a detailed report of its findings and conclusions to the Governor and General Assembly by February first of each odd-numbered year. Recommendations for such legislation as it deems necessary is submitted to the General Assembly.

Role in the State Water Plan

Through active participation in the Illinois State Water Plan Task Force, the Water Resources Commission contributes its knowledge in the legislative

process. It will be the tool used by the State Water Plan Task Force to sponsor and assist in the passage of any determined legislation. IWRC also assists the Department of Commerce and Community Affairs in the public participation/education aspect of the State Water Plan by coordinating the various meetings which are held for this purpose throughout the state. IWRC has been designated by the State Water Plan Task Force to explain the findings and conclusions to the members of the General Assembly, and initiate any legislation deemed necessary to implement the plan.

ILLINOIS WATER RESOURCES CENTER

The Agency and Its Mission

The Water Resources Center (WRC) at the University of Illinois at Urbana-Champaign coordinates a program of innovative water research tailored to the needs of Illinois and the Midwest. The research is conducted by scientists at colleges and universities throughout the state and the three State Scientific Surveys, and is supported by university, state, and federal funds administered through the Center. It also engages in cooperative research projects with other WRC's in the midwest.

In addition to addressing regional water resources needs, the WRC's research program provides water research training for many graduate students employed as research assistants.

The center also is responsible for disseminating water resources information to the public and scientific community.

The WRC was established by the University of Illinois in 1963. One year later, the center was designated as one of fifty-four water research institutes in the United States and its possessions authorized for federal support by the 1964 Water Research Act. In 1973, the center became part of the University of Illinois Institute for Environmental Studies.

The WRC Director coordinates the center's activities, assisted by three advisory committees and several editors and research associates.

The WRC receives an annual allotment of federal funds from the Office of Water Research and Technology (OWRT), U.S. Department of the Interior. The University of Illinois also provides funds to support a portion of the research program and center activities. Additional funds are obtained from other governmental agencies. The 1978 Water Research and Development Act provides funds to OWRT for three major research programs. Under the Annual Cooperative Program, about thirteen Illinois projects are selected each year on the basis of their innovative focus and their bearing on state and regional water resources needs.

The OWRT Matching Grant Program provides federal funds, matched by university funds, for larger studies involving more time and money. Projects are chosen on the basis of both national and state priorities.

OWRT's current Focused Research Program supports studies on water reuse, water conservation, and water problems of urbanizing areas. A continuing focused program provides funds for saline water conversion research.

State funding through the University of Illinois amounts to approximately \$125,000 per year. The Federal grants consist of \$115,000 per year as an allotment from OWRT plus matching grants, which totaled \$222,000 in FY 81.

Research supported by the center covers a wide range of water-related topics. Some are aimed at improving the basic state of knowledge in hydrology, fluid mechanics, and water chemistry, but most are directly related to practical problems of water supply, quality, control, and disposal. Several current projects deal with the detection and removal of pollutants and with the effects of these substances on humans, plants, and animals. Others

investigate the design of domestic water supply and wastewater treatment systems; management and restoration of man-made lakes; efficient use of water in irrigation; recharging groundwater with effluent from advanced waste treatment plants; impact of recreation on navigation in the Mississippi and Illinois rivers; an inquiry on Illinois rural water districts; techniques for reducing flood damage; and the relationship between water resources management practices and water demands for energy production.

Education

Although the Water Resources Center does not offer courses or grant degrees, the center has helped establish several water-related courses at the University of Illinois. The center also contributes to the educational program through its support of research projects, since each project usually relies on one or more part-time graduate assistants.

The center maintains a library of recent Illinois and national publications related to water resources. About four hundred technical reports are received annually, and these reports are catalogued, advertised in "News and Announcements", and circulated on request.

Seminars and Workshops

The WRC conducts many workshops on such topics as alternative wastewater treatment systems, the restoration of Illinois lakes, and instream flow methodologies.

In addition, the center holds annual meetings to bring Illinois researchers, agencies, and other research users together to discuss current water studies and research needs. The meetings often focus on single topics such as the

Illinois River or water and land problems in urbanizing areas.

Each year the WRC also sponsors a number of seminars on the University of Illinois campus to provide students and staff the opportunity to hear outstanding visiting scientists or to learn about current Illinois research.

Water Resources Scientific Information Center

In 1966, the Water Resources Scientific Information Center (WRSIC) was established in Washington, D.C., and was designated the national center for the collection and dissemination of scientific and technical water resources information. WRSIC provides custom-tailored literature searches in answer to specific inquiries about the existence, location, and availability of documents. The Illinois Center's terminal, directly connected to the national WRSIC data bank, is available for use by Illinois scientists and administrators.

Publications

Dissemination of research information is an important activity of the Water Resources Center. The center issues several types of publications.

Final Reports - At the completion of each research project, a final report is published. Since the beginning of FY 1975, sixty-three such reports have been published, increasing to 158 the total number published by the Center. WRC reports are sent to various organizations, libraries, and individuals around the state and to the other water resources research centers.

Newsletters - To keep scientists, administrators, and users informed of current developments in the water resources field, the Center publishes a

quarterly newsletter called "News and Announcements". This newsletter presents information on available funding, conferences, current water-related legislation, and national and state developments. It also contains abstracts of final reports published by the center and a list of the center's recent library acquisitions. "News and Announcements" now reaches about 850 persons and is available without charge by writing or calling the center.

Role in the State Water Plan

Through active participation in the Illinois State Water Plan Task Force, the Water Resources Center makes available its various resources. Additionally, the center prepares and publishes, Illinois Water, Newsletter of the Illinois State Water Plan. Also, it organizes and acts as liaison for the Water Plan Regional Advisory Committees.

ILLINOIS DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES

Agency and Its Mission

The Department of Transportation is responsible for planning, developing and maintaining the state's air, land, and water transportation systems.

The Division of Water Resources' principal programs and responsibilities involve water resources development, regulation, and management. The Division, therefore, conducts the State urban flood control, water supply, navigation, and ports planning and development programs.

The Division is responsible for protective jurisdiction over the public waters of Illinois and regulates construction in the rivers, lakes, and streams of the state. State floodplain regulations are administered in designated areas. The Division of Water Resources is also responsible for allocating and regulating the diversion of water from Lake Michigan for apportionment among communities in the Metropolitan Chicago area.

The construction program of the Division is primarily devoted to urban flood control projects although it also includes some navigation projects and water supply projects. Many construction projects under the responsibility of the Division are conducted in cooperation with the U.S. Army Corps of Engineers and U.S. Department of Agriculture, Soil Conservation Service. Other projects are planned, designed and constructed by the Division in cooperation with units of local government as specifically authorized by the Illinois General Assembly.

The Division of Water Resources is, in addition, the responsible lead state agency for: dam safety, National Flood Insurance Program coordination, floodplain management technical assistance, coastal zone management, discharge of dredged and fill materials, hydropower, multi-purpose reservoirs, cooperative stream gaging, water supply and assessment, and instream protected flow evaluations.

The Director of the Division of Water Resources has represented the State of Illinois on the Upper Mississippi, Great Lakes, and Ohio River Basin Commissions, as well as the Great Lakes Compact Commission.

Funding and Staff

The Division of Water Resources operates its program with a staff of approximately 150. The Division's staff is mainly professional with 123 technical positions of which half are engineers.

The Division's funding is supplied from three basic sources as approved by the Illinois General Assembly.

The construction program of the Division has in the past averaged about \$10 million per year and is funded out of the state's Capitol Development Bonds. The Division's technical studies, services, and staff are funded at a level averaging \$6 million per year and funds are appropriated from the State's General Revenue account. Federal funds are also administered by the Division which are periodically available for special programs and studies under the Division's responsibility. These funds have averaged about \$500,000 per year.

Division of Water Resources Programs

Urban Flood Control - This program consists of all surveying, mapping, streamflow data collection, engineering planning, environmental studies, design, construction and right-of-way acquisition to implement structural and non-structural flood control projects. Many of these projects are conducted in cooperation with Federal flood control agencies. This program to reduce flood damages within the state is conducted in accordance with the Flood Control Act of 1945; Master Plan Act of 1959; Rivers and Lakes Act of 1911; and other specific project authorizations.

River and Lakes Regulation - This program involves the supervision, regulation, and control of all uses of public waters through permits, licenses and leases issued to protect the public trust in navigable waters, meandered lakes, and Lake Michigan. Approvals or permits are required for any activity that may obstruct navigation or the flow of flood waters, insure dam safety, or create coastal zone hazards. No state, local, or private entity is exempt from regulation pursuant to this authority under the Rivers and Lakes Act of 1911.

State/Federal Water Resources Coordination - The objective of this program is to effectuate consistent policies, programs, projects and priorities between state, interstate, and Federal agencies pertaining to water resources management in Illinois. Program and Federal project managers are assigned to coordinate with all programs of the Corps of Engineers, Soil Conservation Service, U.S. Geological Survey, National Weather Service, Federal Insurance Administration and Federal Emergency Management Agency. Close liaison with Federal agencies and neighboring state water resources agencies is maintained

through Illinois representation on river basin commissions, interstate compact commissions, and other interstate organizations. Illinois testimony is prepared for presentation before Congressional authorization and appropriation committees.

Navigation and Ports Development - This program consists of all studies, design, construction and right-of-way acquisition for improving, operating and maintaining public waters for commercial and recreational navigation pursuant to the Rivers and Lakes Act of 1911, Illinois Waterway Act of 1919, Lake Calumet Harbor Act of 1929, Flood Control Act of 1945, and Kaskaskia Watershed Act of 1965. Technical and financial assistance is provided for the planning, development, and operations of regional port districts. Participation in Federal waterway planning and policy formulation is a key activity under this program.

Public Water Supply - Allocation and regulation of all water diverted from Lake Michigan to serve the people of Northeastern Illinois pursuant to the 1967 U.S. Supreme Court decree is an intensive activity under this program. Water is also allocated through regulation and sale from state-owned storage in Carlyle, Shelbyville, Rend, and Kincaid multi-purpose reservoirs. This program is also conducting a detailed identification and inventory of regional water supply availability and demand to identify the timing and areas of impending shortages.

Local Assistance - The objective of this program is to enhance the use of local government powers and resources to deal with local water problems. Workshops, manuals, and direct assistance in joining the National Flood Insurance Program; formulating, enacting, and administering floodplain

regulations, sediment and erosion control regulations, storm drainage regulations, and related zoning, subdivision, and building code changes; organizing local planning and steering committees; disaster planning; and applying for assistance from other agencies and programs is provided.

Role in the State Water Plan

The Director of the Division of Water Resources is the designated Chairman of the State Water Plan Task Force. The Division's Deputy Director is a Task Force member. The Division also supplies a full-time staff person to assist the State Water Plan Task Force in its planning activities.

The Division is the State Water Plan Task Force lead agency for the water planning topics of Flood Damage Mitigation and Water Use Law and support agency for the topics of Water Conservation, Competition for Water, and Integration of Water Quality and Quantity Management.

egencies of the Department of Agriculture
DEPARTMENT OF AGRICULTURE

Agency Land Mission

The Division of Natural Resources was formed within the Illinois Department of Agriculture on January 1, 1980. The Department consolidated all the natural resource concerns within its authority into one Division. The Division is comprised of four major sections. These are:

1. Grant-In-Aid Section
2. Management and Technical Assistance Section
3. Land Management Section
4. Land Reclamation and Watershed Treatment Section

The Division of Markets handles programs which relate to the transportation of agricultural goods - one of which is navigation.

Agency Responsibilities Related to Water

Most programs and responsibilities of the Department related to water resources are handled by the Division of Natural Resources. The primary mission of the Division is to reduce soil erosion from agriculture on all land within the State to sustainable rates by the year 2000. It is anticipated that attainment of these goals will reduce the sediment and pollutant loads entering aquatic systems and therefore, improve water quality.

The Department carries out several programs to promote soil and water conservation and improve rural water resources. These include: funding to local soil and water conservation districts, conservation educational

programs, newsletters, priority setting for rural water resource projects in cooperation with the U.S. Army Corps of Engineers and the Soil Conservation Service, review of surface mine reclamation permits, funding for soil surveys, providing cost-share money for reduced and no-till conservation practices, review of permits for rural water distribution systems, and review of legislation.

Issues related to navigation are monitored by the Division of Markets.

Objectives by Sections

Grant-In-Aid Section - The overall objective for this Section is to provide and maintain an accurate and efficient accounting of all financial transactions for the Division.

Management and Technical Assistance Section - Primary goal is to reduce soil erosion losses within the State to acceptable limits within the guidelines established by the 208 Water Quality Plan and the Soil Erosion and Sedimentation Guidelines.

Land Management Section - The primary objective of the Land Management Section is to develop and implement a farmland preservation program in accordance with the Governor's Executive Order 4, dated July 22, 1980.

Land Reclamation and Watershed Treatment Section - The primary objective is to administer programs dealing with water resources in an effective and efficient manner as required by State and federal laws and regulations.

Funding and Staff

The Division receives assistance and advice from a 7 member statutory committee. The Committee is comprised of two ex-officio members, which are the Director of the Illinois Department of Agriculture and the Director of Agricultural Extension of the College of Agriculture of the University of Illinois. The other five members are active farmers who are appointed by the Governor with the consent of the Senate. On March 16, 1981 the Department expanded the statutory committee to include a broad range of natural resources interest. The committee was renamed as the Soil Erosion and Water Quality Advisory Committee. It is made up of 24 members which represent gubernatorial appointees, farm organizations, statewide organizations, and state and federal agencies.

The Division includes 27 employees, of these 21 are professional employees and 6 are support staff.

The Division of Natural Resources has a total budget of \$2,421,079 for Fiscal Year 1982. The funding sources for this are: state appropriation \$2,369,700, Title III \$30,000, IEPA \$21,379.

Role in the State Water Plan

The Department is responsible for the development of three issues or sub-issues related to the State Water Plan. These include lead agency responsibility for Erosion and Sediment Control, the Rural Flood Control portion of Flood Damage Mitigation, and the Irrigation portion of Competition for Water.

DEPARTMENT OF CONSERVATION

The Agency and Its Mission

The Illinois Department of Conservation (DOC) was created in 1925 by Act of the Illinois General Assembly. The Department is charged with the preservation, conservation, and enhancement of Illinois' natural and cultural resources, and provides many of the state's outdoor recreation opportunities.

The Department operates under a variety of laws. Major laws governing Department programs include: Boat Registration and Safety Act, Endangered Species Protection Act, Fish Code of 1971, Wildlife Code, Forest Products Transportation Act, Snowmobile Registration and Safety Act, State Parks and Nature Preserves Act, Timber Buyers Licensing Act, and Wild or Scenic Rivers.

In 1971 by Governor's proclamation, the Department of Conservation was charged with responsibility for Statewide Comprehensive Outdoor Recreation Planning (SCORP) and coordination among recreation providers in both the public and private sectors.

Funding and Staff

The Department is funded through a variety of Federal and state sources. On the state side, monies are derived from sport and commercial fishing and hunting license sales and fines. From the registration and titling of boats, all fines from boat safety violations and excise tax monies derived from the sale of marine fuels and lubricants are all deposited in the Illinois Boating Fund. Illinois Waterfowl Stamp monies are deposited in a fund earmarked for waterfowl management and habitat protection and development. Camping fees and concessionaire revenues are deposited in the State Park fund. The DOC also

receives appropriations from the State's General Revenue Fund and the Capital Development Bond Fund.

Federal funding sources which assist the DOC in the discharge of its duties and responsibilities are quite diverse. Over the past 15 years the major dependable funding source for the Department and local recreation agency land acquisition and recreation site development has been the annual Land and Water Conservation Fund allocations from the U.S. Department of Interior's Heritage Conservation and Recreation Service, which the Department shares with local agencies on an even split basis. The future of this funding source is uncertain due to recent Federal budget cuts. The Department also receives annual allocations from the Dingell-Johnson Fish Restoration Fund, the Pitmann-Robinson Wildlife Restoration Fund, the Anadromous Fish Fund, the Historic Preservation Fund, Rural Fire Protection Assistance Fund, Young Adult Conservation Corps Fund, and the U.S. Department of Interior's Office of Surface Mining.

State funding via income, general revenue and capital development bonds amounts to \$41,890,000 in FY '82. Federal grants-in-aid and State allocations total \$38,059,000 for the same period; however, much of this Federal money is passed through to fund local agency projects.

The Department, in carrying out its mission, employs 1290 technical, field and office staff and several hundred temporary seasonal employees. It operates five regional offices at Alton, Champaign, Spring Grove, Sterling, and Benton and has field offices in many Illinois counties. One of the State's largest property owners, the Department owns, operates or leases over 290 sites containing a total of 328,000 acres, including 72,000 acres of surface water.

The character of these sites is as diverse as the DOC's responsibilities, being comprised of State Parks, State Fish and Wildlife Areas, State Forests, State Nature Preserves, State Historic and Archaeological Sites, State Boating Access Areas, State Recreation Areas, State Trails, State Tree Nurseries, State Fish Hatcheries, and State Game Farms.

The DOC is organized into four Bureaus: Administrative Services, Planning and Development, Natural Resources, and Public Lands and Historic Sites. Their responsibilities are as follows:

Bureau of Planning and Development - This Bureau is responsible for statewide comprehensive outdoor recreation planning and policy development and orderly planning and development for all Department owned or leased lands.

Bureau of Public Lands and Historic Sites - Responsibility for state parks, forests, conservation areas, trails, natural areas, nature preserves, and historic sites is in this Bureau.

Bureau of Natural Resources - Personnel of this Bureau provide technical assistance to managers of Department lands and other government properties and to private landowners on wildlife, forestry, and fishery conservation practices. Recently the Bureau also developed a new Natural Heritage Section which is concerned with preservation and conservaton of natural ecological areas.

Bureau of Administrative Services - Administrative support for the Department is provided by this Bureau.

Young Adult Conservation Activities

Operating as a Bureau within the Department, IYACC is a Federally funded program initiated in 1978 to provide jobs to young persons 16 through 23, who are no longer in school. Enrollees are used to improve state and local public lands, and to provide emergency assistance during flooding, winter storms, and other natural hardships.

Conservation Advisory Board

This nine member board, appointed by the Governor, was established in 1955 to advise the Director on policies, programs and activities of the Department.

Illinois Nature Preserves Commission

This nine member commission was created in 1963, and is appointed by the Governor. The Commission oversees the Illinois nature preserves system and promotes the preservation of natural diversity throughout the state. Functions of the Commission include maintaining registries and records of nature preserves, participating in developing plans for management and use of nature preserves, and promoting and approving dedication of nature preserves.

Illinois Endangered Species Protection Board - This nine member board was created in 1972, and is appointed by the Governor. The Board identifies State endangered species and State threatened species and advises the DOC on the management of these species.

Research Projects

The Department carries out field studies aimed at the collection of data necessary to the management of terrestrial and aquatic habitats and improved forest resource and natural ecosystem management.

It also funds and cooperates in university research in the fields of fish, wildlife, forest, endangered species, and historical and archaeological sites.

Education

The Department's information and education efforts include the development of publications designed to provide property owners with the necessary information to allow them to manage the fish and wildlife populations and forests which occur on their lands and waters. Education materials are also prepared to facilitate the teaching of resource management and conservation principles in the grade and high schools.

Publications and Information

The DOC keeps the public informed as to its activities and major resource issues by publishing a weekly newsletter, "Outdoor Highlights", which has 23,000 subscribers and by issuing "News Releases" to explain Administrative Orders, tell of upcoming events, and explain DOC positions. The Department's Audio-Visual Section produces a weekly fifteen minute program, "Conservation

Today", which is aired on some 200 radio stations statewide, and periodic documentaries carried on 30 television stations.

Site brochures are produced, which describe the area, its history and setting and give information on the availability of facilities. A Canoeing Guide and a Waterway Access Map have also been developed for use by the boating public. Much literature is available on fishing and hunting opportunities.

Public Involvement

The DOC involves the public in its planning process in many ways, including statewide activity participant surveys, the 180 member SCORP Panel of Advisors, and the sponsoring of regional public issue oriented meetings and workshops. As a part of its master management planning process for DOC owned and operated facilities, it hosts site specific workshops to gain citizen-user involvement in plan development.

Water Related Activities

All Divisions in the Department are in some way involved in water related programs and activities. The Division of Fish and Wildlife Resources employs biologists who carry out necessary studies and management on both the DOC and other water areas aimed at the production of quality fishing and waterfowl hunting experiences. The same personnel carry out studies to determine the potential environmental impacts of water development and related proposals. The Department has constructed and/or has accepted the recreational management responsibility for 72,000 acres of surface water. These water bodies are both artificial and natural, and range from one acre ponds to the large lakes like the 26,000 acre Carlyle Reservoir.

DOC law enforcement officers reside in all 102 Illinois counties and among other responsibilities provide a safety patrol for water areas and inspect private and rental boats for safe operation.

Boat and dockage rental facilities are available on most DOC water areas.

The Department is in the process of modernizing its statewide fish hatchery system. This work will be complete in early 1982 and the new facilities will have a production capacity in excess of 50,000,000 fish of 15 species per year. These new facilities were designed to handle Illinois' fish production needs for the next fifty years.

Role in the State Water Plan

The Department of Conservation is the agency responsible for two of the State Water Plan's major issues: "Water Based Recreation" and "Aquatic and Riparian Habitat". The Department serves as a support agency on the "Integration of Water Quality and Quantity Management, Water Use Law, and Flood Damage Mitigation" issues.

DEPARTMENT OF COMMERCE AND COMMUNITY AFFAIRS

The Agency and Its Mission

The Illinois Department of Commerce and Community Affairs (DCCA) was formed through the consolidation of three former state agencies: the Department of Business and Economic Development, the Governor's Office of Manpower and Human Development, and the Department of Local Government Affairs. These three agencies were merged by Executive Order Number 3-1979 to integrate existing economic and community development programs, thereby increasing the effectiveness of the state's industrial and community development efforts.

The primary mission of DCCA is to ensure economic stability, enhance business prosperity, increase employment and employment opportunities, and promote the increased capabilities of local governments and other public entities to achieve balanced development of physical, economic, fiscal, and human resources. In carrying out this mission, the Department functions as the focal point for technical assistance and professional services to the business and governmental communities in Illinois. Through a variety of programs, DCCA extends services to almost every segment of the State's population.

The major divisions of the department and their basic functions are as follows:

Division of Commercial and Industrial Development

The Division of Commercial and Industrial Development is the agency's link to the business community. The Division serves to create and maintain jobs for Illinois by encouraging business expansion and location in the State, and by helping communities develop and implement economic development programs. The Division also administers the State's civic center support program and assists

the film industry in seeking locations for productions.

Division of International Business

The Division of International Business promotes commerce between Illinois and world markets. Illinois has led the nation in exports more often than any state over the last decade. Overseas sales of agricultural and manufactured products now exceeds \$10 billion annually. Assistance is available through foreign offices in Brussels, Hong Kong, and Sao Paulo, as well as three program offices in Illinois.

Division of Government and Community Services

The Division of Government and Community Services provides assistance to units of local government. The Division helps communities improve their management capabilities by providing planning and management assistance in the areas of housing, community development, resource conservation, and state and federal program funding. It also works with communities in promoting tourism.

Division of Employment and Training Services

The Division of Employment and Training Services administers the federal Comprehensive Employment and Training Act (CETA) job training and employment grant programs in 71 Illinois counties which do not qualify for direct CETA funding. It also manages statewide employment and training programs under five special CETA grant programs.

Funding and Staff

In fiscal year 1982, the Department's overall budget will total \$224 million. Of this amount, approximately \$9.4 million will be provided from State general revenue funds, with the remainder being obtained from federal program and

special state funding.

Water Related Activities

DCCA's water related activities are carried out primarily through its Office of Resource Conservation which conducts and coordinates several grant and technical assistance programs in the areas of energy and water resources. Combining financial aid with information and assistance on conservation methods enables the office to more fully respond to the needs of its clients.

The Water Conservation Technical Assistance Program helps localities make the best use of their existing water supplies through sound management practices and conservation techniques. Assistance is provided to local officials as well as individuals and public service groups through direct field contacts and supportive workshops and publications. Emergency assistance has been provided in recent years with respect to drought related problems experienced by several Illinois communities.

In addition, the efforts of the Office of Resource Conservation, staff members in the Office of Housing and Community Development assist communities in planning for and obtaining loans and grants needed to improve water supply and treatment systems.

Role in the State Water Plan

The Department of Commerce and Community Affairs, through its representative, participates actively in the work of the Illinois Water Plan Task Force, and serves in a lead role with respect to the areas of Water Conservation, Drought Contingency Planning, and Public Participation.

DEPARTMENT OF MINES AND MINERALS

The Agency Background

The Department of Mines and Minerals is one of the original code departments created in 1917 by act of the legislature under the Civil Administrative Code. Basically, the responsibilities of the Department stem from the following; Administration of the Coal Mining act and the Metal Mining act; Administration of An Act in Relation to Oil, Gas, Coal and Other Underground Resources; Administration of the Surface Mined Land Reclamation Act; Administration of the Explosives Act; and the Abandoned Mined Lands Reclamation Act. The Department is organized into divisions as follows: General Office; Division of Oil and Gas; Land Reclamation Division, Explosives Division, and the Abandoned Mined Lands Reclamation Division.

Administration of the laws is aided by a Mining Board, Miners' Examining Board, Oil and Gas Advisory Board, the Abandoned Mines Lands Reclamation Council, and the Surface Mining Advisory Council.

Land Reclamation Division

The Land Reclamation Division was organized in 1962 following passage of The Open Cut Land Reclamation Act. The law required that efforts be made by mine operators to reclaim lands affected by open cut or surface mining and, thereby, to encourage the conservation and use of such lands. After an operator has met various requirements for permit, bond and fees, he may undertake reclamation of the land for forest, horticulture, pasture, or row crop production, or for recreational and wildlife development, or other useful purposes which have been approved by the Land Reclamation Division. This law was strengthened in 1967, 1971, and 1975. The 1975 law provided for the

return of topsoil, with provisions of a suitable rooting medium for all lands with row-crop potential. The Division was responsible for all surface mining, including coal and aggregate production.

Passage of the Federal Surface Mining Control and Reclamation Act in 1977 led to passage by the Illinois General Assembly in 1978 of a bill authorizing the Department to implement a permanent program. Permanent legislation passed the General Assembly in 1979.

The interim and permanent programs make use of an Interagency Committee to assist the Department in meeting the broad federal requirements. Cooperating divisions were established by the Illinois Environmental Protection Agency, the Department of Agriculture, the Department of Conservation, and the Division of Water Resources of the Department of Transportation.

The interim program is concerned with requiring all mine operations to have a permit, and to require all operations to meet federal performance standards. The permanent program will provide for additional environmental safeguards, civil penalties for violation of regulations, special provisions for reclaiming prime farmlands, and provisions for declaring certain lands as unsuitable for surface mining.

Oil and Gas Division

The Division of Oil and Gas enforces legislation that pertains to the prevention of waste and dissipation of oil and gas resources. By strict enforcement of the spacing requirements, the Division prevents the drilling of an excessive number of wells on small tracts of land. The Division acts as arbitrator through the medium of a public hearing, and solves many problems

among the operators, landowners, and royalty owners regarding drainage claims and drilling units.

The Oil and Gas Division has the authority to make any reasonable rules and regulations necessary to prevent the pollution of fresh water supplies by oil, gas, or salt water. Permits must be obtained from the Oil and Gas Division for drilling all water wells, as well as gas and oil wells, and for plugging wells. In addition, the Oil and Gas Division is authorized to prohibit wells which would pollute, by oil, gas, or other foreign substances, fresh water supplies.

Abandoned Mined Lands Reclamation Council

The Abandoned Mined Lands Reclamation Council was established in 1975 for the purpose of addressing problems presented by earlier unregulated mining.

During 1979, the Council sought and received Federal funds provided through the Surface Mining Control and Reclamation Act of 1977. At that initial time, the funds were limited strictly to emergencies and extreme danger cases.

The Council expects to qualify for greater Federal assistance when the State Reclamation Plan for abandoned mine lands is approved by the Federal Office of Surface Mining. Although the State will continue to obtain funds to remedy emergency and extreme danger problems, the approved Plan will also allow the Council to receive funds for projects involving other environmental concerns.

Mine Health and Safety

The department provides safety and rescue training for miners, inspects both coal and non-coal mines, and operates six mine rescue stations. The safety

and rescue training is conducted both on-site and in departmental facilities.

The Department's mine inspections are coordinated with those of the federal Mine Safety and Health Administration and labor union safety teams to ensure compliance with health and safety standards. Together, these agencies seek to ensure the highest possible level of workplace safety for Illinois miners.

Six rescue stations throughout the mining region provide skilled rescue crews to ensure timely response to mine emergencies.

The analytical laboratory analyzes mine rock dust and mine air to detect characteristics which cause coal mine fires and explosions. Coal samples are tested to ensure the coal purchased for state institutions is of a high grade and quality.

Explosives Division

The Explosives Division was created in 1971. It is responsible for administering legislation pertaining to the manufacture, possession, storage, transportation, use, sale and gift of explosives. The Division processes applications and issues licenses for explosive storage magazines throughout the State. Inspections are made to determine if the explosive storage is secure and if it is located a safe distance from the general public.

With the advent of the Explosives Licensing Act of 1971, the Division began issuing licenses to individuals who wish to use explosives.

EMT Training Division

The EMT Training Division was established in December, 1978 as a result of the

state legislature passing Senate Bill 649, known as the "Coal Mine Medical Emergencies Act".

The function of this Division is the training and coordination of all phases of Emergency Medical Technician programs, including recertification, continuing education, basic courses, and recommendation of emergency medical supplies. Additional functions include liaison between the Department and Illinois Department of Public Health (IDPH) to assure statewide certification of Emergency Medical Technicians (EMT's) in the coal industry. After certification, these EMT's are capable of treating such serious injuries as head and spinal injuries, amputations, broken bones and are certified to administer Cardio-Pulmonary Resuscitation (CPR), plus many other illnesses or injuries.

Role in the State Water Plan

The Department participates in the Water Plan development through membership on the Task Force.

DEPARTMENT OF PUBLIC HEALTH

The Department and Its Mission

The Department is engaged in a broad range of health services for the State's eleven million residents.

The Division of Engineering administers and enforces state water supply laws and sanitation codes. Activities and facilities thus regulated are: plumbing, water wells, water well pump installations, sewage disposal, manufactured housing, swimming pools, bathing beaches, private and semi-private water supplies, and approximately 12,000 non-community water supplies. A non-community water supply is a public water supply serving a facility frequented by the non-resident public, e.g., schools, restaurants, hospitals, industrial facilities, recreational areas, etc., which are served by their own water supply.

Aside from the non-community water supply regulation, the Division of Engineering has been licensing approximately 650 water well and pump contractors a year who construct approximately 14,000 new water wells each year with the majority of these supplies being private.

Inspections and consultation for program effectiveness are conducted through regional offices. Water samples are analyzed for organic and inorganic contaminants and bacteria for private, semi-private, and non-community supplies, as required or requested.

Funding and Staff

The Division of Engineering, eight Regional Offices, and three laboratories are funded primarily by the State's general revenue fund. The non-community water supply program is funded in part through U.S. Environmental Protection Agency Water Supply Program supervision grants. The FY 82 allotment to the Department is \$260,000.

The staff directly and primarily concerned with water supply programs in the Division of Engineering consist of three professional and one clerical personnel at this time. The staff in the Regional Offices are generalists, performing numerous program functions, including water supply. Support services in the Department for water supply activity include laboratory analysts and data processing analysts and programmers.

Role in the State Water Plan

Through active participation in the Illinois State Water Plan Task Force, the Department of Public Health makes available its various resources.

DEPARTMENT OF ENERGY AND NATURAL RESOURCES
(FORMERLY INSTITUTE OF NATURAL RESOURCES)

The Agency and Its Mission

The Illinois Department of Energy and Natural Resources is an executive-branch agency of Illinois state government. Originally formed in July 1978 by Governor James Thompson, as the Institute of Natural Resources, it was created by the reorganization of the former Institute for Environmental Quality and Division of Energy of the former Department of Business and Economic Development. In January, 1979, the State Geological, Water, and Natural History Surveys and State Museum were added to the structure and function of an Institute of Natural Resources, which has become the Department of Energy and Natural Resources in September 1981.

The mission of the Department can best be described by its legislative mandate as follows:

"It shall be the duty of the Department to investigate practical problems, implement studies, conduct research and provide assistance, information and data relating to the technology and administration of environmental protection; energy; the natural history, entomology, zoology and botany of this State; the geology and natural resources of this State; the water and atmospheric resources of this State; and the archeological and cultural history of this State. The Department shall obtain, store, and process relevant data; recommend technological, administrative, and legislative changes and developments; cooperate with other federal, state or local governmental research agencies, facilities or institutes in the selection of projects for study; cooperate with the

Board of Higher Education and with the public and private colleges and universities in this State in developing relevant interdisciplinary approaches to problems; evaluate curricula at all levels of education and provide assistance to instructors; and sponsor an annual conference of leaders in government, industry, health and education to evaluate the state of this State's environment, natural resources and energy supply and consumption."

Estimated funding for water resource and atmospheric related activities within the Department is \$5.5 million per year. Approximately 40% of the funding is from grants and contracts from state and federal agencies and private companies. An estimated 200 scientists, engineers, and technicians are engaged in water resource and atmospheric related activities.

There are five Divisions within the Department with activities related to State water planning. They are the three Scientific Surveys (the Water, Natural History, and Geological Survey Divisions), the Resource Development Division, and the Division of Environmental Management. Their principal activities are summarized below.

Water Survey Division

The State Water Survey is the primary agency in Illinois concerned with water resources research. The Survey has an 86-year history in research, data collection and service in areas of water chemistry, water supply, water quality, meteorology, and climatology. The Survey works cooperatively with all state and federal agencies concerned with water and weather in Illinois. Because of the Water Survey's unusual data collections and research

capabilities including staff expertise, they often conduct research projects and data collection under contracts or grants.

Research, data collection, and service activities of the Water Survey are organized under seven sections: Aquatic Chemistry, Atmospheric Chemistry, Climatology, Groundwater, Surface Water, Meteorology, and Water Quality. Service and support activities are found in the Analytical Chemistry Laboratory, Communications, and Data and Information Management Units. The Laboratory serves the public by performing free mineral analyses of water, and the Information Unit supplies copies of data to many users around the state.

Research and data collection activities within each section are directly related to water planning activities. Research related to climate and weather include climate variability and change, climate prediction, climate impacts on man and environment, hydrometeorology, and weather modification.

Research related to surface water includes flood hydrology, river hydraulics and sediment, and urban stormwater. Groundwater studies include research on groundwater quality and groundwater contamination and analytical techniques and digital methods for aquifer assessment. Groundwater and surface water resource assessment are an important part of the Water Survey's program.

Research related chemistry and water quality includes deposition of atmospheric pollutants, aquatic organic chemistry, sediment chemistry, water treatment programs, eutrophication studies, waste water treatment, and lake and stream studies.

Data programs include a statewide network of observation wells for collection of groundwater levels, collection of water use data statewide, a new statewide stream sediment network, and a new statewide climate network. Extensive data files on groundwater quality and climatology are maintained. Sedimentation rates for many water supply reservoirs are available. The Water Survey supports 40 stream gages in the USGS stream-gaging program.

The research and interrelated data collection programs are integrated in a services program. Findings and data are presented in an array of publications, workshops are conducted for user groups in various specialty areas, and staff members teach and give many talks at conferences and meetings around the state.

Natural History Survey Division

The Natural History Survey has been studying aquatic ecosystems in Illinois for over a hundred years and has voluminous data on distributions, historical changes in these distributions, and ecological requirements of numerous groups of aquatic organisms. Among the best-studied organisms are fishes (major reports published 1908, 1979), aquatic insects (several reports 1915-1965), birds (several reports, 1889-1979), amphibians and reptiles (1961), plankton (1903) and mussels (1971). Reports are presently in preparation on several other groups, especially crayfishes, aquatic fungi, birds, and several groups of insects. Distributional and other demographic changes in many organisms native to Illinois are documented in these reports. Demographic changes analyzed in conjunction with ecological requirements of organisms are being used to identify various forms of habitat degradation and the responses of these organisms to change in the water resources of Illinois.

The scientific staff of the Natural History Survey conducts a number of studies which continually assess the natural resources of the State. Of particular importance are the long-term records of waterfowl and fish utilizing the larger rivers throughout the State. Many of these records are of several decades duration and are the only type of information against which changes in the water resources can be compared. In addition, the Survey has a major effort in predicting the response of biological communities to changes in aquatic habitats. Some of these studies include the life histories and habitat preferences of various fishes, fish genetics, water quality parameters as they are related to biological organisms, toxicities of coal leachates, factors responsible for fingernail clam die-offs, population dynamics and oxygen and current requirements of stream invertebrates, effects of backwater lakes on proposed changes in water flow, and special issues which concern field sampling methods and data analytical techniques.

The Natural History Survey has had a long-term commitment for collecting information on the natural resources related to the water and associated aquatic habitats. These data sets, as well as the studies which must be performed, permit the planning process with respect to the water resource to be based on a data set which is perhaps the most unique in the United States.

State Geological Survey Division

The Geological Survey program with respect to water falls into four categories: collection of water well records, research and public service in groundwater resources, research and public service relative to groundwater and associated geologic conditions in connection with engineering and environmental problems, and studies of stream and lake processes, erosion and

sedimentation, and sedimentary history in Lake Michigan and other inland lakes and in major rivers in Illinois.

Driller's logs of water wells, drill cuttings from wells, and geophysical logs are collected and filed at the Survey. Some of these records are submitted in compliance with the Illinois Water Well Construction Code.

The Hydrogeology and Geophysics Section of the Geological Survey studies the distribution and characteristics of water-yielding formations (aquifers) in Illinois. Results of these studies are disseminated through publication of reports on groundwater conditions and through letter reports to citizens, municipalities, and industry who seek information prior to drilling water wells. The Geological Survey and Water Survey jointly respond to such requests.

Resource Development Division

The mission of this Division is to promote the assessment, proper development and use of natural resources native to Illinois, and to encourage the development of untapped energy resources and adoption of new production/utilization technologies employing Illinois' plentiful coal and renewable energy resources. To this end, the program systematically evaluates promising emerging technologies for their social, economic, environmental and energy benefits and costs.

The Resources Development Division has several programs which require information about and directly affect the water resources of Illinois. The synthetic fuels siting and development program both stimulates the demand for

Illinois' water resources for the synthetic fuels industry and requires information concerning the location, quality and quantity of the resources.

The Division has recently established the Illinois Coordinated Review Process to expedite the permitting of major energy development facilities. The Lands Unsuitable for Mining Program within the Division will use water resource information as well as other natural resource data to assess the impacts of surface mining and surface impacts of underground mining in Illinois.

The Division has recently established a low-head hydroelectric development program that includes: 1) an inventory of sites, 2) reconnaissance level studies of five sites, 3) an implementation manual, relative to the development of hydropower in Illinois. Based upon current economics and technology, Illinois has a potential hydroelectric generating capacity of between 57-130 megawatts. Fully developed, the five most feasible sites will increase generating capacity by 13 megawatts.

Division of Environmental Management

Under conditions of constantly changing economics, technology, and social values, citizens of Illinois and their farms, businesses, and units of government need to respond with technically sound and cost-effective solutions to long-standing environmental problems, as well as some newer ones. Seeking to remove the barriers to innovative solutions, the Division of Environmental Management sponsors applied research in the areas of air quality, waste disposal, environmental health, and economic impacts, as well as water resources. Typical research projects include on-site demonstrations of bio-chemical decomposition of pesticide wastes, gathering and analyzing

sediment data for court hearings, and cost-benefit studies on the effects of proposed legislation.

Role in the State Water Plan

The Department participates in the work of the Water Plan Task Force. It has lead-agency responsibility for the Energy and Urban Stormwater sub-issues as well as the issue on Atmospheric Changes and Management.

ENVIRONMENTAL PROTECTION AGENCY

The Agency and Its Mission

The Illinois Environmental Protection Agency (IEPA) was created by the Environmental Protection Act of 1970. The passage of this Act allowed for the consolidation of existing State pollution control laws which had been administered by the Illinois Department of Public Health, Division of Sanitary Engineering, the Sanitary Water Board, and the Air Pollution Control Board.

The enforcement and regulatory functions of the Department of Public Health were transferred to IEPA in July of 1970. The quasi-judicial functions of the Sanitary Water Board and Air Pollution Control Board were conferred upon the Illinois Pollution Control Board (PCB) which was also created by the 1970 Act. A companion agency, the Institute for Environmental Quality (now part of The Department of Energy and Natural Resources) was also established by the Act to undertake research in environmental issues and to stimulate environmental education efforts.

The Environmental Protection Act has given the Agency a very broad mandate to protect the Illinois environment. It is the Agency's goal to achieve and maintain conditions which allow for the realization of the best environmental quality possible, consistent with the social and economic needs of the people of the State of Illinois. To carry out this mission, the Agency employs a staff of approximately 750 people, operating in five primary divisions: Land/Noise Pollution Control; Public Water Supply; Water Pollution Control; Air Pollution Control; and Laboratories. In addition, the agency maintains several special environmental programs related to emergency response,

agriculture, and mine pollution control. The operating budget for the agency was approximately \$25 million in State fiscal year 1981.

Program with Respect to Water Management

IEPA is involved in a wide range of program activities in the area of water management. Most of these activities are carried out by planning and program functions within the Divisions of Water Pollution Control, Land pollution Control, and Public Water Supply. In addition, a well developed program for enforcement and technical assistance has evolved in the field operations section (FOS) in each respective division. These Agency personnel operate out of various regional offices throughout the state.

The specific water management mandates given to IEPA as the State's primary environmental agency are contained within the various titles of the 1970 Environmental Protection Act. These form the basis of individual division programs and characterize the nature of their enforcement and regulatory approaches. Pursuant to the Act, the PCB develops implementing regulations (called chapters) for these titles. The main chapters of the Act which are related to water issues are: Chapter Three (Water Pollution); Chapter Four (Public Water Supply); and Chapter Seven (Solid Waste).

Aside from the mandates of state environmental legislation, the Agency has undertaken a number of water related functions due to federal legislative initiatives. The Agency is designated as the state's agent to administer provisions of the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA) and the Safe Drinking Water Act (SDWA). These three acts impact the enforcement and regulatory strategies of the three divisions in the Agency concerning ground and surface water as well.

The Agency programs which most directly impact surface water resource management are those administered within the Division of Water Pollution Control. The Division administers the construction grants program for sewage treatment plants, issues wastewater discharge permits, maintains a water quality planning and monitoring program and conducts an extensive compliance assurance program for wastewater dischargers. The Division of Public Water Supply is also actively involved in the protection of potable water uses, with primary emphasis being placed on establishing and maintaining high levels of quality control in water supply treatment and distribution systems.

In addition to a broad range of surface water management programs, the Agency is concerned with groundwater as well. The Division of Land Pollution Control is actively involved in implementing the mandates of RCRA with respect to the protection of groundwater supplies from solid wastes, hazardous waste, or underground injection disposal practices. This division also shares responsibility with the Division of Public Water Supply to implement the requirements of the Safe Drinking Water Act for the maintenance of high quality underground drinking water supplies.

Role in the State Water Plan

IEPA has been assigned the lead role in the development of Integration of Water Quality and Quantity Management. As such, the Agency is working in conjunction with IDOT-Division of Water Resources, Department of Conservation, and Illinois State Water Survey to define the range of concerns encompassed by this issue. Preliminary discussions with these agencies indicated that the definition of water uses will be the central focus of the quality/quantity integration issue. Problems in definition will be addressed by policy and

technical determinations regarding who determines legitimate uses, which waters provide these uses and what programs are needed to assure that existing or potential uses can be realized.

EMERGENCY SERVICES AND DISASTER AGENCY

The Agency and Its Mission

The Illinois Emergency Services and Disaster Agency (ESDA), supported by the ESDA Act of 1975, bears the responsibility for coordination of manpower and resources from state and federal agencies in time of emergency and disaster. Irrespective of whether the problem is natural (i.e., a flood, tornado or earthquake) or man-made (i.e., a train derailment, radiological accident at a nuclear power plant, or hazardous materials incident), the Illinois ESDA is charged with providing human needs for shelter, medical assistance, and the entire complement of emergency assistance functions. The scope of ESDA's response, therefore, has been broadened beyond the rather narrow mission of its predecessor, the Illinois Civil Defense Agency.

Disposition of services is affected through a network of Regional Coordinators located in each of nine regional offices throughout the State of Illinois. Emergency services program development in county and municipal governments is supervised and supported by the coordinator of each mutual aid region. Routine and emergency communications are established through a radio network linking the State Emergency Operations Center with ESDA regional offices and participating county governments. In this manner, direction and control during emergency operations is facilitated through the state operations centers to the operations centers in each county, ensuring an immediacy of response available only through the support of local governments.

Much of the support provided at the local level is in the form of volunteer service. Guided by the career professionals and the training and education programs provided by State ESDA, the people of Illinois are ensured the most

timely and efficient response to emergencies, most of which are handled totally at the local level.

Funding and Staff

The Illinois ESDA receives an annual appropriation of federal funds, administered through its counterpart in Washington, the Federal Emergency Management Agency (FEMA). Of these federal monies, a portion goes for reimbursement of up to 50% of the administrative costs for operations of state and local ESDA units. The Illinois General Revenue Fund matches the federal component of these monies for Emergency Management Assistance as well as those supporting a Disaster Planning Improvement Grant for maintenance of the State Comprehensive Disaster Plan. Additionally, two programs are supported entirely at the federal level for State Planning for All Risk Crises/Nuclear Civil Protection (shelter survey and crisis relocation planning) and Radiological Defense (the maintenance and calibration of low and high-range radiological instrumentation in the event of a nuclear attack).

The Illinois General Assembly, through revenues collected from a tax on the utilities, funds a program for the preparation of offsite emergency plans in the event of an accident at or around a nuclear power station. This effort, the Illinois Plan for Radiological Accidents, has broad implications for all natural and man-made hazards which might imply evacuation and relocation to congregate shelters until conditions are safe for re-entry into the affected area. Finally, the General Assembly appropriates monies into a State Disaster Fund for reimbursement of expenses incurred by the State in the course of disaster operations. When the resources of a locality or the State are exhausted, damage assessment and a request for federal assistance through Presidential Declaration of emergency or disaster are processed through the

ESDA as the liaison for the administration of emergency federal assistance.

Staffing of Illinois ESDA consists of a Division of Field Services with nine regional coordinators and their secretaries, providing first-line support to localities when an incident has exceeded the capabilities of their resources. A Communications Division operates and maintains the radio network linking the state operations center with each county operations center. A Hazardous Materials Division receives, as identified by statute, telephone notification of hazardous materials incidents in an effort to provide timely response and coordination among the several State agencies responding.

Role in the State Water Plan

Having developed a number of plans, among them the State Comprehensive Disaster Plan, which reference flood disaster response and drought contingencies and by placement of career professionals throughout mutual aid regions of the state, ESDA is daily fulfilling its mandate to ensure the preparedness of the State of Illinois to adequately protect the health and property of the people. By virtue of these existing drought and flood response programs, ESDA's participation in the Water Plan Task Force is one of responding to water-related problems related to natural or man-made events.

CAPITOL DEVELOPMENT BOARD

The Illinois Capitol Development Board (CDB), the State's building construction manager, employs 240 staff that report through an Executive Director to a seven person lay Board appointed by the Governor.

Although CDB is generally regarded as a building construction agency, its water-related activities are numerous. It is represented on the Abandoned Mines Reclamation Council, the Governor's Task Force on Energy Conservation and Coal Conversion, and the State Water Plan Task Force.

CDB is involved in a variety of water-related construction activities. All major construction for the Department of Conservation is handled by CDB. This includes water-related recreational facilities, water fowl resting areas, and the almost completed fish hatcheries at Little Grassy Lake and Sand Ridge State Forest.

CDB is authorized to provide port facilities throughout the State as they are approved by the Governor and the Illinois General Assembly. To date, projects have included cargo handling facilities for the Shawneetown, Tri-City, and Chicago Regional Port Districts. In the design stage is a recreational boat harbor for the Waukegan Port District.

Through CDB's management of the construction/rehabilitation of public facilities, the Agency is routinely involved with user agencies that may be large consumers of potable water. Many of the State's larger correctional, mental health, or university institutions have water demand requirements that exceed those of many small villages and cities. In addition to normal

domestic use, these facilities consume water through cooling equipment, laundries, and institutional kitchens. In some instances on-site water treatment and/or sewage treatment plants are State operated.

Although the Capital Development Board is not directly involved in the management or immense consumption of the State's water resources, it is in a position to positively affect the State's image regarding water management.

Role in the State Water Plan

The CDB participates in the Water Plan development through membership on the Task Force.

APPENDIX B
INDIVIDUALS WHO PARTICIPATED DIRECTLY
IN THE
STATE WATER PLAN DEVELOPMENT
DURING 1981

WATER PLAN TASK FORCE
FEDERAL AGENCY ADVISORY GROUP
FUTURE DEVELOPMENT ADVISORY GROUP
REGIONAL ADVISORY COMMITTEES

WATER PLAN TASK FORCE

Office of the Governor

Don Etchison

Rich J. Carlson

Bureau of the Budget

Larry Nakrin

Water Resources Commission

Betty Lou Reed

Lawrence M. Madden

John Cory

Jack Williams

Sherron Ackley

University Water Resources Center

Glenn E. Stout

Richard Buhr

Division of Water Resources

Donald R. Vonnahme

Gary R. Clark

Department of Agriculture

James F. Frank

Marvin Hubbell

Department of Conservation

Bruce Clark

Edward Hoffman

Greg Tichacek

Department of Commerce and Community Affairs

David Farrell

George Bogdanich

Department of Mines and Minerals

George R. Lane

Department of Public Health

Fred Crawford

James Mills

Institute of Natural Resources

Stanley A. Changnon, Jr.

Richard J. Schicht

Mitch Beaver

Environmental Protection Agency

Roger Kanerva

Robert Hagele

William Hammel

Robert Clarke

James Pendowski

Emergency Services and Disaster Agency

Thomas Zimmerman

Capital Development Board

Fred C. Garrott

Task Force Officers and Staff

Frank Kudrna, Chairman

William C. Ackermann, Executive Director

John K. Flowe, Consultant

Gary R. Clark, Staff

FEDERAL AGENCY ADVISORY GROUP

Arthur Klingerman, Corps of Engineers

James Schnerre, Corps of Engineers

Paul Kearns, Department of Energy

Gary A. Williams, Environmental Protection Agency

Tom Groutage, Fish and Wildlife Service

Sheila D. Huff, Department of the Interior

Larry G. Toler, U. S. Geological Survey

Robert Pierce, Heritage Conservation and

Recreation Service

Konrad J. Banaszak, Office of Surface Mining

Marvin Furman, Office of Surface Mining

Warren J. Fitzgerald, Soil Conservation Service

Eugene Goldfarb, Department of Housing and

Urban Development

Jon W. Linfield, Farmers Home Administration

Gerald A. Townsend, Farmers Home Administration

William C. Ackermann, Chairman, Water Plan Staff

Gary Clark, Secretary, Water Plan Staff

FUTURE DEVELOPMENT ADVISORY GROUP

Robert L. Pinkerton, Illinois Association of Regional Councils
Jon Scholl, Illinois Agricultural Association
Jane Johnson, Illinois Council of Watersheds
Margaurite Nelson, Illinois Council of Watersheds
Steve Pittman, Illinois Environmental Council
Ken Alderson, Illinois Municipal League
Thomas Reid, Illinois Manufacturers Association
Lawrence A. McHugh, Illinois Manufacturers Association
L. F. Russell, Illinois Oil and Gas Association
Ray Bodnar, Illinois State Chamber of Commerce
Sidney M. Marder, Illinois State Chamber of Commerce
Richard Kehn, Illinois Wildlife Federation
Richard D. Robbins, Lake Michigan Federation
Larry Kamer, Lake Michigan Federation
Anne Nadakavukaren, League of Women Voters
Irv Camden, Rend Lake Conservancy District
Harold Roffman, Illinois Society of Professional Engineers
Robert S. Shierry, American Water Works Association
Otto S. Holden, American Water Works Association
Sandy Guettler, Illinois Office of Tourism
Joel Satterfield, Illinois Office of Tourism
John T. Pfeffer, Illinois Association of Sanitary Districts
Dean Albrecht, Illinois Water Well Association
Paul Schultz, Illinois Water Well Association
Clarence W. Klassen, Illinois Coal Association
Richard A. Pavia, Financial Consultant
William C. Ackermann, Chairman, Water Plan Staff
Gary Clark, Secretary, Water Plan Staff

REGIONAL ADVISORY COMMITTEES

Northern Region

Mike Bacon, Rockford
Virginia Balsamo, Barrington
Kenneth Bowden, DeKalb
George P. Brettrager, Rockford
Richard Curran, Joliet
Patricia Dahlberg, DeKalb
Eugene Hardiek, Dixon
Frederick Hayward, Kirkland
Peter Howe, Chicago
Charles Hughes, Northlake
Arthur N. Kay, Geneva
Richard G. Kerr, Rockford
Glenn Lyons, Stockton
Lawrence M. Madden, Freeport
Eugene Perry, Jr., DeKalb
E. Stuart Richter, Prophetstown
Michael P. Saunders, Chicago
Thomas Talsma, Geneva
Sally Valette, Dekalb
Ron Zegars, Elgin

Northeastern Illinois (Water Resources Technical Advisory Committee of
Northeastern Illinois Planning Commission)

Carl T. Blomgren, Jr., Hinsdale
Richard Carlson, Chicago
John B. V. Corey, Chicago
James Daugherty, Chicago Heights
Ralph L. Evans, Peoria
Martin A. Galantha, Libertyville
George F. Heck, Crystal Lake
Richard Lanyon, Chicago
Gordon McCluskey, Lockport
Mose McNeese, Highland
Orville L. Meyer, Wheaton
Allen W. Noehre, DeKalb
Albin Pagorski, Elgin
Robert T. Palmer, Elmhurst
Michael Phillips, Chicago
Allan L. Poole, Naperville
Matthew D. R. Riddell, Chicago
Louise Rome, River Forest
William C. Ackermann, Chairman, Urbana

Central Region

Richard G. Bjorklund, Peoria
T. Wilkes Coleman, Peoria
Herman Dirks, Bloomington
Gordon L. Dowell, East Peoria
George Brye, Bloomington
Glen A. Ekey, Bloomington
Robert W. Frazee, Henry
Jack M. Fuller, Peoria
M. Jane Johnson, Gilson
Richard A. Kalus, East Peoria
B. J. Mathis, Peoria
Don Mealiff, Mendon
Otis E. Michels, Peoria
Susan Nash, Macomb
Leo Pfeiffer, Forest City
Robert L. Pinkerton, East Peoria
George Sweir, Bloomington
John H. Van Ness, East Peoria

Southern Region

Duane Baumann, Carbondale
Vincent A. Birchler, Chester
Ted Clark, Harrisburg
Wayne Corzine, Anna
Dale Cougill, Metropolis
Jack E. Foster, Carbondale
Janet Fryman, Carbondale
Robert W. Holloway, Perey
A. S. Kirkikis, Carbondale
Robert H. Mason, Harrisburg
David G. McDonald, Fairview Heights
Charles B. Muchmore, Carbondale
Jerry Reynolds, Carbondale
Rudy Rice, DuQuoin
Donald P. Satchell, Carbondale
Lyle V. A. Sendlein, Carbondale
Ralph Smith, Whittington
Noel Stallings, Carbondale
Jack Taylor, Joppa
Conrad Wetzel, Harrisburg

Southwest Region

Richard F. Astrack, St. Louis
Helen Christich, Granite City
Philip M. Corlew, Edwardsville
Charles V. Evans, Belleville
Robert H. Freeman, Godfrey
Wilber Greathouse, Granite City
Robert W. Greaves, East St. Louis
Paul T. Hawkins, Edwardsville
Charles Hess, Edwardsville
Mike Keefe, Collinsville
Steve Kessler, Nashville
Robert Koepke, Edwardsville
Jim Krejei, Edwardsville
Truman W. May, Edwardsville
Jerry Lavelle, St. Louis
Stanley L. Reeble, Red Bud

APPENDIX C
REPORTS ON THE
FUTURE OF ILLINOIS

REPORTS ON THE FUTURE OF ILLINOIS

Introduction

It is clear that if the State Water Plan is to have meaning, it must consider broad social and economic trends and the future problems and opportunities of the State. Therefore, it is indeed fortunate that the Water Plan Task Force was able to consider two recent and authoritative reports. These are "Illinois: The Future" and "Illinois 2000", which are summarized and interpreted in the sections which follow.

Water resources relate directly or indirectly to virtually every economic, social, and cultural activity of our people. Water is an abundant resource for development, but it can be a destructive force, and it can at times and in places represent a constraint upon our future.

Task Force on the Future of Illinois

The report "Illinois: The Future" is the product of a Task Force on the Future of Illinois. The Task Force was created by Public Act 80-1046 of September 27, 1977 and amended by Public Act 81-769 of September 16, 1979. It was directed to report to the General Assembly and the Governor by January 15, 1980. It was further directed to evaluate and articulate State goals and objectives regarding the future of Illinois and to recommend an agenda for implementing actions.

The Task Force was composed of four members each from the House and Senate and nine public members. After extensive meetings, hearings, and commissioned

papers, it published a final report of 263 pages and a summary report of 39 pages - both dated January 1980.

View of the Future - The report does not project either a preferred or a range of alternate futures. It does have a philosophy for the future, including themes, goals, an agenda for action, and recommendations.

The philosophy is to recognize that the frontier and continuous economic expansion are in the past. The goal, instead, should be to change trends where it is realistic to do so, and to face them creatively where change is unlikely. There should be a willingness to plan the use of limited resources, and employ advanced technology, productivity, and commitment for the benefit of our citizens. Relevant findings and recommendations follow:

Government and the People - On many critical issues, citizens cannot effectively plead their cases within the political system because neither the citizen nor the official is well informed.

Government must do a much better job of obtaining useful information about the State and of analyzing the consequences of present and proposed programs.

It is recommended that Illinois government build the capacity to set goals, devise strategies, and measure performance in securing the long and short-term development of the State. Government should prepare an annual statewide long-range capital development plan. It should limit the number of state agencies.

Population - Between 1980 and 2000, our population will grow more slowly than the nation, and will increase from approximately 11.3 to nearly 13 million in that period. The number of households will grow twice as fast as population, average age will be greater than today, and the number of children will decline. The fastest growing areas in the state will be in the Chicago suburbs. Rural areas will also gain population.

Economy - Manufacturing and jobs will grow, but at a slower rate than in the past. Our share of the national total will decline from 6.5% to 6.1% by the year 2000.

Transportation - Illinois highways and waterways - each moving over 80 billion ton-miles of freight per year - are in need of modernization and repair. Ridership on the state's public transportation systems is increasing and is straining existing capacity.

Natural Resources Including Water - Illinois natural resources of coal, soil, and water, are extensive. Recent coal production has been disappointing, but is expected to improve.

Illinois has vast acreage of productive soil, but erosion rates are excessive, and we can not count on continually increasing agricultural production by the year 2000, if this continues. Some 76% of erosion is from cropland and 87% from rural land. Incentive programs for erosion control are recommended, and if this fails, pursue alternatives.

Overall, the State has ample water supplies, however, there are areas facing shortages and competition for dwindling ground water. We will have to anticipate future use and prepare for it. An updated State Water Plan is recommended. With regard to water quality, the report advocates finding means to mitigate adverse economic impacts of water quality standards and analyzing the benefits and costs of environmental standards and investments. Management of waste disposal should encourage recycling and requiring the waste producer to bear the cost of treatment and disposal.

The opportunities for recreation should be increased, particularly near established communities.

Energy - Maintain Illinois' diverse and substantial energy supplies through fair regulation, by maximum development of coal consistent with environmental maintenance, by encouraging alternative energy development, and by conservation.

Education, Dependent Population, and Health - The report addresses these topics, but recommendations do not appear to be directly or indirectly related to water resources planning.

Report on Illinois 2000

The study and report on "Illinois 2000" was conducted by an Advisory Council, a Board of Trustees, and a series of issue teams affiliated with the Illinois

State Chamber of Commerce. The activity was conducted during 1978 and early 1979. The resulting report in Phase I in which trends, options, and tentative goals are outlined for the purpose of broadening discussion of the choices facing Illinois. It is intended that a Phase II report will set goals and select preferences for reaching them.

A 41-page Executive Summary of "Alternative Economic Futures for Illinois" has been the basis for this review and interpretation.

The Illinois 2000 report is primarily concerned with improving the business climate as this is affected by investments, taxes, and regulations. It has little to say about water resources as either a major resource opportunity or as a constraint. However, what it has to say about Illinois' character and strengths, key problems, external influences on the economy, and priority goals has general relevance in the preparation of a State Water Plan.

In the sections which follow, the most relevant elements are copied from the report and from a follow-on document entitled "You and Goals for Illinois' Economic Future."

Population - The growth of the population has slowed from the pace recorded in the early 1950's and 1960's and is expected to continue at a slower rate through the year 2000. Nearly 1.4 million additional people are expected to reside in Illinois at that date, up from today's population of 11.3 million.

Personal Income - Average Illinois per capita income in 1977 was \$7,768 compared with the U.S. average of \$7,019. This figure is second only to California among the most populated states.

Industrial Assets - Illinois leads all states in the manufacturing of farm machinery, non-electrical machinery, fabricated materials, steel, food products, printing, chemicals, telephones, candy, soap, and appliances. It ranks third among the states in total manufacturing exports.

Agricultural Assets - The state has the richest agricultural land in the country, producing more corn and soybeans than any other state. It leads the nation in agricultural exports by value.

Labor Force - Illinois' mature, reliable and skilled labor force has been a key to steady economic growth for the state.

Geographic Location - Illinois' central market location in the Great Lakes region has allowed it to become a major national transportation hub. These prime features are equally important to international trade and travel.

Energy Resources - Illinois is considered a "balance energy" state because of its near-equal reliance on coal, natural gas, and petroleum products. Nuclear power plays an increasing role in electric power generation. Illinois also has the largest bituminous coal reserves of any state.

Financial Center - There is growing acknowledgement of the importance of Illinois' financial institutions to the Midwest, the U.S. and to international capital markets.

Key Problems for the Future - Illinois possesses many advantages as described above. Yet to take these features for granted without examining key problems which have a growing impact on the economy would be naive. The following provides a synopsis of concerns which evolved from the Illinois 2000 process.

1. Competition from other regions of the U.S. appears to have a negative impact on the state's economy and business activity. Although no firm information is available on business departures due to more favorable climates elsewhere, the perceived displacement must be examined and actions taken to retard such a trend.
2. The environmental constraints posed by the Illinois coal reserves' high sulfur content impinge on the state economy and, more specifically, on the southern and western portions of the state where the reserves exist. The use of Illinois coal, coupled with proper environmental management, could reduce operating costs for business and could allow the state to prepare for potential national energy shortages.
3. Despite the extensive transportation network in Illinois, there are funding problems associated with general maintenance which pose substantial questions.
4. Urban sprawl is complicating the health of cities and adding to the dilemma of supporting public services. People are moving out in search of other housing and living environments. Businesses, too, are departing as the expenses of rehabilitating vintage plants and equipment become too great a

burden. The aging manufacturing base must be dealt with otherwise it will lead to lower production capabilities and will encourage some businesses to relocate outside the state.

External Influence - The people of Illinois must examine the future in the context of national and international variables over which they have little control. Major concerns such as inflation, energy prices, international corporate and union decisions, and federal regulations and tax policy are all generally beyond the scope of state, public, or private sector action. Yet they must be understood and considered as Illinois 2000 participants seek policies over which state and local government and the private sector actually have influence. Illinois 2000 provided the following assumptions in order for the issue teams to standardize the external factors for all teams, while permitting focus on areas of state influence.

1. The organization, role and interrelationships among federal, state and local government will remain essentially the same through the year 2000. The trend of increasing government involvement in private activity will continue.

2. The national economy will continue to grow at moderate rates through the year 2000. And while the postwar cycles of prosperity and recessions will continue, no major booms or depressions are anticipated.

3. The rising price of energy will encourage alternatives to be developed in the next 25 years.

4. Climatic conditions will not vary enough to have a major economic impact between 1978 and the year 2000.

5. The current level of world tension will remain constant, requiring continued outlays for national defense spending at current rates.

6. World population will continue to increase at about 2% a year, culminating in a world population of over 6 billion people by the year 2000.

Goals for Illinois' Economic Future - The report recommends:

1. Improve Illinois' economic investment climate.
2. Halt the relative decline of the manufacturing sector.
3. Emphasize retention and expansion of existing firms through industrial development programs and use incentives to locate new jobs in areas of high unemployment.
4. Improve the economies of our older urban centers.
5. Discourage continued urban sprawl, through a joint effort of local governments and the private sector to utilize existing urban areas for future development.

6. Reduce by at least 50% erosion of agricultural land.
7. Preserve prime agricultural land through the action of local authorities, supplemented by statewide incentives.
8. Ensure adequate funding for both public and private sector agricultural research.
9. Develop more in-state markets for Illinois agricultural products and expand national and international markets through a joint effort of shippers, transportation systems, farmers' associations, and the state and federal agencies.
10. Increase the use of Illinois coal and nuclear power consistent with protection of the environment.
11. Increase development and use of alternative energy sources, such as solar, wind, biomass, water, and gasohol.
12. Expand energy conservation programs within the State.
13. Increase the state role in development of Illinois' energy sources.
14. Establish a state procedure to reduce the time needed to gain approval of energy facility siting. Guarantee adequate provision for public input in the process, with particular emphasis on local government.

15. Adopt pricing policies for Illinois' regulated energy utilities which will encourage production, ensure a fair rate of return, and promote conservation.

16. Meet national environmental goals through a state plan which is consistent with the character and needs of Illinois.

17. Assume responsibility at the state level for implementation of federal environmental standards which are not exclusively administered by the federal government. Seek federal funding for implementation of programs mandated by the federal government.

