International, Regional, Federal-State, Interstate and Federal Organizations With Water and Related Land Resources Programs in Minnesota, 1971

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FOREWORD

This Bulletin is published in furtherance of the purposes of the Federal water resources research Act of 1964. The purpose of the Act is to stimulate, sponsor, provide for, and supplement present programs for the conduct of research, investigations, experiments, and the training of scientists in the field of water and resources which affect water. The Act is promoting a more adequate National program of water resources research by furnishing financial assistance to non-federal research.

The Act provides for establishment of water resources research institutes or centers at universities throughout the Nation. On September 1, 1964, a water resources research center was established in the graduate school as an interdisciplinary component of the University of Minnesota. The center has the responsibility for unifying and stimulating university water resources research through the administration of funds covered in the Act and made available by other sources; coordinating university research with water resources programs of local, State and Federal agencies and private organizations throughout the State; and assisting in training additional scientists for work in the field of water resources through research.

This Bulletin is number 42 in a series of publications designed to present information bearing on water resources research in Minnesota and the results of some of the research sponsored by the center. This Bulletin is concerned with the inventory of International, regional, Federal-State, interstate and Federal organizations with activities pertaining to the water and related land resources of Minnesota. Congressional process as it affects water and related land resources and president's Nixon proposals for reorganizing Federal water and related land resources agencies are briefly described. Information provided is up-to-date as of May 1971.

Hopefully, the information in this Bulletin will assist the State legislature, State executive branch, local governmental officials, private organizations, and citizens in better understanding the Federal government's involvement in the development and management of Minnesota's water and related land resources. The Center plans to study and report within the next year on voluntary organizations in the State with activities pertaining to the water and related land resources of Minnesota.

This Bulletin is related to the following project:

OWRR Project No.: A-021-Minn.
Project Title: Water Resources Administration in Minnesota
Principal Investigator: W.C. Walton, Univ. of Minn., Graduate School
Project Began: July 1, 1969 Scheduled Completion: June 30, 1972
FCST Research Category: VI-E
Publication Short Title: Federal Water Resources Administration in Minnesota, 1971
Publication Abstract:
This Bulletin is concerned with the inventory of International, regional, interstate, Federal-State, and Federal organizations with activities pertaining to the water and related land resources of Minnesota as of May 1971.
There are 5 International, 5 regional, 3 interstate, and 4 Federal-State organizations with programs in the State. Federal responsibilities in water and related land resources planning, development and management in Minnesota are divided among 30 units in 8 executive departments and agencies; 6 independent agencies; 6 units in the executive office of the president; 9 other boards, committees, councils and commissions; and 1 quasi-official agency. In fiscal Year 1970, Federal Outlays for water and related land resources activities in the State totaled about $75 million or 2.3 percent of total Federal outlays in Minnesota of about $3.3 billion. There were about 1,300 Federal employees residing in Minnesota in fiscal year 1970 with assignments pertaining to water and related land resources.

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Water policies as expressed in Minnesota's water laws, problems associated with differing scientific and legal classifications of water, privatization of water rights, socialism and precedent in court decisions, insecurity of existing water rights, coordination of State agencies, and conflicts of Federal-State jurisdiction.

The second bulletin pointed out that there has grown a complex arrangement for the administration of water resource activities in Minnesota. A considerable part of the administrative system remains in private and local government hands; but a larger (and increasing) share falls to State and Federal governments. The trend has been toward more and more public involvement in water resource activities through a larger and larger number of administrative agencies. The administrative system has become so large that few if any governmental officials and citizens have a clear understanding of the entire system. There are many responsible people who feel that the proper development and management of water resources is being hindered by present institutional arrangements.

For each of the demands for governmental action in the water-resource field in Minnesota a State program can be identified. A reciprocal relationship has been developed between those who sought the service in the first instance and the public agency established to provide the service. The pattern at the State level is duplicated at the Federal level and a large number of agencies.

The institutions participating in water-resource activities have various roles and look at the use and misuse of water from a variety of viewpoints. Each institution has different resources at hand to be able to achieve its purposes. The institutions work with different sectors of the public and have varying amounts of influence: some have a small clientele, others are more broadly based.

In Minnesota, the planning, development, and management of water and related land resources in the past has been largely the responsibility of local units of government such as counties, cities, and villages. The structure of local units of government varies from one institution to another and often contrary decisions that result from this variety of approaches are reflected in the general legislation applicable to local units of government and in the special legislation adopted at each legislative session to deal with local problems.

There are several examples of the nullifying effect of existing water laws. Statements concerning mandatory coordination and cooperation of State, local, and Federal agencies and other organizations such as commissions and compacts contained in the codified and uncodified State water laws, for the most part, are weak expressions describing piece-meal cooperation, often on a voluntary basis, between agencies and organizations. Responsibility for comprehensive coordination and cooperation within the water and related land resources development and management field is not centralized. There is not a single entity charged specifically with the responsibility of coordinating

The most ambitious attempt by the State legislature to require coordination has been the establishment of the water resources board which was created with the declared power of resolving contradictions in the existing programs when applied in a specific proceeding and with the objective of establishing a forum where conflicting aspects of the public interest can be presented and considered, the inconsistencies resolved, and a controlling State water policy determined. The water resources board has an excellent assignment, but there is no requirement imposed upon agencies to present questions to the board. Thus, an excellent legislative objective is set forth in the State law, but by reason of the lack of any requirement to submit questions to the board, there have been few if any State-wide water policies enunciated by the water resources board since its creation in 1955.

During most recent legislative sessions there have been hearings concerning reorganization of State agencies in the field of natural resources. Two Governors have appointed committees to study Minnesota's government and the recommendations have pertaining to water resources agencies. During the 1967 session of the legislature, the department of conservation was reorganized and a pollution control agency was created. Reorganization study committees have never been provided with a comprehensive document on the water-resource institutional environment and they must make recommendations without adequate information. A comprehensive compilation of information pertaining to water resources administration in Minnesota does not exist. Few have a clear understanding of the complicated influence and interactions of water-resources institutions.

Based on these conclusions, the center decided to support a 3-year research project entitled "Water Resources Administration in Minnesota," starting July 1, 1969. The objectives of the research project are (1) to inventory, appraise and evaluate water and related land resources legal institutions, administrative structures, and public administrative processes and techniques, legislative processes and policies in Minnesota and (2) to make recommendations which will be more conducive to achieving coordinated water resources programs. The history of water and related land resources administration will be traced. The application of water laws, resources and methods used in working for institutional goals, the nature of each institution's involvement in water and related land resources activities, coordination between units of government, and administrative costs will be examined. The research project will include a study of: (1) the State resources board since its creation in 1955.

The results of the research project will be published in 3 bulletins. One bulletin will contain information on water and related land resources State administration, legislative process and policies in Minnesota as of 1970. The other 2 bulletins will be concerned with information on Federal administration and voluntary organizations in Minnesota.

The first bulletin was released in January 1971 and is entitled "Water and Related Land Resources State Administration, Legislative Process and Policies in Minnesota, 1970," by W.C. Walton and D.L. Hills. In this bulletin, information is provided concerning the membership, powers, duties, staff,
Information is presented concerning water and related land resources measures introduced in the 1969 session of the legislature, senate and house committees handling water and related land resources bills, registration files for lobbyists and the Minnesota resources commission. Water and related land resources policies enunciated to date by the legislature and related land resources policies enunciated to date by the legislature and related land resources policies enacted to date by the legislature and related land resources policies enacted to date by the legislature and related land resources policies enacted to date by the legislature and related land resources policies enacted to date by the legislature and related land resources policies enacted to date by the legislature are listed. Existing state policy questions are identified and a list of specific policy statements and resolutions which could be debated by the 1971 legislature is provided. Environmental concerns and the need for a State environmental policy are discussed. A list of specific environmental policy statements and actions which could be debated by the 1971 legislature is provided.

In this bulletin, the second bulletin in the series, information is provided concerning the membership, powers, duties, staff, budgets and programs of International, regional, Federal-State, interstate and Federal organizations with water and related land resources programs in Minnesota. Congressional process as it affects water and related land resources and proposals for reorganization of Federal agencies are described.

The data and information presented in this bulletin were obtained from annual reports and other publications of organizations, from Federal statutes and by interviewing selected officials of Federal agencies. The preparation of this bulletin would have been impossible without the wholehearted support of Federal agencies who freely provided information requested by the writers. Federal agency personnel were most cooperative in assisting the writers in inventorying information.

**INTERNATIONAL ORGANIZATIONS**

Several International organizations are concerned with the water and related land resources in Minnesota. Included among these are: International joint commission, Great Lakes study group, Great Lakes fisheries commission, coordinating committee on Great Lakes basin hydraulic and hydrologic data, and International St. Lawrence river board of control.

**International Joint Commission**

Introduction

As an outgrowth of Intergovernmental discussions of specific boundary-water problems prior to 1900, Canada and the United States formed a temporary International waterways commission in 1903 to investigate and report on the conditions and uses of waters adjacent to the boundary. This temporary group recognized the need for establishment of mutually satisfactory ground rules for use of waters of common concern, and foresaw the desirability of permanent procedures designed specifically to facilitate conformance to any agreed principles, and to settle future questions as they arose. As a result of this forward-looking effort, the boundary waters Treaty of 1909 was successfully negotiated and put into effect.

The International joint commission was formed to carry out the purposes of the boundary waters Treaty of 1909, which are:

- To prevent disputes regarding the use of boundary waters and to settle all questions which are now pending between the United States and the Dominion of Canada...along their common frontier, and to make provision for the adjustment and settlement of all such questions as may hereafter arise....

It is evident from the expanding role being assigned to the commission by both governments that the work of the commission is growing in importance to the United States and Canada. There are critical water shortages in many border sections, and pollution infests the Great Lakes and many of the river systems along the border from northeast to the Pacific northwest. These and other problems are growing more complex and more difficult of solution each day as population increases and industries expand in both countries. The increasing use of water by domestic, industrial, and recreational interests demands that corresponding, additional quantities of water of improved quality be made available for consumption. These needs not only create greater efforts toward water pollution abatement but also create complex requirements for perfection in hydrologic (levels and flows) operations in lakes and rivers at a number of locations along the United States and Canadian Border (see Welsh, M.E. 1969. Role of the International Joint Commission. Proc. 12th Conf. Great Lakes Res. p. 871-875).

About one-third of the Nation's boundary with Canada consists of water areas. The increasing utilization of these water resources has placed greater demands upon the commission. There has been in recent years an increase in the number and complexity of matters coming before the commission. Under
study and surveillance are problems of water levels control, water pollution, and water development for generating power and for navigation, conservation, and irrigation. Along the entire border area there is a continuing program in the abatement of air pollution. Upon the completion of the Niagara power project and the St. Lawrence power project, water control requirements demand constant attention. The controls over levels and flows in these areas must conform to the interests of riparians and requirements for both power generation and navigation. The rapid growth of population and industry in both the United States and Canada has increased the pollution problem in the International waters and particularly in the area of the Great Lakes rivers. The commission has established water quality objectives for the St. Croix river in the State of Maine, the Rainy river in the State of Minnesota, and all connecting channels between the Great Lakes -- which with proper surveillance will provide the maintain water quality that is essential to both domestic and industrial needs.

Primary among the agencies currently engaged in Great Lakes planning and resource management are the Great lakes basin commission, the Great Lakes compact commission, the upper Great Lakes regional commission, the Great Lakes fishery commission and the International joint commission. Despite the International nature of the Great Lakes and the importance of recognizing Canadian interests in any decisions affecting the lakes, only the Great Lakes Fishery commission and International joint commission are International in character.


The Treaty recognized three distinct types of situations for which different ground rules were needed. These are: boundary waters—that is, the common waters of lakes and rivers along which the boundary passes excluding the second and third types of waters described by the Treaty, upstream waters—that is, waters in one country which flow into boundary waters, or which flow toward the boundary and cross it; and downstream waters—that is, waters in one country in rivers which have crossed the boundary, or waters which flow out of boundary waters. They provide that navigation of such waters shall be open to inhabitants or either country on an equal basis, and that each country reserved for itself exclusive jurisdiction and control of upstream waters and the right, in effect, to use such waters as it sees fit. At the same time, however, each country agreed that any injury resulting from its actions should give nationals of the other country the same rights of redress that its own nationals would have. Furthermore, the provisions for joint investigation of problems of common concern afford opportunity to plan for and use upstream waters to the mutual advantages of each country.

The Treaty's provisions are most explicit and complete with respect to boundary waters. They provide that navigation of such waters shall be open to inhabitants of either country on an equal basis, and that each country shall have and similar rights to use boundary waters for various purposes, with first priority to domestic and sanitary uses, second to navigation, and third to power and irrigation. It was also agreed that uses of boundary waters on one side of the boundary which affect their natural level or flow on the other side would be permitted only by special agreements or with the approval of the applicable governmental authorities.

After waters have crossed the boundary or left boundary waters, the Treaty provides that they may not be obstructed to the extent of raising the natural level at the boundary except by special agreement or with the approval of the International joint commission. The Treaty provides for remedial measures or provisions for protection or indemnity of interests adversely affected in such cases.

In addition to specifying the conditions applicable for the use of upstream, downstream, and boundary waters, the Treaty contains an agreement that "boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." This provision was made at a time when its implications could not be dimly foreseen. It has proved to be one of the most important pledges taken by the two countries. Although the Treaty did not prescribe specific procedures for keeping this pledge, it did make provision for increasingly useful and fruitful to the two countries in solving pollution problems as well as in planning for the best possible utilization of resources for their mutual benefit.

Responsibilities

The Treaty gives the International joint commission responsibilities in several categories. The first of these responsibilities is to approve or disapprove all proposals for use, obstruction, or diversion of boundary waters on either side of the boundary which would affect the natural level or flow of the boundary waters on the other side. These proposals are brought before the commission by what are termed "applications," filed by interested persons -- either public agencies or private corporations or individuals. The second general responsibility of the commission, which is becoming the major work of the commission, is to investigate and make recommendations on specific problems referred to it by either or both governments. It is under this provision of the Treaty that requests, or "recommendations" by the two governments have been made on such varied subjects as lakes. A third category of commission functions is authorized by the Treaty but has not been utilized to date. It would enable the two governments, for a decision which would be binding on the governments. A fourth area of commission activity has arisen out of the exercise of its other functions. This is the continuing supervision of the works it has approved under its directions e.g., on pollution.

Membership and Meetings

The commission consists of six members, three from each country. The United States commissioners are appointed by and serve at the pleasure of the president. The Canadian commissioners are appointed by order in council of the Canadian government and serve at the pleasure of the government.
The commission maintains offices in Ottawa and Washington, each of which is permanently staffed with an executive secretary and supporting administrative personnel. Each office has authority to obtain technical support through direct, continuing assignment or on an "as-required" basis. Under its rules, the commission is required to meet semiannually, during the first week of April in Washington and during the first week of October in Ottawa. At these mandatory sessions, reports on all current activities in both countries are reviewed, and appropriate action taken. In addition, the commission meets several times each year to hold hearings, to make inspections, and to consider specific problems in the areas under consideration. Through this process, the commission can arrange to hold hearings on current activities in a matter of hours when warranted, or may extend over longer periods of time as required in the case of comprehensive and complex investigations.

Boards and Recommendations

When the commission approves an application for works, it usually appoints an International board of control to insure compliance with the conditions specified in the order of approval. Similarly, when reporting to the governments on completion of its investigation following a reference, it may recommend a course of action that will require continuing supervision on an international basis to insure satisfactory results. In such cases the two governments may authorize appointment by the commission of an advisory board, which will establish and maintain such surveillance under the direction of the commission. This follow-through procedure has been used successfully in connection with regulation of water levels -- where International boards of control answering to the commission were created, such as the Kootenay Lake, Niagara River, and St. Lawrence river boards -- and with pollution references, where the advisory boards watch over the progress being made in pollution control and inform the commission.

In the case of an application for commission approval, the burden is on the applicant to furnish all necessary information and data required. Interested persons may intervene in support of or in opposition to the application. This is followed by public hearings, usually on both sides of the boundary, after which the commission hands down its order concerning the project, which is final.

In the case of references, the procedure is somewhat different. The commission appoints an International technical board which is directed to make a thorough investigation of the facts involved and file a written report with the commission. The commission reviews the report, and may request further studies. It then publishes the final board report and schedules full-dress public hearings, normally one in each country in the areas affected, at which any person is given an opportunity to comment on the board's finding and recommendations. The commission then prepares its own report to the two governments. This report reflects the judgment of the commission after having had the benefit of the public hearings and it may differ with the final report of the board.

The commission achieves coordination by creation of international technical boards to assist it with each of its dockets. As a matter of policy, an effort is made to see that the appointments it makes to each board are so balanced, so as is practical, a member from the agencies in each country which have the primary administrative responsibilities for the matter involved. This board, then, becomes an official forum where information and ideas may be freely exchanged by those most knowledgeable about the problem, with the full sanction of both governments, having the end in view of developing a technical report which all of them will support. The members of each board are charged by the commission to act as professional experts rather than as representatives of the point of view of their respective agencies, and in the discussion of their frequent progress reports to the commission this aspect of their mission is emphasized. Over the years a total of 27 boards of control and advisory boards answering to the commission have been created.

With very few exceptions, the two governments have accepted the recommendations which the commission has made. In accepting recommendations contained in commission reports, the governments on several occasions have specifically authorized the commission to take further action as a means of securing compliance with the recommendations. The reports and recommendations of the commission on references are not decisions. They are utilized by the two governments as a basis for negotiation of Treaties, agreements or concurrent action to accomplish the desired purposes. Examples of this function are the commission studies which led to the negotiation of the Columbia river Treaty of 1961, and the air and water pollution studies which have led to the adoption of air and water quality objectives in boundary water areas. This function of the commission has been utilized more frequently and more comprehensively in recent years and has progressed beyond the concept of analysis of current problems to the objective of long-range planning as well.

The role of the commission appears to be changing. In its first 20 years it docketed 23 applications and 8 references. From 1933 through 1952 it received 23 applications and 14 references. In the last 15 years, however, it has received more references than applications, 11 versus 9.

Budgets and Staff

The fiscal years 1970 and 1971 budgets of the commission are summarized below:

<table>
<thead>
<tr>
<th></th>
<th>FY 1970</th>
<th>FY 1971</th>
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</thead>
<tbody>
<tr>
<td>International Joint Commission:</td>
<td>$128,000</td>
<td>$132,000</td>
</tr>
<tr>
<td>United States Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special and Technical Investigations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation to Federal Water Pollution Control Administration</td>
<td>119,000</td>
<td>121,000</td>
</tr>
<tr>
<td>Allocation to Geological Survey</td>
<td>202,000</td>
<td>204,000</td>
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<tr>
<td></td>
<td>$449,000</td>
<td>$457,000</td>
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Detailed information concerning the commission's 1970 budget and staff are given below:
Personnel compensation:
Total permanent
Add pay above the stated annual rate
Net savings due to lower pay scales for part of year
Deduct lapses
Net permanent
Commissioner's (s') Pay, WAE
Total personnel compensation
Personnel benefits:
Permanent and WAE employment
Total personnel compensation and benefits
Travel and transportation of persons
Rent, communications, and utilities
Printing and reproduction
Other services
Supplies and materials
Equipment
Total Other Obligations
TOTAL.

Object Classification
Estimate FY 1970

<table>
<thead>
<tr>
<th>No.</th>
<th>Amount</th>
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<tbody>
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<tr>
<td></td>
<td>$23,100</td>
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<tr>
<td></td>
<td>$128,000</td>
</tr>
</tbody>
</table>

The international joint commission has remained a very small agency, not having found it necessary to build a large technical staff of its own. By drawing on experts from existing agencies in both countries and releasing them when the job is finished, the commission avoids the rigidity that frequently accompanies a large permanent organization.

Programs and Investigations

For fiscal year 1970 the commission's program included: issuance of a new regulation for Rainy and Namakan lakes, Minnesota-Ontario; receipt of a report from technical board on pollution of Lake Erie, Lake Ontario, and the international section of the St. Lawrence river, followed by public hearings; receipt of a report from technical board on air pollution of Port Huron-Sarnia and Detroit-Windsor, Michigan and Ontario, followed by public hearings; public international meeting on progress of water pollution abatement of the Niagara river, New York and Ontario; surveillance of waters to achieve water quality objectives in the St. Croix river, Maine-New Brunswick, connecting channels of the Great Lakes, Rainy river - Minnesota and Ontario, Rainy river of the North-North Dakota, Minnesota and Manitoba; and conduct public hearings on the application for the construction of a wildlife habitat in Duck lake, British Columbia.

The fiscal year 1971 program is to assist the commission by obtaining water information for currently active studies referred to the commission by the State department; carrying out the pertinent portions of international agreements and commission Orders; investigating the water resources of problem areas or of those subject to international development; and forecasting and forestalling water apportionment disputes and other water problems, and analyzing the water situation as required. In fiscal year 1971, the commission through its Rainy lake board of control will maintain close surveillance of Rainy and Namakan lakes under a new plan of regulation of levels and flows of water of these lakes. The technical advisory board will have completed its investigation, and the commission will conduct public hearings prior to submission of a report and recommendations to the government of the United States and Canada on pollution of Lake Erie, Lake Ontario and the international section of the St. Lawrence river.

The boundary waters Treaty of 1909 and subsequent proceedings of the international joint commission provide for maintenance of the natural level or flow of boundary waters between the United States and Canada, and their division or diversion, as well as for other boundary water problems that might arise. Technical assistance provided to the United States is provision of the international joint commission by the U.S. geological survey, principally by the collection and analysis of stream flow data (quantity, quality, sediment load) on international boundary waters. The information provided is necessary for the effective accomplishment of the investigative, administrative and judicial functions of the commission. This is a continuing program that provides for collection and analysis of stream flow data and other hydrologic information; collection and analysis of chemical quality and sediment data; operation and maintenance of gaging station structures and equipment; making detailed computations and issuing appropriate directives pertaining to the apportionment of available supplies in the St. Marys-Mille lage basins as specified in the Treaty and subsequent Orders; participation in the activities of international engineering boards, committees and work groups, including attendance at meetings and conduct of special studies as required; and technical liaison with representatives of the Canadian water resources branch to provide for interchange and mutual acceptance of data for international gaging stations, special studies, and apportionment procedures.

Under provisions of the boundary waters Treaty of 1909 between the United States and Great Britain it is stipulated that the boundary waters between the United States and Canada, "shall not be polluted on either side to the injury of health or property on the other side." Therefore it is the commission's policy to be alert to the possibility of pollution or pollution problems or related subjects which are of immediate interest and concern of both the governments of the United States and Canada. While each country may have on-going programs of data collection and/or specific programs for pollution abatement and control, there is a continuing need for coordination and cooperation between governments in developing and carrying out these programs and exchanging information. Surveillance programs aims are: to ascertain the nature and extent of remedial measures taken on
the United States' side to reduce boundary waters pollution; to evaluate
or modified industrial processes, of new power developments which alter
water pollution effects, and of other developments which alter the amount,
character, or distribution of liquid wastes discharged to the boundary
waters.

Water pollution advisory boards meet on a semi-annual basis to prepare
and make recommendations to the commission to control and abate pollution
of the boundary waters. Semi-annual progress and special reports are also
made to the commission by the advisory board on matters of reference on
boundary water pollution.

Stream sanitation surveys during fiscal year 1971 will include studies
of pollution problems and control measures in the connecting channel areas,
including field work involving: the American Falls, the St. Marys river and Lower Buffalo river; Rainy river; St. Croix river. Remedial measures have been carried out, are being under­
taken, or are planned in all of these areas. With acceptance of the recom­
mandations by the governments the commission will establish a program of
surveillance toward achieving pollution abatement and water quality objec­
tives in these international bodies of water.

In recent years the commission has been active with the assistance of
its technical advisory board investigating air pollution in the Port Huron­
Sarnia and Detroit-Windsor areas of Michigan and Ontario. Upon the comple­
tion of the technical investigation the commission will conduct public hear­
ings, and will submit its report and recommendations to the governments.
At the request of the governments there will be established a program of
surveillance by the commission with periodic reporting to the governments
on progress toward abatement of air pollution in these areas. The commis­
sion also has a continuing role of investigation and reporting to the govern­
ments on any sources of international air pollution along the border.

The commission will become actively engaged in investigations at the
direction of the governments in water pollution of Lake Superior and in
the St. John river and tributaries in the State of Maine and the Province
of New Brunswick. Activities will continue in the commission's investiga­
tion upon measures necessary to preserve or enhance the beauty of the Ameri­
can Falls at Niagara. Also during fiscal year 1971 the commission will con­
tinue its investigation to determine whether measures within the existing
Great Lakes control system can be taken to further regulate water levels
beneficially. Various other studies of References and Applications will
continue to be considered by the commission at the semi-annual meetings in
Octaiva in October and in Washington in April, and at several periodic joint
executive sessions held each year.

Current investigations in the Great Lakes basin under commission sus­
pices include:

Regulation of Great Lakes levels—this is to determine whether further
regulation would be practicable and in the public interest. Such further
regulation might be done to bring about a more beneficial range of stage
for domestic water supply and sanitation, navigation, power and industry,
flood control, agriculture, fish and wildlife, recreation and other benefi­
cial public purposes. Technical studies are under the supervision of the
International Great Lakes levels board. The board appointed a working
committee to prepare the necessary data and studies as requested by the
reference to the International joint commission dated 7 October 1964. In
July 1965 the working committee appointed three subcommittees to determine
the effect of regulation on shore property, power and navigation and a
fourth subcommittee to develop necessary regulation plans. A regulatory
subcommittee was established in September 1967 which is responsible for
carrying out the necessary studies of the regulatory works required for
various plans of regulation. In June 1968 a reports subcommittee was ap­
pointed and given the responsibility for preparing the final report which is
scheduled for completion by October 1972.

Pollution of Lake Erie, Lake Ontario, and the International section
of the St. Lawrence river -- to determine whether waters are being polluted
on either side of the boundary to the injury of health and property on the
other the sources, extent and locations of such pollution, and the most
practicable remedial measures. Technical studies are under the supervision
of the International Lake Erie water pollution board and the International
Lake Ontario-St. Lawrence river water pollution board.

Pollution in the connecting channels of the Great Lakes systems—to
continue supervision as a means to ensure accomplishment of the water qual­
ity objectives recommended for these waters by the commission in 1950 and
accepted by the United States and Canadian governments. Investigations and
surveys are under the supervision of the advisory board on control of pollu­
tion of boundary waters, connecting channels.

American Falls at Niagara— to determine what measures are feasible and
desirable to remove accumulated talus from the base of the falls, to retard
or prevent future erosion and to preserve or enhance the falls. Technical
studies are under the supervision of the American Falls Internation­
al board, formed in August 1967.

Lake Superior levels and flows—to regulate the water levels and out­
flows of Lake Superior through operation of a gated structure at the head
of the St. Marys Rapids near Sault Ste. Marie, Mich. Technical studies are
under the supervision of the International Lake Superior board of con­
trol.

Niagara river remedial works and diversions—to supervise the construc­
tion, operation and maintenance of remedial works provided in the Niagara
river under the 1950 Treaty with Canada. The works allow maximum power
diversions around the falls while maintaining lake Erie water levels and
Treaty flows over the falls for scenic purposes. Technical studies are
under the supervision of the International Niagara board of control.

St. Lawrence seaway and power project— to supervise the operation and
maintenance of the St. Lawrence seaway and power project and the coordinate
regulation of Lake Ontario water levels and outflows. Technical studies are
under the supervision of the International St. Lawrence river board of con­
trol.

On May 30, 1959, the commission received from the governments of Canada
and of the United States, a reference requesting an investigation of pollu­
tion of the Rainy river and Lake of the Woods section of International boun­
dary waters. Following receipt of the reference the commission established
the advisory board on pollution of boundary waters - Rainy river and Lake of the Woods on October 8, 1959, and subsequently appointed members to this board. Members of the Minnesota water pollution control commission and Minnesota department of conservation served on the board. An official of a Federal agency served as chairman of the U.S. section of the board.

On October 1, 1964, the commission received from the governments of Canada and of the United States, a reference requesting an investigation of pollution in the waters crossing the International boundary in the Red river. Following receipt of the reference the commission established the International Red river pollution board on December 2, 1964, and subsequently appointed members to this board. Members of the Minnesota department of health and Minnesota department of conservation served on the board. An official of a Federal agency served as chairman of the U.S. section of the board.

Lake of the Woods is a substantial body of water situated on the International boundary. The lake’s outlet is in Canada, where a dam controls the flow into the Winnipeg river. The convention of 1925 for regulating the levels of the Lake of the Woods provided for establishment of a Canadian control board to regulate the outflow of water from the lake: and when the lake level rises above or falls below stated levels, the rate of discharge from the lake becomes subject to the approval of an International control board. Any disagreement between the members of the international board on the exercise of its functions "shall be immediately referred by the board to the International joint commission, whose decision shall be final."

The rule of the commission under the Rainy lake Convention of 1936 is somewhat different. Rainy lake is also situated on the boundary in the Lake of the Woods watershed. By the term of this Convention, the commission is clothed with power to determine when emergency conditions exist in the Rainy Lake watershed, whether by reason of high or low water, and is empowered to adopt such measures of control with respect to any dams or works in the watershed as the commission deems proper. The commission has prescribed a method of regulating the levels of Rainy lake, designed to prevent emergency conditions from arising, and its control board ensures that the prescribed method of regulation is followed.

Great Lakes Study Group

The Great Lakes study group is an informal international organization including representative of Canadian and United States agencies and institutions engaged in basic and applied research and engineering investigations related to the development and utilization of Great Lakes water resources. The group was formed October 1962 as the Lake Erie study group and was later renamed the Great Lakes study group in recognition of the members’ interests in all the Great Lakes.

The primary purpose of this group is to facilitate the exchange of information and to provide informal coordination among the various research activities relating to the lakes and their basins. The group provides a forum for assisting and coordinating and eliminating duplication. It also sponsors a data repository for the acquisition, storage, retrieval, and dissemination of basic data. This responsibility is performed by the Great Lakes regional data center of the U.S. lake survey, corps of engineers, U.S. army.

The steering committee of the group includes a cochairman, an alternate to the cochairman and a secretary from each country. It investigates problems through ad hoc task groups and committees such as the data processing committee, ships and facility schedule committee and aid to navigation committee, and provides working-level cooperation and forums for research purposes.

The group is organized under the two cochairmen who serve as chairmen to the respective sections of the steering committee. Each provides at group meetings in his country. Meetings are held semiannually and meeting places are rotated between the two countries.

The U.S. cochairman of the group organized a Federal inter-agency committee on Great Lakes research which has in its membership all U.S. agencies with an active interest in the Great Lakes. This committee is concerned with keeping the Federal agencies at the working level aware of what each is doing in Great Lakes research, with a view toward prevention of duplication and establishment of cooperative programs. Semiannual meetings are held by the committee; one in the winter to present detailed plans for the coming year’s research and one in the summer to report on the conformance to plans and status of the activities. The committee furnishes copies of the minutes of its meetings to the group.

Great Lakes Fishery Commission

The Great Lakes fishery commission is an international organization established by the convention on Great Lakes fisheries which was ratified by Canada and the United States in 1955. The commission has the following responsibilities: to formulate a research program or programs designed to determine the need for measures to make possible the maximum sustained productivity of any stock of fish in the convention area which, in the opinion of the commission, is of common concern to the fisheries of the United States of America and Canada and to determine what measures are best adapted for such purpose; to coordinate research made pursuant to such programs, and, if necessary, to undertake such research itself; to recommend appropriate measures to the contracting parties on the basis of the findings of such research programs; to formulate and implement a comprehensive program for the purpose of eradicating or minimizing the sea lamprey populations in the convention area; and to publish or authorize the publication of scientific and other information obtained by the commission in the performance of its duties.

The commission is composed of four members from each country. The U.S. section of the commission is assisted by an advisory committee for each lake on which each bordering State is represented by not more than four persons appointed by the governor with due consideration to the interests of (a) the State agency with jurisdiction over the fisheries, (b) the commercial fishery, (c) the sport fishery, and (d) the public at large.

The commission is required to make use of existing agencies in the performance of its duties whenever possible. It maintains a small staff or secretariat to carry out administrative and coordinating functions, and supervises contracts. The formulation and coordination of research is carried out through technical committees which have been established for each of the Great Lakes. These committees are composed of representatives from agencies
engaged in fishery management or research. Central committees advise the commission on questions of major importance to the Great Lakes fishery as a whole. The two governments are kept informed of the problems faced by the commercial and sport fisheries and recommendations are submitted for transmittal to the appropriate agencies responsible for the regulation of the fishery or engaged in research.

Sea lamprey control is carried out by contracting with the U.S. bureau of commercial fisheries and the department of fisheries and forestry of Canada. Regular treatment of streams in which sea lamprey larvae are produced has reduced the lamprey populations in Lake Superior and Lake Michigan and improved the survival of several important species of fish. The control program was extended to Lake Huron in 1966.

A convention calls upon the U.S.A. to fund 69 percent of the commission's programs and Canada 31 percent. While the States do not share in the costs of the commission, they do incur heavy expenses in raising fish fry to stock Lake Superior. Several advisory committees serve the commission. Among them are committees on scientific matters, lake conditions, etc. Hjalmer O. Swenson, supervisor, fisheries section, game and fish division, Minnesota department of conservation, is chairman of the Lake Superior advisory committee to the U.S. section of the commission. His committee is composed of twelve people (4 from each of the States of Minnesota, Wisconsin and Michigan). The four from each State are: one who is the State representative on fish; one representing sport fishing interests; one representing commercial fisheries; one representing the general public. Members of advisory committee are appointed by the governor of each of the three States.

Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data

The coordinating committee on Great Lakes basic hydraulic and hydrologic data was established in 1953 in the interest of expediting the investigations of Great Lakes problems being carried on by Canada and the United States. The objective of the committee is to determine, through joint studies by appropriate Canadian and United States government agencies, mutually acceptable values of basic hydraulic and hydrologic data for the Great Lakes system during the period of record and in the future. The committee established four subcommittees, vertical control, lake levels, physical data, and river flow - with representation from both governments to carry on the studies.

International St. Lawrence River Board of Control

The International St. Lawrence river board of control supervises the regulation of Lake Ontario, and consequently the St. Lawrence river, in accordance with the International joint commission's orders of approval dated October 29, 1952, and July 2, 1956. An operating committee consists of the Ontario hydroelectric power commission, the Quebec hydroelectric power commission, the power authority of the State of New York, the St. Lawrence seaway development corporation and the department of transport of the Dominion of Canada. The Canadian section has been oriented primarily toward basic research. The United States section has involved university people but has been primarily interested in, and influenced by, Federal agencies.

Minnesota participates in the activities of several regional organizations which are concerned with water and related land resources. Included among these are: upper Great Lakes regional commission, northern Great Lakes area council, Great Lakes task force, conference of Great Lakes congressman, and St. Lawrence seaeway development corporation. In addition, Minnesota has been requested to become a member of two midwest environmental groups: midwest nuclear compact and midwest legislative environmental conference.

Regional Organizations

Upper Great Lakes Regional Commission

Introduction

On August 25, 1965, congress passed the public works and economic development Act of 1965. Section 503 of the Act outlines the program and planning responsibilities of the upper Great Lakes regional commission as follows: to advise and assist the secretary of commerce in the identification of optimum boundaries for the upper Great Lakes economic development region; to initiate and coordinate the preparation of long-range overall economic development programs for the upper Great Lakes economic development region; to foster surveys and studies to provide data required for the preparation of specific plans and programs for the development of the upper Great Lakes economic development region; to advise and assist the secretary of commerce and the member States in the initiation and coordination of economic development districts.

The objective is to promote maximum benefits from the expenditures of Federal, State and local funds; to promote increased private investment in the upper Great Lakes economic development region; to prepare legislative and other recommendations with respect to short-range and long-range programs and projects for Federal, State and local agencies; to develop, on a continuing basis, comprehensive and coordinated plans and programs and establish priorities thereunder. Due consideration is given to other Federal and local planning in the upper Great Lakes economic development region. Other responsibilities are: to conduct and sponsor investigations, research and studies that include an inventory and analysis of the resources of the upper Great Lakes economic development region; to sponsor demonstration projects designed to foster regional productivity and growth in cooperation with Federal, State and local agencies; to review and study Federal, State, and local public and private programs in cooperation with the agency involved; where appropriate, to recommend modifications or additions that will increase their effectiveness in the upper Great Lakes economic development region; to formulate and recommend, where appropriate, interstate compacts and other forms of interstate cooperation.

The commission is also working with Federal, State and local agencies in developing appropriate model legislation; providing a forum for consideration of problems of the upper Great Lakes economic development region; proposing solutions and establishing and utilizing, as appropriate, citizens and special advisory councils and public conferences; and making additional recommendations from time to time to the secretary of commerce and to the State governors and
appropriate local officials, with respect to: the expenditure of funds by Federal, State and local departments and agencies in the upper Great Lakes economic development region in the fields of natural resources, agriculture, education, training, health and welfare, transportation and other fields related to the purposes of the public works and economic development Act of 1965; such additional Federal, State and local legislation or administrative actions as the commission deems necessary to further the purposes of the public works and economic development Act of 1965.

Through title IV of the public works and economic development Act of 1965 and in response to requests from the governors of Michigan, Minnesota, and Wisconsin, the secretary of commerce designated the upper Great Lakes area an economic development region in 1965. This paved the way for the formal organization of the upper Great Lakes regional commission in 1967. The upper Great Lakes regional commission is one of the six Federal-State bodies created to help revitalize lagging economies of multi-State regions. Besides the three-State upper Great Lakes regional commission there are five other regional commissions: the other existing commissions are:

- Appalachian: portions of 13 States from New York to Mississippi
- New England: All of the six New England States
- Ozarks: portions of Arkansas, Kansas, Missouri and Oklahoma
- Coastal Plains: portions of North Carolina, South Carolina and Georgia
- Four Corners: portions of Arizona, Colorado, New Mexico and Utah

Congress has called for creation of an upper Great Plains commission, including portions of North Dakota, South Dakota, Nebraska, Wyoming and Montana and a Mid-Southern commission, covering southeastern Arkansas, northern Louisiana and western Mississippi.

The upper Great Lakes region consists of 119 counties in the northern parts of the States of Wisconsin, Michigan and Minnesota. Approximately 2.7 million people live within the 116,000 square-mile region. Population of the region grew only 4.6 percent between 1950 and 1960 as compared with a National growth of 18.5 percent. Unemployment in the region was nearly twice the national average. The median family income was about $1,000 below the average. Federal outlays within the region in 1967 were $567 per person compared to a National average per capita outlay of $861.

Minnesota counties included in the upper Great Lakes region are: Atkin, Becker, Beltrami, Benton, Carlton, Cass, Chisago, Clay, Clearwater, Cook, Crow Wing, Douglas, Grant, Hubbard, Isanti, Itasca, Kanabec, Kittson, Koochiching, Lake, Lac qui Parle, Le Sueur, Lincoln, Mahaska, Marshall, Mille Lacs, Morrison, Morris, Otter Tail, Pennington, Pine, Polk, Red Lake, Roseau, St. Louis, Sherburne, Stearns, Todd, Wadena and Wilkin.

The commission is devoting a major share of its program effort to the full and proper development of the region's unique water and scenic resources which provide a major basis for economic growth and development of the region in the future.

Organization, Staff and Budgets

The upper Great Lakes regional commission was officially organized on April 11, 1967. The commission is composed of one Federal member appointed by the President by and with the consent of the Senate (the Federal co-chairman) and one member from each participating State in the development region (the governor, or his designee, or such other person as may be provided by the law of the State which he represents). One of the governors serves as State co-chairman.

The commission's work is essentially administrative. The commission generally acts on a quarterly basis while the governors, alternates often have met on a monthly basis. The commission's main office is in Washington, D.C.

The commission choose to formulate plans and programs in cooperation with existing agencies and organizations at the Federal, State and local levels with the result that the commission staff has remained small. Accordingly, under the by-laws, an executive committee consisting of the governors, the Federal co-chairman and the State co-chairman. This committee recommends personnel appointments to the commission. The commission appoints an executive director to be the chief executive and administrative officer for the commission. Each State may nominate a resident of the State to be a commission special employee. A fourth special employee is nominated by the Federal co-chairman and is appointed at large. These employees (not to exceed four at any one time) are non-Federal employees who have knowledge and expertise in economic development and related fields. These temporary employees normally serve from three to twelve months, although the executive committee can approve shorter or longer periods. Salaries for these appointees are commensurate with duties and experience. The commission has established a policy of appointed advisory task forces to oversee projects. Members of these task forces are appointed by the governors and the Federal co-chairman.

The commission receives financial support from the Federal government for planning, technical assistance and administration. After July 1, 1969, not less than one-half of the administrative expenses of the commission was provided by the States.

The commission expended $2.7 million for supplemental grant-in-aid projects in fiscal year 1968, setting in motion direct project expenditures of $12 million, which had secondary effects of more than twice that amount. The commission used its technical assistance funds of about $500,000 to sponsor a number of demonstration projects including: a forest demonstration project and a inland lake renewal and management demonstration project.

The commission was granted approximately $4.1 million for fiscal year 1969. $2.8 million of this was invested in 33 supplemental grant-in-aid projects aimed at stimulating regional economic development. The commission also invested $874,000 in research and demonstration projects which were directed primarily at solving some of the regions economic problems and at determining those factors which are hindering economic growth within the region. Grants to each of the three States totaling $195,000 were provided by the commission in order that they might carry on expanded State programs of public investment planning. A total of 25 demonstration and research projects was supported by the commission; of the $874,000 invested in these...
projects. 83% was invested in demonstration projects and the balance, 17%, was spent on research projects. The total cost of the 53 supplemental grant-aid projects was $23.3 million. Thus, for every commission dollar invested, $8.41 in additional assistance to the region was assured.

The commission's funds enabled communities across the region to receive aid from many Federal agencies. Transportation facilities including two road and bridge improvements and the airport at International Falls received $178,000 in commission aid-about 60% of the total commission investment in Minnesota. Nine construction grants totaling $226,000 were made to vocational-technical schools while five grants were made to stimulate park development projects in Minnesota. The commission also contributed to the development of an industrial park at Detroit Lakes and to the construction of two regional health facilities at Duluth and Virginia.

Some of the research and demonstration projects in fiscal year 1969 were concerned with: population projections for the region, wild rice background, wild rice committee and Indian training, renewal of Great Lakes-St. Lawrence commerce, custom pelletizing of iron ore, and wild rice demonstration.

The budget of the commission was $4 million in fiscal year 1970 and $7.7 million in fiscal year 1971. The commission has approved and is funding a number of projects involving: improving airports; expanding vocational education and, at the university of Minnesota, Duluth basic science (premedical) education; renewing inland lakes; centralizing waste disposal collection in Michigan; helping Indians retain control of wild rice harvesting with new technology; a university of Wisconsin center for training tourist industry workers; a mobile job counseling center in northern Minnesota; a Duluth harbor de-icing demonstration. Also at Duluth, the commission has aided the arrowhead tourism corporation, a device, formed under a law introduced by a State legislator, to pool risk capital for use as long-term loans to expand and renovate resorts.

Minnesota's funding of the upper Great Lakes regional commission in 1969-71 was $71,000. The commission makes available to the governor $65,000 per year under a contract called "Comprehensive State Planning of Public Investment." Staff and consultants to the governor's office for upper Great Lakes programs are paid from this account.

Programs and Activities

The public works and economic development Act directs the commission to plan and prepare long range economic development programs consisting of public investments, demonstration projects, legislative recommendations, and other plans and proposals. The commission has benefited from the region's rich history of previous research and planning. In the early thirties, the National resources committee established a special regional planning agency, the northern lake States regional committee. More recently, such groups as the upper midwest research and development council and the northern Great Lakes resource development committee have done extensive research planning and programming work.

A regional economic development plan and five-year program dated December 1970 was prepared and submitted to the secretary of commerce by the commission. The proposed public investment program involves the expenditure of $546 million to be spent over 5 years and financed by $382 million in Federal funds and $164 million in State and local funds as shown below:

<table>
<thead>
<tr>
<th>Federal (millions)</th>
<th>State/Local (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>55</td>
</tr>
<tr>
<td>Second Year</td>
<td>78</td>
</tr>
<tr>
<td>Third Year</td>
<td>82</td>
</tr>
<tr>
<td>Fourth Year</td>
<td>83</td>
</tr>
<tr>
<td>Fifth Year</td>
<td>84</td>
</tr>
<tr>
<td>Total</td>
<td>382</td>
</tr>
</tbody>
</table>

In addition, a 5-year private investment incentive program, based on tax credits, is estimated to amount to $325 million in Federal tax revenues temporarily foregone. The program would develop an estimated $1.2 billion in private investment and create 100,000 new jobs within the region.

The 5-year program could be implemented by the commission. Federal costs of program elements are summarized below (Regional Economic Development Plan and Five-Year Program, 1970. Upper Great Lakes Regional Commission): Federal Costs 5-year Program (Millions)

<table>
<thead>
<tr>
<th>Regional Program</th>
<th>(Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business &amp; Industry Development</td>
<td>$ 29.2</td>
</tr>
<tr>
<td>Industrial Development Fund</td>
<td></td>
</tr>
<tr>
<td>Resource Industry Development</td>
<td></td>
</tr>
<tr>
<td>Forest Improvement &amp; Timber Utilization</td>
<td>2.6</td>
</tr>
<tr>
<td>Minerals, Fuel and Energy</td>
<td>2.8</td>
</tr>
<tr>
<td>Agricultural Development</td>
<td>3.6</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Highway Backbone System</td>
<td>231.0</td>
</tr>
<tr>
<td>Airports</td>
<td>26.1</td>
</tr>
<tr>
<td>Great Lakes</td>
<td>1.5</td>
</tr>
<tr>
<td>Manpower and Education</td>
<td>44.8</td>
</tr>
<tr>
<td>Lake and Scenic Resource Development</td>
<td></td>
</tr>
<tr>
<td>Scenic Access and Development</td>
<td>11.7</td>
</tr>
<tr>
<td>Restoration and Protection of Fisheries, Lakes and Lakeshores</td>
<td>12.0</td>
</tr>
<tr>
<td>Great Lakes Fisheries</td>
<td></td>
</tr>
<tr>
<td>Lakes and Lakeshores Renewal</td>
<td>3.8</td>
</tr>
<tr>
<td>Small Craft Harbors</td>
<td>4.8</td>
</tr>
<tr>
<td>Improvement of Tourist Services</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Planned improvements in the natural, man-made, and technological environment of the region fall into categories relating to the development and utilization of natural resources, public work projects and manpower training and education. Federal funds would be expended: to improve timber supplies and their utilization; through demonstrations of modern harvesting techniques, grading and marketing of timber, and safety practices; to develop the region's minerals, fuel, and energy resources through geological
studies, technical assistance for using iron ore resources more efficiently, exploration of outside sources of fuel and energy and their delivery, and stimulating action by energy-supply and related industries to expand the electric power supply, for demonstrations and studies to develop agriculture in the region, including soil surveys, to develop a "key routes" highway program as part of a long-range "backbone" highway system; to develop a regional airport system designed to spur economic development; to develop an informational system on the overseas trade capabilities of the Great Lakes and seaway ports, analyze the economic effects of seaway tolls, develop reciprocity agreements between the U.S. and Canada concerning a free trade area at Sault St. Marie, and research other matters affecting water transportation in the region; for vocational training facilities, manpower training and employment information system; for lake and scenic resource development to provide transportation links for a regional network of scenic and access roads, help develop State and local parks, make public improvements to underwater recreation and accommodation facilities, provide planning, zoning, resource renewal, and preservation demonstrations, and assure concerted development of the scenic network; to develop a large system of fish cultural facilities on the upper Great Lakes; to eradicate undesirable fish from lakes and restock with desirable species, increase the fish-carrying capabilities of selected waters and maintain catchable fish in an ecological balance through stocking; for development of small-craft harbors on the upper Great Lakes; and to aid and stimulate development of tourist services.

Northern Great Lakes Area Council

The northern Great Lakes area council, a regional and international tourist organization, was formed in 1945 at a conference on Mackinac Island, Michigan, attended by Governor Thye of Minnesota, the governors of Michigan and Wisconsin and the premier of Ontario. The governors of the three States and the premier of Ontario are ex officio members of the council and its executive advisors. Minnesota's other members appointed by the governor are:

Richard Dyke, Alexandria
G.F. (Bud) Kratoska, Grand Marais
Julius Perlt, Minneapolis
John Sneekar, Silver Bay
James Vance, Worthington

Council members receive no compensation but may be reimbursed for actual expenses in attending the one meeting of the year, usually in September and an occasional semi-annual meeting.

The council objectives are: to encourage conservation and develop tourist and recreational resources of the northern Great Lakes area; to advertise the area's recreational and health-giving facilities; to recommend expansion and improvement of air, rail, boat and highway transportation facilities; and to encourage uniform regulation of natural resources.

The States contribute equal amounts to be used for council personnel and to carry out council objectives. Minnesota's department of economic development contributes $10,000 each year out of its budget to the advertising budget spent for ads in Holiday magazine and other travel periodicals.

Great Lakes Task Force

The Great Lakes task force was established pursuant to a request by the conference of Great Lakes senators that "the port and shipping interests on the Lakes coordinate and join together in presenting their views on Great Lakes shipping matters." The purpose of the task force are: to encourage the orderly regional development of the Great Lakes region and to foster and promote an environment for the region. The task force seeks out items or positions on which all component organizations can agree (not oppose), and presents views and recommendations as a unified body.

The membership of the Great Lakes task force consists of the following: the council of Lake Erie ports, the Great Lakes commission, the Great Lakes terminal association, the International association of Great Lakes ports (U. S. Section), the International longshoremen's association (Great Lakes district), the U.S. Great Lakes shipping association. Each component organization has one vote and simple majority rule is followed. A duly appointed proxy may vote in the event that one member is absent. Advisors and consultants to the component members are permitted to participate in discussions but do not have the power to vote.

A chairman is nominated and elected by a nominating committee with each component organization having one vote. The chairman commences his duties on January 1 of each year and serves one year or until a successor is qualified. The executive director of the Great Lakes commission serves as secretary to the Great Lakes task force. His responsibilities are to: give notice of all meetings; submit to the membership, prior to meetings, any and all proposals or actions that will require component organization approval; serve as secretary; record proceedings of regular meetings and preserve same in the headquarters; coordinate arrangements for regular task force meetings. As there are no standing committees required by the by-laws, committees are appointed by the chairman as need arises. The task force must approve recommendations by the committees. The task force establishes goals and objectives to guide the orderly development of the area under its study jurisdiction.

The principal objectives and goals of the task force are: to establish equality and equity for America's fourth seacoast and its tributary area and to promote orderly economic development within a quality environment; free the Great Lakes-St. Lawrence seaway system from discriminatory tools and user charges; develop the opportunities for the Great Lakes, America's fourth seacoast, offered by the merchant marine Act of 1970; eliminate discriminatory inland freight rates for service to Great Lakes ports; extend the Great Lakes-St. Lawrence seaway navigation season to eleven months for the 1970-71 navigation season to twelve months by not later than 1980; gain approval for the merchant marine Act of 1970. (Five ships minimum out of each thirty ships designed and constructed); obtain a fair share of USDA and DOD cargoes for shipment through Great Lakes ports; support the work of the Great Lakes environmental conference (governors and prime ministers of eight States and three provinces) in their interstate-international cooperative effort to enhance the environment within the Great Lakes region; seek prompt and equitable solutions for all issues and matters pertaining to water pollution, dredging certification and polluted material containment programs.
Meetings are held at the call of the chairman or on majority vote of the membership. The Great Lakes task force has held two meetings, November 20, 1969, in Detroit, Michigan, and January 21, 1970, in Chicago, Illinois. In March of 1970, a set of by-laws for the Great Lakes task force was approved.

Each year the task force adopts a new budget. All component organizations are required by the by-laws to contribute funds equally, except for the Great Lakes commission which contributes services-in-kind equivalent to one-fourth man year. Contributions from members are submitted to the secretary during January of each year. The secretary submits a financial statement twice a year.

The Great Lakes task force in January of 1970, discussed the importance of the formation of a conference of Great Lakes congressmen to support and give legislative consideration to programs which affect the Great Lakes region.

Conference of Great Lakes Congressman

The conference of Great Lakes congressmen coordinates its activity with the Great Lakes task force and political, regional and business officials in the overall development and conservation of the Great Lakes region. As does the conference of Great Lakes senators, the conference of Great Lakes congressmen coordinates action in regard to the passage of bills that have an effect in the Great Lakes region. Membership consists of a Republican and a Democrat congressman from each of the eight Great Lakes States. Congressman John A. Blatnik, from Minnesota, is chairman.

St. Lawrence Seaway Development Corporation

The St. Lawrence seaway development corporation was established by congress to construct, maintain, operate and promote the United States portion of the navigation facility on the St. Lawrence river providing ocean access to Great Lakes deep-draft shipping. Included among the seaway corporation's goals are the: promotion of greater use and development of ports along the Great Lakes; development of the intermodal transportation aspects of commerce within the Great Lakes basin; increased use of the seaway by United States and foreign interests; implementation of the president's export program; implementation of the administration's merchant marine program; and development of a greater civic and industrial interest in the seaway. To achieve these goals the corporation has considerable latitude in coordinating efforts of various echelons of navigation and transportation interests.

INTERSTATE COMPACTS AND COMMISSIONS

Minnesota has entered into four interstate compacts involving the creation of four interstate commissions which are concerned with water and related land resources planning, development and management in the State. These commissions are: Great Lakes commission, Wisconsin-Wisconsin boundary area commission, South Dakota-Minnesota boundary waters commission and Tri-State waters commission. Current meetings are underway to consider the creation of the Great Lakes management compact.

Great Lakes Commission

Introduction

Along with the increasing importance of the Great Lakes to the region and the Nation came the realization of the need for an interstate agreement for utilization and conservation of the waters of the Great Lakes. The movement to meet this need developed and progressed through a series of interstate conferences sponsored by the council of State governments, and culminated in a resolution unanimously adopted by representatives of the eight Great Lakes States to establish the Great Lakes basin compact.

Through their legislatures, the States of Illinois, Indiana, Michigan, Minnesota and Wisconsin ratified the compact in 1955. Subsequently, similar action was taken by Pennsylvania (1956), New York (1960), and Ohio (1961). In ratifying the compact, the States designated the Great Lakes commission as their joint research and advisory agency on Great Lakes water resources development, programs and problems. The Province of Ontario and the Province of Quebec, or either of them, may become States party to the compact by taking such action as their laws and the laws of the government of Canada may prescribe for adherence thereto.

In July 1968, the 90th congress passed legislation giving its consent to the Great Lakes basin compact and the president signed S. 660 into law as P.L. 90-419. This action satisfies the requirement of the Constitution of the United States which provides that interstate compacts shall have the consent of congress.

The purposes of the compact are, through means of joint or cooperative action: to promote the orderly, integrated, and comprehensive development, use and conservation of the water resources of the Great Lakes basin; to plan for the welfare and development of the water resources of the basin as a whole as for those portions of the basin which may have problems of special concern; to make it possible for the States of the basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time; to advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, recreational, and other legitimate uses of water resources of the basin; and to establish and maintain an intergovernmental agency to the end that the purpose of the compact may be accomplished more effectively.
The basin, for the purposes of the compact, consists of so much of the following as may be within the party States: Lakes Erie, Huron, Michigan, Ontario, St. Clair, Superior, and the St. Lawrence river, together with any and all natural or man-made water interconnections between or among them; all rivers, ponds, lakes, streams, and other watercourses which, in their natural state or in their prevailing condition, are tributary to Lakes Erie, Huron, Michigan, Ontario, St. Clair, and Superior or any of them or which comprise part of any watershed draining into any of said lakes.

Each party State agrees to consider the action the commission recommends in respect to: stabilization of lake levels; measures for combating pollution, beach erosion, floods, and shore foundation; uniformity in navigation regulations within the constitutional powers of the States; proposed navigation aids and improvements; uniform or effective coordinating action in fishing laws and regulations and cooperative action to eradicate destructive and parasitical forces endangering the fisheries, wildlife and other water resources; suitable hydroelectric power developments; cooperative programs for control of soil and bank erosion for the general improvement of the basin; and diversion of waters from and into the basin.

Powers and Duties

The commission has power to: collect, correlate, interpret, and report on data relating to the water resources and the use thereof in the basin or any portion thereof; recommend methods for the orderly, efficient, and balanced development, use, and conservation of the water resources of the basin or any portion thereof to the party States and to any other governments or agencies having interests in or jurisdiction over the basin or any portion thereof; consider the need for and desirability of public works and improvements relating to the water resources in the basin or any portion thereof; consider means of improving navigation and port facilities in the basin or any portion thereof; consider means of improving and maintaining the fisheries of the basin or any portion thereof; recommend policies relating to water resources including the institution and alteration of flood plain and other zoning laws, ordinances and regulations; recommend uniform or other laws, ordinances, or regulations relating to the development, use and conservation of the basin's water resources to the party States or any of them and to other governments, political subdivisions, agencies or intergovernmental bodies having interests in or jurisdiction sufficient to affect the basin or any portion thereof; consider and recommend amendments or agreements supplementary to this compact to the party States or any of them and assist in the formulation and drafting of such amendments or supplementary agreements; prepare and publish reports, bulletins, and publications appropriate to this work and fix reasonable sale prices therefore; with respect to the water resources of the basin or any portion thereof; recommend agreements between the governments of the United States and Canada; recommend mutual arrangements expressed by concurrent or reciprocal legislation on the part of congress and the parliament of Canada including but not limited to such agreements and mutual arrangements as are provided for by Article XIII of the Treaty of 1909 relating to boundary waters and questions arising between the United States and Canada. (Treaty Series, No. 548); cooperate with the governments of the United States and of Canada, the party States and any public or private agencies or bodies having interests in or jurisdiction sufficient to affect the basin or any portion thereof; at the request of the United States, or in the event that a province shall be a party State, at the request of the Government of Canada, assist in the negotiation and formulation of any treaty or other mutual arrangement or agreement between the United States and Canada with reference to the basin or any portion thereof; and make all recommendations and do all things necessary and proper to carry out the powers conferred upon the commission by the compact, provided that no action of the commission shall have the force of law in, or be binding upon, any party State.

The commission may sue and be sued, acquire, hold and convey real and personal property and any interest therein. Transactions involving real or personal property conform to the laws of the State in which the property is located, and the commissioner may by bylaws provide for the execution and acknowledgment of all instruments in its behalf. The commission makes and transmits annually to the legislature and governor of each party a report covering the activities of the commission for the preceding year and embodying such recommendations as may have been adopted by the commission. The commission may issue such additional reports as it may deem desirable.

The commission's actions do not have the effect of law in any State but under the compact each State agrees to consider recommendations of the commission. The commission has only advisory powers. In addition to other duties assigned by law, the Great Lakes commission members of Minnesota during the 1969-77 biennium reviewed the programs and activities of the upper Great Lakes regional commission and the Great Lakes basin commission and reported to the State legislature on November 15, 1970, its recommendations for coordination of the activities of these commissions.

Membership and Meetings

The commission is composed of not less than three commissioners nor more than five commissioners from each party State designated or appointed in accordance with the laws of the State which they represent and serving and subject to removal in accordance with such law. Until July 1, 1971, there were five commissioners on the commission from Minnesota who were members of the legislature, two members of the house of representatives and two members of the senate; and one member to be from either the senate or the house and said house members were appointed by the speaker of the house and the members of the senate were appointed by the committee on committees. The commissioners so appointed exercised all voting rights conferred by the compact on the commissioners.

The 1971 legislature enacted the following bill: "there shall be five commissioners on the Great Lakes commission from this state-four of whom shall be members of the legislature; two being members of the house of representatives and two being members of the state senate; and one member shall be appointed by and serve at the pleasure of the governor. The said house members shall be appointed by the speaker of the house and the members of the senate shall be appointed by the committee on committees. The commissioners so appointed shall exercise all voting rights conferred by the compact on the commissioners from the party state as provided in Article IV, (B and C) of the compact."
Each State delegation is entitled to three votes in the commission. The presence of commissioners from a majority of the party States constitutes a quorum for the transaction of business at any meeting of the commission. Actions of the commission are by a majority of the votes cast except that any recommendations made pursuant to Article VI of the compact requires an affirmative vote of not less than a majority of the votes cast from each of a majority of the States present and voting. The commissioners of any two or more party States may meet separately to consider problems of particular interest to their States, but no action taken at any such meeting is deemed an action of the commission unless and until the commission specifically approves the same. In the absence of any commissioner, his vote may be cast by another representative or commissioner of his State provided that said commissioner or other representative casting said vote has a written proxy in proper form as may be required by the commission.

The commission elects annually from among its members a chairman and vice-chairman. The commission appoints an executive director who also acts as secretary-treasurer, and who is bonded in such amount as the commission may require. The executive director serves at the pleasure of the commission and at such compensation and under such terms and conditions as may be fixed by it. The executive director is custodian of the records of the commission with authority to affix the commission's official seal and to attest to and certify such records or copies thereof. The executive director, subject to the approval of the commission in such cases as its bylaws may provide, appoints and removes or discharges such personnel as may be necessary for the performance of the commission's functions. Subject to the aforesaid approval, the executive director may fix their compensation, define their duties, and require bonds of such of them as the commission may designate. The executive director, on behalf of, as trustee for, and with the approval of the commission, may borrow, accept, or contract for the services of personnel from any State or government or any subdivision or agency thereof, from any intergovernmental agency, or from any institution, person, firm or corporation; and may accept for any of the commission's purposes and functions under this compact any and all donations, gifts, and grants of money, equipment, supplies, materials, and services from any State or government or any subdivision or agency thereof or intergovernmental agency or from any institution, person, firm or corporation and may receive and utilize the same.

The members of the commission serve without compensation, but the expenses of each commissioner are met by the State which he represents in accordance with the law of that State. All other expenses incurred by the commission in the course of exercising the powers conferred upon it by the compact, unless met in some other manner specifically provided by the compact, are paid by the commission out of its own funds. The commission submits to the executive head or designated officer of each party State a budget of its estimated expenditures for such period as may be required by the law of that State for presentation to the legislature thereof.

An executive committee, comprised of the commission's chairman and vice-chairman and one representative from each member State, exercises general supervision over the commission program and activities between meeting times and serves in an advisory capacity to the chairman. To add further expertise, the States have appointed advisors with technical backgrounds to serve on the several standing committees of the commission.

The program of the commission is carried out through its two regular meetings held each year, the work of five standing committees, special committees and meetings as needed and staff activities at the Ann Arbor office of the commission. Special programs concerning various Great Lakes water resource problems and developments are arranged in connection with the commission's meetings and participation commonly includes State and Federal officials, Canadian Provincial officials and other water resource specialists.

Close cooperation is maintained between the commission and State and Federal agencies administering Great Lakes water resource programs. Each State delegation on the commission regularly submits reports on each meeting of the commission to the governor and to State agencies with Great Lakes interests and responsibilities. Special reports on Great Lakes developments are made to the governors and other State officials and bodies as warranted and regular reports are made to the governor and legislature in each member State every two years.

Within the Great Lakes commission there are five standing committees: (1) seaway, navigation and commerce; (2) pollution control; (3) water resources; (4) fisheries and wildlife; and (5) shoreline use and recreation. These committees indicate the broad interest of the Great Lakes commission in water management, the development of a quality environment for the region and the orderly development of the Great Lakes region, mid-continent North America and the Nation.

In 1970, Minnesota's membership on the commission was as follows:

Hon. Gordon Rosenmeier, chairman - member of the senate
L.L. Duxbury - member of the house of representatives
Hon. Raymond J. Higgins - member of the senate
Thomas E. Tice - member of the house of representatives
Hon. Donald Sinclair - member of the senate

Minnesota members and advisors on standing committees in 1970 were:

Seaway, navigation and commerce - senator Higgins and Conrad M. Fredin, president, seaway port authority, Duluth
Water resources - senator Sinclair and Guy J. Kolhoffer, Jr., State planning agency
Shoreline use and recreation - representative Tice and Joseph Sifer, State planning agency
Fisheries and wildlife - representative Duxbury and Richard Wetterssten, department of Natural resources
Pollution control - senator Rosenmeier and John Badalich, pollution control agency

Budget

As the Great Lakes commission is an agency of States, its funds are derived solely from contributions by member States. Each State contributes
quarterly an equal sum, during the fiscal year beginning July 1. The commission's budgets for fiscal years 1969-72 are given below:

<table>
<thead>
<tr>
<th>Year</th>
<th>States</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 69</td>
<td>8 States</td>
<td>$72,000</td>
</tr>
<tr>
<td>FY 70</td>
<td>8 States</td>
<td>$72,000</td>
</tr>
<tr>
<td>FY 71</td>
<td>8 States</td>
<td>$104,000</td>
</tr>
<tr>
<td>FY 72</td>
<td>8 States</td>
<td>$104,000</td>
</tr>
</tbody>
</table>

### Activities and Accomplishments

The Great Lakes commission is considered the action group on Great Lakes matters and has traditionally been involved in lobbying for legislation in Congress for seaway, decreased seaway tolls, harbor improvements, etc. Representative activities and accomplishments of the commission are listed below:

#### Water Resources

Spearheaded effort to have the problem of Great Lakes water levels referred to IJC (International joint commission) - effected October 1964; requested and obtained detailed study of proposed Lake Erie-Ohio river canal project to assure no loss of water to the Great Lakes basin; recommended construction of engineering works to regulate water levels in Lakes Michigan, Huron and Erie - corps of engineers "Report on Lake Regulations," December 1965; supported UNESCO's plans for international hydrologic decade (1965-75), and offered Great Lakes commission support - continuing; assisted in formation and supported legislation on Federal water resources planning Act - P.L. 89-80; conducted Great Lakes water resource conference; urged amendment of the flood control Act of 1936 to allow use of Federal funds to alleviate inundation problems on the Great Lakes - BOB (budget of the budget) approved July 1959; and endorsed and supported feasibility and planning study of lake Erie-Ontario canal.

#### Pollution Control and Abatement

Spearheaded effort to have referred to IJc problem of pollution of Lake Erie and Lake Ontario and the International section of the St. Lawrence river - effected October 1964; supported passage of the water quality Act of 1965 - P.L. 88-234; urged FWPCA (Federal water pollution control administration) to develop efficient sewage treatment process for removal of nutrients (FWPCA conference, lake Erie pollution); pointed out the need for each port city on the Great Lakes to provide for the handling of refuse from pleasure craft and commercial ships - continuing; supported extension of Federal oil pollution Act of 1924 to the waters of the Great Lakes and the St. Lawrence river - continuing; supported establishment of FWPCA Great Lakes regional water pollution laboratory - approved January 1963; no further action taken to date - continuing; recommended Federal and State financial incentives for construction of capital improvements to control water pollution in potable water; reviewed the multiplicity of agencies engaged in enforcing pollution control and providing sewage facilities, and suggested necessity of municipal, State and Federal coordination - continuing; encouraged the surgeon general, U.S. public health service, to publish amendments to the interstate quarantine regulations relative to disposal of sewage and wastes from vessels operating on the Great Lakes - continuing; and monitored the corps of engineers - FWPCA pilot program for alternate disposal methods for polluted dredged material.

### Fisheries and Wildlife

Encouraged uniformity in State fishing regulations - continuing; formulated a model Great Lakes fisheries Act; formulated programs for emergency clean-up of overabundance of alewives in lake Michigan; supported efforts of the Great Lakes fishery commission and the U.S. fish and wildlife service to control the sea lamprey and to rehabilitate the lake trout fishery; endorsed implementation of the convention with Canada on Great Lakes fisheries - the Great Lakes fisheries Act of 1956, P.L. 84-557; maintained active interest in and support of the anadromous fish program for the Great Lakes - continuing; and joined the international association of fish, game and conservation administrators in programs to coordinate Federal grant programs for fish and wildlife conservation.

### Shoreline Use and Recreation

Served as forum for discussion on ownership of alluvial lands, laws and regulations pertaining to submerged lands, and regulations for use of shorelines - continuing; supported enactment of a modal State boating Act under the provisions of P.L. 85-913; gained Federal support for extension of shore protection legislation to include projects in the Great Lakes - BOB approved July 1959; assisted in the shoreline survey program of the national park service - "Our Fourth Shore" report of the National park service; encouraged Federal assistance for flood plain information studies - river and harbor and flood control Act of 1968; and endorsed action by all States to acquire lake shore lands for recreational programs; inventoried public lands.

### International Relations

Maintained contact with various Canadian agencies to effect international action on matters to control and abate pollution in lakes Ontario and Erie and connecting channels, and to regulate the water levels of the Great Lakes - two references to IJC; continued liaison with Canadian entities on water resource matters; and held exploratory conference with the provinces of Ontario and Quebec concerning augmentation of water supply in the Great Lakes.

### Seaway, Navigation and Commerce

Conducted a symposium on St. Lawrence seaway trade developments - seaway institute, March 1964; supported efforts to effect a more equitable share of military cargo movement through Great Lakes ports and the seaway - continuing; reviewed the need to determine the feasibility of extending the Great Lakes shipping season - P.L. 89-298; made recommendations incorporated in the Federal pilotage bill for the Great Lakes - P.L. 86-555, and for administration of the Act; recommended dual locks on the Illinois waterway - P.L. 87-874; contracted with the bureau of the census for compilation of data on the foreign commerce of the Great lakes ports - continuing; promoted increased use of Great Lakes ports for exporting surplus agricultural products under government assistance programs - begun 1959; opposed tolls and user charges for the seaway and all inland waterways in the United States - continuing; endorsed Federal subsidies for U.S.-flag vessels operating on Great Lakes foreign trade routes - approved May 1958; urged adoption of a free-trade period on all export cargo at Great Lakes ports equal to that for ocean ports - accomplished; urged Federal support.
for Great Lakes shipping companies for capital investments in vessels - continuing; sponsored symposium on port organization and administration - November 1958; supported the continuation and extension of U.S.-Flag vessel developmental trade routes into the Great Lakes - report, maritime administration, October 1965, Great Lakes foreign trade routes; recommended review of freight rates for government cargo under Section 22, ICC Act - November 1958; supported the continuation and extension of U.S.-Flag vessel developmental trade routes into the Great Lakes - report, maritime administration, October 1965, Great Lakes foreign trade routes; recommended review of freight rates for government cargo under Section 22, ICC Act - continuing; recommended enlargement of the new Poe lock at Sault Ste. Marie to accommodate 1000-foot vessels - completion scheduled for 1966; established cooperative programs with Great Lakes ports for monthly reporting of overseas trade expansion program for 10th anniversary commemoration of the St. Lawrence seaway - scheduled for summer 1969.

In establishing the commission, the States directed that it serve them as a fact-finding and advisory agency on developments relating to the water resources of the Great Lakes. In accordance with this mandate, the commission obtains a wide range of information and statistics concerning subjects vitally affecting the States and localities in the region and subsequently analyzes the material and disseminates the findings through a variety of channels. These range from the reports on current developments in all aspects of Great Lakes water resources presented in the commission bi-monthly news letter to advisory services to State agencies, university personnel, industry and news media. Publications of the commission are: Great Lakes news letter - bi-monthly, official minutes of Great Lakes commission meetings - following each meeting, Great Lakes research checklist - semi-annually, summary of State and Provincial regulations relating to sport fishing on the Great Lakes - annually, overseas tonnage statistics for Great Lakes, proceedings of the Institute of the St. Lawrence seaway, Great Lakes port organization and administration, Great Lakes programs and problems, sea construction, commerce and tolls, commerce of the Great Lakes ports, reduction of pollution in the Great Lakes boundary waters, law of the Lakes, The Great Lakes basin drainage system, Great Lakes - St. Lawrence seaway commerce references; and water levels of the Great Lakes.

Representation and liaison is maintained with: Federal departments and agencies, International association of Great Lakes ports, Great Lakes study group, association of State and Interstate water pollution control administration for drainage area of Great Lakes - St. Lawrence seaway, Great Lakes maritime institute, Great lakes task force, Great Lakes shipping association and Canadian water resources agencies.

Minnesota-Wisconsin Boundary Area Commission

Introduction

A Minnesota-Wisconsin boundary compact was ratified, enacted into law and entered into with the State of Wisconsin by the 1965 Minnesota legislature. An interstate commission to be known as the Minnesota-Wisconsin boundary area commission was created as part of this compact. The first meeting of the commission was held in January 1966. The commission was created largely as the result of interstate controversy surrounding the construction of the northern states power company's Allen S. King generating plant at Oak Park Heights, Minnesota on lake St. Croix.

The purpose of the compact was the present and future protection, use and development in the public interest, of the lands, river valleys, and waters comprising the common boundaries of Minnesota and Wisconsin. Through the compact, Minnesota and Wisconsin agree to consider, and to promote the consideration by its municipalities of, the recommendations of the commission with respect to: joint regional planning for the development of boundary areas; measures for controlling air and water pollution, maintaining water quality, and controlling water use; programs for control of soil and river bank erosion and the general improvement of the river basins; diversion of water from and into the rivers; restrictions and regulation of land use development designed to preserve the scenic and recreational attributes of the river basins; and other restrictions, regulations or programs. Minnesota and Wisconsin reserve the right at anytime to withdraw from the compact, but such withdrawal must be based upon a law properly enacted according to the Constitution and laws of the withdrawing State.

Membership, Officers and Meetings

Minnesota and Wisconsin each appoint five commissioners. The manner of appointing such commissioners, terms of office and provisions for removal and suspension of commissioners or appointments to fill vacancies are determined by each State pursuant to the laws thereof but each commissioner is a resident of the State from which he is appointed. Commissioners from Minnesota are appointed by the governor with the advice and consent of the senate, each for a 4-year term at the pleasure of the governor. Commissioners serve without compensation, but the actual and necessary expenses incurred by commissioners in the performance of their duties are met by the State.

The commission table of organization for the period July 1969 - January 1971 is shown below:

**STATE OF MINNESOTA**

Commissioners

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merlin H. Berg</td>
<td>Minneapolis</td>
<td>July 1969 - June 1971</td>
</tr>
<tr>
<td>Dr. Max L. DeBolt</td>
<td>Winona</td>
<td>July 1969 - June 1973</td>
</tr>
<tr>
<td>Mrs. Justine Kerfoot</td>
<td>Grand Marais</td>
<td>July 1969 - June 1973</td>
</tr>
<tr>
<td>Roderick A. Lawson</td>
<td>Stillwater</td>
<td>July 1969 - June 1973</td>
</tr>
<tr>
<td>John H. Rippe</td>
<td>Caledonia</td>
<td>July 1969 - June 1973</td>
</tr>
</tbody>
</table>

Legislative Advisory Committee

| Rep. Bernard O. Carlson  | - Chairman    |
| Sen. Alf Bergerud        |               |
| Sen. Robert Brown        |               |
| Sen. Rollin Gleeve       |               |
| Sen. Lew W. Larson       |               |
| Sen. Roger Laufenhurger  |               |
| Rep. Howard Albertson    |               |
| Rep. Joe Gimpster       |               |
| Rep. Robert W. Johnson   |               |
| Rep. Dwight Swanson      |               |

32

33
Technical Advisory Committee

Clarence Buckman, Dept. of Natural Resources
Robert Carlson, Dept. of Agriculture
Robert C. Elsweller, Metropolitan Council
F.H. Geisenhoff, Dept. of Economic Development
George E. Lough, Water Resources Board
Barry A. Nelson, Winona Alderman-at-Large
Patrick Scully, Dakota County Commissioner
Robert Tower, Pollution Control Agency
N. Ted Waldor, Dept. of Highways
William C. Walton, University of Minnesota

STATE OF WISCONSIN
Commissioners

September 1965 - September 1969
John Boenhard, La Crosse
Flagler F. Flinchbaugh, Danbury
Roger L. Hartman, Alma
September 1968 - September 1973
Ralph H. Nest, Jr., Prescott
September 1967 - September 1972
Ted O. Morgen, Baldwin
September 1969 - September 1971
David E. Madd, La Crosse
September 1969 - September 1974
Legislative Advisory Committee

Rep. Robert Hoche - Chairman
Sen. Arthur Cirilli
Sen. Robert P. Knowles
Sen. Phil Knutson
Sen. Wilfred Schueller
Rep. Harvey Duchalm
Rep. Kyle Kenyon
Rep. Norbert Nettelman

Technical Advisory Committee

Carl Bihlbaum, Dept. of Natural Resources
Gary Carlson, Dept. of Administration
William Eich, Dept. of Justice
F.J. Griffith, Dept. of Agriculture
Ralph Hoyd, Dept. of Local Affairs and Development
Al J. Kabetski, Dept. of Local Affairs and Development
William Skyles, Dept. of Natural Resources
Dr. Phillip Sundal, Dept. Local Affairs and Development
C.W. Threinen, Dept. of Natural Resources
Harvey Wirth, Dept. of Health and Social Services

The commission annually elects from among its members a chairman who cannot succeed himself, a vice chairman who is not a citizen of the State represented by the chairman, and a secretary treasurer. The commission meets at the call of the chairman, or at the call of three of its members, upon five days notice, but at least twice in each calendar year, and such mandatory meetings may not be held in the same calendar quarter year. The commission held 14 regular meetings in the period January 1969 - January 1971. In addition, the commission sponsored 3 interstate conferences.

Each State is required to have a legislative advisory committee and a technical advisory committee; each committee is limited to ten members. The committee members serve without compensation, but the actual and necessary expenses incurred by members and their staff are met by the State according to the laws thereof. The legislative advisory committee in Minnesota consists of five members of the house appointed by the speaker and five members of the senate appointed by the committee on committees. Members of the legislative advisory committee select a chairman and other officers as may be deemed necessary. The technical advisory committee in Minnesota has been relatively inactive and is comprised of ten members, appointed by the governor and serving at his pleasure. The members must be either an officer or employee of the executive branch of State government, or of any governmental subdivision, or body politic and corporate of the State.

Responsibilities, Powers and Duties

The commission is charged with the responsibility of assisting in coordinating the studies, conservation efforts and planning undertaken by the several departments, agencies, or municipalities of Minnesota and Wisconsin with respect to boundary lands, rivers and waters. The commission's duties include making recommendations, reviewing and correlating studies of the federal government and other agencies, developing plans and evolving findings, and doing all things necessary and proper to carry out the powers conferred upon the commission by the compact. No recommendation, plan or finding of the commission is to have the force of law or be binding upon or limit the powers of Minnesota or Wisconsin or their departments, agencies, or municipalities.

The commission must cooperate with the Federal government and with any public or private agency having an interest in, or jurisdiction sufficient to affect the present and future protection, use and development in the public interest of lands, rivers or waters comprising the common boundary of Minnesota and Wisconsin. The commission may make recommendations with regard to land and water use in boundary areas to the proper department, agency or municipality of Minnesota or Wisconsin, including proposed laws, administrative rules, ordinances or other regulations. For the purpose of obtaining information relative to land and water use in boundary areas, the commission may hold public hearings.

The commission may study land and water conservation, development and use factors which affect the boundary areas for the purpose of determining the most beneficial and practicable plan for: regional development; navigation, including public access to waters; dams and improvements for flood control and industry; agriculture; fish and wildlife; recreation, including agencies having jurisdiction over natural, scenic or other cultural resources; the development of housing, commerce and industry; control of air and water pollution; and any other beneficial public purposes. The commission may appoint subcommittees for the purpose of conducting specific studies.
On or before January 15 of each odd numbered year the commission must make a report to the governors and legislatures of Minnesota and Wisconsin. The commission may accept, for any of its purposes and functions, donations, gifts, grants and appropriations of money, equipment, supplies, materials and services from the Federal government, from either State or from any department, agency or municipality thereof, or from any institution, person, firm or corporation.

Expenditures and Staff

The commission appoints an executive director and a secretary and engages consultants and research assistants. Information concerning the commission staff complements 1966-71 is summarized below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>Secretary</td>
<td>Research Asst.</td>
</tr>
<tr>
<td>1966</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1967</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1968</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1969</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1970</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1971</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The commission's activities are supported by funds appropriated by legislatures from the general revenue funds of Minnesota and Wisconsin. Commencing July 1, 1965, each State has appropriated $25,000 per biennium to support the commission. Some income is derived from interest on funds deposited in a bank by the commission. Information concerning expenditures by the commission is summarized below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>$ 483</td>
</tr>
<tr>
<td>1967</td>
<td>26,268</td>
</tr>
<tr>
<td>1968</td>
<td>24,762</td>
</tr>
<tr>
<td>1969</td>
<td>27,040</td>
</tr>
<tr>
<td>1970</td>
<td>44,109</td>
</tr>
<tr>
<td>1971</td>
<td>38,625</td>
</tr>
</tbody>
</table>

Accomplishments

The commission has been chiefly concerned with interstate problems associated with the watersheds of the St. Croix, St. Louis and Nemadji rivers and the Mississippi river and counties bordering it on both sides. It has reviewed activities, programs and projects in these areas and made recommendations concerning the resolution of conflicts. The commission has fostered and promoted uniformity of laws involving interstate air, water and land partly in connection with numerous hearings. The commission has assisted in coordinating activities of the various organizations having interest in the commission's areas of concern. The commission has studied and made recommendations pertaining to problems associated with such matters as: impacts of NSP Allen S. King generating plant at Oak Park Heights; potential impacts associated with the possible future construction of a power plant at St. Croix River; pipelines crossing the St. Croix river; pedestrian traffic on a proposed new interstate bridge across the St. Croix River; proposed temporary causeway at O'Brien State Park; taxation of public utilities; proposed four-State upper Mississippi river compact; public access to St. Croix river; littering of shorelines; flood plain zoning; spray killing of vegetation along railroad and county road right-of-aways; pollution; recreation potential; public beaches; harbor controls on navigable rivers; power transmission lines; silting and erosion; heavy barge traffic and recreational use of rivers; water quality standards; delineation of flood plains; scenic zoning; St. Croix scenic riverway bill; water surface zoning; fishing regulations; industrial locations and standards; uniformity in legislation; comprehensive land use planning; water skiing; Apple River scientific area; State boundary line; corps of engineers permit notices; year-round navigation and channel deepening on the upper Mississippi river; water safety laws; wild river bill and Sever's dam; upper Mississippi river comprehensive water and related land resources plan; Bayport dam; use of spoils from dredging; Lake Superior pollution conference; reciprocity on vacation schools; Forest Lake city drainage; small boat harbors; upper Mississippi River national recreation area; Twin Cities sewerage plan; Winnan sewage treatment plant; St. Croix wild river plan; watercraft pollution spill contingency plan; Kinnickinnic River proposal; environmental monitoring program; NSP Allen S. King power plant; coast guard barge-lighting experiment; reciprocity, State parks; proposed large housing development along St. Croix river; Afton State park; Sunrise State park; and Minnesota-Wisconsin boundary trail.

The commission has evolved several new, significant cooperative inter-governmental programs, some of the most noteworthy being: a governmental operations and providing the proper setting for making decisions on a number of major public issues. The commission has provided the initiative and the forum for establishment of the new St. Croix river intergovernmental planning conference, an organization of nearly 40 local governmental units in the lower St. Croix valley. By using a model resolution and organizational framework suggested by the commission, these local units are working cooperatively to solve problems of common concern.

In anticipation of growing use conflicts and traffic problems, the first detailed study of recreational use of the popular lower St. Croix river was initiated and conducted by the commission in the summer of 1970. This was an excellent example of cooperation on the part of State and local governments, private enterprise (marinas and boat liveries), and the commission. The findings will be useful to many agencies in evaluating the need for water zoning, in guiding future recreational facility development, and in planning more effective boating law enforcement patterns.

Recognizing the problems experienced by governmental agencies and industry in attempting to control and clean up accidental spills of pollutants in the boundary rivers, the commission brought together officials of four Federal agencies, three State agencies, and two industry organizations to develop a plan for handling such problems. A spill prevention committee was created at a special "Spill Control Conference" called by the commission in August of 1969. This committee met several times to work out details, and a follow-up conference session was spon-
sored by the February 1970. By April, a coordinated government-industry plan was basically complete, an accomplishment which a major daily newspaper in the area cited as being "something of a bureaucratic miracle".

The commission served as the liaison between the St. Croix river intergovernmental planning conference and the Federal-State study team which is now analyzing the potential for addition of the lower St. Croix river to the National wild and scenic rivers system. Recognizing that it may be several years before congress could take final action on the proposal, the commission viewed the planning conference as a coordinated approach to take advantage of the work being done by the study team by requesting that the team offer some guidance on local zoning criteria in the interest of avoiding actions which might be detrimental to the preservation of the unique attributes of the valley. The idea was accepted, and guidelines were formulated and presented by the study team in October, 1970. The commission reviewed and endorsed the guidelines, recommending that each local governmental unit use them in making land use decisions affecting the river corridor. These guidelines are considered to be a very useful model for a coordinated regional approach to balanced preservation and development of scenic river corridors, not only in the St. Croix area but also in other parts of the Nation.

The study of the potential for addition of the lower St. Croix river to the National wild and scenic rivers system, as directed by the congressional Act of 1968, began in January of 1970. Well in advance of the study, the commission urged the governors of Minnesota and Wisconsin to jointly request that it be a cooperative State-Federal study. The commission also helped set the stage for the study by formally recommending several procedures which have since served as a guide to the study team. To assure that all local interests were provided with factual information on the study in its earliest stages, the commission sponsored a public meeting at Hudson, Wisconsin, in February of 1970 at which Federal and State officials discussed procedures and answered questions about the project. Over 160 persons attended from throughout the study area. The study team of Federal and State personnel has relied heavily on the commission for current field data, and commission staff has provided substantial input in the development of the field report which will soon be forwarded to the president and congress. The commission office has served as the focal point for study team meetings and field work, as a clearinghouse for State inputs to the report, and as an all-important information center for local government officials and private interests in the valley.

South Dakota-Minnesota Boundary Waters Commission

The 1939 legislature created an interstate commission to be known as the South Dakota-Minnesota boundary waters commission, which consists of the director of the game and fish commission of South Dakota and the commissioner of conservation of Minnesota, or their legal successors, and an engineer appointed by the mutual consent of the governors of South Dakota and Minnesota for a period of four years. The commission has the power and authority to investigate and determine the most desirable and beneficial levels of boundary waters artificially controlled and to prescribe a plan for controlling and regulating said levels; to prescribe and promulgate rules and procedure for the conduct of its investigations, surveys, and hearings; to make such orders as may be necessary to further the purposes of the law; and to hold hearings and take such evidence as may be presented, either after complaint or upon its own initiative, as to the desirability of any water level and plan of regulation, and to make such orders concerning the same as in its opinion are for the best interests of the public. Hearings are held at such time and place as may be designated by the commission, in either State, in any county affected by the subject matter. The commission can not incur any obligation for expenses except after an adequate legislative appropriation. The commission may upon verified petition apply to the district court or the circuit court in either State, as the case may be, in any county affected by the subject matter, for an injunction restraining the violation of any order, notice, rule or regulation made by it pursuant to the provisions of the law. The attorney general of both States act as legal advisors to the commission. The commission was relatively inactive in 1971.

It was determined that the most desirable and beneficial level for the waters of Big Stone lake from May 1 to October 1 is elevation 967, project datum, and the South Dakota-Minnesota boundary waters commission, the director of game and fish of South Dakota and the commissioner of conservation of Minnesota maintain and operate the Big Stone control dam in conformance herewith. Stop logs are kept in place and maintained in the outlet dam of Big Stone lake at all times when the water elevation of said lake is 967, or less, project datum, and during such time the outflow from the outlet dam is regulated so as not to exceed 100 cubic feet per second (c.f.s.).

Tri-State Waters Commission

Introduction

The need for some type of coordinated water and related land resources planning effort for the orderly but accelerated development of the Red river of the north region was recognized years prior to the establishment of the Souris-Red-Rainy river basins commission. Partly as a result of the ravaging floods which occurred in the mainstem and tributary streams of the Red river prior to 1930, but primarily because of the severe drought conditions which descended upon the area after 1930 and threatened municipal and agricultural water supplies, the governors of Minnesota, North Dakota, and South Dakota held a tri-State conference in Fargo in July of 1935 to discuss their mutual concern over existing problems. They agreed that a coordinated water plan for the entire basin should be formulated as a necessary preliminary to effective action. An interstate committee was organized in November of that same year and was charged with undertaking the studies essential to such a plan.

Headquarters of the committee were located in St. Paul, Minnesota, and the work was carried on through the State planning boards. Specific studies were undertaken by the water and sanitary engineers of the three States, who also reviewed and updated basic hydrologic data.

Accompanied by State, county, and local officials, water and sanitary engineers and interested citizens the Committee conducted an extended inspection of the basin in the Spring of 1936. Meetings were held each night
during which local problems were presented and discussed. An outgrowth of these meetings was the recommendation that a tri-State waters commission be formed. Enabling legislation was enacted by the legislatures of the three States in 1937, and in April, 1938, by Act of Congress, the commission was approved.

The tri-State waters commission was reasonably active from its inception until about 1945. It held its first official meeting in Eureka, South Dakota, on June 16, 1937, and its last official meeting in Moorhead, Minnesota on August 6, 1943. Since that time, the commission has been, for all practical purposes, inactive.

Its failure is attributed to two factors: (1) at only 10 of the 17 meetings held by the commission there present a legal quorum; (2) although the commission was given jurisdiction over the entire area of the Red river of the north, the Minnesota legislature, in authorizing the pact, specifically provided that "said commission shall have no power or jurisdiction over water levels or stream flow in the Otter Tail river." Since the foregoing area is the source of a large portion of the flow in the Red river, its exclusion weakened the effectiveness of the commission. Efforts since the date of its last activity to revive the commission have failed.

In September of 1961, the States of Minnesota and North Dakota discussed the advisability of reactivating the tri-State waters commission. In January, 1962, at a meeting held to discuss the question further, the Red river basin planning committee was established in lieu of further attempts to re-activate the tri-State waters commission. The principal purposes and objectives of the newly formed committee were to: cooperate with other agencies in the preparation of plans and programs for the development and conservation of all natural resources in the Red river basin; coordinate programs of Federal and State agencies; stimulate and encourage local and State planning; serve as a clearing house of information for local, State, and Federal planning agencies; give consideration to the formulation of a Red river basin planning committee in lieu of further action of the commission; and the like.

The last regular meeting of the committee was held in Fargo, July 29, 1966, at which all members were present except governors Rolvaag and Guy, and members Gutaw and Enright. About 30 Federal, State and local officials and visitors were present. The main purpose of the meeting was to hear Henry P. Caulfield, Jr., executive director, water resources council, discuss the provisions of Public Law 89-80 and the application of governors Guy and Rolvaag for the establishment of a Red river basin commission thereunder.

The contents of Minnesota Statutes 1969, Sections 114.09 to 114.11 pertaining to the commission are given below. These Statutes were repealed by Act of the 1971 legislature.

"The State of Minnesota does hereby enter into a compact with the States of North Dakota and South Dakota whereby it agrees to cooperate with those states in carrying out the following terms and conditions. Each of the States of North Dakota, South Dakota, and Minnesota undertakes to cooperate with the other two states for the most advantageous utilization of the waters of the Red river of the North, for the control of the flood waters of this river, and for the prevention of the pollution of such waters. To that end these three States do hereby create a district to be known as the Tri-State Waters Commission, which shall be a body corporate and shall have the powers, duties, and jurisdiction as shall hereafter be conferred upon it by acts of the legislatures of each of said three States, concurred in, when of a character to require such concurrence, by act of Congress.

The Tri-State Waters Commission, hereafter in this compact called the commission, shall consist of nine commissioners, three from each state, appointed by each state in such manner and for such length of term as may be determined by the legislature thereof. Each commissioner shall be a citizen of the state from which he is appointed, and at least one commissioner from each state shall be a resident of the drainage area of the Red River of the North. Each commissioner may be removed or suspended from office in such manner as shall be provided by the law of the state from which he shall be chosen. Each commissioner shall receive such compensation as may be provided by the legislature of the State he represents, which compensation shall be paid by such state. Each commissioner shall be paid actual expenses necessarily incurred in the performance of his duties as such commissioner.

The commission shall elect from its number a chairman and a vice-chairman and shall appoint, and at its pleasure remove, an executive secretary and such other officers and assistants as may be required to carry out the provisions of this compact in effect and shall fix and determine their duties, qualifications, and compensation. It shall adopt a seal and suitable bylaws and promulgate rules and regulations for its management and control. A majority of the members from each State shall constitute a quorum for the transaction of business, the exercise of any powers, or the performance of any duties, but no action of the commission shall be binding unless at least two of the members from each State shall vote in favor thereof. The commission shall keep accurate accounts of all receipts and disbursements and shall make an annual report to the governor of each State setting forth in detail the operations and transactions conducted by it pursuant to this compact, and shall make recommendations for any legislative action deemed by it advisable. Including amendments to the statutes of the States which may be necessary to carry out the intent and purpose of this compact, and such changes in the area of the district as may seem desirable. The commission shall not incur any obligations for salaries, office, or other administrative expenses prior to the making of appropriation adequate to meet the same; nor shall the commission pledge the credit of any of the States except by and with the authority of the legislatures thereof. Each State reserves the right to provide hereafter by law for the examination and audit of the accounts of the commissoner of Water Resources.
sion by its comptroller or other official. It shall be the duty of the commission to study the various water problems relating to water supply within the Tri-State Waters Area.

Plans for works on boundary waters in these drainage areas prepared by the state, municipal or industrial agencies, shall receive the approval of the commission before construction is begun.

It shall be the duty of the commission to maintain and control lake levels and stream flow on boundary waters within the area, but such action shall be taken only with the approval of the authorized county or state agencies, in which such lake or stream is located, but the commission shall have no power or jurisdiction over water levels or stream flow in the Otter Tail river which is known as that portion of the Red river originating in Becker and Otter Tail counties extending and flowing in a southerly and southwesterly direction through the counties of Becker, Otter Tail, and Wilkin, and emptying into the Red River of the North at the junction of the Belts de Sioux at Breckenridge, Minnesota, and its chain of lakes and its tributaries. The commission shall have power to cooperate with any duly authorized federal, state, or municipal agency in studies and surveys, construction, maintenance, and operation of water projects within the scope of its jurisdiction. The commission shall be authorized to exercise the power of eminent domain, to acquire such real and personal property as may be reasonably necessary or appropriate for or incidental to the execution of its authorized purposes, and generally to exercise in connection with its property and affairs and in connection with property within its control any and all powers which may be exercised by a private corporation in connection with similar property and affairs.

The commission shall study the methods of financing the construction, control, maintenance, and operation of projects and shall recommend for enactment to the legislatures of the states concerned such legislation as will effectuate the purposes and ends of the commission. Each state shall bear its proportionate share of the expenses of the commission based on the pro rata value to such state of the activities of the commission, which expense shall be provided for by appropriation by the legislature. Should any part of this compact be held to be contrary to the constitution of any of the states or of the United States, such part of the compact shall become inoperative as to each state, but all other severable provisions of this compact shall continue in full force and effect.

This compact shall become operative immediately after the passage of an act substantially conforming to the compact provisions of sections 114.09 to 114.11 by the legislature of each of the three states which are parties hereto, or, as to such state, in the event that either or both of the other two states parties hereto shall provide for the consummation of this compact by action of the governor, upon the entering into a compact signed by the governor of such state or states and the governor of this state substantially embodying the provisions of this compact. The governor of this state is hereby authorized to enter into such a compact. The three commissioners from this state on the Tri-State Waters Commission shall be appointed as follows: two of the commissioners shall be appointed by the governor from residents of the Tri-State Waters Area and shall serve for a term of two years. The third shall be the commissioner of conservation. Each commissioner shall be reimbursed for actual expense in attending the meetings of the commission and in performing his duties as such commissioner and $10 for each day of actual service.

FEDERAL-STATE PLANNING ORGANIZATIONS

In the last two decades, the water and related land resources planning programs of Federal agencies have expanded greatly, and new Federal agencies have been brought into the planning field. Institutional arrangements for coordinating Federal planning efforts with the planning activities of State, local, and private organizations have improved. Federal-State planning organizations are conducting, or will be conducting, studies whose geographic major river basin and sub-river basin areas will essentially blanket the Nation.

There are four Federal-State planning organizations concerned with water and related land resources planning, development and management in Minnesota. They are: Souris-Rainy river basin commission, Great Lakes basin commission, upper Mississippi river comprehensive basin study coordinating committee and Missouri basin inter-agency committee. The areas of responsibility in Minnesota of Federal State planning organizations are shown in Figure 1.

Historical Information

Water resources development in the early days of the Nation was primarily the responsibility of private institutions. First plans were of the individual single-purpose project type for building mills or for improving a waterway for navigation. An outgrowth of an interstate argument over navigation was the commerce clause of the Constitution which gave the Federal government control over interstate and foreign commerce (see Fox, I.K., 1967. Review and Interpretation of Experiences in Water Resources Planning. Selected Chapters from Organization and Methodology for River Basin Planning. WRC-0167.5, Georgia Institute of Technology).

The Albert Gallatin report of 1808 was concerned with an improved transportation system. The report did not result in the authorization of projects by congress nor the initiation of construction. During the canal era, State governments played a leading role in the water resources development field. As the result of unwise investments made in canal facilities, numerous States adopted constitutional amendments which precluded State governments from borrowing money to invent in large public works projects.

The Windom report was submitted to congress in 1874 and it recommended the construction of navigation facilities to compete with the railroads and the construction of competitive railroad lines. The report was not adopted by congress; railroads were regulated through the establishment of the Interstate commerce commission a few years later.

The first Federal commission created to plan for comprehensive water resources development was the Mississippi river commission, established in 1879. The rivers and harbors Act of June 28, 1879, which authorized the appointment of the commission, directed it "...to take into consideration and mature such plan or plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi river; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the postal service."
The commission, although its members were to be appointed by the president subject to the advice and consent of the senate, was directed to report to the secretary of war, and three of the commissioners were required to be selected from the army corps of engineers. The balance of the commission was to include one member from the coast and geodetic survey, and three from civil life, two of whom must be civil engineers. The staff of the commission was to be furnished by detail of officers and men from the corps of engineers and the coast and geodetic survey. The Mississippi river commission exists today, and it has been assigned the task of carrying out works of improvement authorized by congress.

A similar commission was created under the terms of the rivers and harbors Act of July 5, 1884, to superintend and direct improvement of the Missouri river. The Missouri river commission consisted of five members, appointed by the president with the advice and consent of the senate. Three commissioners had to be selected from the corps of engineers and two from civil life. This commission also was responsible to the war department. It was abolished by the rivers and harbors Act approved June 13, 1902, and its work and functions were transferred to the secretary of war.

In 1884 congress abolished all tolls on government canals and improved rivers. The California debris commission, created by the Act of congress approved March 1, 1883, in addition to its function of controlling hydraulic debris in the Sacramento and San Joaquin rivers, had responsibility for masting and adopting plans for improving navigability and affording flood relief in those rivers and their tributaries. In 1902 the reclamation Act was passed, establishing the reclamation service and initiating the policies which are the forerunners of those that now guide the bureau of reclamation.

On March 14, 1907, president Theodore Roosevelt appointed the inland waterways commission to prepare and report on a comprehensive plan to prepare and report on a comprehensive plan the improvement and control of the river systems of the Nation. The commission in 1908 made a series of recommendations calling essentially for a comprehensive approach to be followed in all planning for the use of inland waterways and that, wherever practicable, Federal agencies should cooperate with States, municipalities, communities, corporations, and individuals with a view to an equitable distribution of costs and benefits. The commission recommended that congress authorize the president to appoint and organize a National waterways commission to bring into coordination the work of the several agencies of the Federal government that already had responsibilities with respect to inland waterways. Congress implemented the recommendation of the commission to create a National waterways commission. The commission was composed of 12 congressmen, six from each house of congress. The commission made significant recommendations with respect to navigation canals, relationships between waterways and railways, public terminals, impounding reservoirs for flood prevention, the influence of forestation upon the navigability of streams, and desirable legislation for the development and control of water power.

In 1917, congress authorized a waterways commission consisting of seven members to be appointed by the president of the United States at least one of whom was to be chosen from the active or retired list of the army corps of engineers, and at least one of whom was to be an expert hydraulic engineer from civil life or the public service. The members of the waterways commission were never appointed, and the provision creating the commission was repealed by the Federal water power Act of 1920. The Federal power Act of 1920
recognized the unity of the river basin and the importance of considering all purposes to be served in the planning of river basin facilities.

Congress, in 1927, authorized a series of comprehensive reports on most of the rivers of the Nation on the basis of a list and estimate of cost prepared by the Army Corps of Engineers and the Federal Power Commission and printed in House Document 308, 69th Congress, 1st Session. Under this authorization, the Corps of Engineers proceeded to prepare "308" reports or plans for water resources development for the purposes of navigation, flood control, hydroelectric power, and irrigation on almost all of the rivers of the United States. The work and preparation of these river basin planning reports continued through the middle 1930's, and they formed the foundation for much of the river basin development authorized during that time and in the early postwar period.

In response to congressional resolutions in the 1930's, the president established a cabinet committee on water flow (Secretary of Interior, War, Agriculture, and Labor) to report on a comprehensive plan for the improvement and development of the rivers of the Nation and to serve in guiding congressional legislative activity for river development. The committee selected 10 major river basins and watersheds that were most promising for early development, and suggested further studies and adequate planning prior to development. The basins selected, in order of priority, were (1) Tennessee, (2) Great Lakes-St. Lawrence, (3) main stem Mississippi, (4) Missouri, (5) Sacramento-San Joaquin, (6) Delaware, (7) Columbia, (8) Colorado, (9) Ohio, and (10) Great Salt Lake Basin.

Prior to World War II, general work on comprehensive planning continued in Washington under committees and commissions established under the executive power of the president. These included primarily, the Mississippi Valley Commission of the public works administration, the National resources board and its water planning committee, the National resources committee with its water resources committee, and, finally, the National resources planning board. Out of the efforts of these agencies, in cooperation with State officials and Federal agencies, a series of drainage basin reports were prepared outlining the scope of potential water resources development. This work was put on the shelf during World War II, when Congress abolished the National resources planning board. The activities of the National resources board were incorporated by reference into every rivers and harbors and flood control Act since, and form the basis for coordination of the work of the corps of engineers, the bureau of reclamation, and the States affected by their proposed water resource development work.

In the years immediately before and after World War II, several serious attempts were made to establish valley authorities in the Missouri river and the Columbia river basins. Federal agencies increased their efforts at voluntary coordination of their individual programs through the medium of interagency committees. Thus, interagency river basin committees were established to coordinate river basin development work in the Missouri and the Columbia river basins. These first two interagency river basin committees were set up under the aegis of the Federal interagency river basin committee, a voluntary organization formed in 1943 under an agreement between the secretaries of interior, war, and agriculture and the chairmen of the Federal power commission, to coordinate river basin development work in the Missouri and the Columbia river basins. These two committees were followed by the Federal interagency river basin committee, under the chairmanship of a representative of the department of the army, to conduct the study. The committee consisted of representatives of the departments of agriculture, army; interior; commerce; health, education, and welfare (originally represented by its predecessor, the Federal security agency); and labor, and the Federal power commission, with participation by representatives of the States of Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico, Oklahoma, and Texas. As the work of the committee went into the final stages, President Eisenhower appointed an adviser to assist in the resolution of differences that had arisen among the committee members during the conduct of the study. The report on the comprehensive plan which evolved was transmitted to Congress on June 18, 1956, roughly six years after the committee was formed. A similar interagency committee was established in 1950 to carry out comprehensive studies of river
basins in the New England-New York area, also under the authority contained in the 1950 flood control Act. The plan which evolved from these studies was transmitted to congress on June 18, 1956 (see Schad, T. M. 1967. Legislative History of Federal River Basin Planning Organizations. Selected Chapters from Organization and Methodology for River Basin Planning. WRC-0167). A commission under the direction of president Truman undertook a broad study of water resources policy. The president’s water resources policy commission, when it reported in December 1950, suggested that congress set up a separate river basin commission for each of the major basins. Each river basin commission, on a representative basis, should be authorized to coordinate the surveys, construction activities, and operations of the Federal agencies in the several basins, under the guidance of independent chairman appointed by the president, and with the participation of State agencies in the planning process. The commission recommended that congress designate the Federal government as the independent agency to participate in the river basin commissions, to provide representation of all agencies with functions included in water resources programs. The recommendations were never formally placed before congress. In 1954, president Eisenhower established an advisory committee on water resources policy consisting of his secretaries of agriculture, defense, and interior, to make an extensive, in depth review of all aspects of water policy. The committee was asked to make recommendations for the strengthening, classification, and modernization of water policies, and to suggest an approach to the organizational problems involved to assure that the Federal government and State and local governments and other non-Federal interests might cooperate to develop the Nation’s water resources. The advisory committee, which reported to the president on December 25, 1955, also recommended the establishment of independent agencies at the Federal, regional, or river basin level, for such purposes and duration as required to effectively plan for the use and development of water resources. The recommendation called for a permanent non-voting chairman of each such committee to be appointed by the president. Membership was to include one representative of each Federal department having water resources responsibilities, to be appointed by the head of his department, and one qualified representative of each affected State, to be appointed by its Governor, all to serve on an equal basis. Advisory participation by the Federal power commission and the department of justice was suggested when appropriate. Each water resources committee was to prepare and keep up to date a comprehensive plan for development of water and related land resources in its basin. Work of the Federal agencies and the several river basin committees was to be coordinated by an interagency committee on water resources under the chairmanship of a coordinator of water resources in the executive office of the president. President Eisenhower transmitted the report to congress on January 17, 1956, commending its fundamental purposes and objectives and recommending that the congress give prompt attention to its proposals. But, in the absence of any specific recommendations by the president for legislation to implement the recommendations of his advisory committee, no action was taken by the congress. Proposals were made during the 1950’s to establish river basin planning commissions in various river basins of the Nation. Among those are planning commissions for the northeastern United States, the Susquehanna, the Columbia, and the Missouri river basins. Two river basin commission proposals appeared in 1958 that were destined to become law. These were for the United States study commissions for the southeast river basins and the Texas river basin. The senate select committee on National water resources, established in 1959 to conduct a study of nationwide dimensions, released its final report on January 30, 1961. This was a major document in the water resources field at the time, and it carried with it a number of far-reaching recommendations for National water policy. The committee urged: 1) Federal-State cooperation in preparation of comprehensive river basin plans, 2) Federal grants to the States for water resources planning, 3) a broadening of Federal research efforts in the area, and 4) Federal-State cooperation in flood control programs and water storage projects. From these and other recommendations of the committee emerged the framework of broad new legislation. Later in the year, several of the senate select committee’s major recommendations were introduced in congress by the Kennedy administration. Features of the bills were: 1) a ten-year program of matching grants to the States for water resources planning, 2) coordination of all Federal water resources activities within a proposed interagency water resources council, and 3) a proposal for establishment of river basin commissions in each major river basin of the country to conduct comprehensive planning. The Kennedy administration water resources planning bills were not seriously considered. The general characteristics of the bills, granting a preponderance of authority to the Federal government, suggested overtones of centralization and made them unappealing to many members of congress and to State water resources officials. Title II of the bills, providing for establishment of joint Federal-interstate river basin commissions, bore the brunt of the criticism; its specific requirement that States, as well as Federal, membership on such commissions be appointed by the president proved to be unsatisfactory. On September 22, 1961, as an amendment to Title II was amended to provide that State membership on river basins commissions would be determined by the States themselves. On July 22, 1965 president Lyndon B. Johnson signed into law the water resources planning Act. The 1965 law embodied essentially the features originally recommended by the senate select committee’s 1961 report on national water resources. Approaches to River Basin Planning

Seven different approaches to water and related land resources river basin planning have been used in the postwar period. Some of these are but minor variations of others. These seven approaches may be characterized as follows:

(1) The individual Federal agency planning effort. This situation is an agency such as the corps of engineers or the bureau of reclamation proceeds with the planning without adopting any formal arrangements for coordination other than those specified in the flood control Act of 1944. Generally speaking, consultations with other agencies and with State and local governments occur as the planning proceeds. In some cases other agencies will be requested to contribute to the planning effort, but the principal agency assumes full responsibility for the program.

(2) The ad hoc coordinating committee chaired by a representative of a Federal or State agency and comprised of representatives of participating States and Federal agencies.
(3) The river basin inter-agency committee, which usually has an annually rotating chairmanship, and also is comprised of participating States and Federal agencies. These inter-agency committees now are chartered by the water resources council.

(4) The interagency river basin commissions. These are essentially an outgrowth of the inter-agency committee, but they differ in several respects. States and agencies are represented on the commission, but the commission has its own appropriation to finance a central staff and to conduct a certain portion of the planning effort. Individual agencies are also expected to contribute to the planning effort. The chairman of the inter-agency commission is independent of the participating agencies. The commission, as a whole, not only coordinates the planning effort but recommends a plan of development in its report.

(5) State water resources planning. In recent years there has been a growing interest in the strengthening of State water resources planning activities. In the past, most States have been concerned primarily with data collection, the administration of water allocation law, and certain regulatory activities.

(6) The State-Federal commission. In the Delaware river basin commission has been established with representatives from the four basin States and the Federal government to undertake planning activities in that particular basin. The commission is responsible for maintaining up to date a basin-wide comprehensive plan, and all programs undertaken by Federal, State, and local agencies and private organizations must be consistent with that plan.

(7) The river basin commission established under the authority of the Federal water resources planning Act of 1965. The chairman of the commission is a Federal employee appointed by the president and reports to the president through the water resources council. The commission has a professional staff jointly supported by State and Federal funds. During the period 1965 through 1970, five river basin commissions were established: New England river basins commission, Pacific northwest basin commission, Great Lakes basin commission, Souris-Red-Rainy river basins commission and Ohio river basin commission.

In a special message to congress, president Kennedy in February 1961 accepted the recommendation of the senate select committee and committed his administration to the goal of developing comprehensive plans through these seven approaches for all major river basins by 1970. Presidents Johnson and Nixon renewed the commitment, although budgetary requirements have resulted in advancing the scheduled date of completion. As an initial step in carrying out this commitment, coordinated budgets were prepared for 18 studies whose geographic areas would blanket the Nation, except for the two areas of Alaska and the Tennessee valley authority. This was the first time that the major Federal agencies had coordinated their planning schedules and funding estimates in this manner. This action assured the working together of these agencies in a cooperative planning effort.

The Souris-Red-Rainy river basins commission and the Great Lakes basin commission are examples of the 7th approach. The Souris-Red-Rainy river basins commission is composed of representatives of participating States (Minnesota, North Dakota and South Dakota) and Federal agencies (department of agriculture; department of the army; department of commerce; department of health, education and welfare; department of housing and urban development; department of the interior; department of transportation; and Federal power commission). The Great Lakes basin commission is comprised of representatives of participating States (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) and Federal agencies (department of agriculture; department of army; department of commerce; department of health, education and welfare; department of housing and urban development; department of interior; department of justice; department of transportation; and Federal power commission).

The upper Mississippi river comprehensive basin study coordinating committee is an example of the 2nd approach. The committee is composed of representatives of participating States (Illinois, Indiana, Iowa, Minnesota, Missouri, South Dakota and Wisconsin) and Federal agencies (department of agriculture; department of army; department of commerce, department of health, education and welfare; department of interior, and Federal power commission) under the chairmanship of the committee is held permanently by the army corps of engineers which also provides a small staff for the committee. The States do not provide funds for staff support and are invited to participate in committee activities through letters to governors. The Missouri basin inter-agency committee is an example of the 3rd approach. The committee is composed of representatives of participating States (Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming) and Federal agencies (department of agriculture; department of the army; department of commerce; department of health, education and welfare; department of the interior; department of labor and Federal power commission). The chairmanship of the commission is rotated annually among Federal agencies; a standing committee on comprehensive basin framework planning is permanently chaired by the army corps of engineers. The States do not provide funds for staff support. Staff support is provided by Federal agencies; the States do not provide funds for staff support.

Planning Concepts

Four types of plans that have been used frequently in the literature of comprehensive river basin planning are the following:

Framework Plan (Type I). A framework plan provides long-term projections of population growth and economic development; translation of such projections into demands for water and related land resource uses; hydrologic projections of water availability both as to quantity and quality and projections of related land resource availability; outline of the characteristics of projected water and related land resource problems and the general approaches that appear appropriate for their solution. While potential sites may be identified, project formulation studies are not included in the framework plans. The framework plan provides general guides to future water resource development. The plan indicates which areas have water problems calling for prompt detailed planning efforts as well as those where no such problems are current or projected. In addition, the plan provides a substantial contribution of fact and analysis which subsequent detailed planning activities must build on. Normally, the framework plan is the first phase of the comprehensive plan to be prepared by river basin commissions established under the water resources planning act.
Comprehensive River Basin Plans (Type 2). Comprehensive river basin plans extend the scope beyond the type 1 plan to define and evaluate projects in sufficient detail, including project formulation, to comprise a basis for authorization of those Federal and Federally assisted projects to be initiated in the next 10 to 15 years.

Project or Single-Purpose Plans (Type 3). These are plans of narrower geographic compass or by a single agency that usually relate to one project or purpose or a proposal for preservation or improvement of water and related land resources. These studies indicate the relationship of the proposed programs and projects to the comprehensive plan for the river basin, if no comprehensive plan has completed, the relationship to probable later development needed or to be undertaken in the basin.

Cooperative Plans (Type 4). These plans are State-sponsored studies of water resources for all or a part of a State in which one or more Federal agencies are participating.

In 1970, the water resources council adopted a new planning policy. Its objectives were to establish levels instead of types of planning and to clearly differentiate the levels. The policy identified three distinctive levels of pre-authorization planning. Framework studies and assessments are merged into the first and broadest level of planning. They are the evaluation of the broad basis of the needs and desires of people for conservation, development and utilization of water and related land resources and will identify regions (hydrologic, political, economic, etc.) with complex problems which require a more detailed investigations and analyses, and may recommend specific implementation plans and programs in areas not requiring regional or river basin plans. They will consider Federal, State and local means and will be multiple objective in nature. The studies will not involve basic data collection, cost estimation, or detail plan formulation. It is envisioned that the framework studies and assessments will be National in nature broken down by regions, and that the primary input will come from existing data interpreted by experienced planners from all disciplines.

The second level of planning involves regional or river basin planning. They are preliminary or reconnaissance level water and land plans for selected areas. These plans are prepared to resolve complex problems identified by the framework studies and the assessments and will vary widely in scope and detail; will focus on the middle term (15 to 25 years) needs and desires; will involve Federal, State and local interests in plan development; will identify and recommend action plans and programs to be pursued by individual, Federal, State, and local entities. This type study will be programmed only where problems are inter-disciplinary, or such complexity that an intermediate planning step is needed between framework and implementation level studies. The plans will provide a more detailed interpretation of National and regional projections; identify alternative methods and programs; identify alternative projects in uses of water and related land resources; include multiple purpose considerations in each project or program; and evaluate the impacts of both proposed land uses and projects on the environment. Benefits and costs will be determined to the extent necessary to identify the selection of proper alternatives. The quality of life and the regional priorities will be evaluated. One important aspect of the second level studies is that programs or projects recommended must recognize and be based on reasonable assumptions of the investment capabilities of agencies designated to carry out such programs or projects whether such agencies be Federal, State or local.

From the National view, the logical order of comprehensive river basin planning would be, first, the preparation of the framework plan which delineates the areas that need more detailed studies, followed by type 2 or type 4 plans that identify projects that should be constructed in the next 15 years. Type 3 plans which lead to project authorization should be made concurrently or follow. This sequence has not always been followed because of pressing development needs; and as a result, many type 2 plans were initiated before the completion of any of the framework plans. This would be quite a serious matter if it were not for the fact that there has been some fairly broad-scale planning in areas where type 2 studies are under way.

The six major elements of the framework plan are as follows:

1. Projections of economic and population development. Economic and population base studies start with information from a nationwide study by the office of business economics of the department of commerce and the economic research service of the department of agriculture, to prepare economic projections, including population and growth in major economic sectors, to the years 1980, 2000, and 2020.

2. Translation of economic and population projections into needs for water and related land resources uses. The economic projections are made for employment, income, and output for major economic sectors. In addition, information is collected on efficiency of water use in different economic sectors, on costs of water and other substances that affect rates of water use in relation to economic activity. Relating projected economic activity and population growth to water use and pollution loadings is a responsibility of field planners.

3. Appraisals of the availability of water supplies, including quantity and quality. The use of mathematical models and computers has provided substantial improvement in this technique in recent years and is utilized to the extent practicable in the framework plan.

4. Appraisals of the availability and characteristics of related land resources. This involves the classification of soils and relating them to potential agricultural use, including irrigation capabilities. Also included are urban land changes, outdoor recreation and wildlife needs, greenbelts, and other potential uses.
Outline of the characteristics of projected water and related land resources problems. Based on the collection of the foregoing data, the critical problem areas are identified, and the characteristics of the problems are brought into focus.

Alternative approaches that appear appropriate for solution for the foregoing problems. This analysis is based on the general knowledge of development opportunities and costs, reasoned approximations, available data, and judgment of experienced planners. Those basins or parts of basins that have problems are described, including the possible solutions. Areas where no problems are expected in the immediate future are also indicated.

Framework plans are useful to the congress in meeting the Nation's projected needs for water and related land resources by indicating the merits of more detailed studies of subbasins and of specific projects. Detailed plans for individual projects are strengthened when it can be shown that they are a part of a well-conceived comprehensive planning program. The nationwide viewpoint provided by the completed framework program brings into focus the priorities of development and urgency of solutions to problems.

Framework and type 2 plans are prepared following guidelines provided by the water resources council. Framework plans are normally broken into a number (generally exceeding 15) of functional appendices. Work groups, chaired mostly by Federal agency personnel with representatives from both State and Federal agencies, prepare the appendices. It takes committees and commissions from 3 to 6 years to complete a framework plan. Federal agency participation in work group activities is financed through appropriations by congress. The cumulative Federal cost for work group activities is roughly $1 million per year per committee or commission. In addition, the participating States provide some data and manpower for work groups.

Framework plans involving Minnesota are being prepared by the Souris-Red-Rainy river basins commission, Great Lakes basin commission, upper Mississippi river comprehensive study coordinating committee and Missouri basin inter-agency committee. A type 2 plan is being prepared by the Souris-Red-Rainy river basins commission. A type 4 river basin plan was prepared for the Big Sioux river basin which involves parts of Minnesota, South Dakota and Iowa. This plan was sponsored by the State soil and water conservation commissions in the three States as well as the east Dakota conservation subdistrict and the South Dakota water resource commission. The soil conservation service, economic research service, and the forest service, agencies of the Federal department of agriculture, cooperated with the sponsors in this type 4 planning effort. The Minnesota soil and water conservation commission is working with Federal department of agriculture on a type 4 plan for the southern Minnesota river basin in Minnesota.

Souris-Red-Rainy River Basins Commission

The water resources council by resolution adopted December 28, 1966 concurred in the requests for the establishment of the Souris-Red-Rainy river basin commission of the governors of the States of Minnesota and North Dakota to which the governor of South Dakota had given his concurrence. Acting upon the request of the council, president Johnson on June 20, 1967 declared the establishment of the Souris-Red-Rainy river basin commission under the provisions of the water resources planning Act of 1965. President Johnson also appointed Gordon K. Gray of Valley City, North Dakota, to be the first Federal chairman of the commission. President Nixon appointed R.A. Hendrickson of North Dakota to be the second Federal chairman. The vice chairman has been the Minnesota representative of the commission.

The commission was organized on August 3-4, 1967. The organization of the commission is shown in figure 2. Federal members and alternates are appointed by the head of the respective departments; State members and alternates are appointed and serve at the pleasure of the respective governors. The salary, personnel benefits and travel expenses of the vice chairman are paid by Minnesota.

The headquarters of the commission are located in Moorhead, Minnesota. One half of the commission's staff expenses are funded by the participating States; the other half is borne by the Federal government through the council. The State's sharing of the commission's staff expenses are equally apportioned among Minnesota and North Dakota. Minnesota's shares of the commission staff expenses during fiscal years 1966, 1967 and 1968 were $26,600, $54,714, and $30,000, respectively. The commission's staff expenses average about $120,000 per year. In fiscal year 1970, the commission staff consisted of 6 professionals and 3 secretaries.

Under the provisions of the water resources planning Act, the commission is directed to prepare and keep up-to-date a comprehensive, coordinated joint plan for Federal, State, interstate, local and governmental development of water and related resources. The comprehensive river basin plan was to be submitted on or before June 30, 1972. Federal funds (about $1.4 million) were made available for the preparation of a framework plan during fiscal years 1968, 1969 and 1970. The framework plan was originally scheduled for completion by June 30, 1970 and it was later scheduled for completion by June 30, 1971. A type 2 plan for the Red river basin excluding the Devil's lake, Pembina and Roseau river basins was initiated in fiscal year 1971 and is scheduled for completion by January 1, 1972.

The areas of the basins and jurisdiction of the commission extend to those portions of the States of Minnesota, North Dakota and South Dakota that are drained by the Souris-Red-Rainy rivers system. These areas comprise about 59,300 square miles, of which approximately 28,475 square miles are in Minnesota, 29,850 square miles in North Dakota and 975 square miles are in South Dakota. In addition, there are about 30 square miles in northeastern Montana.

The executive order which established the commission provides that:

"Consideration shall be given to consolidating the Commission with a Missouri River Basin Commission, if and when such a commission is established. If a consolidation does not occur, the commission shall terminate within six months after the submission of the comprehensive
river basin plan in accordance with Section 204 (3) of the Act, or
on June 30, 1972, whichever is earlier; unless upon recommendation
of both the Council and not less than one-half the number of member
states, this order is extended."

In 1971, the States requested the water resources council to extend the
termination date of the commission to June 30, 1973.

**Great Lakes Basin Commission**

The water resources council by resolution adopted March 7, 1966 con­
curred in the requests for the establishment of the Great Lakes basin com­
misson of the governors of the States of Indiana, Michigan, Minnesota, Ohio
and Wisconsin to which the governors of Illinois, New York, and Pennsylvania
had given their concurrence. Acting upon the request of the council, presi­
dent Johnson on April 20, 1967 declared the establishment of the Great Lakes
basin commission under the provisions of the water resources planning Act
of 1965. President Johnson also appointed Raymond F. Clevenger of Sault
Sainte Marie, Michigan to be the first Federal chairman of the commission.
President Nixon appointed F.O. Rouse of Michigan to be the second
Federal chairman of the commission. The vice chairman have been the Ohio and Penn­
sylvania representatives of the commission.

The commission was organized on June 19, and 20, 1967. The organi­
zation of the commission is shown in figure 3. The headquarters of the com­
misson are located in Ann Arbor, Michigan. One half of the commission's
staff expenses are funded by the participating States; the other half is
borne by the Federal government through the council. The State's sharing
of the commission's staff expenses are apportioned equally among the States.
Michigan's shares of the commission's staff expenses during fiscal years
1968, 1969 and 1970 were $15,000, $22,500 and $20,000, respectively. The
commission's staff expenses average about $360,000 per year. In 1970,
commission staff consisted of 7 professionals and 8 clerks.

Under the provisions of the water resources planning Act, the Great
Lakes basin commission is directed to prepare and keep up-to-date a com­
mprehensive-coordinated joint plan for Federal, State, interstate, local
and non-governmental development of water and related resources. The com­
mprehensive river basin plan was to be submitted on or before June 30, 1971.
Federal funds (about $2.4 million) were to be available for a framework
plan. This plan was to be completed by June 30, 1971. The framework plan
has been rescheduled for completion during fiscal year 1972. Other activi­
ties of the commission are: Publication of the report, "Long-Range Sched­
ules of Priorities for Water and Related Land Resources Programs." This
represents the first attempt to list and evaluate the priority of current
and proposed Federal and State programs impacting on the Great Lakes basin
water resources. Securing funding of a study to determine the feasibility
of applying limnological systems analysis techniques to planning for manage­
ment of the water and related land resources of the Great Lakes basin. Co­
ordination of numerous related water planning activities.

The geographical area with which the Great Lakes basin commission is
concerned consists of the United States portion of the drainage area of the
five Great Lakes and their tributaries, plus those tributaries of the St.
Great Lakes Basin Commission

Chairman

Vice Chairman

Federal Members
Chairman
Dept. of Agriculture
Dept. of Army
Dept. of Commerce
Dept. of Housing and Urban Development
Dept. of Interior
Dept. of Justice
Dept. of Transportation
Federal Power Commission

State Members
Chairman
Illinois
Indiana
Michigan
Minnesota
New York
Ohio
Pennsylvania
Wisconsin

Lawrence river which reach that stream within the United States. In dimension—118,000 square miles of land and 61,000 square miles of lake areas—this represents about 6 percent of the total area of the 48 contiguous States.

Upper Mississippi River Comprehensive Basin Study Coordinating Committee

The upper Mississippi river comprehensive basin study, to develop a framework plan which will provide a broad guide to the best use or combination of uses of water and related land resources of the basin to meet foreseeable short and long-term needs, was authorized by a resolution of the U.S. senate committee of public works in May 1962. The resolution directed the army corps of engineers to review previous reports on the upper Mississippi river basin in the interest of comprehensive development of water and related land resources of the basin. The army corps of engineers interpreted this congressional mandate to mean that a coordinated comprehensive study of the basin area should be carried out. It was felt that the cooperative efforts of Federal agencies, States, local public agencies, and private interests in the upper Mississippi basin should be invited.

Federal agency funds were provided to carry out the study program. States were originally expected to finance their own participation. Participation of local public agencies and private groups was expected to be purely voluntary. After several rounds of study cost estimates and attempts to define the degree of study detail, a Federal cost estimate of about $4 million was finally settled upon for the upper Mississippi river study. These funds have been distributed by direct appropriation by congress in some cases, and by reimbursement of Federal agencies by the army corps of engineers in other cases.

Actual start of the study began in fiscal year 1963. The study was originally scheduled for completion in December 1968; the framework plan was nearing completion in 1971. Federal agency cooperation was requested and obtained by an exchange of agreements between heads of departments of agriculture; commerce; health, education and welfare; interior; the Federal power commission and the corps of engineers. Each of the Federal departments designated a representative to serve on a coordinating committee. The coordinating committee has met at about 3-month intervals to review study progress, to provide advice on study direction, and to act as a discussion group. The coordinating committee was organized on February 6-7, 1964 and has the membership shown on Figure 4.

The first study item prepared was a plan of study. This was accomplished in 1963 to 1964. The plan of study was prepared to provide an early definition of the problems, to define policies that would govern the conduct of the study, to define needs and objectives of the study, to define the scope and scale of the study, and to provide an information vehicle whereby reviewing personnel could determine the adequacy of the study plan. The plan of study proposed that the final report be broken down into seventeen functional appendices plus the main report.

Primary lead agencies and advisory committees have assisted the army corps of engineers in collecting data or have offered advice on how a particular appendix should be prepared. Eight of these advisory committees were established early in the study; the chairman of each committee was also the...
The Missouri Basin Inter-agency Committee was comprised of the governors of the ten States that lie partially or entirely within the Missouri River basin, and the seven Federal agencies, primary mission of coordination and programming of State and Federal activities involved in water and related land resource development. Its charter was dated November 16, 1954 as follows:

"5. Responsibilities

"(b) The efforts of the committee on coordination of work and solutions of conflicts will be directed towards all agencies and the State agencies involved in the programming, scheduling, and operation of water and related land resource development projects.

"(1) investigation and planning of water and related land resources projects, including scheduling and implementation of basic data "(2) investigation and planning of water and related land resources projects, including scheduling and implementation of basic data.

In mid-1964, Federal agencies and States started a framework plan for the Missouri River Basin Area, leading to a report scheduled for completion by June 30, 1969. The framework plan will provide broad and comprehensive guidance for the preparation of the Missouri River basin comprehensive plan. The plan, which was nearing completion in 1971, has a total cost of about $5.5 million. The Missouri basin inter-agency committee, composed of the governors of the ten States that lie partially or entirely within the Missouri River basin, and the seven Federal agencies, has a primary mission of coordination and programming of State and Federal activities involved in water and related land resource development. Its charter was dated November 16, 1954 as follows:

"5. Responsibilities

"(b) The efforts of the committee on coordination of work and solutions of conflicts will be directed towards all agencies and the State agencies involved in the programming, scheduling, and operation of water and related land resource development projects.

"(1) investigation and planning of water and related land resources projects, including scheduling and implementation of basic data. The framework plan will provide broad and comprehensive guidance for the preparation of the Missouri River basin comprehensive plan. The plan, which was nearing completion in 1971, has a total cost of about $5.5 million. The Missouri basin inter-agency committee, composed of the governors of the ten States that lie partially or entirely within the Missouri River basin, and the seven Federal agencies, has a primary mission of coordination and programming of State and Federal activities involved in water and related land resource development.

The committee's charter was dated November 16, 1954 and authorized the committee to coordinate and resolve conflicts among agencies and the State agencies involved in the programming, scheduling, and operation of water and related land resource development projects. The committee has a primary mission of coordination and programming of State and Federal activities involved in water and related land resource development.
they have provided input data to work groups and task forces.

The Role of the State in Federal-State Planning

In a letter of intent addressed to the Federal water resources council and dated September 2, 1966, governor Rolvaag designated the Minnesota State planning agency to administer title III funds of the Federal water resources planning Act of 1965. Since then the State planning agency has assumed leadership in Minnesota's participation in the activities of Federal-State planning organizations and has made considerable progress toward preparing a statewide water and related land resources plan.

A water resources coordinating committee was created in January 1967 to assist the State planning agency. The committee has members from the following State agencies and other organizations: department of natural resources, geological survey, department of health, State soil and water conservation commission, department of agriculture, department of economic development, department of highways, university of Minnesota, metropolitan council, pollution control agency, water resources board, league of Minnesota municipalities and association of Minnesota counties. The chairman of the committee has served as Minnesota's representative to Federal-State planning organizations. Members of the committee have volunteered to represent the State on work groups of Federal-State planning organizations.

Members of the committee, because of financial and manpower limitations, have only been able to attend a few work group meetings, contribute some information to work groups, and review and comment on materials prepared by work groups. They are participating to the limit of their capability. The funds provided State agencies through title III of the water resources planning Act for participation in Federal-State planning activities are not adequate. In addition, Minnesota's legislature has provided State agencies with no funds to participate in Federal-State planning activities. Minnesota is doing as much as it possibly can under the existing circumstances. Governor LeVander appointed individuals and representatives from private enterprise of the Red-Rainy river basins to serve on a citizen's advisory council. This council is assisting the State planning agency in participating in the activities of the Sours-Red-Rainy river basins commission.

The committee's total budgets for fiscal year 1967, 1968, 1969 and 1970 are summarized below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Statewide planning Activities</td>
<td>$42,000</td>
<td>$27,000</td>
<td>$41,400</td>
<td>$68,000</td>
</tr>
<tr>
<td>Federal-State Planning Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. Organization Chart for Comprehensive Basin Planning Activities of Missouri Basin Inter-
Souris-Red-Rainy River Basins Commission

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$26,400</td>
<td>$54,714</td>
<td>$30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$15,600</td>
<td>$28,286</td>
<td>$28,322</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$42,000</td>
<td>$83,000</td>
<td>$56,321</td>
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</tbody>
</table>

Great Lakes Basin Commission

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$15,000</td>
<td>$22,500</td>
<td>$20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$10,900</td>
<td>$21,600</td>
<td>$20,175</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$25,900</td>
<td>$44,100</td>
<td>$40,175</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Upper Mississippi River Coordinating Committee

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$10,000</td>
<td>$20,000</td>
<td>$20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$20,000</td>
<td>$20,000</td>
<td>$10,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Missouri Basin Inter-Agency Committee

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$8,000</td>
<td>$8,000</td>
<td>$5,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grand Total

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$52,000</td>
<td>$122,900</td>
<td>$196,500</td>
<td></td>
<td>$181,496</td>
</tr>
</tbody>
</table>

¹Assessment for commission staff expenses.

Federal fund expenditures associated with title III of the water resources planning Act made by the committee in fiscal years 1967, 1968, 1969 and 1970 were $26,000, $40,000, $47,100 and $47,100, respectively.

Information concerning the staff complement of the State planning agency supporting the committee is summarized below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resources Planning Director</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Water Resources Planner</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Secretary</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Draftsman</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The committee, during the period 1967-71, has made considerable progress towards the preparation of a framework statewide plan. Three publications have been completed and contain summarized information on: present and past economic and population conditions; availability of water and related land resources; past resources development; water laws, policies and government; present and past water and related land resources problems and planning information needs; an assessment of the States projected (1969-2020) economy, population, water and related land resources availability, demands, opportunities, needs, problems and possible solutions to problems; a set of major planning goals, objectives and policies for possible adoption by the State; programs and projects recommended by Federal-State regional planning organizations; alternative programs and projects from the State viewpoint; factors to be considered in selecting programs and projects; and existing State planning policy questions. The statewide plan will enable the State to react to the plans being prepared by Federal-State planning organizations.

Federal executive branch agencies concerned with water and related land resources planning, development and management in Minnesota are (see figure 6): executive office of the president—office of management and budget, domestic council, office of emergency preparedness, office of science and technology, National council on marine resources and engineering development, council on environmental quality; executive departments—department of the interior including: office of saline water, environmental planning staff, office of water resources research, United States fish and wildlife service—bureau of sport fisheries and wildlife, National park service, bureau of mines, geological survey, bureau of land management, bureau of Indian affairs, bureau of outdoor recreation, bureau of reclamation; department of agriculture including: farmers home administration, forest service, soil conservation service, economic research service, agricultural research service, cooperative State research service, extension service, agricultural stabilization and conservation service; department of commerce including: office of business economics, economic development administration, National oceanic and atmospheric administration; department of Defense—army corps of engineers; department of health, education and welfare; department of housing and urban development; department of transportation including: Federal highway administration and coast guard; and department of justice; independent agencies—atomic energy commission, Federal power commission, interstate commerce commission, National science foundation, water resources council, environmental protection agency; other boards, committees, councils and commissions—citizen's council for environmental quality; National water commission; advisory board on National parks, historic sites, buildings, and monuments; Federal advisory council on regional economic development; Federal council for science and technology; Federal radiation council; migratory bird commission; National forest reservation commission; National park foundation; presidents science advisory committee; quasi-official agency—National academy of sciences-National academy of engineering-National research council; Twin Cities Federal executive board (see "United States Government Organization Manual - 1970/71," Office of The Federal Register, General Services Administration, Superintendent of Documents, Government Printing Office, Washington, D.C.).

Federal responsibilities in water and related land resources planning, development and management in Minnesota are divided among 30 units in 8 executive departments and agencies: 6 independent agencies; 6 units in the executive office of the president; 9 other boards, committees, councils and commissions; and 1 quasi-official agency. A number of other agencies, such as the general accounting office, which has the responsibility for auditing the operations of Federal water resources agencies and therefore has a considerable group of experts having knowledge of Federal water resources activities have not been included in the compilation, because their responsibilities are dependent upon primary activities of other agencies. Likewise, other agencies such as the military departments and the agencies of the general services administration, which engage in water resources activities such as water supply, pollution control, and power generation solely for their own installations, are omitted.
Federal Outlays for Natural Resources Programs


Table 1. Composition of Federal Government Budget, Fiscal Years 1945-70.

<table>
<thead>
<tr>
<th>Function</th>
<th>Percent of Total Budget FY 1945</th>
<th>Percent of Total Budget FY 1950</th>
<th>Percent of Total Budget FY 1955</th>
<th>Percent of Total Budget FY 1960</th>
<th>Percent of Total Budget FY 1965</th>
<th>Percent of Total Budget FY 1970</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Defense</td>
<td>85.7</td>
<td>80.4</td>
<td>78.8</td>
<td>78.8</td>
<td>78.8</td>
<td>80.3</td>
</tr>
<tr>
<td>International Affairs and Finance</td>
<td>3.5</td>
<td>11.1</td>
<td>3.0</td>
<td>3.3</td>
<td>3.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Space Research and Technology</td>
<td>≈</td>
<td>0.1</td>
<td>0.2</td>
<td>0.4</td>
<td>4.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Agricultural and Rural Development</td>
<td>1.7</td>
<td>6.5</td>
<td>5.9</td>
<td>3.6</td>
<td>4.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Natural Resources</td>
<td>0.3</td>
<td>2.9</td>
<td>0.7</td>
<td>1.1</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Commerce and Transportation</td>
<td>4.4</td>
<td>3.9</td>
<td>1.6</td>
<td>5.2</td>
<td>6.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Community Development and Housing</td>
<td>-0.2</td>
<td>0.6</td>
<td>*</td>
<td>1.1</td>
<td>0.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Education and Manpower</td>
<td>0.2</td>
<td>0.5</td>
<td>0.8</td>
<td>1.1</td>
<td>1.9</td>
<td>3.7</td>
</tr>
<tr>
<td>Health</td>
<td>0.2</td>
<td>0.6</td>
<td>0.4</td>
<td>0.8</td>
<td>1.5</td>
<td>6.6</td>
</tr>
<tr>
<td>Income Security</td>
<td>1.3</td>
<td>10.8</td>
<td>13.4</td>
<td>19.8</td>
<td>21.7</td>
<td>22.3</td>
</tr>
<tr>
<td>Veterans Benefits and Services</td>
<td>1.2</td>
<td>20.5</td>
<td>6.6</td>
<td>5.9</td>
<td>4.8</td>
<td>4.4</td>
</tr>
<tr>
<td>General Government</td>
<td>0.8</td>
<td>2.7</td>
<td>1.7</td>
<td>1.4</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Interest</td>
<td>3.7</td>
<td>13.3</td>
<td>8.8</td>
<td>9.0</td>
<td>8.7</td>
<td>9.3</td>
</tr>
<tr>
<td>Allowances</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Undisturbed Deductions</td>
<td>-2.8</td>
<td>-3.9</td>
<td>-1.8</td>
<td>-2.5</td>
<td>-2.6</td>
<td>-3.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*less than 0.05%

The budget for natural resources programs has ranged from 0.3 to 2.9 percent of the total annual budget and outlays for natural resources programs were about 2.5 billion in fiscal year 1970 or 1.3 percent of total outlays. The president's budget for fiscal year 1972 calls for natural resources program outlays of $4.2 billion or 1.9 percent of total outlays.

Natural resources program budget outlays by subfunction in fiscal year 1970 are given below:

<table>
<thead>
<tr>
<th>Subfunction</th>
<th>Outlay (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resources and Power</td>
<td>2,245</td>
</tr>
<tr>
<td>Land Management</td>
<td>754</td>
</tr>
<tr>
<td>Recreation Resources</td>
<td>370</td>
</tr>
<tr>
<td>Mineral Resources</td>
<td>94</td>
</tr>
<tr>
<td>Other Natural Resources Programs</td>
<td>122</td>
</tr>
<tr>
<td>Deductions for Offsetting Receipts</td>
<td>1,105</td>
</tr>
<tr>
<td>Total Natural Resources</td>
<td>2,680</td>
</tr>
</tbody>
</table>

(from The Budget of the United States Government, Fiscal Year 1972)

Water resources and power programs develop projects to control water pollution, produce hydroelectric power, control floods, prevent erosion, improve navigation, and provide recreation facilities. Public land and national forest programs preserve wildlife, scenic resources, and wilderness areas. At the same time, these programs yield forest products, livestock forage, water and minerals, and afford broad opportunities for recreation. Under land management programs, access roads and trails are constructed and the resources of the lands are protected from damage by fire, insects, disease, erosion, and improper use. Recreation programs include management and protection of the National park system, construction and maintenance of park facilities, operation of National wildlife refuges, sport fisheries and wildlife research and technical assistance, construction of Federal fish hatcheries, and preservation of historical properties. Mineral resources programs include research on the conservation and development of minerals and fuels, research in metallurgy and mining, economic and statistical analysis, and coordination of oil and gas activities. Other natural resources programs include such activities as water resources investigations, geological and mineral resource surveys, and topographic and mapping.

Federal natural resources program outlays in fiscal year 1970 by program and agency are given in table 2.

Table 2. Fiscal Year 1970 Federal Natural Resources Program Outlays Subdivided by Program and Agency

<table>
<thead>
<tr>
<th>Program and Agency</th>
<th>Outlay (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water resources and power:</td>
<td></td>
</tr>
<tr>
<td>Environmental Protection Agency (water pollution control)*</td>
<td>262</td>
</tr>
<tr>
<td>Corps of Engineers*</td>
<td>1,195</td>
</tr>
<tr>
<td>Department of the Interior:</td>
<td></td>
</tr>
<tr>
<td>Bureau of Reclamation*</td>
<td>263</td>
</tr>
<tr>
<td>Power marketing agencies*</td>
<td>139</td>
</tr>
<tr>
<td>Office of Saline Water*</td>
<td>90</td>
</tr>
<tr>
<td>Office of Water Resources Research and other</td>
<td>12</td>
</tr>
<tr>
<td>Tennessee Valley Authority</td>
<td>211</td>
</tr>
<tr>
<td>Soil Conservation Service--watershed projects*</td>
<td>115</td>
</tr>
<tr>
<td>Federal Power Commission and other</td>
<td>28</td>
</tr>
<tr>
<td>Subtotal, water resources and power</td>
<td>2,245</td>
</tr>
<tr>
<td>Land management:</td>
<td></td>
</tr>
<tr>
<td>Forest Service*</td>
<td>556</td>
</tr>
<tr>
<td>Bureau of Land Management and other*</td>
<td>193</td>
</tr>
<tr>
<td>Mineral resources*</td>
<td>94</td>
</tr>
<tr>
<td>Recreation resources:</td>
<td></td>
</tr>
<tr>
<td>Bureau of Outdoor Recreation</td>
<td>117</td>
</tr>
<tr>
<td>National Park Service*</td>
<td>139</td>
</tr>
<tr>
<td>Bureau of Sport Fisheries and Wildlife*</td>
<td>115</td>
</tr>
<tr>
<td>Other natural resources programs</td>
<td>122</td>
</tr>
<tr>
<td>Deductions for offsetting receipts:</td>
<td></td>
</tr>
<tr>
<td>Interfund and intragovernmental transactions</td>
<td>-1</td>
</tr>
<tr>
<td>Proprietary receipts from the public</td>
<td>-1,195</td>
</tr>
<tr>
<td>Total</td>
<td>2,480</td>
</tr>
</tbody>
</table>

*Includes both Federal funds and trust funds

(from The Budget of the United States Government, Fiscal Year 1972)
Federal natural resources outlays in fiscal year 1970 for public works programs associated with water resources and related developments are given in table 3.

<table>
<thead>
<tr>
<th>Program and Agency</th>
<th>Outlay (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood control works:</td>
<td></td>
</tr>
<tr>
<td>Agriculture: Soil Conservation Service (mostly grants)</td>
<td>62.2</td>
</tr>
<tr>
<td>Army: Corps of Engineers—Civil</td>
<td>273.6</td>
</tr>
<tr>
<td>Grants</td>
<td>6.4</td>
</tr>
<tr>
<td>Interior: Bureau of Reclamation</td>
<td>2.3</td>
</tr>
<tr>
<td>State: International Boundary and Water Commission</td>
<td>7.5</td>
</tr>
<tr>
<td>Tennessee Valley Authority</td>
<td></td>
</tr>
<tr>
<td>Total flood control works</td>
<td>352.6</td>
</tr>
<tr>
<td>Beach erosion control: Army: Corps of Engineers—Civil</td>
<td>2.5</td>
</tr>
<tr>
<td>Irrigation and water conservation works:</td>
<td></td>
</tr>
<tr>
<td>Agriculture: Soil Conservation Service (mostly grants)</td>
<td>15.5</td>
</tr>
<tr>
<td>Interior:</td>
<td></td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>4.3</td>
</tr>
<tr>
<td>Bureau of Reclamation</td>
<td>64.7</td>
</tr>
<tr>
<td>Loan and grant program</td>
<td>3.8</td>
</tr>
<tr>
<td>Total irrigation works</td>
<td>88.3</td>
</tr>
<tr>
<td>Navigation facilities:</td>
<td></td>
</tr>
<tr>
<td>Army: Corps of Engineers—Civil</td>
<td>189.2</td>
</tr>
<tr>
<td>Transportation: Saint Lawrence Seaway Corporation</td>
<td>1.1</td>
</tr>
<tr>
<td>Tennessee Valley Authority</td>
<td></td>
</tr>
<tr>
<td>Total navigation facilities</td>
<td>189.3</td>
</tr>
<tr>
<td>Multiple-purpose dams and reservoirs with hydroelectric power facilities:</td>
<td></td>
</tr>
<tr>
<td>Army: Corps of Engineers—Civil</td>
<td>269.2</td>
</tr>
<tr>
<td>Interior: Bureau of Reclamation</td>
<td>63.0</td>
</tr>
<tr>
<td>Tennessee Valley Authority</td>
<td>13.4</td>
</tr>
<tr>
<td>Total multiple-purpose facilities</td>
<td>356.6</td>
</tr>
<tr>
<td>Power plants: Tennessee Valley Authority</td>
<td>261.7</td>
</tr>
<tr>
<td>Power transmission facilities:</td>
<td></td>
</tr>
<tr>
<td>Interior:</td>
<td></td>
</tr>
<tr>
<td>Bureau of Reclamation</td>
<td>23.1</td>
</tr>
<tr>
<td>Bonneville Power Administration</td>
<td>101.9</td>
</tr>
<tr>
<td>Southwestern Power Administration</td>
<td>3.1</td>
</tr>
<tr>
<td>Tennessee Valley Authority</td>
<td>59.5</td>
</tr>
<tr>
<td>Total power transmission facilities</td>
<td>187.6</td>
</tr>
<tr>
<td>Total water supply and waste disposal</td>
<td>455.9</td>
</tr>
<tr>
<td>Total water resources and related developments</td>
<td>1,883.5</td>
</tr>
</tbody>
</table>

Coordinated long-range economic, hydrologic and land-use projections are employed to help assure economic design of water resources facilities. Outlays for such preliminary planning, surveys and investigations are not included in the table above.

Federal outlays for water resources and related developments during the period fiscal years 1963-72 are shown in figure 7. It can be seen that outlays for water supply and waste disposal have been increasing in relation to outlays for other major types of water resources development.

Federal funding for selected environmental activities during the period fiscal years 1961-72 is shown in figure 8. Activities covered include: pollution control and abatement programs; sewer and water programs; selected programs to protect and enhance the environment; and programs to understand, describe, and predict environmental conditions. The relationship between Federal outlays and budget authority for water pollution control programs is shown in figure 9.


Water supply and waste disposal facilities:
- Funds appropriated to the President: Appalachian regional development program (grants) 5.2
- Agriculture: Farmers Home Administration (grants) 21.9
- Commerce: Economic Development Administration (primarily grants) 75.5
- Housing and Urban Development:
  - Grants 109.0
  - Loan disbursements 43.7
- Interior: Bureau of Reclamation 23.9
- State: International Boundary and Water Commission 2.3
- Environmental Protection Agency (grants) 176.4
- Total water supply and waste disposal 455.9
- Total water resources and related developments 1,883.5

(from Special Analyses, Budget of The United States Government, Fiscal Year 1972)
Figure 7. Federal Outlays for Water Resources and Related Developments.

Figure 8. Federal Budget Authority for Major Environmental Quality Programs.

Figure 9. Relationship Between Federal Outlays and Budget Authority for Water Pollution Control Programs.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of Water</td>
<td>2.8</td>
<td>3.2</td>
<td>1.9</td>
<td>1.5</td>
<td>0.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Water cycle</td>
<td>13.1</td>
<td>14.9</td>
<td>17.2</td>
<td>19.6</td>
<td>20.9</td>
<td>21.5</td>
</tr>
<tr>
<td>Water supply augmentation and conservation</td>
<td>12.6</td>
<td>19.3</td>
<td>32.3</td>
<td>34.1</td>
<td>34.7</td>
<td>36.1</td>
</tr>
<tr>
<td>Water quality management and control</td>
<td>3.9</td>
<td>3.6</td>
<td>5.0</td>
<td>5.1</td>
<td>5.1</td>
<td>5.7</td>
</tr>
<tr>
<td>Water quality management and protection</td>
<td>10.6</td>
<td>12.4</td>
<td>26.7</td>
<td>34.4</td>
<td>36.0</td>
<td>36.2</td>
</tr>
<tr>
<td>Water resources planning</td>
<td>2.5</td>
<td>3.0</td>
<td>5.9</td>
<td>9.5</td>
<td>11.1</td>
<td>11.4</td>
</tr>
<tr>
<td>Resources data</td>
<td>1.8</td>
<td>2.0</td>
<td>2.2</td>
<td>2.5</td>
<td>2.6</td>
<td>2.7</td>
</tr>
<tr>
<td>Engineering works</td>
<td>4.2</td>
<td>2.7</td>
<td>5.9</td>
<td>6.6</td>
<td>6.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Manpower, grants and facilities</td>
<td>18.3</td>
<td>24.4</td>
<td>19.6</td>
<td>10.4</td>
<td>12.6</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70.0</strong></td>
<td><strong>85.5</strong></td>
<td><strong>116.7</strong></td>
<td><strong>123.7</strong></td>
<td><strong>130.6</strong></td>
<td><strong>133.5</strong></td>
</tr>
</tbody>
</table>

At the end of fiscal year 1970, there were 2,552,571 full-time permanent civilian employees in the Federal executive branch. Total fiscal year 1970 employment in agencies of concern is given below:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Agriculture</td>
<td>82,553</td>
</tr>
<tr>
<td>Department of Commerce</td>
<td>25,427</td>
</tr>
<tr>
<td>Department of Defense, Civil Functions</td>
<td>30,293</td>
</tr>
<tr>
<td>Department of the Interior</td>
<td>56,570</td>
</tr>
<tr>
<td>Environmental Protection Agency</td>
<td>5,778</td>
</tr>
</tbody>
</table>

Federal civilian employment as of June 1970 in Minnesota totaled 29,818.

Federal Outlays for Water and Related Land Resources Programs in Minnesota

In fiscal year 1970, Federal outlays for water and related land resources activities in Minnesota totaled about $75 million or 2.3 percent of total Federal outlays in Minnesota of approximately $3.3 billion (see table 4). About 1.2 percent of Federal outlays for water and related land resources activities in the entire Nation were made in Minnesota. Federal outlays generally means obligations of government administered funds, except deposit funds. However, in some instances the data may represent costs or expenditures. The document "Federal Outlays in Minnesota" is published for the executive office of the president by the information services division, office of planning, research and evaluation of the office of economic opportunity, through its Federal information exchange system.

Table 4. Federal Outlays in Minnesota by Selected Function, FY 1970

<table>
<thead>
<tr>
<th>Function</th>
<th>Outlay (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Defense</td>
<td>708.1</td>
</tr>
<tr>
<td>Atomic Energy</td>
<td>3.7</td>
</tr>
<tr>
<td>Defense-related activities</td>
<td>1.4</td>
</tr>
<tr>
<td>Econ. and Financial Assist.</td>
<td>7.7</td>
</tr>
<tr>
<td>Food for Freedom</td>
<td>.6</td>
</tr>
<tr>
<td>Space Res. and Tech.</td>
<td>58.4</td>
</tr>
<tr>
<td>Farm Income Stabilization</td>
<td>519.4</td>
</tr>
<tr>
<td>Finance's Farm and Rural Housing</td>
<td>19.2</td>
</tr>
<tr>
<td>Agri. Land and Water Resources</td>
<td>8.4</td>
</tr>
<tr>
<td>Res. and Other Agri. Services</td>
<td>15.3</td>
</tr>
<tr>
<td>Water Resources and Power</td>
<td>18.5</td>
</tr>
<tr>
<td>Land Management</td>
<td>7.8</td>
</tr>
<tr>
<td>Mineral Resources</td>
<td>2.8</td>
</tr>
<tr>
<td>Fish and Wildlife Resources</td>
<td>12.7</td>
</tr>
<tr>
<td>Recreational Resources</td>
<td>.8</td>
</tr>
<tr>
<td>Air Transportation</td>
<td>16.8</td>
</tr>
<tr>
<td>Water Transportation</td>
<td>2.0</td>
</tr>
<tr>
<td>Ground Transportation</td>
<td>128.6</td>
</tr>
<tr>
<td>Postal Service</td>
<td>147.3</td>
</tr>
<tr>
<td>Advancement of Business</td>
<td>3.9</td>
</tr>
<tr>
<td>Area and Regional Development</td>
<td>7.0</td>
</tr>
<tr>
<td>Regulation of Business</td>
<td>.2</td>
</tr>
<tr>
<td>Concentrated Community Development</td>
<td>15.7</td>
</tr>
<tr>
<td>Community Environment</td>
<td>34.9</td>
</tr>
<tr>
<td>Community Facilities</td>
<td>7.8</td>
</tr>
<tr>
<td>Community Planning and Administration</td>
<td>1.2</td>
</tr>
<tr>
<td>Maintenance of Housing Mort. Market</td>
<td>39.7</td>
</tr>
<tr>
<td>Elem. and Secondary Education</td>
<td>16.3</td>
</tr>
</tbody>
</table>

Vocational Education 6.7
Manpower Training 10.9
Sci. Ed. and Basic Research 5.0
Other Ed. and Manpower Aids 10.2
Health 204.6
Income Security Payments 748.5
Social and Indiv. Services 46.2
Vet. Service-Connected Compensation 104.5
Vet. Readjust. Benefits 34.4
Vet. Hosp. and Med. Care 36.0
Other Vets. Benef. and Serv. 26.0
Interest on Public Debt 153.8
Int. on Refunds of Rec. 1.6
Central Fiscal Operations 11.2
General Prop. and Records Management 15.1
Central Personnel Management 1.0
Law Enforcement and Justice 9.8
All other -- not calculated --- 3,259.2


Fiscal years 1967-70, Federal outlays for water and related land resources programs in Minnesota subdivided by agency are listed in table 5.

Table 5. Federal Outlays for Water and Related Land Resources Programs in Minnesota by Agency, Fiscal Years 1967-70

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of the Interior</td>
<td>15.0</td>
<td>22.1</td>
<td>24.6</td>
<td>34.6</td>
</tr>
<tr>
<td>Department of Agriculture</td>
<td>24.2</td>
<td>25.2</td>
<td>21.7</td>
<td>20.9</td>
</tr>
<tr>
<td>Department of Commerce</td>
<td>4.1</td>
<td>2.5</td>
<td>2.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Army Corps of Engineers</td>
<td>7.8</td>
<td>7.6</td>
<td>10.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Department of Health, Education, and Welfare</td>
<td>0.3</td>
<td>0.2</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>Department of Housing and Urban Development</td>
<td>3.8</td>
<td>9.3</td>
<td>3.9</td>
<td>8.3</td>
</tr>
<tr>
<td>Department of Transportation</td>
<td>1.6</td>
<td>1.8</td>
<td>3.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>56.8</td>
<td>68.7</td>
<td>66.2</td>
<td>74.6</td>
</tr>
</tbody>
</table>


Taking into account fluctuations in outlays from year to year, total Federal outlays for water and related land resources programs in Minnesota increased from about $57 million in fiscal year 1967 to $75 million in fiscal year 1970. Most of the increase has occurred in water pollution control and fish and wildlife programs.

In fiscal year 1970, there were about 1,300 Federal employees residing in Minnesota with assignments pertaining to the planning, development and management of the water and related land resources. In fiscal year 1967, there were about 1,200 such Federal employees. The distribution of Federal employees according to departments in fiscal year 1970 was approximately as follows: department of agriculture - 466, army corps of engineers - 437, department of the interior - 289, department of commerce - 73, and others 35. In the department of agriculture the largest number of Federal employees were with the soil conservation service, forest service and agricultural research service, in that order. The largest number of Federal employees in the department of the interior were with the bureau of sport fisheries and wildlife, geological survey, and others in that order. Most of the Federal employees in the department of commerce were with the National weather service. Most Federal employees are located in the Twin Cities and at Duluth.


The office of management and budget was established in the executive office of the president pursuant to reorganization plan 2 of 1970, effective July 1, 1970. The office's functions include the following: to aid the president to bring about more efficient and economical conduct of government service; to assist in developing efficient coordinating mechanisms to implement government activities and to expand interagency cooperation; to assist the president in the preparation of the budget and the formulation of the fiscal program of the government; to supervise and control the administration of the budget; to conduct research and promote the development of improved plans of administrative management, and to advise the executive departments and agencies of the government with respect to improved administrative organization and practice; to assist the president by clearing and coordinating departmental advice on proposed legislation and by making recommendations as to presidential action on legislative enactments, in accordance with past practice; to assist in the consideration and clearance and, where necessary, in the preparation of proposed executive orders and proclamations; to plan and promote the improvement, development, and coordination of Federal and other statistical services; to plan and develop information systems to provide the president with program performance data; to plan, conduct, and promote evaluation efforts to assist the president in the assessment of program objectives, performance, and efficiency; to plan and develop programs to recruit, train, motivate, deploy, and evaluate career personnel; and to keep the president informed of the progress of activities by agencies of the government with respect to work proposed, work actually initiated, and work completed, together with the relative timing of work between the several agencies of the government all to the end that the work programs of the several agencies of the executive branch of the government may be coordinated and that the moneys appropriated by the congress may be expended in the most economical manner with the least possible overlapping and duplication of effort. Expenditures of the office totaled $11,676,000 in fiscal year 1970.

In order to facilitate budgeting activities, all departments and establishments of the executive branch, authorized by law to plan, propose, undertake, or aid public works and improvement projects financed in whole or in part by the Federal government, prepare and keep up-to-date, by means of at least an annual revision, carefully planned and realistic long-range programs of such projects. (All such programs being hereinafter referred to as "advance programs"). Whenever any estimate of appropriation is submitted to the office by such departments and establishments for the carrying out of any
vestigations, plans and specifications, or other planning activities, whether for public works and improvement project or projects or for the financing of any such project or projects or for examinations, surveys, investigations, plans and specifications, or other planning activities, whether preliminary or detailed, for any such project or projects, the advance program or programs relating to the proposed work or expenditure are submitted to the office as an integral part of the justification of the estimates presented. The director of the office, upon the basis of the estimates and advance programs submitted reports to the president from time to time, but not less than once a year, consolidated estimates and advance programs in the form of an over-all advance program for the executive branch of the Federal government. Before any department or establishment submits to the congress, or to any committee or member thereof, a report relating to, or affecting in whole or in part, its advance programs, or the public works and improvement projects comprising such programs, or the results of any plan preparation for such programs or projects, such report is submitted to the office for advice as to its relationship to the program of the president. When such report is thereafter submitted to congress, or to any committee or member thereof, it includes a statement of the advice received from the office.

Domestic Council

The domestic council was established in the executive office of the president pursuant to reorganization plan 2 of 1970, effective July 1, 1970. The purpose of the council is to formulate and coordinate domestic policy recommendations to the president. The council assesses National needs and coordinates the establishment of National priorities; recommends integrated sets of policy choices; provides a rapid response to presidential needs for policy advice on pressing domestic issues; and maintains a continuous review of on-going programs from a policy standpoint.

The domestic council is composed of the president, the vice president, the attorney general, and the secretaries of agriculture, commerce, health, education, and welfare, housing and urban development, the interior, labor, transportation, and the treasury, and such other heads of agencies as the president may designate. The council operates through a series of ad hoc project committees which may be set up to deal with either broad program areas or specific problems. The committees may draw for staff support on department and agency experts, supplemented by the council's own staff and that of the office of management and budget. The council staff operates under an executive director who is also one of the president's assistants. Estimated expenditures of the council in fiscal year 1971 totaled $1,473,000.

Office of Emergency Preparedness

The office of emergency preparedness, so designated by Act of October 21, 1968, is a redesignation of the office of emergency planning. The purpose of the office is to assist and advise the president in the coordination and determination of policy for all emergency preparedness activities.

The agency is divided into three program offices: the National resource analysis office, the government preparedness office, and the field operations office. In addition, eight regional offices carry out readiness policies and plans under the guidance of the director, field operations. The office is concerned with the following areas of preparedness for a National emergency: use of resources such as manpower, materials, industrial capacity, transportation, and communications; the civil defense program; the organization of government; stabilization of the civilian economy; rehabilitation after enemy attack; and continuity of Federal, State, and local governments.

This office also determines the kinds and quantities of strategic and critical materials to be acquired and stockpiled against a war emergency under the strategic and critical materials stock piling Act of 1946.

It investigates the importation of commodities to determine whether the rate or circumstances of such importation threaten to impair the National security within the terms of the trade expansion Act of 1962.


The federal disaster Act enables States and local governments to receive supplemental Federal assistance when the president declares a major disaster. A major disaster may be declared in the event of war, earthquake, flood, hurricane, or other disaster. The administration of the disaster assistance program includes the authority to coordinate and direct the disaster relief activities of all Federal agencies, and to administer the disaster relief funds made available by congressional appropriation to the president. After the president declares a major disaster, the office may direct any Federal agency to provide the needed assistance in the stricken area. In the field of water resources, the objective of the emergency program is to assure adequate safe water for human survival and for essential services and industry, including livestock and agriculture requirements, through effective management and use of water resources during the emergency and the recovery period; conservation and effective use of manpower, materials, equipment, and supplies required for water supply operations; and operation, repair, and restoration of facilities to provide water for essential needs.

Office of Science and Technology

The office of science and technology was established in the executive office of the president by reorganization plan 2 of 1962, effective June 8, 1962. The director and deputy director are appointed by the president with the advice and consent of the senate.

The director of the office provides advice and assistance to the president with respect to developing policies and evaluating and coordinating programs to assure that science and technology are used most effectively in the interests of National security and general welfare.

Functions of the office include: evaluation of major policies, plans, and programs of science and technology of the various agencies of the Federal government; giving appropriate emphasis to the relationship of science and technology to National security and foreign policy, and measures for furthering science and technology in the Nation; Assessment of selected scientifi
and technical developments and programs in relation to their impact on National policies; review, integration, and coordination of major Federal activities in science and technology giving due consideration to the effects of such activities as non-Federal resources and institutions; assuring that good and close relations exist with the Nation's scientific and engineering communities so as to further in every appropriate way their participation in strengthening science and technology in the United States and the free world; and such other matters consonant with law as may be assigned by the president to the office.

The director of the office of science and technology serves as chairman of the Federal council for science and technology. The council secretariat is provided by the office. Expenditures by the office totaled $1,850,000 in fiscal year 1970.

National Council on Marine Resources and Engineering Development

The National council on marine resources and engineering development was established in the executive office of the president by the marine resources and development act of 1966, as amended by the acts of January 2, 1968 and May 23, 1969. The council provides advice and assistance to the president with regard to his responsibilities to develop and maintain a coordinated, comprehensive, and long-range National program to assure that marine science and technology are most effectively used in the interests of National security and the general welfare.

The council is composed of the vice president, as chairman, the secretaries of State, the navy, the interior, commerce, health, education, and welfare, and transportation, the chairman of the atomic energy commission, the director of the National science foundation, and a secretariat, headed by a civilian executive secretary appointed by the president.

The council functions to: survey and review annually all significant marine science activities, including policies, plans, programs, and accomplishments of all departments and agencies in the United States engaged in such activities; develop a comprehensive program in marine science activities to be conducted by departments and agencies of the United States, independently or in cooperation with such non-Federal organizations as States, industry, the United States, and industry; designate and fix responsibility for the foregoing marine science activities by the departments and agencies of the United States; and make the necessary recommendations to the president and to the agencies priorities among programs designed for the conservation, development and utilization of renewable and non-renewable resources; and to determine the effectiveness of programs of protecting and enhancing the environment.

The responsibilities of council on environmental quality are to: evaluate existing and proposed policies and activities of the Federal government directed to the control of pollution and the enhancement of the environment; to make recommendations to the president and other Federal agencies for the accomplishment of other objectives which affect the quality of the environment; to recommend ways and means for achieving the desired results; to report to the president and the agencies priorities among programs designed for the control of pollution and for enhancement of the environment; to determine the need for new policies and programs for dealing with environmental problems; to ensure that programs are being adequately addressed individually and collectively; and to foster investigations, studies, surveys, research, and analyses relating to ecological systems and to the United States economy, security, health and welfare from marine science activities; under the foreign policy guidance of the president, coordinate a program of international cooperation in work done pursuant to the act; and provide policy guidance to the National science foundation on sea grant college and programs under the act of October 15, 1966 and prepare the president's annual report to the congress on marine science affairs. Expenditures of the council totaled $937,000 in fiscal year 1970.

Council on Environmental Quality

According to the National environmental policy act of 1970, the president must transmit to the congress annually beginning July 1, 1970, an environmental quality report which shall set forth: the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; a review of the programs and activities (including regulatory activities) of the Federal government, the State and local governments, and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

There was created in the executive office of the president a council on environmental quality. The council is composed of three members who are appointed by the president to serve at his pleasure, by and with the advice and consent of the senate. The president designates one of the members of the council to serve as chairman.
environmental quality, the impact of new and changing technologies thereon, and means of preventing or reducing adverse effects from such technologies.

In exercising its powers, functions, and duties under the Act, the council must consult with the citizens' advisory committee on environmental quality established by executive order, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and utilize, to the fullest extent possible, the services, facilities and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

There was established in the executive office of the president an office to be known as the office of environmental quality. The chairman of the council on environmental quality is the director of the office. The estimated expenditures by the council and the office in 1970 totaled $1,588,000.

The department of the interior was created by Act of March 3, 1849, which transferred to it the general land office, the office of Indian affairs, the pension office, and the patent office. The department also had responsibility for supervision of the commissioner of public buildings, the board of inspectors and the warden of the penitentiary of the district of Columbia, the census of the United States, and the accounts of marshals and other officers of the United States courts, and of lead and other mines in the United States.

Over the years there were added to the original functions (and later removed) activities in such areas as education, hospitals and eleemosynary institutions, labor, the Alaska railroad, railroad accounts, and interstate commerce. With the creation of subsequent executive departments and certain independent agencies, the role of the department of the interior changed during the more than 100 years of its existence from that of general housekeeper for the Federal government to that of custodian of the Nation's natural resources. Under the defense production Act of 1950, as amended, and related legislation, the secretary was delegated responsibilities relating to petroleum and natural gas, solid fuels, electric power, fishery commodities or products, and metals and minerals.

The jurisdiction of the department includes the custody of 750 million acres of land; the conservation and development of mineral and water resources; the promotion of mine safety and efficiency; the conservation, development, and utilization of fish, wildlife, and marine resources; the coordination of Federal and State recreation programs; the administration of the Nation's scenic and historic areas; the operation of job corps conservation centers; the reclamation of arid lands in the West through irrigation; and the management of hydroelectric power systems. The department of the interior is also responsible for the welfare of about 240,000 persons in the territories of the United States and in the trust Territory of the Pacific islands and provides services to about 440,000 Indians and Alaska Native people.

In formulating and administering programs for the management, conservation, and development of natural resources, the department pursues the following objectives: the encouragement of efficient use; the improvement of the quality of the environment, the assurance of adequate resource development in order to meet the requirements of National security and an expanding National economy; the maintenance of production capacity for future generations; the promotion of an equitable distribution of benefits from Nationally-owned resources; the discouragement of wasteful exploitation, the maximum use of recreational areas; and the orderly incorporation of Indian and Alaska Native people into our national life by creating conditions which will advance their social and economic adjustment.

The fiscal year 1970 program distribution of budget authority for the department of interior is shown in table 6. Budget authorities in fiscal year 1970 for selected agencies of the department are presented below:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Federal Funds</th>
<th>Trust Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureau of land management</td>
<td>$193,301,000</td>
<td></td>
</tr>
<tr>
<td>Bureau of Indian affairs</td>
<td>$322,642,000</td>
<td></td>
</tr>
<tr>
<td>Bureau of outdoor recreation</td>
<td>$149,585,000</td>
<td></td>
</tr>
<tr>
<td>Geological survey</td>
<td>$102,912,000</td>
<td></td>
</tr>
<tr>
<td>Bureau of mines</td>
<td>$118,054,000</td>
<td>$1,337,000</td>
</tr>
<tr>
<td>Bureau of sport fisheries and wildlife</td>
<td>$123,061,000</td>
<td>$253,000</td>
</tr>
<tr>
<td>National park service</td>
<td>$148,902,000</td>
<td>$288,600,000</td>
</tr>
<tr>
<td>Bureau of reclamation</td>
<td>$395,241,000</td>
<td>$6,916,000</td>
</tr>
<tr>
<td>Office of saline water</td>
<td>$25,000,000</td>
<td>$561,230,000</td>
</tr>
<tr>
<td>Office of water resources research</td>
<td>$28,738,000</td>
<td></td>
</tr>
</tbody>
</table>

Land, forage, timber:
- Land classification and disposition: 9.3
- Earth study and measurement: 48.9
- Earth hazards: 1.8
- Land utilization, protection, and restoration: 12.1
- Timber production: 11.3
- Livestock forage production: 9.9
- Transportation system: 14.3
- Fire protection: 31.3
- O & C allocation to Forest Service: 2.3
- General support: 5.4
- Category total: 146.6

Recreation use and preservation:
- Planning and assistance: 15.7
- Land acquisition: 119.9
- Recreation development: 44.5
- Road construction - National Park Service (Federal Highway Administration): 41.0
- Management/operations/maintenance/protection: 103.0
- Rare or endangered species: 1.5
- Wildlife habitat and production--including migratory birds: 68.5
- Fish habitat and production: 31.8
- General support: 6.2
- Category total: 432.1

Indians:
- Education program support: 13.2
- Educational research and development:
- Education personnel training: 16.0
- School construction: 99.1
- Elementary and secondary education: 6.0
- Post-secondary education: 4.0
- Adult education: 35.3
- Job training and placement: 45.2
- Reservation development: 39.2
- Community services (including welfare): 38.6
- Transportation: 19.6
- Repair and maintenance, B & U: 10.3
- Claims and treaty obligations: 103.4
- General support: 6.0
- Tribal funds: 432.1
- Miscellaneous funds: 6.0
- Category total: 432.1

Territories:
- Trust Territory: 48.1
- American Samoa: 7.2
- Guam: 7.8
- Virgin Islands: 14.4
- Office of Territories: 0.5
- Category total: 78.0

Other programs:
- Payments to Treasury, States, and subdivisions: 91.2
- Secretarial direction and administrative support (solicitor): 6.6
- Secretarial direction and administrative support (secretary): 10.9
- Category total: 108.7
- Total distributed to programs above (Federal and trust funds): 1,961.8
- Offsetting proprietary receipts: -811.4
- Intragovernmental transactions: -31.2
- Total budget authority, Department of the Interior: 1,119.2


According to data presented in the publication "Federal Outlays in Minnesota", office of economic opportunity, National technical information service, total Federal outlays in connection with the department of the interior water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Outlays (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>15.0</td>
</tr>
<tr>
<td>1968</td>
<td>22.1</td>
</tr>
<tr>
<td>1969</td>
<td>24.6</td>
</tr>
<tr>
<td>1970</td>
<td>34.6</td>
</tr>
</tbody>
</table>

Fiscal Year 1970 program summaries for departmental agencies are:

<table>
<thead>
<tr>
<th>Agency and Program</th>
<th>Federal Outlays (100,000 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureau of Sport Fisheries &amp; Wildlife</td>
<td>125,93</td>
</tr>
<tr>
<td>Management and Investigations of Resources</td>
<td>14,60</td>
</tr>
<tr>
<td>Construction</td>
<td>3,64</td>
</tr>
<tr>
<td>General Administration Expenses</td>
<td>3.79</td>
</tr>
<tr>
<td>Federal Aid in Wildlife Restoration</td>
<td>13.20</td>
</tr>
<tr>
<td>National Wildlife Refuge Fund</td>
<td>4.00</td>
</tr>
<tr>
<td>Migratory Bird Conservation Account</td>
<td>75.78</td>
</tr>
<tr>
<td>Federal Aid in Fish Restoration and Management</td>
<td>5.66</td>
</tr>
<tr>
<td>Contributed Fund</td>
<td>0.01</td>
</tr>
<tr>
<td>Sport Fish Production</td>
<td>2.79</td>
</tr>
<tr>
<td>Sport Fish Management</td>
<td>0.67</td>
</tr>
<tr>
<td>Wildlife Services</td>
<td>1.45</td>
</tr>
<tr>
<td>Anadromous Fish Management</td>
<td>0.34</td>
</tr>
<tr>
<td>Bureau of Mines</td>
<td>33.76</td>
</tr>
<tr>
<td>Conservation &amp; Development of Mineral Resources</td>
<td>26.36</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>3.85</td>
</tr>
<tr>
<td>Solid Waste Disposal</td>
<td>0.17</td>
</tr>
<tr>
<td>Consolidated Working Fund</td>
<td>3.00</td>
</tr>
</tbody>
</table>
The office of saline water, under the supervision of the assistant secretary—water and power development performs functions vested in the secretary of the interior by an Act of July 3, 1952. This Act authorizes the office of saline water to perform the following specific functions:

**Research.**—Formulates and maintains currently a productive research and development program for the economic conversion of saline water by stimulating and sponsoring private and governmental research; studies needs for saline water conversion, and the quality and quantities of converted water required; plans research and development activities to meet these needs; and conducts economic studies of costs of water by saline water conversion using various processes as compared with other standard methods.

**Contracts and Grants.**—Prepares, negotiates, and supervises research and development contracts and grants; and determines which scientific organizations and individuals are equipped to conduct research and development work, which processes should be emphasized or curtailed and the direction that each should take, in connection with investigation of new theories, principles, and phenomena of an exploratory nature embracing any field of science of potential use in applying developments, but without regard to the economic and processes; and applied research and development of practical applications in production of devices, systems, materials, and processes, including pilot plants, cost estimates, designs, and product engineering, with complete regard for all economic factors.

**Test Beds and Test Facilities.**—The saline water demonstration Act approved on September 2, 1958, authorized the construction and operation of saline water demonstration plants in various parts of the country. An amendment to the basic saline water Act of 1952 approved on June 24, 1967, changed these demonstration plants into research and development test beds and thus made them a part of the basic research and development program where experimental hardware can be introduced into the saline water conversion process employed by the specific plant in order to obtain performance data. Test beds and test facilities currently in operation are: a long tube vertical multiple-effect distillation test bed, a materials test center, and a facility located at Newport, Oreg.; a multi-effect distillation test bed, pilot plant, and facility located at Webster, S. Dak., used for the testing on brackish water; a forced circulation, vapor compression distillation test bed, brackish water test center, and facility located at Roswell, N. Mex., used for testing on brackish waters; a multi-effect distillation test bed and facility located at San Diego, Calif. includes a 2.4 mgd test module, including pilot plant testing. Research efforts, including field test programs, are being stepped up to develop new desalting techniques, to improve known processes, and to develop the promising membrane process.

**Environmental Planning Staff.**

The environmental planning staff is a small professional group under the direction of an assistant to the secretary with the mission of providing assistance to the secretary on a broad range of environmental activities. The staff works to reconcile conflicting interests which have an adverse effect on the environment. The staff formulates resource policies, analyzes resource management philosophies, and coordinates departmental activities involving various functional interests where several bureaus are involved.

**Coordination.**—Coordinates and exchanges information on saline water conversion research, private and governmental; prepared publicity and information on the subject; plans and manages meetings and symposia; and coordinates and integrates results of its activities with private organizations and governmental agencies.

**Helium Fund** 0.02

**Contributed Funds** 0.03

**Mineral Health and Safety Grants** 2.33

**Geological Survey** 6.98

**Mineral and Water Resources Investigations and Topographic Mapping** 6.98

**Federal Water Pollution Control Administration** 160.70

**Water Supply and Water Pollution Control** 19.18

**Construction Grants for Waste Treatment** 137.62

**Building and Facilities** 3.90

**Bureau of Land Management** 16.66

**Management of Land and Resources** 16.66

**Construction and Maintenance** 1.82

**Bureau of Commercial Fisheries** 0.98

**Management and Investigations of Resources** 0.18

**Federal Aid for Commercial Fisheries** 10.47

**Promote and Develop Fishery Products** 0.23

**Bureau of Reclamation** 0.33

**Construction and Rehabilitation** 0.33

**Bureau of Outdoor Recreation** 5.62

**Outdoor Recreation Assistance** 5.62

**Construction CE** 2.30

**Office of Water Resources Research** 3.05

**Department of the Interior—General** 7.85

**Forest Protection and Utilization, FS** 0.32

**General Investigations CE** 0.43

**Construction CE** 1.10

**Parks and Forests** 1.49

**Water Resources** 3.76

**Administration** 0.75

**Total** 346.16
eral-State river basin commissions authorized by the water resources planning Act of 1965.

Office of Water Resources Research

The office of water resources research (OWRR), under the supervision of the assistant secretary—water and power development, administers the program of water resources research and training authorized by the water resources research Act of 1964, as amended. Major program purposes are to: develop through research new technology and more efficient methods for resolving local, State, and nationwide water resource problems; train water scientists and engineers through their on-the-job participation in research work; and facilitate water research coordination and the application of research results through dissemination of information about ongoing and completed research. OWRR does not maintain its own laboratories or perform "in-house" research.

Under title I of the act, OWRR provides annual fund allotments to support one State university water resources research and training institute in each State and in Puerto Rico; additional funds are provided to these institutes for additional specific research project work on a dollar-for-dollar matching-fund basis. Other universities and colleges may participate in the title I program work of the designated State institutes. Under title II of the act, grants and contracts are made with academic, private, public, or other organizations and individuals having water research competence for support of urgently needed water resources research work.

OWRR also operates a water resources scientific information center for disseminating information to the Nation's water resource community, in project abstract and other summary formats, regarding ongoing water research projects and the results obtained from completed water resources studies and investigations.

Programs in Minnesota

The water resources research center (WREC) was established in the graduate school, university of Minnesota on September 1, 1964. The center has responsibility for stimulating university of Minnesota and State and private college water resources research through administration of OWRR funds associated with the water resources research Act of 1964; coordinating the research with programs of local, State and Federal agencies and private organizations throughout the State; and assisting in training additional scientists for work in the field of water resources through research. The following State and private colleges are participating in the center's programs: St. Mary's college, St. Cloud State college, Gustavus Adolphus college, Bemidji State college and Winona State college.

The center does not conduct research nor does it have research facilities. It plans and arranges for divisions of the university of Minnesota and State and private colleges to conduct competent research of either a basic or practical nature in relation to the physical-biological-economic-social-political aspects of water resources. The center strengthens research activities of departments and schools and assists in expanding interdisciplinary research and in molding multidisciplinary research into balanced overall water resources research programs.

One of the purposes of the center is the stimulation and review of education offerings for students which will prepare them for careers in the field of water resources. The center assists in recruiting students and in guiding them into appropriate programs of study. The center has been helpful to the university of Minnesota in developing new courses bearing on water resources, a new graduate option in hydrogeology, and a program of graduate education in water resources.

The center has an advisory committee and a consulting council. The advisory committee consists of 15 faculty members from 15 schools, departments and divisions of the university of Minnesota; the consulting council is composed of 19 representatives from organizations outside the university. The center maintains close liaison with the various schools, departments and divisions of the university of Minnesota, State and private colleges, State water agencies, Federal water agencies, private research firms and consultants and voluntary organizations through its advisory committee and consulting council, through its membership on the water resources coordinating committee, State planning agency and through its membership on the intercollegiate committee on environmental studies at the university of Minnesota.

The center's research budget increased from $52,297 in fiscal year 1965 to $324,261 in fiscal year 1971 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Center's Research Budget</th>
<th>Non-Federal Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>$52,297</td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>153,952</td>
<td>0</td>
</tr>
<tr>
<td>1967</td>
<td>164,938</td>
<td>28,907</td>
</tr>
<tr>
<td>1968</td>
<td>182,723</td>
<td>38,010</td>
</tr>
<tr>
<td>1969</td>
<td>228,799</td>
<td>35,507</td>
</tr>
<tr>
<td>1970</td>
<td>295,270</td>
<td>39,221</td>
</tr>
<tr>
<td>1971</td>
<td>324,261</td>
<td>40,464</td>
</tr>
</tbody>
</table>

The center maintains close liaison with the various schools, departments and divisions of the university of Minnesota, State and private colleges, State water agencies, Federal water agencies, private research firms and consultants and voluntary organizations through its advisory committee and consulting council, through its membership on the water resources coordinating committee, State planning agency and through its membership on the intercollegiate committee on environmental studies at the university of Minnesota.

Research conducted through the center is relevant to water resources problems in Minnesota and the Nation. The main thrust of the center's programs has been directed toward:

Establishing a practical baseline of water quality for Lake Superior through the use of the continuous plankton recorder technique; the analysis and interpretation of existing Federal, State, and local water resources legislation and court decisions and ways and means for improving water laws in Minnesota; ascertainment of the physiological and ecological requirements of the algal species responsible for severe blooms on lakes scattered throughout the State to assist in controlling the excessive productivity of polluted lakes;
determining methods for rain fall-runoff predictions which are based on the physical characteristics of ungaged small watersheds and rainfall characteristics of ungaged small watersheds; reconciling and integrating water quality management with the ecological and social-economic objectives of the total water resources management in Minnesota; determining the role of potholes in the groundwater recharge; formulation of an economic optimizing model for water quality and sewage disposal on selected stretches of the upper Mississippi river; investigation of programs that appear to have special merit relative to hydrologic analysis for determination of design floods and for design of spillways and related structures; investigation of soil dynamic changes when interacting with water to assist in solving water problems such as infiltration, water spreading and flow properties in soils; determination of runoff-time distribution for a variety of watershed sizes and slopes; determining the role of bottom sediments in the phosphorus cycle for lakes of different types to assist in devising corrective measures for overfertilized lakes; development of techniques that will pinpoint polluted areas in reaches of the upper Mississippi River where algae might be profitably administered to control pollution; investigation of mist irrigation as a method of reducing water stress in potato crop production and thereby reducing transpiration; investigation in the mechanics of soil moisture movement and retention assist water resources developers and managers in estimating recharge to groundwater reservoirs and the effect of soil moisture movement on surface water runoff; inventorying, appraising, and evaluating water resources administration in Minnesota to provide background information for legislative action concerning reorganization of State water resources agencies; biomass determination and productivity measurements in the west end of Lake Superior to assess the extent of eutrophication; investigation of the ecology of the periphyton in the wave-washed and near-shore areas of the west end of Lake Superior for detection of advancing eutrophication in the lake; study of citizens groups involved at the grass roots to improve the water resources environment in metropolitan areas and environs in the USA; and determining existing ecological conditions in the Mississippi River near Monticello, Minnesota before operation of a large nuclear power plant and monitoring environmental changes due to the thermal discharge from the power plant generator.

The center's fiscal year 1971 research program consisted of the following projects:

Economics of water quality control in the upper Mississippi River, Minnesota; evaluation of selected computer programs in hydrology; water resources administration in Minnesota; zooplankton biomass and incipient eutrophication in Lake Superior; alleviation of lake pollution by utilization of aquatic plants for nutritional, medicinal or industrial purposes; prediction peak flow of small watersheds by use of channel characteristics; mathematical simulation of a large watershed using the systems approach to quantity and quality analysis; influence of mist irrigation on moisture stress growth, yields and quality of potatoes and other vegetable crops; characteristics of the soil matrix that affect water storage and movement; pollution and the ecology of nearshore periphyton of Lake Superior; participatory ecology: A study of citizens' groups involved at the grass roots to improve the water resources environment in the Minneapolis-St. Paul, Miami and environs, and two other metropolitan areas and environs in the USA; and determining existing ecological conditions in the Mississippi River near Monticello, Minnesota before operation of a large nuclear power plant and monitoring environmental changes due to the thermal discharge from the power plant generator.

The center continuously compiles information on needed and neglected water resources research areas with the assistance of its advisory committee and consulting council. The selection of research projects to be sponsored gives due regard to changing research needs of the State and is approached on an interdisciplinary basis. During the winter months of 1966, about 350 people having an interest in water resources research in Minnesota were solicited by the center for information concerning needed areas of water resources research. Expansions in research programs are required to solve existing and anticipated problems pertaining to: environmental quality improvement, including pollution control and prevention; provision of additional water-oriented recreation facilities and protection of natural resources; provision of adequate municipal water supplies; flood damage reduction; and soil and water management.

In 1969, a task force of the center's consulting council conducted a survey to obtain information concerning efforts and expenditures for water resources research conducted in Minnesota 1963 through 1968. According to the survey, total research effort in terms of number of ongoing projects and man-years of effort reached a peak in 1967; financial support for water resources research has declined since then. The number of ongoing projects rose from 53 in 1963 to 96 in 1967 and was 73 in 1968. Total expenditures increased from $629,000 in 1963 to $1.8 million in 1967 and were $1.5 million in 1968. Man-years of effort rose from 43 in 1963 to 98 in 1967 and was 81 in 1968.

The work of university and college student research assistants and research associates accounted for about 40 percent of the total man-years of effort in 1968. The work of professional and sub-professional employees of Federal, State, local and private organizations accounted for about 60 percent of the total man-years of effort. The average expenditure per project rose from about $13,000 in 1963 to about $21,000 in 1968.

In general, research effort by all measures has been consistently high in the following 4 research FCST categories: Water cycle, Water quantity management and control, Water quality management and protection, and Engineering works.
During the period 1963-68, the university of Minnesota was the organization conducting the greatest amount of research with Federal agencies; State and private colleges and private enterprises (others); and State agencies followed in that order. In 1968, expenditures by the university of Minnesota, Federal agencies, State agencies and others were $637,000; $506,000; and $46,000; and $304,000, respectively. While the university of Minnesota conducts the largest amount of research, much of this research is funded by Federal agencies and the State. For example, in 1968, funding of research projects conducted at the university of Minnesota was about as follows: Federal - $525,000 and State $95,000.

The department of agriculture and the department of the interior were the Federal agencies carrying on the bulk of water resources research programs in Minnesota, followed by the U.S. army corps of engineers in the department of defense. The agricultural research service and forest service accounted for the major share of research in the department of agriculture. The geological survey and Federal water pollution control agency accounted for the major portion of research by the department of the interior.

Within the university of Minnesota, water resources research has been carried on in 16 different divisions representing the biological, physical and social sciences. The St. Anthony falls hydraulic laboratory has led in research effort followed by the department of agricultural engineering, and the divisions of agricultural economics, department of horticultural sciences, department of geological survey, St. Anthony falls hydraulic laboratory, department of agricultural engineering, school of forestry, department of soil science, school of public health, Minnesota geological survey, St. Anthony falls hydraulic laboratory, department of agricultural economics, department of horticultural sciences, department of anthropology, department of sociology, and department of pharmacology. About 21 percent of the center's funds in fiscal year 1971 were allocated to State and private colleges.

About 65 percent of the center's research expenditures are for salaries and wages; 8 percent are for non-expendable property and expendable materials and supplies; and 27 percent are for other costs including indirect costs and fringe benefits. About $79,000 has been encumbered for nonexpendable property assigned to divisions of the university of Minnesota and State and private colleges. Expenditures for salaries and wages have been equally divided between the categories of principal investigators and director; research associates and fellows; graduate students and undergraduate students; technical assistants, and clerical assistants.

For several years the center has known that the need for research concerned with the social-economic-political aspects of water resources is great. However, in fiscal year 1967, not a single research project proposal concerned with these aspects was submitted to the center. In contrast, the center's fiscal year 1971 program included 6 social-economic-political projects whose support constituted about 36 percent of the center's budget. This trend of increased emphasis of the center's research program on social-economic-political aspects of water resources is expected to continue. Most of the research the center has supported or will support in the future can be broadly classified as environmental research.

In fiscal year 1971, about 47 students receive part-time employment or other financial support through center's programs. Forty-five students have received financial support from the center and have received advanced degrees. Of these, 3, 2 were employed in water-related work; fifteen were employed by Federal agencies, 5 were employed by State or local governments, 8 were employed by universities and 6 were employed by private enterprises. There are about 100 students at the university of Minnesota majoring in water resources related fields; about 46 water resources oriented students graduated last year. A large proportion of these students used center equipment and received financial support from the center. A total of 52 regular faculty members of the university of Minnesota are currently engaged in teaching, research and/or advising in water resources. The graduate school bulletin contains 84 courses of potential interest to graduate students oriented towards water resources.

The center has published and distributed to 550 people throughout the State 23 quarterly newsletters and 111 information circulars in an effort to disseminate information concerning water resources. Research projects supported by OWRR have generated 64 technical reports and theses. Upon request, the center has distributed about 135 copies of its publications per month to people throughout the State and Nation. The center has widely distributed 30,000 copies of 38 bulletins describing the results of research projects. A subcommittee of the center's advisory committee in 1965 prepared a brochure on graduate education in water resources at the university of Minnesota. The brochure has been helpful in recruiting students to the university.

To provide an opportunity for professional people and students working in the field of water resources to meet and to exchange information, the center has sponsored 17 interdisciplinary seminars since 1964. Attendance at the seminars has averaged 50 people. The center sponsored a 2 1/2-day short course on ground water resource evaluation in 1965. The course was attended by 50 people from Minnesota, Manitoba, North Dakota, Missouri and Iowa.

At governor Rolvaag's request, the center director served on a 19-member Minnesota water resources review committee in 1966. The center director also attended the special midwestern governor's conference on water resources and pollution at Lexington, Kentucky in 1966. At governor LeVander's request, the center director from 1967 to 1969 served part time as water resources planning director, Minnesota State planning agency, Minnesota's representative on the Souri-Red-Rainy rivers basin commission, Great Lakes basin commission and upper Mississippi river coordinating committee and Minnesota's alternate representative on the Missouri basin interagency committee. The center director also served as vice chairman of the Souri-Red-Rainy rivers basin commission. With the assistance of the center the Minnesota State planning agency has made considerable progress in preparing a statewide framework water and related land resources plan and in participating in Federal-State planning activities. At the request of university of Minnesota presidents, the center director has served as a technical advisor on the Minnesota-Wisconsin boundary area commission.
Water Resources Council Representative Staff

The water resources council representative staff, under the jurisdiction of the assistant secretary--water and power development, assists in the unification and coordination of the secretary's responsibilities under the water resources planning Act of 1965. The office coordinates the review and formulation of departmental positions on questions coming before the water resources council.

United States Fish and Wildlife Service

The United States fish and wildlife service was created in the department of the interior November 6, 1956. As provided by the fish and wildlife Act of 1956, which established the service, it replaced the former fish and wildlife service, established June 30, 1940, by reorganization plan III. The service is composed of the office of commissioner and one bureau: bureau of sport fisheries and wildlife responsible for wild birds, mammals (except whales, seals, and sea lions), and sport fisheries.

Bureau of Sport Fisheries and Wildlife

The objectives of the bureau of sport fisheries and wildlife are the perpetuation, use, and enjoyment by the people of the sportfish and wildlife resources of the Nation. This is done through production and distribution of hatchery fish, the operation of a nationwide system of wildlife refuges, the regulation of migratory bird hunting, the management of fish and wildlife populations by scientific research and methods, and the improvement and protection of a quality environment for fish and wildlife resources to exist, for conducted in cooperation with the States and private organizations.

The bureau of sport fisheries and wildlife consists of a headquarters, office at Washington, D.C., five regional offices, wildlife refuges, fish hatcheries, research laboratories, and other offices located in the 50 States.

The bureau has programs for research, development, and management of fish resources, Federal aid to State fish and wildlife agencies, and technical assistance in preserving and enhancing water and related resources for sport fishing. A system of over 100 fish hatcheries is operated for the propagation and distribution of various species of sport fishes, including trout, salmon, bass, and catfish. The stocking of public waters and farm fish ponds is carried out in cooperation with State fish and game departments.

Research is conducted on the nutritional and disease factors that affect hatchery-raised fish and the factors that affect their survival and growth after they are planted in various waters.

To increase the value to the public of hatchery-raised fish, the stocking program is coordinated with State and Federal agencies, Indian tribes, and the public to furnish modern techniques for the management of fishing waters for the maximum public enjoyment.

The goal of wildlife programs is to protect and enhance the values of the Nation's wildlife species, enjoyed through hunting, for recreation, bird watching, photography, and related activities. Research is conducted through waterfowl management study, other migratory bird research, upland wildlife work, pesticide-wildlife relationship studies, disease and parasite studies, bird and mammal control methods, and replenishment and protection of endangered wildlife species such as the rare whooping crane and the Key deer.

The 30 million acre National wildlife refuge system includes 326 refuges and game ranges managed for migratory birds, protection of endangered species, public enjoyment of natural resources, and economic benefits from sales of land products and concessions. Wildlife surveys are carried out in cooperation with and under treaties with the Canadian and Mexican governments, pursuant to the migratory bird Treaty Act and other Federal Acts. These surveys provide information for the establishment of Federal hunting regulations monitored through a nationwide wildlife law enforcement program.

Professional advice is provided to increase the fish and wildlife productivity of Indian and other lands. Under the animal and bird damage control program, the bureau helps States, counties, and other organizations in cooperative control of animals and birds which endanger human health or cause damage to crops, forests, or physical properties.

Bureau, State, and private employees; students; and representatives of foreign governments secure training in fish and wildlife research and management programs at bureau training centers, or in cooperative units functioning under agreements with universities and the fish and game department of the State where the unit is located. Professional training, conservation education, and technical advances result from such activity.

Funds are allotted annually to State fish and wildlife departments for use in fish and game management programs; the conservation and development of anadromous fish occur through a State-Federal cooperative program which is now concentrating on the salmon and steelhead fisheries of the Great Lakes and Pacific Northwest and on restoration of Atlantic coast salmon spawning areas.

The bureau studies water use projects proposed by Federal or private agencies for the probable effects of such projects on fish and wildlife resources and recommends measures for their conservation and development. Emphasis is placed on conservation of estuaries and development of comprehensive river basin plans which consider future recreational needs based on fish and wildlife.

Funds are received from other agencies to assist in bureau programs such as land acquisition for recreation areas and for endangered species under the land and water conservation Act; participation in planning and constructing fish and wildlife facilities on other agency water projects; operation of two job corps centers; and insect and disease control in cooperation with USDA.
Programs in Minnesota - The north central regional office of the bureau of sport fisheries and wildlife is located in Minneapolis. The organizational chart for the office is shown in figure 11. The north central region includes the States of North and South Dakota, Nebraska, Minnesota, Iowa, Missouri, Wisconsin, Michigan, Illinois, Indiana, and Ohio. The first three lie in the central flyway; the other States fall within the Mississippi flyway.

The program of the department of the interior's bureau of sport fisheries and wildlife in Minnesota is keyed both to the primary responsibilities of the bureau for the management and preservation of migratory birds and to participation in a variety of State fish and wildlife management programs. Many bureau operations pertain to Federal lands within the State and to programs of wildlife management of National significance. State conservation agencies, the bureau of sport fisheries and wildlife, and other Federal agencies engaged in natural resource management work closely to coordinate their efforts.

The division of wildlife refuges administers five major National wildlife refuges in Minnesota--Agassiz in Marshall county, Tamarac in Becker county, Rice Lake in Aitkin county and Sherburne in Sherburne county. A part of the upper Mississippi river wildlife and fish refuge lies in Houston, Winona and Wabasha counties. A sixth major refuge, the Big Stone National wildlife refuge, which will total 10,000 acres, has been authorized by congress as an integral part of an army corps of engineers project on the upper reaches of the Minnesota river in Lac qui Parle and Big Stone counties. This area will be important in the management of migrating geese.

The sprawling upper Mississippi river National wildlife and fish refuge extends for 284 miles along the Mississippi river from Wabasha, Minnesota, to Rock Island, Illinois. About 33,000 acres of its 195,000 acres are in Minnesota. Some 270 species of birds, 50 species of mammals, and 113 species of fish occur in the upper Mississippi river refuge, and more than 3 million people visit the refuge annually to camp, boat, hunt, fish, or study birds. A total of 41,000 acres are closed to hunting to protect the spectacular flights of waterfowl which pass through each spring and fall. The refuge was established by congress in 1924.

The 61,500-acre Agassiz National wildlife refuge in Marshall county (formerly known as the Mud Lake refuge) occupies a bay in prehistoric lake Agassiz. As many as 60,000 ducks use the refuge marshes in spring and fall and resident Canada goose flocks have been developed under refuge management programs. Deer, moose, and a wide range of furbearers live on the refuge; local trappers capture about 8,000 muskrats in season from refuge marshes.

The 39,200-acre Tamarac National wildlife refuge, located in Becker county has nearly 10,000 acres of excellent marshlands that provide nesting and feeding grounds for waterfowl. Although two-thirds of the refuge is timberland, intensive development has increased the value of the refuge for producing ducks and geese as well as more upland game and deer. Hunting, fishing, and picnicking are permitted.

The Rice Lake National wildlife refuge in Aitkin county comprises 17,230 acres. In addition to its waterfowl, the refuge also has an abundance of upland game birds, furbearers, and big game. Fishing is permitted on parts of the refuge abutting the Rice river. Also administered by Rice Lake is the Mille Lacs National wildlife refuge.
Sherburne National wildlife refuge in Sherburne county is located within an hour's drive of the Twin Cities. About 82 percent of the 31,000-acre site has been acquired. Visitor centers and interpretive trails will make a trip to this refuge educational as well as recreational. Waterfowl, deer, and small game will be abundant.

The division of wildlife services carries out the following activities:

Conducts the cooperative animal damage control program within the State, in conjunction with principal cooperators, for the protection of domestic and game animals, food and feed supplies, forests and crops, to reduce the incidence of wild animal-borne diseases among humans, livestock, wild animals, and nuisance or hazard-creating birds and wild animals at airports or public installations.

Conducts a program of wildlife enhancement designed to provide assistance to Federal, State, local and private individuals for the purpose of realizing the full potential of wildlife resources with initial emphasis on military and Indian lands with particular attention to migratory species. Included is the inspection of all landowner requests for drainage assistance under the U.S. Department of Agriculture's ASCS-ACP program and performance of biological activities and services for two wetlands offices. This function, including personnel, was transferred to this division in August 1967.

Conducts a program of pesticides appraisal and monitoring within the State with the primary objective of preventing adverse effects on wildlife resources, with emphasis on interior lands to insure that Federally-conducted pesticides operations do not adversely affect wildlife resources, establishing a pesticides appraisal system in the State, and participating in a National monitoring program.

Much of the Nation's effort to preserve duck-producing wetlands in the face of agricultural drainage has been concentrated in Minnesota, one of the three top duck-producing States. Minnesota possesses wetlands that are vital for the Nation's waterfowl. To protect an estimated 67,000 breeding areas totaling nearly 350,000 acres in 19 west-central Minnesota counties, the department of sport fisheries and wildlife and the State department of conservation are purchasing outstanding wetland areas or obtaining long-term leases to protect these areas from draining, burning, or filling. The bureau's wetland acquisition program in Minnesota has resulted in the purchase of fee title tracts totaling 76,960 acres as of June 30, 1970. Wildlife easements have also been secured on tracts totaling 29,922 acres. A wetlands manager and his staff are stationed at each of the area acquisition offices—one at Fergus Falls and one at Benson. Two new wetlands offices were opened in 1971. Management of these valuable tracts is being directed toward the improvement of habitat conditions for waterfowl production.

The division of river basin studies determines the effects on fish and wildlife resources of Federal or Federally-licensed projects under the authority of the fish and wildlife coordination Act and other Federal conservation statutes. The objective is to insure that fish and wildlife values receive equal consideration and are coordinated with other benefits of water resource development programs.

The division investigates and reports on irrigation, flood control, navigation, hydroelectric power, and water supply projects of the bureau of reclamation and corps of engineers; programs of the department of agriculture for small watershed development; non-Federal hydroelectric power and nuclear power development under Federal license; private irrigation development subject to Federal assistance; and other non-Federal water resource developments under Federal permit including dredge, fill, and other work in navigable waters. Specific measures for inclusion in project plans to protect and improve fish and wildlife resources are recommended.

Under its follow-up program, the division is conducting orderly analyses of various completed projects to: determine whether or not recommendations have been adopted; to evaluate the biological soundness and results of measures adopted; and to appraise the validity of findings on anticipated project effects included in the project report. Information obtained is valuable in refining and improving the techniques used in studying new projects and developing fish and wildlife recommendations for inclusion therein.

The division has been assigned departmental responsibilities conferred by the estuary protection Act. The study of estuaries directed by the Act has been completed and sent to congress. Initial efforts have been made to implement section 3, which authorizes long-term cost-sharing agreements between the secretary and States and local subdivisions to assist in developing and managing estuaries.

The division of river basin studies is responsible for investigating proposed water resource development projects to determine their effects on fish and wildlife and to recommend measures to prevent or reduce damages and to improve conditions for these resources. These studies and subsequent reports are authorized in accordance with the provisions of the fish and wildlife coordination Act. Types of projects investigated include: (1) flood control, navigation, estuarine, and small boat harbor projects of the Army corps of engineers; (2) hydroelectric projects of the Federal power commission; (3) small watersheds (P.L. 566); (4) comprehensive river basin studies investigated jointly by the departments of the army; (5) interior; (6) agriculture; and health, education and welfare; nuclear electric power projects of the Atomic Energy Commission; and special studies. The following projects and investigations in Minnesota are being studied by the division to determine their effects on the fish and wildlife resources (numbers in parentheses are project types as described above).

Iowa-Cedar river, Freeborn, Mower, and Dodge counties (1)
Minnesota river valley (1)
upper Mississippi river comprehensive basin studies (4)
Yellow Medicine-Lac Qui Parle river, western Minnesota (1)
Zumbro river (1)
Mississippi river 12' channel (1)
Red river of the north basin (1)
Six small watershed projects, statewide (3)
Hydroelectric projects, statewide (2)
Monticello nuclear power, Wright county (5)
Local flood protection projects (1)
Prairie Island nuclear power, Goodhue county (5)
upper Mississippi National recreation area (6)
St. Croix wild river study (6)
upper Iowa wild river study (6)
Entuarine study of Great Lakes (6) Electric steam plants (6) and Great Lakes comprehensive basin study (4).

Bureau fishery specialists work with the upper Mississippi river conservation committee-composed of biologists from the States along the upper stretches of the river—in collecting fishing statistics, making life history studies of the native fish, and making pollution investigations. A National fish hatchery located at New London produces about 1 1/2 million fish annually for stocking numerous farm ponds and many of the larger lakes of the State. The fish produced are primarily largemouth and smallmouth bass, blue gills, northern pike, and walleye. Fishery management activities are on: Red Lake, Grand Portage, and White Earth Indian reservations; Tamarac National wildlife refuge; and the sea lamprey control program on the north shore of lake Superior.

As part of the division of management and enforcement activities, U.S. game management agents are stationed in St. Paul, Grand Rapids, Fergus Falls and Mankato; at the latter location are headquartered an agent-pilot and plane which are available for use in the central part of the region and by other divisions. The bulk of the agents' duties involve routine or operational law enforcement and management activities. Notable law enforcement problems include: the many private waterfowl clubs and other private and public hunting areas in the State, the increasing number of United States citizens hunting in Canada and returning with game, and enforcement on Indian reservations. Approximately 690 permits are in force in Minnesota; these necessitate considerable supervision and inspection by agents.

Management activities in Minnesota are numerous and varied. A comprehensive bald eagle nest survey in the Chippewa National forest, undertaken by bureau and forest service personnel, has been rescheduled as a biannual project. This area has perhaps the densest concentration of bald eagles of any area in the 48 contiguous States. The Chippewa forest waterfowl survey is conducted annually. The bureau cooperates with the Minnesota department of natural resources and future farmers of America in a mallard duckling rearing and release program.

The northern prairie wildlife research center, Jamestown, North Dakota has a project in Minnesota entitled "Description and Classification of Wetlands on the Chippewa National Forest." The Denver wildlife research center has two activities of a continuing nature in Minnesota. One is continuing research that can best be summarized under the heading "Deer and Moose Ecology in Relation to Timber Management," the other is research on "Moose Population and Movements at Agassiz National Wildlife Refuge."

The bureau's Federal aid review of land appraisals for the State of Minnesota for 1970 covered 112 fee parcels covering 6,467 acres, valued at $844,669, and 12 easement cases covering 301.56 acres, valued at $20,000. This consisted of a total of 60 units, four of which were field checked for adequacy. In addition, appraisers completed a specific appraisal for the State of Minnesota of the former Chicago, Rock Island and Pacific Railroad r/o/v - 36 miles long covering 97.0 acres with an estimated value of $83,000. All others were reviewed in the office. This included both fisheries and wildlife projects.

The bureau of sport fisheries and wildlife administers programs which supply Federal aid for acquiring wildlife lands and for research, among other things. In the 26 years since Federal aid for wildlife restoration began in Minnesota, more than $7 1/2 million in Federal funds has been apportioned to the State for wildlife projects and programs.

Minnesota is participating through the bureau in the anadromous fish conservation program. The following project has been funded: Anadromous fish habitat development. 1967-1971. ($99,314). To increase the area available for spawning and angling fish by constructing fish passage facilities.

The bureau is involved in statewide fisheries research concerning: walleye propagation methods, warm water fisheries investigations, and cold water fisheries investigations. The bureau is also involved in combination Pittman-Robertson & Dingell-Johnson projects concerning statewide fish and wildlife surveys.

National Park Service

The National park service was established in the department of the interior by an Act of August 25, 1916. Subsequent acts, executive orders, and proclamations have added to the National park system and expanded the activities of the service.

The fundamental objective of the National park service is to promote and regulate the use of National parks, monuments, and similar reservations in conformity with the Act of August 25, 1916, in order to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." This objective extends to the service's activities in the preservation of American antiquities, historic and prehistoric sites and buildings, and properties of National historic or archeologic significance as well as the operation of recreation areas of National significance. A further objective of the service is to provide assistance to the States in the management, operation, and development of public park and recreational-area facilities; and, through a grants-in-aid program, in the preservation planning, acquisition, and development of historic properties.

The National park service is composed of a headquarters staff in Washington, D.C.; three service centers; six regional offices; and 277 field areas, which include National parks, monuments, recreation areas, and numerous categories of historic areas.

The programs carried on by the National park service stem primarily from its responsibility to provide and promote the use of areas for public enjoyment, and to protect the natural and historic resources comprising such areas. The protection program consists not only of preventing fires, stream pollution, and injury to natural, historic, or prehistoric features, but also of restricting uses that are incompatible with the basic purposes of the parks. An integral part of the overall program is to provide for the needs of the visiting public. The service also conducts interpretive, informational, and investigative programs relating to park resources and use.
Programs in Minnesota

The National park service administers two areas in Minnesota--Pipestone National monument (283 acres) and Grand Portage National monument (770 acres). For these areas, and the other units of the National park system, the National park service has developed a long-range program to provide essential facilities and services for the visiting public. Tentative plans for Pipestone National monument call for road and trail improvement projects and the installation of water and sewer lines. At both Pipestone and Grand Portage, special attention will be given to interpretive facilities and services.

At the request of the State, the National park service made a study of the Kabetogama peninsula (about 12 miles east of International Falls in St. Louis and Koochiching counties) and the surrounding lands and water adjacent to the boundary between the United States and Canada. This study resulted in a proposal to establish voyageurs National park. This park, which has been authorized by congress, is an irregularly shaped area about 72 miles long from east to west, and varies in width from 3 to 5 miles, will contain approximately 108,000 acres of land and 60,000 acres of water. The park--in the scenic lake country, still relatively free from manmade intrusions--will include a portion of the historic voyageurs' route, the route traveled by the rugged frontiersmen in search of fur-bearing animals. It will provide outstanding water recreation opportunities, particularly boating and fishing, in a wilderness of lakes and forests.

A number of legislative proposals have been introduced and/or passed in congress to preserve, for public use and enjoyment, the scenic St. Croix river in Minnesota-Wisconsin, including its principal tributary, the Namekagon river.

The National park service established on January 1, 1971 a land acquisition office at Duluth. The office has responsibilities related to the following Federal park, riverway and lakeshores: voyageurs National park, St. Croix National scenic riverway, apostle island National lakeshore, Indiana dunes National lakeshore, and sleeping bear dunes National lakeshore. The office performs the following tasks: maps ownership of lands, check title to provide survey for and appraise lands, determine land values, conduct land sales and closing activities, conduct condemnation proceedings in conjunction with U.S. district attorney office, and give relocation assistance to people being displaced by Federal projects.

Bureau of Mines

The bureau of mines was established July 1, 1910, in the department of the interior by the organic Act of May 16, 1910, as amended. The 1910 Act, as amended, has been supplemented by several statutes, including those that authorize the production and sale of helium, the conduct of research on environmental problems associated with mineral wastes, and most recently the Federal metal and nonmetallic mine safety Act of 1966, and the Federal coal mine health and safety Act of 1969, that deals with the inspection of domestic mines and enforcement of health and safety standards.

The bureau of mines conducts research and administers regulatory programs necessary for performance of the governmental function to stimulate the private sector toward the production of an appropriate and substantial share of the national mineral and fuel needs in a manner that best protects the public interest. Specifically, concern is directed toward the satisfaction of current and emerging needs: the real cost of such achievements; the assessment of related social-economic factors; minimization of occupational hazards to workers; reduction of wastes; and insurance that mineral raw materials are supplied and mineral-based products are used and disposed of without objectionable social and environmental cost. To accomplish these objectives, the bureau performs research, provides information to the public, conducts inquiries, and enforces laws pertinent to the extraction, processing, use, reuse, and disposal of minerals and mineral fuels.

The bureau is composed of a headquarters in Washington, D.C. and a field organization. The headquarters is divided into three functional categories: management staff, planning, administrative, and information functions which support all of the bureau activities; a deputy director, health and safety, responsible for compliance and enforcement obligations and powers; and a deputy director, mineral resources and environmental development, responsible for research, resource, and environmental activities. Field activities include: two administrative field offices; in the health and safety function: coal and metal/nonmetal mine safety district and subdistrict offices, technical support centers, and field health groups; and in the mineral resources and environmental development function: mining, metallurgy, and energy research centers and laboratories, field operation centers, and state liaison offices.

Functions include surveillance and evaluations of the industrial and commercial outlook for minerals and fuel deposits to determine the relationship of mineral supply, demand and technology to the National and world economy; studies and projects concerning the relationship of the mineral industries to environmental problems; collection, evaluation, and publication of mineral industry statistics; and conducting engineering studies regarding effective mining practices. Also included are research programs concerning extraction, processing, use, and disposal of minerals, mineral fuels, and helium production.

Programs are conducted to control health hazards and to reduce fatalities and injuries in the mineral industries. This is accomplished through mine inspections, field investigations, research and development, approval and testing of mining equipment and protective devices, analysis of accident statistics, safety education, training and motivation, health studies, and devising and enforcing appropriate health and safety standards.

Programs in Minnesota

For more than four and a half decades, the bureau of mines has been contributing to the advancement of Minnesota's thriving mineral economy. As the richest area of the State become depleted and mineral requirements of the State and Nation expand, these contributions assume increasing importance.
Bureau research in mining and metallurgy develops improved methods for extracting and processing a variety of ores and other mineral-bearing subsurface deposits. Evaluations of the State's mineral resources help provide a sound and knowledgeable basis for their conservation and development. Bureau health and safety programs are a source of constant assistance in minimizing hazards in the mineral industries.

The bureau's activities in Minnesota are carried on in close cooperation with State officials and with all segments of industry. These activities are centered at a modern research installation in the Minneapolis-St. Paul area and at a health and safety field office in Duluth that serves the six-state area of Minnesota, North and South Dakota, Nebraska, Wisconsin, and Michigan.

The bureau's Twin Cities research center is one of the best equipped installations in the world for scientific investigations in mining and metallurgy. The findings of its scientists, engineers, and technologists are valued in many parts of the Nation and in foreign lands, but Minnesota, with its great metal mining industries, is the principal beneficiary.

Mining research performed at the Twin Cities center is both basic and applied. Besides studying the fundamental properties of mineral structure, such as the bonds that hold mineral crystals together and the forces that can break these bonds, bureau experts are finding ways to improve efficiency and reduce costs in conventional mining practices such as drilling and blasting. In both kinds of research, the ultimate goal is the same: to hasten the necessary transition of mining from the status of an art to that of a science and to make mining more economical and thereby make possible the development of large resources of low-grade materials that cannot yet be mined and processed profitably.

A major bureau effort in metallurgy, and one holding high promise, is aimed at bringing into production vast deposits of nonmagnetic taconite, useless at present but potentially a large source of iron. Unlike the magnetic variety of taconite which already is being mined and processed by industry, nonmagnetic ores cannot be treated with methods and equipment now available. Bureau scientists at the Twin Cities center recently determined a refining technique for converting these nonmagnetic taconites into the magnetic kind by roasting them in the presence of scrap iron. This process may open an abundant new source of iron in Minnesota and at the same time enlarge the market for scrap.

In another important area of bureau research on iron, progress is being made in efforts to improve the technology of conventional pelletizing. Studies now underway are emphasizing the conversion of iron ore into pellets—ideal blast furnace material—by a process that also removes some of the ore's impurities. Still other experiments, directed from the Twin Cities center, are contributing new concepts and techniques in the making of pig iron. Already this work has pointed the way to more efficient operation of blast furnaces, showing how a better grade of pig iron can be obtained using less fuel.

Closely related to research on iron are bureau studies of Minnesota's second most important metal--manganese. A process now under development to extract manganese from low-grade ores of the Cuyuna range promises to make over 200 million tons of manganese-bearing material available for use in an emergency. Since the United States now must import nearly all the manganese it requires for steel-making, success in this bureau project will significantly improve the Nation's defense posture.

The bureau's economic and technical evaluations of Minnesota's mineral resources have made it an authoritative source of information needed by industry and by others concerned with full realization of the State's mineral potential. Resource evaluation studies are tied closely to bureau research, and as work progresses on developing methods that will permit use of nonmagnetic taconites, reserves of these minerals are being inventoried in expectation of their increasing significance.

The bureau also collects statistics on production, shipments, and other aspects of the mineral industry in Minnesota. This information published regularly helps the bureau direct its research with maximum efficiency and provides industry with an upto-date, comprehensive picture of developments throughout the State.

Experts stationed at the bureau's Duluth health and safety office cooperate with mineral producers to provide mine workers and officials with training in first aid, mine rescue, and accident prevention. In addition to these continuing tasks, special assignments are undertaken from time to time. Typical of these is a study of dust conditions and their effect on the health of workers in the State's granite industry.

Other bureau research is directed toward the development of new and improved technology for recovering and recycling metals and mineral values from the wastes generated by industry and the public. As part of a study for NASA's office of advanced research and technology to develop basic information needed for utilizing extraterrestrial mineral resources, the Twin Cities mining research center has been working with a suite of simulated lunar rocks.

Geological Survey

The geological survey was established by an Act of March 3, 1879, which provided for "the classification of the public lands and the examination of the geological structure, mineral resources, and products of the National domain." The Act of September 5, 1962, expanded the authorization to include such examinations outside the National domain. Topographic mapping and chemical and physical research were recognized as an essential part of the investigations and studies authorized by the organic Act, and specific provision was made for them by congress in an Act of October 2, 1886.

Provision was made in 1894 for gauging the streams and determining the water supply of the United States. Authorizations for publication, sale, and distribution of material prepared by the geological survey were contained in several statutes.

The broad objectives of the geological survey are to perform surveys, investigations, and research covering topography, geology, and the mineral and water resources of the United States; classify land as to mineral character and water and power resources; enforce departmental regulations applicable to oil, gas, and other mining leases, permits, licenses, develop-
ment contracts, and gas storage contracts; and publish and disseminate data relative to the foregoing activities.

The geological survey consists of a headquarters organization, most of which is in Washington, D.C., and a field organization made up of separate functional area offices and their subordinate field offices.

The geological survey is assigned the responsibility of performing the following functions:

Conservation.—Classify Federal lands as to their value for leasable minerals or for reservoir and waterpower sites; supervise the operations of private industry on mining and oil and gas leases on public domain, acquired, Indian, outer continental shelf, and certain naval petroleum reserve lands to ensure maximum utilization and prevent waste of the mineral resources, to limit damage or pollution to the total environment, and to secure the safety and promote the welfare of workmen; maintain production accounts and collect royalties; prepare and publish maps and mineral and water resources investigations on Federal lands; and provide the bureau of land management and other Federal agencies geologic and engineering advice, evaluations, and inspection services for the management and disposition of the public domain.

Geology.—Make geologic surveys and investigations to determine and appraise the mineral and mineral fuels resources and geologic structure of the United States and its territories, and provide scientific and technical assistance in appropriate fields, both domestically and abroad, to other Federal agencies, and administer an exploration program for the discovery of domestic mineral reserves by private industry with Federal assistance. Activities include: geologic mapping; physical exploration, when necessary; development of new prospecting techniques; research into geologic processes to provide guidance for significant geologic interpretations; specialized research in geochemistry, geophysics, and paleontology in support of the geologic and mineral resource investigations; and collection and synthesis of geologic information on mineral and mineral fuels resources. The results of investigations are published by cooperative agencies, and in trade and technical journals.

Topographic Mapping.—Prepare, publish, and revise maps of the National topographic map series, covering the United States and its outlaying areas. Operate the map information office, which collects and furnishes information concerning maps, aerial photography, and control survey data. Coordinate mapping activities financed by Federal funds and provide for transfer of map-related information to the National map information office. Conduct research in topographic surveying and mapping, including the component phases of control surveys, aerial photography, photogrammetry, and cartography, on both the techniques and the instrumentation of mapping operations. Prepare and publish, in cooperation with contributing organizations, the National atlas of the United States. Carry out research on domestic geographic names and provide staff assistance to the board on geographic names in its standardization of names for Federal usage.

Water Resources.—Determine the source, quantity, quality, distribution, movement, and availability of both surface and ground waters. This work includes investigations of floods and shortages of water supply, their magnitude, frequency, and relation to climatic and physiographic factors; the evaluation of available waters in river basins and ground-water provinces, including water requirements for industrial, domestic, and agricultural purposes; the determination of the chemical and physical quality of water resources and its relationship to various parts of the hydrologic cycle; special hydrologic studies of the interrelations between climate, topography, vegetation, soils, and the water supply; research to improve the scientific basis of investigations and techniques; scientific and technical assistance in hydrologic fields to other Federal agencies and to licensees of the Federal power commission. As prescribed by bureau of the budget circular No. A-67, coordinate Federal water data acquisition activities, which includes designing and operating a National water data network, organizing the National network data, and maintaining a central catalog of information on water data and acquisition activities. The results of these investigations are published in the series of geological survey publications.

Eros Program.—The earth resources observation satellite is a departmental program for acquiring, processing, distributing, and applying remote sensor data collected from aircraft and spacecraft toward the solution of resources and environmental problems.

Programs in Minnesota

The U.S. geological survey, St. Paul district, in cooperation with State and local agencies, is responsible for appraisal of the quantity and quality of the State's water resources, for interpretive studies pertaining to existing or potential water problems, and for research in the field of hydrology and related sciences. As a Federal agency concerned with water, the survey's role is unique; it provides the main bulk of data on which practically all development and management activities related to water are based. The survey is also unique in the extent to which it shares with State and local water agencies the responsibility for planning and financing water resources investigations. The data network maintained by the survey in cooperation with State and local agencies is the chief source of basic water data in the State.

Basic facts on streamflow are continuously collected by the geologic survey in Minnesota. Partial records of flow are collected at sites and records of the water level are maintained for lakes. Water sampling stations are established for monitoring the chemical and physical quality of the State's surface waters. In addition, samples of water are periodically collected from wells in major water-bearing units to check long-term changes in quality that may take place. Groundwater levels also are measured throughout the State.

The raw data from the networks provides information on day-to-day variations. Areial and interpretive studies seek to increase the usefulness of the data in the development and management of the water resources. The geological survey is now making a series of interpretive water reports that describe the entire State. These reports divide the State into 39 watersheds and present the characteristics of streamflow, availability and occurrence of ground water, and the chemical quality of surface and ground water. These tangible water resources are related to the entire hydrologic cycle through an analysis of climate, terrain, and the effects of man and his activities on the watersheds.
Comprehensive studies of surface waters in Minnesota began in 1909 and have been conducted ever since. Prior to 1946, most streamflow were made at only a few sites in Minnesota, chiefly by the army corps of engineers. In 1909, a cooperative agreement was made between the State drainage commission and the survey providing for a comprehensive survey of the streams of Minnesota with primary emphasis on the potential development of hydroelectric power in Minnesota streams. and on commercial navigation. Under this cooperative agreement a number of stream-gaging stations were established, and operated through 1912, after which their number was reduced. In 1910 increased State and Federal appropriations became available and since that time the number of stream-gaging stations in the State has gradually increased. In 1942 the first gaging stations were established in cooperation with the department of iron range resources and rehabilitation (then called iron range resources and rehabilitation commission).

In 1946 an intensive study of ground-water resources in the vicinity of Moorhead and in Clay county was undertaken, and in 1948 a similar investigation was begun at Cloquet. These investigations were made by personnel assigned from the Grand Forks office of the geological survey, under a cooperative agreement with the Minnesota division of waters, and were financed in part by the municipalities and counties in part by State funds, matched by Federal funds. In 1950, the ground-water branch of the geological survey assigned a geologist to the St. Paul district office. With increased State appropriations available, a cooperative program with the division of waters, Minnesota department of conservation was initiated for investigations of the ground-water resources of the State which has continued until the present. The small amount of State funds which could be allocated to this work has been augmented in most years by contributions from municipalities or counties interested in obtaining reliable factual data on local ground-water resources. In 1953, the Hennepin county board of county commissioners approved a cooperative program involving Minnehaha lake and Minnesota creek, and this was continued until 1963.

In 1954, the iron range resources and rehabilitation commission (IRRRC) inaugurated a cooperative program with the survey for intensive studies of the geology and ground-water resources on the Mesabi Iron Range, and in the same year the board of county commissioners financed a program of measuring a number of observation wells. In 1954 the first systematic investigations of the chemical quality of water in streams and wells on the iron range were started under a cooperative agreement between IRRRC and the quality of water branch, geological survey. In 1960 a similar program, statewide in scope, was financed by the division of waters. Samples are collected from selected streams, lakes, and wells and are subjected to complete laboratory analysis.

In 1962, the IRRRC, due to a shortage of funds, discontinued support of 12 stream gaging stations which had been operated under a cooperative agreement between that agency and the survey. The division of waters assumed responsibility for these stations during fiscal year 1963. In fiscal year 1964, the IRRRC resumed support of five of these stations, and the division of waters added two of them to its permanent program. No cooperative program was ever entered into with IRRRC during the 1963 fiscal year; but in the 1966 fiscal year, funds were provided to complete a ground water investigation in the Hibbing area.

Beginning in July 1963, State funds from the appropriation for hydrologic studies and research (natural resources fund) were allocated to the cooperative agreement with the survey for preparation of watershed unit hydrologic investigations. These funds are included in the cooperative program with the Minnesota division of waters. Additional funds allocated to research were assigned to the survey for investigations of the hydrology of the Twin City metropolitan area. Beginning in 1965, cooperative funds were provided for a study pertaining to the recreational uses of water in Minnesota.

The survey's collection of water resource data is financed either by cooperative cost-sharing agreements with State and local agencies or by Federal funds except in a few instances where total cost of a stream-gaging operation is borne by a private company as a licensee under regulations promulgated by the Federal power commission. The Minnesota division of waters, Minnesota department of highways, Minnesota highway department, and the department of iron range resources and rehabilitation are the State agencies currently participating in the cooperative program with the geological survey. Some municipalities and private companies also furnish financial support on a cooperative basis through the Minnesota division of waters. All Federal funds for water resources investigations are currently obtained either by direct appropriation to the survey or by transfer from corps of engineers, U.S. department of state (for operation of international boundary stations) and fish and wildlife service.

Information concerning active projects as of March 29, 1971 is summarized below:

Collection of basic records, streamflow data - Records collected in cooperation with Minnesota department of natural resources, Minnesota department of highways; U.S. army corps of engineers; U.S. bureau of sport fisheries and wildlife; Federal government; U.S. department of state; FPC licensees: northern states power co., blandin paper co., Minnesota power and light, and ford motor co. Stations at which recurrent records are obtained: continuous daily - discharge 117, peak flow 30, stage only 5, lake or reservoirs - stage 25 and storage change 7; monthly - discharge 21, peak flow 195. Points at which non-recurrent records are obtained: low flow 5 and peak flow 49.

Collection of basic records, ground water data - Records collected in cooperation with Minnesota department of natural resources, Minnesota geological survey and Federal government. Stations at which recurrent records are obtained: continuous daily - water levels 16, weekly - water levels 9, monthly - 42 and other water levels 11.

Collection of basic records, water quality data - Records collected in cooperation with Minnesota department of natural resources, U.S. army corps of engineers, FWMA, ABC and Federal government. Stations at which recurrent records are obtained: continuous daily - sediment 2; monthly - biologic 1, inorganic 4, organic 1, and physical 6; other - inorganic 38, physical 38 and sediment 17.

Hydrology of watersheds in Minnesota - In 1859, the division of waters of the Minnesota department of conservation published bulletin 10 "Hydrologic Atlas of Minnesota." This bulletin divided the State into 39 watershed units, and summarized the occurrence of water in the State. Investigations of watersheds will provide general information on surface and ground...
water availability, quality, and use for municipal, industrial and agricultural development. A publication will be prepared for each of the 39 watersheds. Projects are underway for the watersheds in southern Minnesota and the upper Mississippi river basin, planned to begin in fiscal year 1972 for the Rainy river basin, and are completed for the Red river basin. State bulletins have been published for the watersheds in the Lake Superior area. Existing records are analyzed and additional information obtained through field study. Using geologic maps, well inventories, and records of well drillers, maps of availability of ground water are constructed and supplemented with information on aquifers. From analysis of surface water flows, maps are prepared showing the availability of surface water. Insets show effects of floods and characteristics of high and low flows, and relationships between ground and surface waters. Water budgets for watersheds are prepared. Quality of water analyses are studied, and the results shown graphically or in map form.

Artificial recharge, Twin Cities artesian basin - An experiment is being made in the Mpls.-St. Paul metropolitan area to test and demonstrate the hydrologic feasibility of recharging fractured carbonate rocks of the Twin Cities artesian basin. This project involves test drilling, setting of observation wells, and construction and experimentation of one injection well finished at a depth of about 400 feet. Another project is underway in the Twin Cities artesian basin to assemble all readily available geologic and hydrologic data, to analyze the hydrologic system on the basis of these data, and to identify future data and project needs. The artificial recharge project derives direct benefit from this project. An electric analog model has been prepared for the Twin Cities metropolitan area and is available for use.

Studies in the iron range area - In 1956, studies of the iron range area for ground water potential were begun. These studies were completed in 1971. Data have been transferred to automatic data processing form. Miscellaneous measurements of streamflow are being made on the principal streams in the area at geologic and geomorphic boundaries. Streamflow gains and losses will be analyzed with respect to geologic and hydrologic environments.

Lake hydrology studies - Water budgets for Shagawa lake, Ely and Lake Sallie, Detroit Lakes have been prepared in conjunction with FWPCA research projects for development of methods and techniques for control of accelerated eutrophication of lakes.

Bridge Site Investigations - These investigations provide data design engineers with the essential information regarding peak flows at proposed waterway crossings.

Ground Water for irrigation near Little Falls - The potential yield of sand and gravel deposits for irrigation use is being investigated.

The geological survey has published 7 1/2-minute (1:24,000-scale--1 inch equals 2,000 feet) topographic maps for more than one-fourth of the area of the State. This mapping covers principally the urban areas of Minneapolis, St. Paul, Mankato, Rochester, Austin, and Duluth, and also the northeastern part of the State. The maps provide basic data for urban planning, mining and water resource studies, and preliminary engineering investigations. In addition, much of the State is covered by 1:3-minute (1:62,500-scale 1 inch equals about 1 mile) topographic maps. These maps are useful for less intensive land-use studies and for resources development. Almost 60 percent of the State is covered by 15-minute or 7 1/2-minute maps. The entire State is covered by maps of the 1:250,000-scale (1 inch equals about 4 miles) series. A State topographic map at 1:500,000-scale (1 inch equals about 8 miles) was published in 1963.

Most of the mapping in Minnesota at this time is being done in cooperation with the State department of administration under a program in which the cost is shared equally by the State and Federal governments. The pace of the program was recently increased significantly with the aim of completion of the program was recently increased significantly with the aim of completion of the program was recently increased significantly with the aim of completion of the program was recently increased significantly with the aim of completion of the program was recently increased significantly with the aim of completion of all of the work in the upper Mississippi river basin, planned to begin in fiscal year 1972 for the Rainy river basin, and are completed for the Red river basin. State bulletins have been published for the watersheds in the Lake Superior area. Existing records are analyzed and additional information obtained through field study. Using geologic maps, well inventories, and records of well drillers, maps of availability of ground water are constructed and supplemented with information on aquifers. From analysis of surface water flows, maps are prepared showing the availability of surface water. Insets show effects of floods and characteristics of high and low flows, and relationships between ground and surface waters. Water budgets for watersheds are prepared. Quality of water analyses are studied, and the results shown graphically or in map form.

Artificial recharge, Twin Cities artesian basin - An experiment is being made in the Mpls.-St. Paul metropolitan area to test and demonstrate the hydrologic feasibility of recharging fractured carbonate rocks of the Twin Cities artesian basin. This project involves test drilling, setting of observation wells, and construction and experimentation of one injection well finished at a depth of about 400 feet. Another project is underway in the Twin Cities artesian basin to assemble all readily available geologic and hydrologic data, to analyze the hydrologic system on the basis of these data, and to identify future data and project needs. The artificial recharge project derives direct benefit from this project. An electric analog model has been prepared for the Twin Cities metropolitan area and is available for use.

Studies in the iron range area - In 1956, studies of the iron range area for ground water potential were begun. These studies were completed in 1971. Data have been transferred to automatic data processing form. Miscellaneous measurements of streamflow are being made on the principal streams in the area at geologic and geomorphic boundaries. Streamflow gains and losses will be analyzed with respect to geologic and hydrologic environments.

Lake hydrology studies - Water budgets for Shagawa lake, Ely and lake Sallie, Detroit Lakes have been prepared in conjunction with FWPCA research projects for development of methods and techniques for control of accelerated eutrophication of lakes.

Bridge Site Investigations - These investigations provide data design engineers with the essential information regarding peak flows at proposed waterway crossings.

Ground Water for irrigation near Little Falls - The potential yield of sand and gravel deposits for irrigation use is being investigated.

The geological survey has published 7 1/2-minute (1:24,000-scale--1 inch equals 2,000 feet) topographic maps for more than one-fourth of the area of the State. This mapping covers principally the urban areas of Minneapolis, St. Paul, Mankato, Rochester, Austin, and Duluth, and also the northeastern part of the State. The maps provide basic data for urban planning, mining and water resource studies, and preliminary engineering investigations. In addition, much of the State is covered by 1:3-minute
and to utilize the skill and capabilities of Indian and Alaska Native people in the direction and management of programs for their benefit.

In carrying out these objectives, the Bureau works with Indians and Alaska Native people, other Federal agencies, State and local governments, and other interested groups in the development and implementation of effective programs for their advancement; seeks for them adequate educational opportunities in public education systems, assists them in the creation and management of educational systems for their own benefit, or provides from Federal resources the educational systems needed; actively promotes the improvement of their social welfare by working with them to obtain and provide needed social and community development programs and services; works with them in the development and implementation of programs for their economic advancement and for full utilization of their natural resources consistent with the principles of resource conservation; and acts as trustee for their lands and monies held in trust by the United States, assisting them to realize maximum benefits from such resources.

Programs in Minnesota

Indian reservation lands comprise approximately 734,800 acres of Minnesota's land base. Most of this land, 682,100 acres, is tribally owned. The remaining 52,700 is in individual Indian ownership. An additional 28,554 acres of submarginal land is available to Indians for other than farming purposes. The principal reservations, all Chippewa, are:

Red Lake reservation.--Located in northern Minnesota, this is the largest of Minnesota's Indian reservations, with a population of some 3,290. It is a "closed reservation"--that is, all lands within the reservation are owned by the tribal band as a whole. There is some farming on the reservation, however, commercial fishing, timber cutting, work at the tribally owned sawmill at Redby, and hunting are the chief sources of income. Red Lake offers fine fishing and hunting for sportsmen and adequate lodging adjacent to the reservation. The entire reservation is a sanctuary for the American bald eagle.

Two large areas of wildlife habitat on the Red Lake reservation damaged by dredging of rivers for drainage have been restored. The developed areas should greatly augment the hunting of migratory birds; with fur-bearing animals returning to these areas, trapping operations of the Indian will increase.

White Earth reservation.--Situated in western Minnesota near Bemidji, the reservation is home to 2,550 Indians. Timberwork, construction, and seasonal farmwork are the major sources of employment. Some benefits are also derived from the harvesting of wild rice and maple syrup. The reservation has many lakes for boating, fishing, and swimming.

Nett Lake reservation.--In northern Minnesota, it adjoins Kabetogama State forest and game refuge and Koochiching State forest and game refuge. Two wild rice processing plants are located on the Nett Lake reservation; the harvesting and processing of wild rice in August attract many visitors. Employment is scarce on the reservation except during this 4-week harvesting season. Some Indians are employed in a small rug-making business. The reservation is considered one of the best duck hunting areas in the State; waterfowl hunting, boating, fishing, and swimming abound in the Pelican Lake area. Vermillion Lake reservation, a part of the Nett Lake reservation, is another popular tourist and resort area. The population of the Nett Lake reservation is estimated at 665.

Leech Lake reservation.--Near Bemidji, the reservation is entirely enclosed by the Chippewa National forest. The economy of the reservation depends largely on forest products and tourist trade. Since these activities are mostly seasonal, unemployment exists, especially during the winter months. Many families derive some income from selling handmade arts and crafts articles such as birchbark souvenirs and headwork. About 2,550 Indians live on the reservation.

Grand Portage reservation.--Located in the extreme northeastern tip of the State along the Pigeon river on the Canadian border, it is the site of the historic Grand Portage National monument. As reservation employment is limited, many Indians seek employment elsewhere for at least a part of the year. Some commute to jobs in the mines, on docks, and with the railroad. Local jobs consist of roadwork, fishing, timber hauling, and summer activities connected with the tourist trade. The reservation offers fine trout fishing in stream and spring-fed lakes and deep-sea fishing in Lake Superior. The population is approximately 335.

The Grand Portage Band is proposing Grand Portage Indian park as a complement to the Grand Portage National monument. This Indian park, if authorized by the Band, the Minnesota CHIPPEWA Tribe, and the U.S. government, will be of major recreational potential.

Fond du Lac reservation.--Adjoining Fond du Lac State forest and refuge, it is noted for its numerous lakes, forest cover, and wildlife habitat. The Indians on the reservation are generally more prosperous than any other Indian group within the State because of the numerous work opportunities in a nearby major industrial center and in the mills at Duluth and Cloquet. The Band operates a fish hatchery on the reservation. Approximately 850 Chippewa reside on the reservation.

Mille Lacs reservation.--Located 100 miles north of Minneapolis-St. Paul on Mille Lacs Lake, sources of income include logging and timbering, sale of birchbark souvenirs, summer resort jobs, and conducting tours for visitors. It is a major resort and recreational area, with approximately 114 resorts and numerous lakeshore subdivisions for seasonal homesites. It is noted for its winter and summer fishing. The reservation population at present totals 920.

In addition to the above mentioned communities there are: (1) four Sioux communities in southern Minnesota totaling 3,280 acres; and (2) Minnesota Public Domain allotments of 905 acres.

When proposed recommendations of a recent wild rice study are in actual practice, greater recreational development will result for the White Earth, Vermillion Lake and Red Lake reservations. Establishing more wild rice paddies is expected to improve the wildlife environment, and it is also anticipated that more tourists will come to view the harvesting of the wild rice.

The State of Minnesota has assumed full responsibility for the education of all Indian children. The bureau of Indian affairs maintains no schools of its own either off or on the reservations. However, in order to meet special
needs of the adult population, the bureau conducts adult education programs on the Red Lake, Leech Lake, White Earth, and Mille Lacs reservations. The bureau has also instituted a number of summer programs in the State for vacationing Indian students.

The bureau supplements the scholarship aids available to Indians through their tribes, the State, and outside sources with approximately $25,000 yearly.

The harvesting of timber provides an important source of income and employment for Indians in Minnesota. All cutting of reservation timber is administered by bureau of Indian affairs' foresters, working in cooperation with local Indian tribes. The forestry program of the bureau also provides for the protection of forests from fire, insects, and disease; the bureau will continue its efforts to expand markets for Aspen which is in plentiful supply throughout the Indian-owned lands.

Bureau of Land Management

The bureau of land management was established on July 16, 1946, through the consolidation of the general land office (created in 1812) and the grazing service (founded in 1934) in accordance with the provisions of sections 402 and 403 of the president's reorganization plan 3 of 1946.

The bureau classifies, manages, and disposes of the public lands and their related resources according to the principles of multiple-use management. It also administers the mineral resources connected with acquired lands and the submerged lands of the outer continental shelf.

The bureau organization consists of the headquarters in Washington, D.C., three detached offices having bureau-wide responsibilities, a basic field organization of State and district offices, and other field offices which perform limited functions.

The bureau is responsible for the management of 60 percent of the Nation's Federal lands and administers the Federal laws pertaining to these lands. This responsibility covers 20 percent of the Nation's total land base. Lands under its jurisdiction are located primarily in 10 States in the far West and in Alaska. However, scattered parcels of public land are located in an additional 14 States.

Public land resources managed by the bureau include timber, minerals, wildlife habitat, livestock forage, public recreation values, and open space. Bureau programs provide for the protection, orderly development, and use of all these resources under principles of multiple use and sustained yield, and for a quality environment. It manages watersheds to protect soil and enhance water quality, develops recreation opportunity on public land, and makes public land available through sale or lease to individuals, organizations, local governments, and other Federal agencies when such transfer is in the public interest.

The bureau is responsible for the survey of Federal lands and maintains public land records. It is responsible for mineral leasing on much of the public land held by other Federal agencies and for leasing the mineral deposits of the outer continental shelf.

Programs in Minnesota

The bureau of land management has a Lake States project office in Duluth. The office territory includes Minnesota, Wisconsin and Michigan.

By 1966 only 40,982 surveyed acres of widely scattered land and an unknown number of unsurveyed islands (original estimate of 5,000 - 9,000) remained in the jurisdiction of the bureau in Minnesota. Cadastral surveys were being made only on specific islands when requested by an applicant. This resulted in high costs of survey and field examination. Eventual classification and sale resulted in little if any reduction in the bureau's problem of managing land in a fragmented ownership pattern. The bureau decided to re-evaluate its programs in Minnesota to determine how the remaining lands and resources best can meet the present and future needs. A supplemental appropriation of $100,000 for fiscal year 1967 expressed the congressional intent to commence an inventory of the unsurveyed islands in Minnesota.

Effective March 15, 1966 the jurisdiction of Minnesota bureau of land management, except administration of the mineral resources, was transferred to the Montana State office. (Effective September 13, 1967 the remaining functions were transferred from the eastern States land office to the Montana State office.) After considering alternatives a small office was established in Duluth directly responsible to the Montana State director. By September 1967 this office was operating with five people - a project manager, clerk, forester, a mineral resource specialist, and a topographical specialist. One summer employee is retained each year. This crew devised a unique land and island inventory system complete with instructions, forms, data processing format and a record keeping system. They locate existing pertinent information and coordinate their efforts with interested parties and other agencies. They also maintain the bureau's routine management functions in Minnesota.

The mission of the office is to identify and physically inventory the public lands and surface resources in the jurisdiction of the bureau. The land classification process started only after the total inventory results are known. Following a physical examination of each unsurveyed parcel, surveyed lot or composite tract, data is recorded, summarized and analyzed for each county. The effort to date includes these major items: a detailed search of the official land office records to identify surveyed land with surface jurisdiction remaining with the bureau; a thorough and systematic office and field investigation to identify unsurveyed islands or other unsurveyed land still in the jurisdiction of the bureau; a specific inventory report which records data about each parcel of surveyed or unsurveyed land in the bureau's jurisdiction; and county summaries of selected inventory source data available through ADP.

Surveys in all 87 counties in Minnesota have been completed; over 5,000 islands have been studied, of which over 1,100 were claimed as Federally owned. These will be transferred to other Federal agencies or sold to the private sector depending upon whether the islands have substantial public value or no public value. The remaining 3,900 islands will belong to the State or have been transferred or sold by the State to private ownership. No islands were viewed in National forests, Indian lands or in the Mississippi river parkway.
In Minnesota the bureau of land management has administrative jurisdiction over approximately 41,000 acres of public lands in 22 counties. About 97 percent is in Koochiching, Lake of the Woods and Roseau counties. The lands in Koochiching county consist mainly of four blocks, some 20,000 acres of which were withdrawn by executive order 5110 of December 3, 1928, in connection with an agreement with Great Britain to control the water level in the Lake of the Woods and Rainy rivers. The land is all located in a poorly drained area characterized by intermittent open marsh, grass, and low ridges timbered with spruce, tamarack, balsam fir, and associated species. Due to drainage problems, it is almost inaccessible and has little potential use. During the past 10 years, most of the area has been cut over for small Christmas trees. Also, pulpwood from the area has been sold, however, pulpwood over approximately 41,000 acres of public lands in 22 counties.

About 97 percent is in Koochiching, Lake of the Woods and Roseau counties. The lands in Koochiching county consist mainly of four blocks, some 20,000 acres of which were withdrawn by executive order 5110 of December 3, 1928, in connection with an agreement with Great Britain to control the water level in the Lake of the Woods and Rainy rivers. The land is all located in a poorly drained area characterized by intermittent open marsh, grass, and low ridges timbered with spruce, tamarack, balsam fir, and associated species. Due to drainage problems, it is almost inaccessible and has little potential use. During the past 10 years, most of the area has been cut over for small Christmas trees. Also, pulpwood from the area has been sold, however, pulpwood has been discontinued until it is determined what disposition is to be made of the land. These lands could be used as a basis of exchange for State-owned lands within established or proposed Federal programs such as National forests, National parks, or National wildlife refuges. Such exchange needs, however, may take several years to develop.

Bureau of Outdoor Recreation

The bureau of outdoor recreation was created April 2, 1962. Under the Act of May 28, 1963, the bureau is responsible for promoting coordination and development of effective programs relating to outdoor recreation. In performing these responsibilities the bureau reports to the secretary through the assistant secretary—public land management. The bureau carries out most of the responsibilities delegated to the secretary under the land and water conservation fund Act of 1965. Numerous functions are performed under the Federal water project recreation Act.

The bureau has government-wide responsibilities in outdoor recreation and, as the Federal focal point in outdoor recreation, is in the mainstream of efforts to enhance and protect the environment.

The bureau is responsible for preparing and maintaining a continuing inventory and evaluation of the outdoor recreation needs and resources of the United States; preparing a system for classification of outdoor recreation resources; formulating and maintaining a comprehensive nationwide outdoor recreation plan; promoting coordination of Federal plans and activities relating to outdoor recreation; cooperating with and providing technical assistance to States, political subdivisions, and private interests; encouraging interstate and regional cooperation; sponsoring, engaging in, and assisting with research relating to outdoor recreation; and cooperating with and providing technical assistance to Federal departments and agencies. Under the land and water conservation fund Act of 1965, the bureau also administers financial assistance grants to States for the purpose of facilitating outdoor recreational planning, acquisition, and development activities. The Fund also helps finance acquisition of needed Federal land and water areas. Under the provisions of the Federal water project recreation Act, the bureau participates directly in the planning, coordination, and establishment of uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multipurpose water resource projects.

The bureau is composed of a headquarters staff in Washington, D.C., and six regional offices. The regional office concerned with Minnesota is in Ann Arbor, Michigan.

Bureau of Reclamation

The reclamation Act of 1902 authorized the secretary of the interior to locate, construct, operate, and maintain works for the storage, diversion and development of waters for the reclamation of arid and semiarid lands in the western States. To perform these functions, the secretary in July 1902 established a reclamation service in the geological survey. In March 1907 the reclamation service was separated from the survey, and in June 1923 the name was changed to bureau of reclamation.

The program of the bureau of reclamation is designed to stabilize and to promote the growth of local and regional economies through optimum development of water and related land resources throughout the 17 contiguous western States and Hawaii. Reclamation projects provide for some or all of the following concurrent purposes: irrigation water service, municipal and industrial water supply, hydroelectric power generation and transmission, water quality improvement, fish and wildlife enhancement, outdoor recreation, flood control, navigation, river regulation and control, and related uses. Through contractual agreements with project beneficiaries, the bureau arranges for repayment to the government of reimbursable costs incurred in the construction and operation of water resource projects.

The bureau consists of the following principal segments: the commissioner's office at Washington, D.C., the engineering and research center at Denver, Colo., seven regional offices, project and other operating offices in the regions, and river basin planning offices.

Major functions include: investigation and development of plans for the regulation, conservation, and utilization of water and related land resources including basewide water studies; administration of water research programs to develop maximum use of resources including weather modification and construction of authorized projects for which funds have been appropriated by the congress; operation and maintenance of projects and facilities constructed by the bureau, and review of the operation and maintenance of bureau-built projects and facilities which are operated and maintained by water users; settlement of public or acquired lands on bureau projects; administration of the small reclamation projects Act of 1956; and negotiation, execution, and administration of repayment contracts, water-user operation and maintenance contracts, and contracts required by statutes relating to the irrigation of excess lands.

The bureau has responsibility for the sale, interchange, purchase, or transmission of electric power and energy generated at powerplants constructed and operated by the bureau, except surplus electric power from nine hydroelectric plants operated by the bureau in the Pacific Northwest; and six powerplants on the Missouri river and one on the Rio Grande that were constructed by other Federal agencies.

The bureau constructs and operates job corps civilian conservation centers. It renders technical assistance to foreign countries in water resources development and utilization in cooperation with the agency for International development of the department of State, and other agencies engaged in International technical cooperation.
Introduction

The department of agriculture was created by Act of congress approved May 15, 1862, and until 1889 was administered by a commissioner of agriculture. By Act of February 9, 1889, the powers and duties of the department were enlarged. It was made the eighth executive department in the Federal government, and the commissioner became the secretary of agriculture.

The department is directed by law to acquire and diffuse useful information on agricultural subjects in the most general and comprehensive sense. The department performs functions relating to research, education, conservation, marketing, regulatory work, agricultural adjustment, surplus disposal, and rural development.


The fiscal year 1970 program distribution of budget authority for the department of agriculture is shown in table 7. Budget authorities in fiscal year 1970 for selected agencies of the department are presented below:

- Agricultural research service - $262,253,000 Federal funds
  $1,144,000 trust funds
- Cooperative State research service - $62,640,000 Federal funds
  $2,000 trust funds
- Extension service - $264,940,000 Federal funds
  $999,000 trust funds
- Economic research service - $14,962,000 Federal funds
  $2,100 trust funds
- Agricultural stabilization and conservation service - $561,150,000 Federal funds
- Farmers home administration - $154,883,000 Federal funds
- Forest service - $8,928,623,000 Federal funds
  $75,167,000 trust funds


Figure 12. Organization Chart for the Department of Agriculture.

(From The Budget of the United States Government, Fiscal Year 1972)
Table 7. Fiscal Year 1970 Program Distribution of Budget Authority, Department of Agriculture

<table>
<thead>
<tr>
<th>Program Category</th>
<th>Budget Authority (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm income</td>
<td>4,739</td>
</tr>
<tr>
<td>Agricultural production capacity</td>
<td>625</td>
</tr>
<tr>
<td>Agricultural marketing and distribution system</td>
<td>141</td>
</tr>
<tr>
<td>Food for peace</td>
<td>920</td>
</tr>
<tr>
<td>Export market development</td>
<td>89</td>
</tr>
<tr>
<td>Foreign agricultural development</td>
<td>4</td>
</tr>
<tr>
<td>Food and nutrition</td>
<td>1,507</td>
</tr>
<tr>
<td>Health and safety</td>
<td>132</td>
</tr>
<tr>
<td>Youth development and family living</td>
<td>42</td>
</tr>
<tr>
<td>Community development services</td>
<td>29</td>
</tr>
<tr>
<td>Housing</td>
<td>42</td>
</tr>
<tr>
<td>Public facility and business expansion</td>
<td>427</td>
</tr>
<tr>
<td>Resource protection and environmental improvement</td>
<td>252</td>
</tr>
<tr>
<td>Recreation, wildlife and natural beauty</td>
<td>57</td>
</tr>
<tr>
<td>Timber</td>
<td>362</td>
</tr>
<tr>
<td>General administration</td>
<td>5</td>
</tr>
<tr>
<td>Program Support</td>
<td>46</td>
</tr>
<tr>
<td>Total distributed to programs above</td>
<td>9,419</td>
</tr>
<tr>
<td>Deduction for offsetting receipts</td>
<td>-490</td>
</tr>
<tr>
<td>Total budget authority, Department of Agriculture</td>
<td>8,929</td>
</tr>
</tbody>
</table>

1/Budget authority does not reflect program level.

(From Special Analyses, Budget of the United States Government, Fiscal Year 1972)

According to data presented in the publication "Federal Outlays in Minnesota," office of economic opportunity, national technical information service, total federal outlays in connection with the department of agriculture water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Outlays (Million dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>24.2</td>
</tr>
<tr>
<td>1968</td>
<td>25.2</td>
</tr>
<tr>
<td>1969</td>
<td>21.7</td>
</tr>
<tr>
<td>1970</td>
<td>20.9</td>
</tr>
</tbody>
</table>

In fiscal years 1967-70, Federal outlays in connection with the various agencies in the department of agriculture were as follows:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Federal Outlays (Million dollars):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Conservation Service</td>
<td>3.1 4.5 4.2 4.0</td>
</tr>
<tr>
<td>Forest Service</td>
<td>10.3 7.0 7.1 7.6</td>
</tr>
<tr>
<td>Farmers Home Administration</td>
<td>0.5 4.1 3.6 2.3</td>
</tr>
<tr>
<td>Agricultural Research Service</td>
<td>1.2 0.8 0.7 0.8</td>
</tr>
<tr>
<td>Agricultural Stabilization and Conservation</td>
<td>8.8 8.4 5.7 5.7</td>
</tr>
<tr>
<td>Other</td>
<td>0.3 0.4 0.4 0.5</td>
</tr>
<tr>
<td>Total</td>
<td>24.2 25.2 21.7 20.9</td>
</tr>
</tbody>
</table>

Fiscal year 1970 program summaries for agencies are:

<table>
<thead>
<tr>
<th>Agency and Program</th>
<th>Federal Outlays (100,000 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Conservation Service</td>
<td>40,35</td>
</tr>
<tr>
<td>Resource Conservation and Development</td>
<td>3,83</td>
</tr>
<tr>
<td>River Basin Surveys and Studies</td>
<td>4,65</td>
</tr>
<tr>
<td>Watershed Planning</td>
<td>1,33</td>
</tr>
<tr>
<td>Watershed Works of Improvement</td>
<td>4,07</td>
</tr>
<tr>
<td>Conservation Technical Services</td>
<td>26,55</td>
</tr>
<tr>
<td>Soil Survey</td>
<td>3,92</td>
</tr>
<tr>
<td>Forest Service</td>
<td>75,78</td>
</tr>
<tr>
<td>Forest Roads and Trails</td>
<td>15,04</td>
</tr>
<tr>
<td>Shared Revenue from National Forest</td>
<td>1,98</td>
</tr>
<tr>
<td>Forest Protection and Utilization</td>
<td>49,47</td>
</tr>
<tr>
<td>Assistance to State-Trees and Utilization</td>
<td>1,41</td>
</tr>
<tr>
<td>Working Capital Fund</td>
<td>5,05</td>
</tr>
<tr>
<td>Expenses, Brush Removal</td>
<td>0,16</td>
</tr>
<tr>
<td>Cooperative Work</td>
<td>2,02</td>
</tr>
<tr>
<td>Land and Water Conservation Fund</td>
<td>1,25</td>
</tr>
<tr>
<td>Farmers Home Administration</td>
<td></td>
</tr>
<tr>
<td>Loans</td>
<td>23,27</td>
</tr>
<tr>
<td>Recreational Facilities</td>
<td>2,68</td>
</tr>
<tr>
<td>Water Systems</td>
<td>1,31</td>
</tr>
<tr>
<td>Sewer Systems</td>
<td>5,84</td>
</tr>
<tr>
<td>Water and Sewer Systems</td>
<td>4,02</td>
</tr>
<tr>
<td>Individual Soil and Water</td>
<td>0,84</td>
</tr>
<tr>
<td>Grants</td>
<td>8,58</td>
</tr>
<tr>
<td>Water System Development</td>
<td>0,32</td>
</tr>
<tr>
<td>Sewer System Development</td>
<td>7,13</td>
</tr>
<tr>
<td>Water and Sewer System Development</td>
<td>1,13</td>
</tr>
<tr>
<td>Agricultural Research Service</td>
<td>7,51</td>
</tr>
<tr>
<td>Soil and Water Conservation Research</td>
<td>7,51</td>
</tr>
<tr>
<td>Agricultural Stabilization and Conservation</td>
<td>57,12</td>
</tr>
<tr>
<td>Agricultural Conservation (REAP)</td>
<td>57,12</td>
</tr>
<tr>
<td>Other</td>
<td>5,00</td>
</tr>
<tr>
<td>Cooperative Extension Work and Grants for Research</td>
<td>5,00</td>
</tr>
</tbody>
</table>

TOTAL                                          209,03

Rural Development and Conservation

The farmers home administration provides financial and management assistance to: farmers to purchase family farms, and to operate and develop such farms and recreational and other nonfarm enterprises, farmers and rural residents to build, buy, and improve homes and essential farm buildings, rural groups to develop recreational facilities and community water supply and waste disposal systems, carry out soil conservation measures, and shift land use to grassland and forestry, local organizations to help finance watershed protection and flood prevention projects, individuals and groups to build housing for domestic farm laborers and rural rental and cooperative housing, low-
income rural families and groups to raise income and living standards, public agencies or private nonprofit organizations in rural areas to develop, conserve, and utilize natural resources, and carry out projects to improve the economy of the areas, and farmers who suffer loss of income, property, and crops, from natural disasters. Applicants must be unable to obtain needed credit elsewhere.

The farmers home administration, along with other department of agriculture agencies, operating through State, area, and county rural development committees, assists other Federal, State, and local agencies to make their services known and effective in local rural areas.

Applications for loans are made at the agency's 1,716 local county offices, generally located in county-seat towns. A county or area committee of three individuals, at least two of whom are farmers, certifies or recommends as to eligibility of applicants and amounts of loans and reviews borrowers' progress.

Each loan is based on a plan that should provide enough income to raise family living standards and to meet payments on the borrowers' debts.

Funds for loans and grants made by the farmers home administration come from three sources: annual appropriations by congress, balances in revolving funds, and private lenders who supply funds for loans which are insured by the agency. Most of the loans are now made on an insured basis.

Operating loans are made to eligible operators of not larger than family farms, to assist them in making improved use of their land and labor resources and make adjustments necessary for successful farming. Funds may be advanced to pay for equipment, livestock, feed, seed, fertilizer, for other farm and home operating needs, to refinance chattel debts, provide operating credit to fish farmers, carry out forestry purposes, develop income-producing recreation enterprises, and establish non-farm enterprises to supplement farm income. Each loan is scheduled for repayment in accordance with the borrower's ability to repay, over a period not exceeding 7 years. The interest rate is 6 5/8 percent. A borrower's total principal indebtedness for operating loans may not exceed $35,000.

Farm ownership loans help family farmers obtain the resources needed to improve their living conditions and farm successfully. These loans are made to buy farms or land to enlarge farms; construct or repair buildings; improve land; develop water, forestry, and fish farming resources; establish recreation and nonfarm enterprises to supplement farm income, and refinance debts. The interest rate is 5 percent; repayment period may not exceed 40 years. A borrower's total indebtedness on the farm, including the loan being made, may not exceed $60,000 or the normal value of the security, whichever is less.

Recreation loans may be made to individual farm operators and owners regularly engaged in farming to convert all or portions of their farms to recreation uses. These loans are made to buy and develop land and water resources, build and repair buildings, and pay other real estate and operating costs for outdoor recreation uses. Loan funds may also be used to refinance secured and unsecured debts. The interest rate is 5 percent; repayment period may not exceed 40 years. A borrower's total indebtedness on the farm, including the loan being made, may not exceed $60,000 or the normal value of the security, whichever is less.

Loans to rural groups for soil and water conservation and shifts in land use are made to eligible groups of farmers and ranchers to develop irrigation systems, drain farmland, and carry out soil conservation measures. Loans may also be made for shifts in land use to develop grazing areas and forest lands. Each loan is scheduled for repayment in accordance with the borrower's ability to repay, over a period not exceeding 40 years. The interest rate cannot exceed 5 percent. An association's total indebtedness cannot exceed $4,000,000.

Rural housing loans are made to farmers and other rural residents in open country and small rural communities with population of not more than 5,500. Low and moderate income families who live in a city and work in a rural area also may qualify for loans. Loans are made to build and repair needed homes and essential farm buildings, purchase homes or buy sites on which to build homes. Families who do not have enough repayment ability may use cosigners to assure loan payments. The maximum term is 33 years. The interest rate varies, but in most cases does not exceed 6 1/4 percent. For lower income families the interest rate can be reduced to as low as one percent. The actual rate depends on the size of the family and its income. Loans are also made to provide rental and cooperatively owned housing in rural areas. Funds may be used to build, buy, improve or repair rental or cooperatively owned housing designed to meet the needs of senior citizens who are capable of caring for themselves, and of other low or moderate income families. Such loans usually bear a 6 1/4 percent interest with a maximum term of 50 years, and must be for occupancy by senior citizens and other rural families with not more than moderate incomes. These loans may not exceed $300,000. Loans are also made to individual farmers, groups of farmers, and public or private nonprofit organizations to finance housing facilities for domestic farm labor. The interest rate is 5 percent. The maximum term is 33 years. Grants may be made to public bodies to help finance housing facilities for domestic farm labor. It is expected that such grants will not be more than half the cost of the project.

Emergency loans are made to eligible farmers in designated areas where natural disasters such as floods and droughts have brought about a temporary need for credit not available from other sources. Loans may be made for the purchase of feed, seed, fertilizer, replacement of equipment, livestock, and other items needed to maintain normal operations. Loans may not be made to refinance debts or compensate applicants for their losses. Loans may be made to eligible oyster planters. Emergency loans may also be made outside of designated areas to farmers who have been affected by disaster when the disaster affects only one or a few farms. Loans are scheduled for repayment when income from the crop or livestock financed is normally received. The interest rate is 3 percent.

Economic opportunity loans are made to low-income farmers and other rural residents in open country and small rural communities with populations of not more than 5,500. Farmers may obtain loans to improve farming or develop and expand a small business or service. Other rural people may obtain loans to finance or expand small business and services. The loans are repayable over periods up to 15 years. A borrower's total principal indebtedness for economic opportunity loans may not exceed $3,500. Economic op-
portunity loans also are made to cooperatives serving low-income rural people and providing processing, purchasing or marketing services. The loans are repayable over 30 years.

Grants are available to help communities which currently are without the resources to pay for the development of official comprehensive water and sewer plans in rural areas. Such plans promote efficient and orderly development of rural communities and provide information necessary to avoid overlapping, duplication, underdesign, or overdesign of community water and sewer facilities.

Farmers Home Administration representatives serve on State, area and county technical action panels. These panels help local leaders identify problems that are blocking economic and social growth and locate federal and State services that can be used in solving these problems. Technical action panels also provide technical assistance to rural areas development committees and other locally organized groups to help local people use government programs to create jobs, fight poverty, build new businesses and industry, develop needed community facilities, replace substandard housing and carry out other measures that up-date and strengthen the local economy.

The Farmers Home Administration makes loans and grants to public bodies and nonprofit organizations serving primarily rural residents to develop domestic water supply systems and waste disposal systems. Public or quasi-public bodies and corporations not organized for profit which will serve residents of open country and rural towns and villages up to 5,500 population, which are not part of an urban area, may receive financial and technical assistance in planning, developing and improving and extending water and waste disposal systems when: they are unable to obtain needed funds from other sources at reasonable rates and terms; the proposed improvements will serve primarily farmers and other rural residents; they have legal capacity to borrow and repay loans, to pledge security for loans, and to operate the facilities or services; and they are financially sound and will be effectively organized and managed.

Grants may be made to help finance up to 50 percent of the development cost of a water or waste disposal system when grants are needed to reduce to a reasonable level the charges the users will pay. Loans and grant funds may be used to drill, install, repair, improve, or expand rural water supply and distribution systems including water supply reservoirs; pipelines; wells; pumping plants; water filtration and treatment such as chlorination, fluoridation, and iron removal; purchase a water supply or a water right; install, repair, improve, or expand waste collection, treatment, or disposal systems. Facilities to be financed may include such items as sewer lines, treatment plants, stabilization ponds, sanitary landfills, incinerators, and necessary equipment such as garbage trucks; pay necessary fees; and pay other costs related to the improvements, including the acquisition of rights-of-way and easements, and the relocation of roads and utilities. All systems must comply with applicable state and local laws including those concerned with zoning regulations, health and sanitation standards and the control of water pollution.

A borrower's total indebtedness for these loans together with any assistance in the form of a grant cannot exceed $4,000,000 at any one time. The maximum term on all loans is 40 years. However, no repayment period will exceed any statutory limitation on the organization's borrowing authority nor the useful life of the improvement or facility to be financed. The interest rate varies but may not exceed 5 percent.

The Farmers Home Administration makes soil and water loans accompanied by technical management assistance to owners or operators of farms and ranches including partnerships and corporations to assist them in developing, conserving, and making proper use of their land and water resources. Soil and water loans are made only to applicants who are unable to obtain the credit they need from private and cooperative sources at reasonable rates and terms.

Loans may be used to drill wells and otherwise improve water supply systems for irrigation, home use, and livestock; purchase pumps, sprinkler systems, and other irrigation equipment; acquire a water supply or water right; purchase water stock or membership in an incorporated water users' association; construct and repair ponds and tanks, ditches, and canals for irrigation; dig ditches and install tile to drain farmland; develop ponds and water control structures for the production of fish under controlled conditions. These loans may also be used to level land; carry out basic land treatment practices including liming, fertilizing, and seeding; sub-soil or sod land; establish permanent pastures and farm forests; establish approved forestry practices on a farm such as pest control, thinning, and fire protection. Funds may also be used to build dikes, terraces, waterways, and other erosion control structures. In addition, loan funds may be used to obtain plans and pay fees for legal, engineering, and other technical services.

The interest rate is 5 percent per year on the unpaid principal, except that the rate on loan funds used for approved forestry purposes is 3 percent. Each loan is scheduled for repayment within a period consistent with the borrower's ability to repay. The maximum term is 40 years. A borrower has the privilege of making large payments in years of high income to build up a reserve that may keep the loan in good standing during years of low income. When justified, the first payment of interest and principal on loan funds used for approved forestry purposes may be deferred for up to 15 years. Payments may be deferred only when the borrower's total income will be insufficient to make a payment on the loan.

To be eligible, an applicant must: be a farm operator or farmowner, a partnership that owns and operates a farm, or a domestic corporation engaged in farming; be unable to obtain the necessary credit on reasonable terms and conditions from private or cooperative lenders; be of legal age; possess the character, industry, and ability to carry out the proposed operations, and honestly endeavor to carry out the undertakings and obligations required of him in connection with the loan; plan to improve a farm which is of such size and productive capacity that it will produce agricultural commodities in sufficient quantities that the proceeds from their sale will be a substantial portion of the operator's total cash income, and is recognized in the community as a farm rather than a rural residence; and if the applicant is a tenant, have a satisfactory written lease for a sufficient period of time and under terms that will enable him to obtain reasonable returns on the improvements made with the loan.

The county or area committee of the farmers home administration determines the eligibility of applicants. The committee consists of three farmers who know local farming and credit conditions and what it takes for a
farmer to succeed. The farmers home administration county supervisor will assist the applicant in working out a farm and home plan to determine the soundness of the loan and the applicant's debt-paying ability.

If the applicant operates the farm himself, the plan will show the best use of land, labor, livestock, and equipment. This plan will be a guide for him and his family to follow in operating the farm. It will show the crops and livestock the borrower expects to produce for sale and home use; practices to follow in caring for land, crops, and livestock; proposed expenditures for livestock and equipment for running the farm and home; and the expected income and how it will be used. Before a loan is made it must be clear that he will have enough income to meet farm operating and family living expenses and to repay the loan and other debts.

Soil and water loans are accompanied by advice in sound farm and home management to help farmers and ranchers make profitable use of land, labor, capital, and other resources that will be available to them. The county supervisor furnishes advice and assistance in keeping accurate records of expenses and income and in budgeting and otherwise making wise use of income and credit. He also provides on-the-farm assistance with farm and money management problems during the first few years of the loan.

Each loan will be adequately secured to protect the interest of the government. Usually, a loan will be secured by a real estate mortgage. In certain cases, a loan may be secured by a lien or chattel.

The farmers home administration makes resource conservation and development loans to public agencies and nonprofit corporations in areas that have been designated by the secretary of agriculture as resource conservation and development project areas. These loans may be advanced only after an RCD project plan, developed by sponsors with guidance by the soil conservation service, has been accepted by the secretary of agriculture, and he has authorized SCS and other USDA agencies to help local organizations carry out measures consistent with the plan.

RCD programs to improve the economy of communities in a project area are based on the conservation, development, and use of natural resources. Loans by the FHA, authorized by the food and agriculture Act of 1962, as amended, help local people meet their share of project measure costs. Loans may be made to public bodies which are agencies of States, counties, municipalities, and other State subdivisions and instrumentalities, including public agencies created under State law for making public improvements. Loans also may be made to private organizations formed as nonprofit corporations, or operating on a nonprofit basis although organized under general profit corporation laws. Loans for recreation project measures are limited to rural areas. The term "rural" denotes open country, or a community of not more than 5,500 permanent inhabitants that is not part of, nor likely to become part of, an urbanized area.

Loan funds may be used for such purposes as: water facilities, including the construction or improvement of works of flood prevention, ero-

sion control, irrigation, drainage of land presently or formerly in agricultural production, soil conservation, and water storage for community supply and pollution abatement; shift in land use, such as conversion to pasture, forestry, wildlife areas, grazing, parks, greenbelts, and other open spaces serving rural communities; and recreation developments (in rural areas only) that are outdoor oriented and of benefit to the community. Eligible projects include the installation or improvement of athletic playing fields and courts, golf courses, target ranges, swimming pools and other swimming areas; ponds, lakes, and streams for fishing and boating; including essential related onshore facilities, parks, picnic areas, and campsites; rodeo and horse show areas for use primarily by local residents using livestock from the immediate area; forest trails, caves, and other scenic attractions; historical sites and areas.

Costs which may be met from loan funds include: acquiring project sites and land for public use; securing the use of necessary construction equipment; fees for legal and technical services incidental to a project; building or relocating roads, bridges, utilities, fences, and other improvements necessary to acquiring rights-of-way or building and operating a facility; refinancing debts incurred for the facility prior to loan application to the farmers home administration.

Loan funds may not be used to: buy tracts of land intended primarily for industrial use or later resale to private developers; build motels, housing developments, farm dwellings, dance pavilions; treat land on private or individual land units; newly introduce land to agricultural production; build projects consisting primarily of water or sewage treatment plants or distribution systems; provide drainage benefits to nonrural areas; pay costs that could be met through assignment of payments for participation in agricultural conservation programs.

A portion of a tract purchased with RCD loan funds primarily for non-industrial purposes may be set aside for an industrial park, but RCD loan funds may not be used to develop or build facilities on the industrial park.

Eligible borrowers may obtain amounts commensurate with the applicant's resources, reasonable cost of the project measure to be financed, and the applicant's ability to repay. A loan may not exceed $250,000. Loans may be made for repayment over periods of 30 years or less.

The interest rate is the average rate paid by the U.S. Treasury on obligations of a similar maturity outstanding at the beginning of the fiscal year in which the RCD loan is made. For example, the rate for fiscal year 1967 was 3.275 percent.

All loans will be secured in a manner which adequately protects the interest of the government. Bonds or notes pledging taxes, assessments, or project revenues will be accepted as security if they meet statutory requirements. A mortgage may also be taken on the organization's facilities when State laws permit.

Local organizations can obtain watershed loans or advances to carry out plans to protect, develop and utilize the land and water resources in small watersheds. The loans or advances help local organizations pay costs allocated to them in an approved watershed work plan. The loans are available from the
Loans and advances are made only to finance the local share of costs of improvements in watershed projects approved under the watershed protection and flood prevention Act or in connection with the 11 watershed improvement programs authorized by the flood control Act of 1944. An application for a watershed loan or advance should not be filed until after the SCS approves the watershed for planning.

Eligible local organizations may include a soil or water conservation district, irrigation district, drainage district, flood prevention or control district, municipal corporation, reservoir company or similar organization not operated for profit. It must have authority under State law to obtain, give security for and raise revenues to repay the loan and to operate and maintain the facilities financed with the loan.

Loan funds may be used: To install, repair or improve facilities to: Store and convey irrigation water to farms. Drain farm areas. Store, treat and distribute water mainly for farm household, livestock and crop spraying purposes. Stabilize annual streamflow, increase the recharge of ground water reservoirs and conserve present water supplies. For special land treatment measures, structures or equipment installed or used by the local organization primarily, but not entirely, for flood prevention and which produce community benefits sufficient to justify use of taxes or other local revenues for their installation. To install, repair or improve water storage facilities for such purposes as recreation, fish and wildlife, pollution abatement, streamflow regulation and saline water intrusion control and to meet a municipality's immediate or future water supply needs. A loan for a storage reservoir for municipal water supply may include funds for pipelines and any necessary pumping facilities to convey the water from the reservoir to the existing or proposed municipal treatment facilities or water system. For recreational developments in or adjacent to reservoirs, lakes, natural streams or shore lines including minimum basic facilities needed for public health and safety, access and use. For fish and wildlife developments which may include water resource improvements and minimum basic facilities which are primarily for the improvement of the environment or habitat for fish and wildlife. To buy a full or part interest in land for farm household use, industrial or domestic purposes and of improvements where immediate acquisition is essential to preserve them from interference by other developments.

Loans are scheduled for repayment within the shortest period consistent with the borrowers' abilities to repay. The repayment period may not exceed that permitted by the applicable State law and in no event will exceed 50 years from when the principal benefits of the facilities become available. There must be adequate evidence that income will be sufficient to meet all scheduled repayments.

Advance terms: Advances to preserve sites must be fully repaid with interest prior to beginning construction of works of improvement on the sites thus acquired. If permitted by State law, principal repayments on advances for future water supply may be deferred until 1 year after water is first used from the storage capacity installed with the advance or until the end of 10 years from the scheduled completion date of the structure, whichever occurs first. No interest charged on advances for future water supply until water is first used or the end of 10 years from the date of the advance, whichever occurs first. Thereafter interest payments, at the interest rate established for loans on the date of the advance, will be scheduled at least annually. To be eligible for these terms, there must be evidence that the local organization will use the water and can meet scheduled repayments of principal and interest.

The interest rate is set at the beginning of each fiscal year and applies to all watershed loans made during the year. For example, the rate for the fiscal year beginning July 1, 1966, as set by the formula in the law is 3.225 percent. Once the interest rate is set on a loan, it will not change during the life of that loan. Each borrower may make prepayments in any amount at any time. The total amount of indebtedness for all watershed loans for any one watershed project, whether made to one or more borrowers, shall not exceed $5 million. The maximum amount of any advance for reservoir capacity for future water supply will be 30 percent of the estimated total installation cost of the structure in which capacity for future water supply is to be provided. The amount of an advance to acquire and preserve sites for works of improvement may not exceed the amount determined by the SCS to be necessary.

Watershed loans and advances will be secured in a manner which will adequately protect the interests of the government. Usually, security that can be offered includes general obligation bonds supported by ad valorem taxes, revenue bonds secured by pledges of revenue, other evidences of debt secured by special assessments or by liens on facilities and pledges of income.

These loans help local organizations carry out multiple purpose watershed projects in their communities for flood prevention, and adequate water supplies for irrigation and municipal use, recreation, fish and wildlife improvement and pollution abatement. Such communities are more desirable areas for new industries to establish plants which in turn provide employment for local people. Farmers and businessmen in the area are able to stabilize their incomes because they no longer suffer heavy production losses in certain years because of floods or inadequate water for irrigation, livestock, household use and industry.

Advances by SCS may be used: To pay the construction cost of reservoir capacity including intake and outlet structures for future municipal and industrial water supply. To acquire sites for authorized types of works

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Programs in Minnesota -- Information concerning farmers' homestead loans and grants for water and related land resources projects in Minnesota, during the period 1965-1971, is given below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Water and Sewer Loans</th>
<th>Water and Sewer Grants</th>
<th>Recreation Planning Amount</th>
<th>Watersheds Amount</th>
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<tr>
<td>1965</td>
<td>$116,000</td>
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<tr>
<td>1966</td>
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<td>1971</td>
<td>2,280,000</td>
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S- Subsequent Loans and Grants - All others are Initial Loans and Grants.

Forest Service

First application of the name "forest service" is credited to James Wilson, secretary of agriculture, in a letter of February 1, 1905 to the chief forester. Referring to an Act of February 1, 1905 providing for the transfer of the forest reserves from the department of the interior to the department of agriculture, Wilson said, "Its provisions will be carried out through the forest service under your immediate supervision."

The agricultural appropriation Act of 1906, approved March 3, 1905, also used the name "forest service." However, many of the forestry functions were carried on earlier under different organizational titles.

Today, the forest service is responsible for promoting the conservation and best use of the Nation's forest lands, comprising approximately a third of the Nation's total land area. As part of that responsibility, it develops and manages the 187-million-acre National forest system. The system includes 154 National forests and 19 National grasslands located in 39 States and Puerto Rico.

The forest service protects these lands from fire, insects, and disease; and improves their accessibility and manages their multiple resources to provide orderly and continuous service to present and future generations. Maintenance of stable economic conditions in America's rural areas is another objective of National forest management.

The forest service is responsible for leadership and direction of the rural fire defense program to combat possible mass fires caused by nuclear explosions. It also coordinates mapping work of the department. In addition, the forest service carries on a manpower and youth conservation program, including the management and operation of conservation centers.

As the Nation grows, people demand more goods and services from their forests: wood, water, fish and wildlife, recreation and natural beauty, forage, and special products. The forest service helps fulfill these needs through three major activities:

The Acts of June 4, 1897 and June 12, 1960 provide the fundamental charter for National forest management and development. Technical methods of forestry are applied to the growing and harvesting of timber used in the manufacture of over 5,000 wood and paper products.

Water from National forest watersheds irrigates agricultural areas and supplies the domestic needs of many cities. The forest service manages these watersheds to regulate streamflow and reduce flood danger and soil erosion.

Forage for cattle and sheep owned by local ranchers is produced on the 106 million acres of range environment on the National forest system. Forage for big game and habitats for wildlife are also provided.
National forests are America's playground. They provide scenic drives, picnic and camping areas, and opportunities for all kinds of sports activities, including hunting and fishing. They also include over 9 million acres of the National wilderness preservation system created by the Act of September 3, 1964.

Many species of small game, birds, and fish thrive in the National forest environment and provide unusual hunting, fishing, and photographing opportunities for hordes of annual visitors. Several endangered species find refuge in National forests.

The forest service carries on basic research in eight regional forest and range experiment stations, an institute of tropical forestry in Puerto Rico, and a forest products laboratory at Madison, Wisconsin research authorizations and with other public agencies such as universities, schools of forestry, and State agricultural experiment stations.

Research includes both forest management and wood utilization. It covers the multiple use functions and the protection and management of the resources involved. Typical research activities include genetics to improve tree species, weather modification to decrease lightning fires, remote sensing of wildfires, better reforestation techniques, more efficient timber harvesting methods, ecosystem management, and development of new and better forest products. Other research activities include economic studies, keeping timber resource information current, marketing services, and forest environment research.

The forest service cooperates with States and private owners of forest lands and forest industries. Typical activities include marketing assistance; efficient processing of forest products by small plants; application of good forest management practices; and organized protection against wildfires, diseases, and forest pests. Also included are flood prevention and river basin and small watershed programs; distribution of seedlings for planting woodlands, windbreaks, and shelterbelts; cooperation in fire weather forecasting; and cooperative sponsorship of rural areas programs.

The forest service also administers the naval stores conservation program and assists in the administration of forestry activities involved in agricultural conservation programs.

Programs in Minnesota - In 1902, congress, in unprecedented action, established the Minnesota forest reserve on some 200,000 acres of coniferously wooded hills at the headwaters of the Mississippi river. First National forest to be set aside by Act of congress, this tract of land in northern Minnesota was established to save the area from the depredations of unprincipled timber operators. Subsequently, the forest was renamed the Chippewa—after the Indian tribe. In 1909, a second National forest was established in Minnesota—the Superior, in the northeastern "Arrowhead" section of the State. The Forest service of the Department of agriculture administers these two National forests so that their many natural resources may most benefit the people on a continuing basis. The forest service also conducts research on forest management and protection at a number of projects locations in Minnesota. In cooperation with State natural resource organizations, the forest service offers assistance to private and industrial foresters in the State.

Today, Minnesota's two National forests cover a total gross acreage of 4,343,852 acres—an area only slightly smaller than the combined acreage of the States of Connecticut and Delaware. Each of these forests is administered by a forest supervisor under the direction of the forest service regional forester in Milwaukee, Wisconsin.

National forest land in Minnesota includes 1,497,400 acres of commercial timber. Predominantly coniferous (spruce, balsam, cedar, and pine—red, white and jackpine), these northern forests are interspersed with a liberal sprinkling of hardwoods, notably aspen but including also birch, maple, ash, willow, nut, and cherry. More than three billion board feet of sawtimber is growing on Minnesota's National forests. Timber cut on these forests during 1966 was 148,968,000 board feet. In the past, this timber was used mainly for pulp and fuelwood, but in recent years, under careful management, new uses have been introduced and the harvest has increased in value. In addition to wood fiber, Minnesota's treey yields nuts, maple syrup, cones, etc. A unique resource found in the heartland of the Chippewa National forest is the famous wild rice crop, hand-picked today by the Chippewa Indians just as it was long before the first white man paddled the Mississippi river.

Perhaps the foremost resource of Minnesota's forests is scenery and inherent recreation for the tourist. The forests annually attract thousands of visitors who hike, camp, hunt, fish, and enjoy a variety of water sports. The million-acre boundary waters canoe area, measuring more than 100 miles east-to-west, is located in the Superior National forest. Because of the pressure caused by steadily increasing tourist use and because of the necessity for maintaining a continuous yield from theрагнium timber stands, the forest service has drawn up a development program to intensify management and protection of the National forest land to insure the fullest enjoyment of the forests to the year 2000. In Minnesota, this National forest development program includes: enlargement of the popular boundary waters canoe area through acquisition of State or private lands already within its borders; reforestation of 165,000 acres and timber stand improvement of 440,000 acres; construction of 2,000 family camping units; construction or repair of 3,000 miles of roads, 35 miles of trails, and 700 miles of firebreaks; and fuel reduction on 14,000 acres.

The benefit of forest service knowledge and man power is shared with State and private forest owners in Minnesota, as elsewhere, through cooperative programs for assistance in forest fire, flood, and pest control; distribution of planting stock; control of forest disease; and general management assistance to the small forest owner. In recent years, an average of 4,000 woodland owners in Minnesota have received State and Federal assistance in the management of some 40,000 acres of land. The forest service shipped more than 5.6 million trees from the Eveleth nursery in the Superior National forest during 1966, supplementing some 25 million sent by State and private nurseries to be used for reforesting public and private lands in Minnesota. During the period preceding July 1, 1967, the forest service cooperated in eradicating currant and gooseberry bushes on 1,525 acres, and in control white pine blister rust. In addition, pruning and excising to control the rust was done on 946 acres.

Assistance in the prevention and control of forest fires on State and privately owned lands is one of the foremost of the forest service's cooperative programs. In the early 1900's (during the period of the early timber
barons), the virgin forests of Minnesota were swept by great conflagrations—the most recent of which in 1918, seriously threatened to destroy the city of Duluth. Today, Federal, State and municipal agencies cooperate to provide protection for all of the State’s forest areas.

On the Duluth campus of the University of Minnesota, the Lake States Experiment Station maintains a wood products marketing research project where opportunities for expanding northeastern Minnesota’s manufacturing and marketing of wood products are analyzed. The Lake States Forest Experiment Station is responsible for Federal forestry research in the upper midwest. From its headquarters laboratory on the St. Paul campus of the University of Minnesota, the station carries on research at project locations in the following States: Minnesota, Wisconsin, Michigan, Iowa, Indiana, Illinois, and Missouri. Field headquarters and experimental forests and watersheds are established for these projects to put scientists near their problem areas. More recently, in response to a need for adequate facilities, modern laboratories have been concentrated at strategic locations.

The station is responsible for and is conducting research in several important fields—watershed management, forest protection (fire, insects, and diseases), forest products and engineering, timber management, economics, recreation, and wildlife. Within each of these fields a number of projects are set up to deal with specific problems. Each is planned for a specific period of time, after which it is either terminated or extended depending on how the research has progressed.

Since its beginning, the station has carried on active research in the field of soil and water research, particularly as affected by forest cover. This watershed research effort is a continuing program of independent and cooperative research with universities, State forestry organizations, industries, and other interested groups. The station’s research effort is carefully oriented to complement the efforts of others in this field.

The forest service is actively involved in watershed management research as it deals with forest and related wildlands. Since major rivers in the Lake States have headwaters in forests and/or associated wildlands, improved knowledge of the hydrology of such areas will provide guidance to improving the water regime. Whether water flow is beneficial or harmful, is well regulated, is sustained flow of good quality, or is erratic and silt laden is contingent to a degree on how well the headwaters lands are managed. Generally accepted estimates of water use indicate a doubling in demand by 1980. A logical place to look for additional supplies of water is headwaters areas. Water from this area drains east through the Great Lakes and the St. Lawrence river into the Atlantic Ocean; north through the Red River of the North and Lake of the Woods to Hudson Bay; and south through the Mississippi River to the Gulf of Mexico. This area is the supplier of water to a great extent. Millions of acres of forested bogs and swamps cover the area and water yield from these bogs and swamps is largely unexplored and unknown.

Research in a bog and swamp hydrology project includes studies to determine the hydrologic properties of the millions of acres of northern forest land. Studies include water-storage characteristics of the various peat soils, runoff behavior, and the contribution of swamp land to deep water recharge. Forest cover will be manipulated to determine the effect on land-management practices on snow catch, interception loss, and water yield from these bogs and swamps.

In portions of the northern Lake States, the key hydrologic feature of the area is the deep, porous, sandy soil. Recharge through the deep drift and ground-water movement and behavior are the major considerations. The land features that dominate the area are the forested sandy moraines surrounding the Lake States region and to develop forest-management practices to improve the volume and timing of recharge, and study the quantitative and qualitative relationships between streambank erosion and stream sedimentation. New and less expensive mechanical and vegetative techniques for stabilizing eroding banks, channel bottoms, and adjoining land to improve the quality and usefulness of these streams will be developed and tested.

Research on a deep recharge and streambank erosion studies project is designed to determine the basic qualitative relationships between forests and wildlands and deep recharge in the glacial drift of the northern Lake States region and study the qualitative and quantitative relationships between streambank erosion and stream sedimentation. New and less expensive mechanical and vegetative techniques for stabilizing eroding banks, channel bottoms, and adjoining land to improve the quality and usefulness of these streams will be developed and tested.

A runoff and erosion reduction project is concerned with watershed problems in the southern portion of the Lake States and sections of the central States. Contrasted to the other two areas, its topography is rolling to rough. Soils of this area are nonglaciated and highly erosive. Where these soils have been overgrazed and steep slopes cultivated, many gullies resulted. This hilly, nonglaciated area produces some of the most spectacular erosion problems in the country. It has erosion, sedimentation, and flood problems.

Research on this project will give major emphasis to erosional aspects and the rehabilitation of the area. Studies are designed to determine the importance of runoff and erosion from forests and adjoining lands, how the

Research is carried out in laboratory, plot, and small watershed studies. These studies are concerned with basic and applied research into the relationships of soil, climate, vegetation, and water, and the development of methods and techniques to increase water yields or improve the timing of such yields under various soil, geologic, vegetative, and topo-
forest land can serve as a means for controlling runoff by spreading it through the forest zone or recharging it; and the influence of forest plantations on erosion reduction and elements of the water cycle.

Certain aspects of the station's research bear on the recreational use of lakes and streams. The station's efforts in this field, dating to 1960 when this research was initiated, have included studies on the boundary waters canoe area of the Superior National Forest in northeastern Minnesota and the Huron and Manistee National forests in Michigan's lower peninsula. The station has studied the relation of recreational use to the type and size of water bodies, and to their location, accessibility, and development. The quality standards used in recreational water inventories are being compared to visitor's evaluations.

Soil Conservation Service

The soil conservation service was established under authority of the soil conservation act of 1935. It has responsibility for developing and carrying out a National soil and water conservation program in cooperation with farmers and ranchers and other land users and developers, with community planning agencies and regional resource groups, and with other agencies of government--Federal, State, and local.

The program includes soil erosion control, flood prevention, sediment reduction, land-use planning in rural and rural-fringe areas, recreation, beautification, and water development for agriculture, recreation, wildlife, municipal, and industrial use.

The soil and water conservation program is carried on through technical help to locally organized and operated soil conservation districts; local sponsors of watershed protection projects and resource conservation and development projects; and consultative assistance to other individuals and groups. More than 3,000 soil conservation districts cover almost 2 billion acres in all the States and Puerto Rico and the Virgin Islands.

Assistance to individual district cooperators includes: giving the cooperator a soil and land-capability map of his land; giving him information about practical alternatives for treating and using the land within its capabilities as indicated on the map; helping him develop an orderly plan for installing the treatment measures and making the land use changes needed; and helping him apply parts of the plan that require special skills or knowledge.

One important basis for conservation planning is the National cooperative soil survey for which the SCS is responsible. The work is carried out in cooperation with State agricultural experiment stations and other State and Federal agencies. The soil surveys provide information about soils that is needed for land-use planning on both agricultural and nonagricultural land. Users of the published surveys include farmers and ranchers, engineers, highway departments, planning and zoning bodies, builders, realtors, and others.

SCS has the responsibility for the watershed activities and river basin surveys and investigations of the department of agriculture. Under the watershed protection and flood prevention Act, local sponsoring organizations are given technical and financial help for land treatment and structural measures for flood prevention, fish and wildlife development, recreation, and agricultural and municipal water supply in watersheds up to 250,000 acres in size.

Under authority of the flood control Act of 1944, SCS assists sponsors to plan and apply flood prevention measures and practices in 11 major watersheds comprising approximately 30 million acres. Detailed plans are prepared and applied to tributary watersheds.

River basin surveys are undertaken at the request of cooperating State or Federal agencies. These surveys provide a basis for coordinated resource development of river basin areas.

SCS has administrative leadership of the Great Plains conservation program under the Act of August 7, 1936, as amended by act of November 18, 1969. This program is designed to promote greater agricultural stability in the critical Great Plains area. SCS helps landowners and operators develop plans for installing permanent soil and water conservation practices over a 3- to 10-year period.

SCS has departmental leadership for establishing public recreation areas in watershed projects and for assistance to landowners and operators in developing income-producing recreation enterprises on private land. These areas help provide much-needed outdoor recreation space for America's growing population, and provide added income for America's rural landowners. Many landowners are shifting to recreation as their primary source of income.

Under the food and agriculture Act of 1962, SCS assists local sponsoring groups accelerate planning and development of land and water resources in multiple county areas. Projects may include such measures as flood prevention; developing water resources for recreation, wildlife, agricultural, municipal, or industrial use; conservation planning and establishment on individual land units; improving recreation facilities, including historical and scenic attractions; encouraging new industries to locate in the area and to process products of the area; improving markets for crop and livestock products; and long-range planning to coordinate public efforts in the area. Technical and financial assistance is available for planning and carrying out project measures.

SCS makes and coordinates snow surveys for water supply forecasting in the western States. Irrigation farmers and other water users base their seasonal operations on these forecasts.

SCS gives technical help to landowners and operators who participate in the agricultural conservation, cropland conversion, and cropland adjustment programs of the department of agriculture and certifies to the adequacy of practices installed. SCS also gives technical help to the farmers' home administration in making soil and water conservation loans to landowners and operators.

The work of SCS is directed by the administrator and his staff in Washington, D.C. State offices and a Caribbean office give technical and administrative supervision to about 4,850 local work units where conservation technicians work directly with landowners and operators.
Eight P.L. 566 watershed protection projects were completed in Minnesota by the soil conservation service as of January 1, 1969. In addition, eight P.L. 566 watershed protection projects were underway. The SCS is assisting in the planning for land use and resources in the area included in upper Great Lakes economic development region in northern Minnesota (broad area program).

Twenty-six percent of the needed soil and water conservation work was completed in the State as of July 1, 1967. Approximately 6,500 structures of various types, 3,950 grade stabilization and 550 small retention structures have been built. Nineteen impoundments, 519 mechanical excavations, 1,384 blasting with AN/FO, 44, dams on State owned areas, 28 dugouts on State owned areas, 2,083 stockwater ponds, and 11,442 stockwater pits have been created as of April 3, 1967.

SCS works closely with the Minnesota pollution control agency on plans for controlling feedlot runoff. This includes joint review of proposed plans prepared by SCS for individual installations and by periodic discussions between staff members of both agencies.

In Minnesota, numerous soil and water management purposes are considered when developing a watershed work plan under P.L. 566. These purposes include flood prevention (14 projects on which plans are approved for construction); agricultural water management (9 projects), fish and wildlife (9 projects), recreation (3 projects), municipal and industrial water supply (one project). Structural measures approved for construction on P.L. 566 watershed projects include three multi-purpose reservoirs, 4.4 miles of trout stream improvement, seven floodwater retarding reservoirs, 21 grade stabilization structures, 182 miles of channel improvement, 14 structural measures for fish and wildlife improvement or development and two recreation developments.

Soil surveys in Minnesota are made cooperatively with the university of Minnesota and the forest service. More than 18 million acres of land in Minnesota have a completed modern day soil survey adequate for multipurpose use.
SCS is involved in Federal-State regional water and related land resources framework (Type 1) planning efforts. A plan of study is being prepared for the southern Minnesota river basin study (detailed planning) which is sponsored by the Minnesota Soil and Water Conservation Commission.

A plan of study is being prepared for the Iowa-Cedar rivers basin study.

SCS is involved in the Type IV planning efforts in the Big Sioux river basin and in the Type II planning efforts in the Red river basin.

The resource conservation and development (RC&D) projects in Minnesota cover thirteen counties. The counties of Douglas, Grant, Stephens and Todd were recently added to the WesMin RC&D project and are in addition to the original counties of Swift, Pope, Kandiyohi, Wadena and Otter Tail. The Sauk-Renosc RC&D project covers Atkin, Carlton, Kanabec and Pine counties. Both projects are sponsored by the board of county commissioners from each respective county and the board of supervisors of each soil and water conservation district. The sponsors have proposed more than 251 separate land and wetland-based project measures for rural development. The measures include lake and stream improvements for fishing; lake level stabilization; a large number of new and improved recreational facilities such as canoe and sailboat trails; land use conversion; increased industrial use of resources including the establishment of pulp and paper developments; a variety of watershed improvement measures; and several important community facilities such as senior citizens housing and sedimentation and pollution controls. The applications for new projects are on file. One is for the formation of the north central Minnesota RC&D project covering Lake of the Woods, Beltrami, Tower, Hubbard and Mahnomen counties, and the other is for the proposed Desair basin RC&D project covering the counties of Traverse, Big Stone and thequi Park in Minnesota and the counties of Grant and Roberts in South Dakota. There is interest in forming two other RC&D projects in Minnesota, one project covers the seven counties of Morrison, Stearns, Benton, Sherburne, Isanti, Becker and Wright. There is also interest in southeastern Minnesota covering the twelve-county area of Dakota, Rice, Goodhue, Wabasha, Steele, Redwood, Winona, Freeborn, Mower,Fillmore and Houston.

Conservation and environmental quality developments in Minnesota as of June 30, 1970 are listed below:

- Development of conservation plans by 34,566 landowners on 7,564,203 acres.
- Assistance to develop plans with 439 groups of landowners on 698,616 acres. Completion of detailed soil surveys on 17,539,522 acres. These surveys and their interpretations are used by farmers, developers, engineers, recreation specialists, city, community, county and State planning and zoning agencies, tax assessors, contractors, highway department, and many other individuals, agencies, and organizations that carry out operations affecting land use. A result of the planning, soil surveys, and technical services, landowners in the State have applied conservation measures on the land that have had a marked effect on the development of social, environmental, and economic quality. These practices have controlled pollution of lakes and streams, increased production of existing cropland, enhanced and developed wildlife habitat for both upland and water-based wildlife and developed private recreation. Some of the practices applied are:
  - Contour Farming 864,644 ac.
  - Strip cropping 1,002,605 ac.
  - Minimum tillage 1,009,174 ac.
  - Conservation cropping systems 6,284,351 ac.
  - Diversions 1,036 mi.
  - Terraces 3,346 mi.
  - Pasture and hayland planting 528,753 ac.
  - 7,815 miles of field windbreaks
  - 62,198 acres of farmstead and feedlot windbreaks
  - 312,008 acres of tree planting

To develop woodland on private lands assistance has been given to landowners in applying:

- 577 miles of field border plantings
- 18,460 ponds for stockwater and wildlife
- 522 ponds managed for fish
- 286,604 acres of wildlife wetland management
- 335,016 acres of wildlife habitat management
- 56,787 acres of cropland converted to wildlife and recreation uses

Assistance to private recreation development has resulted in the development and application of:

- 476 commercial recreation enterprises
- 4,133 non-commercial recreation enterprises
- 566 miles of recreation trails and walkways
- 10,089 acres of recreation area improvement

Pollution control in the form of erosion control and sedimentation reduction to lakes and streams has been accomplished through assistance in applying:

- 201,391 acres of critical erosion area control plantings
- 8,580 grade stabilization dams
- 49 multipurpose flood control, wildlife and recreation dams plus all the soil conservation practices applied to private lands.

The application of all of these practices, installed to date, resulted in a total reduction of 44.4 million tons of sediment washing off land into lakes and streams for fiscal year 1970.

Agricultural Economics

Economic Research Service

The economic research service conducts programs of research in agricultural economics and marketing, both domestic and foreign commerce. The results of these studies are widely disseminated.
The relationships between the farm economy and the National economy are studied, as are the economic forces affecting levels of demand, prices, and incomes in agriculture. These research studies provide information on the economic status of farmers, the relation of farm income to nonfarm income, and the outlook for agriculture generally. Farmers and others are provided with essential information to help them adjust to economic forces affecting prices, supply, and consumption of agricultural products and to understand conditions affecting farm people or the agricultural economy.

Research in marketing economics evaluates economic performance of the changing marketing system for agricultural commodities. Primary emphasis is placed on economic analysis of the causes and consequences of changes in the system with respect to producers, marketers, and consumers. An important part of the research is directed toward economic analysis of alternative methods and systems of marketing agricultural commodities considering costs, efficiency, progressiveness, profitability, distribution of income, and other dimensions of market performance.

Research on farming efficiency includes studies of farm labor, trends in mechanization and other technological developments, farm structures, fertilizer and pesticide usage, and livestock feeding practices. Research on profitable adjustments in farming involves appraisals of farm output and productivity (Nationally and by commodity and region), and studies of costs and returns on important types and sizes of farms. Studies of agricultural finance deal with farm credit facilities, financing of farming and production, agricultural risk and insurance problems, accident statistics, and farm real estate values.

Land and water research involves studies of economic utilization of land and water resources, the impact of urban and industrial expansion, land tenure problems, legal-economic aspects of land and water use, and the relationship of resource use and tenure to income and values. River basin and watershed investigations are conducted relating to the formulation of comprehensive river basin plans and programs, watershed planning, development and management programs, and resource conservation projects.

Economic development research is concerned with analysis of the characteristics, income, and employment opportunities of low-income rural people and of chronic depressed rural areas, as well as problems and programs of rural renewal and economic development and growth. It includes statistical and economic analysis of farm population, migration, manpower, and rural levels of living. Studies are made of problems of rural local government, of community organizations, and of government and nongovernment services of a community nature.

Foreign regional analysis work includes research on the total food and agricultural situation by countries and regions. Annual food budgets are prepared as well as key indices reflecting changes in agricultural production by countries, regions, and for the world. Studies are conducted on the long-range outlook for U.S. agricultural exports. Trends in supply and demand throughout the world are analyzed together with their implications for resource adjustment and agricultural policy in the United States. A world food budget is prepared periodically.

Economic development processes in foreign countries are analyzed to ascertain the contribution of agricultural development to general economic growth, the priority of various aspects of agricultural development, and economic effects of present and proposed food aid programs. The effects of alternative U.S. export programs and policies on domestic farm income and foreign trade are analyzed. Studies are made of the effects of monetary and financial programs and of agricultural policies and programs of foreign countries on U.S. exports of farm products. Monthly, annual, and special agricultural trade statistics are developed and published.

Science and Education

Agricultural Research Service

The agricultural research service (ARS) was established by secretary's memorandum 1320, supplement 4, dated November 2, 1953.

ARS conducts research in agricultural production, utilization, and marketing; nutrition and consumer use; and control and eradication of pests, and plant and animal diseases. It also conducts related regulatory and control programs.

Both the research and regulatory programs are carried on at numerous locations in all of the States, U.S. possessions, and a number of foreign countries. Many of the programs are cooperative with the States and other public and private agencies. These programs are organized into the areas of work, described briefly below.

Research is concerned with increasing the efficiency and reducing the costs of marketing agricultural commodities; developing methods and instruments for identifying and measuring product quality objectively; developing procedures for maintaining quality and preventing losses from waste, spoilage, and deterioration; and preventing, controlling, or eradicating insects in stored agricultural products.

Research is directed toward finding new and expanded uses for agricultural products; developing new and improved foods, feeds, drugs, fabrics, industrial chemicals, and other products from agricultural commodities; studying the effects of pesticides on the composition and nutritive value of agricultural products; and investigating processing wastes and their effect on environmental pollution. Health-related tobacco research is also conducted.

Research is also concerned with developing additional knowledge about human nutrition; nutritive values of foods; effective consumer use of food, clothing, and textiles; and efficient management of money, time, and other family resources.

Farm research is directed toward improving methods of soil and water management; improving field and horticultural crops and the control of crop diseases, nematodes, and weeds; developing superior strains of beef and dairy cattle, swine, sheep, goats, and poultry and improving dairy husbandry; controlling livestock diseases and pests; studying the biology and habits of insects and developing biological and chemical methods for con-
trolling insects harmful to man, animals, and crops; developing safe and efficient use of farm power, machines, structures, and materials; investigating pesticide residues in farm products and their effects on the quality of the environment; and studying soil, water, and air pollution, and developing methods to alleviate pollution.

The international programs division administers the foreign research contract and grant program for the department of agriculture under public law 480 and related legislation. Research grants are made to foreign governments and scientific organizations for research on developing new and extended uses for U.S. agricultural commodities, and for conducting farm, forestry, and marketing research. The division coordinates ARS activities in international economic, technical, and cooperative assistance and relations, including training in this country on ARS subject-matter fields, as requested, for foreign nationals. The division also coordinates all foreign translation activities in the department.

ARS regulatory program divisions administer various laws and regulations and conduct cooperative activities in animal inspection and quarantine, pest regulation, and quarantines, animal disease eradication, plant pest control, and pesticides regulation. Regulatory workers seek to prevent entry into the United States of animal and plant diseases and pests, and/or prevent their transmission to other countries via U.S. exports; to control or eradicate many crop and livestock diseases and pests within the United States; to assure humane treatment of laboratory animals by dealers, transporters, and research facilities, and of livestock moving in interstate commerce; to provide for safe and effective use of veterinary biologicals products, pesticidal chemicals and devices by regulating their composition and labeling; and to monitor the effects of pesticidal residues in areas of extensive chemical treatment.

In 1952, research conducted by the soil conservation service was transferred to the agricultural research service. In 1957 the central soil conservation research center was established near Morris, Minnesota, to give consideration to a thirty-seven million acre problem area in western Minnesota and adjoining States. Field and laboratory studies were initiated in four general areas: conservation and efficient use of soil moisture by crop plants; disposal of excess water on agricultural lands; runoff and erosion as influenced by soil, cover, tillage and climate; and development of effective support practices for conservation farming. In 1959 office and laboratory facilities were completed. Also in 1959 a substation was established near Madison, South Dakota. Additional substations were established at Crookston, Minnesota, in 1960 (to conduct tillage and drainage research on Red river valley soils) and at the university of Minnesota, St. Paul, in 1961 (to investigate the fundamentals of soil structure).

In 1961 the soil and water conservation research division was reorganized into seven research branches. At that time the corn belt branch office was established at its present location in the soil science building, university of Minnesota, St. Paul. Many of the research findings at corn belt branch locations outside Minnesota are either directly or indirectly applicable to problems found in Minnesota. All work is conducted in cooperation with the Minnesota agricultural experiment station.

Precipitation measurements are being made in conjunction with water and soil management studies at several locations in western Minnesota and eastern South Dakota. These include projects in drainage, water use efficiency, soil erosion and sedimentation, and micrometeorological studies. Precipitation data obtained in these experiments is used to predict frequency and duration of moisture excesses and deficits.

Evapotranspiration from soybeans, as influenced by row spacing and seeding rate, is the primary objective of an experiment at Morris. Water use efficiencies are then compiled from the evapotranspiration data. Soybeans are extensively grown in western Minnesota; however, little is known about the interrelationships of seeding rates, row spacings and soil moisture use. The latter is often the limiting factor in efficiency of crop production. In addition, there are five experiments underway in Minnesota in which evaporation or transpiration measurements are made. These include experiments on: the interrelationships of soil fertility, plant population, soil properties, and soil moisture on corn yield; improving water-use efficiencies through alteration of microclimate; the characterization of soil moisture regimes; and a summary analysis of evapotranspiration data. Continuous measurements of ground-water levels are made in conjunction with drainage experiments in the Red river valley and in southwestern Minnesota.

Water movement in soils is a primary objective of two research projects at St. Paul. The transient flow rate technique is being used to obtain experimental measurements of soil moisture diffusivity. This study involves a test of the transient method itself, the effects of wetting and drying cycles on diffusivity values and the development of theoretical and empirical models of the diffusion process. At Brookings, South Dakota, a study of the validity of the Darcy constant for unsaturated flow is underway. This includes an examination of those factors causing non-Darcy flow and the development and testing of substitute constants based on these factors. Water flow is also be-

Programs in Minnesota - Agricultural research service, soil and water conservation research division, corn belt branch conducts soil, water and watershed studies designed to meet the needs of the brunt-er, gray brown podzolic, podsol, chernozem, gray wooded and associated soils in the corn belt, with particular emphasis on problems of soil structure, micrometeorological, soil and plant relations, moisture conservation, hydrologic properties of structures, watershed hydrology, sedimentation, water and wind erosion control, water and soil loss prediction, irrigation and drainage. States included are: Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin.

In the early 1920's the bureau of soils, forerunner of the present day soil conservation service and agricultural research service, initiated a study of concrete tile failure. This study clearly revealed that failures were closely associated with the presence of magnesium and sodium salts in the subsoil. Subsequent studies succeeded in defining the causes of drain failure, ways to correct it and maps showing the distribution of the problem area.

In 1946 the soil conservation service established a research team at the St. Anthony Falls hydraulics laboratory, university of Minnesota, Minneapolis, to study the hydraulics of conservation structures. Many of the engineering design features used today in designing water retention reservoirs and farm and highway drainage systems were developed by this USDA research team. Currently the three research hydraulic engineers are conducting research on the hydraulics of closed conduit spillways and associated structures.
ing studied in conjunction with other experiments in Minnesota. These include the effects of soil structural properties on water intake, retention and transmission; depth and spacing of drain tile for water management on wet soils; depth and spacing of drain tile for water management on wet soils; digital computer analyses of moisture flow studies; and the effects of soil tillage and resulting surface configuration on the infiltration, transmission and retention of water.

Water and plants are either directly or indirectly related to nearly all of the research conducted by the branch. These studies consist of: a characterization of water holding and soil physical properties; and surface topographic and roughness features and how they influence water intake, retention, transmission, and losses; soil moisture survey of most of the soil types of western Minnesota and eastern South Dakota; water use efficiencies and water demands of several crops on several soil types; tillage induced soil features that influence water intake and retention and soil temperature, and their results on plant growth; interrelations between fertility-plant population—soil type on the efficiency of crop production; soil moisture-temperature and water influences on efficiency of crop production as influenced and modified by microclimate; and the physiological effects of excess water on crop production efficiency.

Watershed protection is being indirectly examined in four experiments where the effects of land and water management are studied by measuring infiltration, runoff, erosion, and sediment.

Erosion and sedimentation are another major research area of the branch. A total of 12 research projects in west central Minnesota and eastern South Dakota have the elucidation of the erosion process as one of their major objectives. These experiments include: basic laboratory studies of the mechanics of soil detachment by raindrops by measuring splash patterns and shapes as a function of several soil surface conditions; field studies in which the influence of soil management and tillage practices on runoff and erosion are measured on small runoff plots; wind erosion studies and its effect on siltation of surface drainage ditches in the Red River valley; and evaluation of the several factors included in the universal soil erosion equations for the west central Minnesota physiographic region.

Flood abatement studies are located at the St. Anthony Falls hydraulic laboratory and consist of the design and testing of hydraulic structures for safe water conveyance. These include model and analytical studies of various facets of closed conduit spillway design, cantilevered outlets, and the hydraulic characteristics of pipe junction angles.

Drainage research activities in Minnesota include surface and subsurface (tile) drainage of wet soils of southwestern Minnesota, surface drainage in the Red River valley area, and basic studies of soil and water measurements, and, where applicable, plant responses are taken at these experiments.

Water quality and the effectiveness of tile drains in leaching excess soluble salts from the plant root zone are being investigated in connection with the drainage and water management research in Minnesota.

The hydraulics of closed conduit spillways in being studied at the St. Anthony Falls hydraulic laboratory. Both model and analytical analyses are employed in determining design criteria for optimizing spillway performance.

Results from these studies, in addition to being employed in the design of small, on-farm structures, are extensively used in other engineering construction, such as highways and airport runways.

The subject matter of completed projects are: interseeding alfalfa-brome in corn; land-forming on lacustrine soils of the Red river valley; the barnes-aastad soil association; capillary tubing for raindrop simulators; and other subsurface drainage system appurtenances; construction and testing of a plot size rainfall simulator; fundamental studies on soil erosion due to rainfall; design of box inlet drop spillway and its outlet; and development and testing of a turbulent-water antisedimentation device for HS flume.

Cooperative State Research Service

The cooperative State research service administers Federal-grant funds for research in agriculture, agricultural marketing and rural life, and for cooperative forestry research and research facilities. Funds are made available to the State agricultural experiment stations and other designated State institutions in the 50 States and Puerto Rico. It also administers a competitive grant program for basic and applied research.

The technical staff of the service reviews proposed research and research in progress under this program, gives leadership in planning and coordinating the research, and encourages the establishment and maintenance of cooperation between the stations and the department of agriculture.

Extension Service

The extension service is the educational agency of the department of agriculture. It is one of three partners in the cooperative extension service. State governments, through their land-grant universities, and county governments are the other partners. All three share in financing, planning, and conducting extension's educational programs.

The extension service was created by the Smith-Lever Act of 1914. Its program responsibilities have been broadened and strengthened by amendments to the original act and passage of other legislation, such as the agricultural marketing Act of 1947.

Extension helps the public learn about and apply to everyday activities the latest technology developed through research by the land-grant universities, the department of agricultural, and other sources. Major areas of assistance are agricultural production and marketing, home economics and nutrition, 4-H youth development, rural development, and related subjects.

The extension service has a small staff of professional specialists in the subjects listed in the previous section. The State land-grant universities' cooperative extension services have a similar staff of specialists plus area staffs and staffs located in nearly every county throughout the country.
County and area offices are staffed according to need. The staffs vary from one to several per county. The extension staff provides technical and organizational assistance to State extension specialists. It also works directly with personnel of other Federal agencies and National organizations.

State specialists provide technical assistance to county and area staffs and organizations. They interpret research and prepare educational materials for use in extension programs.

Area and county agents work directly with individuals, families, and groups to help them apply the newest proven technology to the everyday problems and opportunities of living and making a living. Nonmetropolitan people make up extension's primary audience. County agents show farmers and ranchers how to apply new and improved production and marketing technology to their operations. This is done through group meetings, demonstrations, tours, publications, mass media, and commodity newsletters. Often they help farmers by helping agribusiness to provide more efficient and better services.

Extension's educational programs for agribusiness include both those engaged in processing and marketing farm products and those selling supplies to producers. These programs feature assistance in evaluating and applying new management techniques and technological developments. Educational work is also done with producer cooperatives and groups considering formation and operation of cooperatives.

Extension home economics agents conduct educational programs for homemakers on such things as nutrition, clothing, home management, child development, and consumer information. They use the same general teaching methods as the agricultural agents.

Extension conducts programs to help boys and girls develop employable skills, explore careers, and develop leadership skills. These programs are conducted primarily through the 4-H "learn-by-doing" projects. The projects are geared to the youth's individual interests and financial ability. They feature the application and importance of science to everyday living. Although 4-H started for rural boys and girls, it has expanded to most small towns and cities and suburbs and is now available in many inner-city locations.

Extension provides educational programs for nonfarm rural homeowners. These programs include lawn and garden care, use of pesticides and herbicides, ornamental horticulture, and civil defense.

Extension workers also cooperate in programs for the benefit of entire communities, counties, or areas. This involves educational programs to help local officials and development groups analyze needs and resources. They also help develop programs and organizations for securing community facilities and programs for resource and human development.

Special programs are conducted in rural civil defense and for low-income people include the same subject-matter areas as the traditional extension programs mentioned above. Low-income people are given more individual assistance through paid and unpaid aides. Major attention in low-income programs is devoted to helping families improve their nutritional level. This program is now operating in more than 960 counties, independent cities, and reservations in the 50 States, District of Columbia, Puerto Rico, and the Virgin Islands. Extension also assists local welfare agencies, community action program agencies, and all other groups or organizations concerned with helping low-income people.

Commodity Programs

The Agricultural Stabilization and Conservation Service

The agricultural stabilization and conservation service (ASCS) in the agency of the department of agriculture that administers specified commodity and related land use programs designed for voluntary production adjustment, resource protection, and price, market, and farm income stabilization. Personnel and facilities of the agency are utilized also for various functions of the commodity credit corporation (CCC), the governmental unit charged with financing agricultural price support and related activities, including commodity acquisition, handling, storage, and disposal operations.

In its activities, the agency's primary responsibilities to promote the National welfare and to carry out the legislative intent of the Congress include those to: improve the economic stability of agriculture by aiding farmers to achieve supply-demand balances that result in an equitable share of both domestic and export markets, and an equitable return on those markets; maintain an even flow of quality products to market at reasonable price to both producer and consumer; and improve and protect soil and water resources by aiding farmers to carry out conservation and land use practices.

All programs administered by ASCS that deal directly with farmers are carried out through State, county, and community committees, established in accordance with provisions of section 8 (b) of the soil conservation and domestic allotment Act of 1935, as amended. The principal activities of ASCS include: price support through commodity loans to farmers; direct purchases of commodities from farmers and processors; acreage set-aside payments on specified commodities, and production incentive payments for wool and mohair. Production adjustment to balance supply and demand, for specified commodities, through cropland set-aside, acreage allotments, marketing quotas, and commodity acreage diversions, when applicable. Conservation assistance through sharing with farmers and ranchers the cost of installing needed soil, water, woodland, and wildlife conserving practices under the rural environmental assistance program (REAP). Management of the commodity credit corporation inventories acquired under price support -- through sales, donations, storage, and related processing and shipping arrangements. The export marketing service is responsible for programs dealing with the export of privately-owned agricultural commodities. The sugar program to provide an equitable sharing of the U.S. sugar market among domestic and foreign supplying areas, to protect the income of domestic producers, and to assure consumers a stable supply of sugar at reasonable prices. Disaster and defense activities to augment feed supplies for farmers and ranchers in areas where natural disasters have reduced feed, to provide emergency conservation assistance in restoring farmlands seriously damaged by widespread flood or drought, and to assist in preparedness planning for civil defense.
The agency is headed by an administrator, an associate administrator, and three deputy administrators. Each of the deputy administrators has responsibility in a specified area of activity: State and county operations, commodity operations, and management. ASCS was established June 5, 1961 by the secretary of agriculture under authority of revised statutes, and reorganization plan 2 of 1953, as well as all other statutes and prior reorganization plans vesting authority in the secretary. The secretary authorized a reorganization of the agency into both program and commodity divisions effective June 26, 1969. Reporting to the office of the administrator are automatic data processing staff groups, the information division, and a group of consultants and staff assistants who review, evaluate and appraise policies and programs as a basis for recommendations to the administrator. Also reporting to the administrator's office are the ASCS data processing center in Kansas City, Missouri, and the New Orleans (interim) data processing center.

Offices and divisions of the agency reporting to the administrator through the deputy administrators are as follows: deputy administrator, State and county operations (NASCO). The offices and divisions reporting to the deputy administrator are responsible for regulatory, compliance, constituency, and program service functions for State and county committees and for the administration through these committees of commodity and land use programs, bin storage, program compliance and appeals, and defense and disaster operations. The aerial photography operation in the compliance and appeals division maintains an eastern laboratory at Asheville, North Carolina, and a western laboratory at Salt Lake City, Utah. Reporting to the deputy administrator are five area directors (with headquarters in Washington, D.C.), 50 ASCS State offices and a Caribbean area office, and five divisions concerned with commodity programs, conservation and land use programs, direct payment programs, compliance and appeals, and disaster and defense.

The ASCS State and county committees are primary units in the agency's field organization. The State committees include three to five members, appointed by the secretary of agriculture. In addition, in each state the director of the agricultural extension service is an ex officio member. There are (1970) 3,061 county committees, with three farmer-members each, elected by farmer-elected delegates to a county convention. One committeeman is elected each year, with two committeemen being holdovers. The county agricultural extension agent is an ex officio member of the committee, or serves as the committee secretary. However, he does not have committee voting rights in either position. To assist the county committee in carrying out program administration, community committees of three farmers each are elected annually by other farmers in each of several local communities within the county. Each ASC county committee employs a county executive director who, for the committee, hires the necessary employees for office work and fieldwork, and sees that the day-to-day office and field operations are effectively and efficiently performed.

ASCS programs are made available to Minnesota farmers by 85 county offices and two sub-offices. Each main office is staffed with a county executive director and from one to nine regular full time clerks, depending on workload volume. In addition, a large number of mostly seasonal part-time employees are engaged in field work such as acreage measurement, inspection of farm stored grain under loan, and bin site maintenance. The overall responsibility for policy and administration is assigned to a three man county committee in each county. County committeemen are elected by the community committeemen who serve as delegates to an election convention each year.

County committeemen serve three year terms and one of these terms expires each year. County committeemen, who are elected by the farmers in the community, serve one year terms. Operating funds are made available to county offices on a workload basis each fiscal year. These funds are deposited to the account of the county committee in a local bank and salaries, and other expenses are paid at the county level from this account.

The agricultural conservation program (ACP) is a nationwide conservation program of the department of agriculture. It is one of the National farm programs administered by the agricultural stabilization and conservation service. The agricultural conservation program was established by the soil conservation and domestic allotment act of February 29, 1936. It has been subsequently amended by various agricultural acts of congress. The ACP shares with farmers (including ranchers and woodland owners) the cost of some of the conservation practices needed to protect, improve and renew soil, water, woodland and wildlife resources on privately owned farm land. Congress authorizes these public funds as the public's share of an investment in conservation work needed in the public interest. Often, the conservation work in the public interest costs more than a farmer can afford to invest from his own resources. Many conservation practices which benefit the Nation bring little or no return to a farmer, or will repay him only after a long time. Generally, the farmer must contribute at least 50 percent of the cost of carrying out a practice from his own pocket. Practice specifications are based on accurate knowledge of the conservation problems and the measures needed to accomplish a sound conservation program for the farm or area. Specifications set up for practices are based on experiment station research, field experience of trained technicians, and experience and observation of farmers.

Basically the National agricultural conservation program is developed and is carried out on the basis of the following principles: the National program contains broad authorities to help meet the varied conservation problems of the Nation. State and county committees and participating agencies shall design a program for each State and county. Such programs should include any additional limitations and restrictions necessary for the maximum conservation accomplishment in the area. The programs should be confined to the conservation practices on which Federal cost-sharing is most needed in order to achieve the maximum conservation benefit in the State or county. The State and county programs should be designed to encourage those conservation practices which provide the most enduring conservation benefits. preference shall be given to practices that help to establish permanent vegetative cover.

Costs will be shared with a farmer or rancher only on satisfactorily performed conservation practices for which Federal cost-sharing was requested by the farmer or rancher before the conservation work was begun. Costs should be shared only on conservation practices which it is believed farmers or ranchers would not carry out to the needed extent without program assistance. In no event should costs be shared on practices except those which are over and above those farmers or ranchers would be compelled to perform in order to secure a crop. The rates of cost-sharing in a county or State are to be the minimum required to result in substantially increased performance of needed conservation practices within the limits prescribed in the National program.
The purpose of the program is to help achieve additional conservation on land now in agricultural production rather than to bring more land into agricultural production. The program is not applicable to the development of new or additional farmland by measures such as drainage, irrigation, and land clearing. If the Federal government shares the cost of conservation practices, the farmers and ranchers should assume responsibility for the upkeep and maintenance of those practices throughout their lifespans.

The rural environmental assistance program (REAP) is the successor to the agricultural conservation program (ACP). County programs are developed and administered by county ASC committees in cooperation with local representatives of the soil conservation service, forest service, extension service, local soil and water conservation districts, and other agricultural agencies. These agencies also assist with the educational and technical work needed in the administration of the program. The State ASC committee allocates the funds available for conservation practices among the counties. The rate of cost-sharing is a percentage of the average cost of the practice considered necessary to obtain needed use of the practice but which will be such that the farmer will make a substantial contribution to the cost of performing the practice. Rates usually do not exceed 50 percent of the average cost of performing the practice.

Regular conservation practices included in the rural environmental assistance program as of February 25, 1971 which can be applied in Minnesota are: establishing permanent vegetative cover; reestablishing permanent vegetative cover; contour stripcropping; field stripcropping; planting for entry trees or shrubs; planting trees or shrubs, farmstead or feedlot shelterbelt; improving vegetative cover; water impoundment reservoirs; improving stand of forest trees; establishing sod waterways; permanent vegetative cover on problem areas; constructing terrace systems; diversions; erosion control dams or ponds; structures to protect water outlets and channels; winter cover crop; stubble mulching; contour farming; wildlife habitat; wildlife cover; wildlife food plots; wildlife habitat and nesting; shallow water areas for wildlife; ponds or dams for wildlife; cover for wildlife and safety; animal waste storage facilities; diversions for the management of animal wastes; and other pollution abatement-conservation practices. About 25 percent of the total assistance provided by the ACP (REAP) is for water resources activities.

A program the cropland adjustment program (CAP) was authorized under the food and agriculture Act of 1965 to supplement production adjustment programs for a lower cost. It encourages needed long range land use changes. Agreements for 5-10 years are used to encourage acreage shifts from surplus crops to conserving uses. Acreages used for row, grain and tame hay crops are eligible.

Participants receive adjustment payments for acres diverted and cost-shares to help establish protective conservation measures. To qualify for participation a farmer must have been the operator during the year prior to the first year of the agreement. Farms on which ownership changes during the 3 years prior to the first year of the agreement are ineligible in most cases. To avoid adverse effect on the local economy of a county or trade area, the acreage placed under agreements is limited. Cropland acreages and allotment histories are preserved for the designated acres.

Under another provision of the program called "Greenspan," CAP also helps local state and other government agencies to acquire cropland for noncrop uses. Such uses as the preservation of open spaces, natural beauty, wildlife development, recreation and prevention of air and water pollution are included. The program provides funds for the purchase of land at the same rate that would have been used if the land had been retained by the farmer. This rate cannot exceed 50 percent of the cost of the land. Cost-sharing for establishment of conservation practices on cropland is also provided.
The department of defense, through the civil functions of the corps of engineers, has the oldest and largest of the Federal water and related land programs. This goes back to the year 1824, when, the engineers of the United States army, being the only body of engineers within the Federal establishment, were given responsibility for work on rivers and harbors for navigation. Over the years, responsibilities in the fields of flood control, hydroelectric power, municipal and industrial water supply, recreation, and planning for all functions of water resources development were added by statute. Programs are administratively directed by the secretary of the army who report to the president through the office of management and budget, without involving the secretary of defense. Work is under the direction of the chief of engineers, and is carried out through 11 division offices, and 38 district offices scattered over the 50 States, most of which have parallel functions in the field of military construction (Water Laws & Policies Appendix, Upper Miss. Coor. Com. 1964).

The scope of and requirements for corps of engineers water resources projects have developed through a long series of river and harbor and flood control Acts. Projects for river basin development, flood control and navigation, require specific authorization by congress after investigations and reports by the corps. Other functions, such as power, water supply, water quality control, recreation, and fish and wildlife enhancement may be included when warranted and local interests will agree to participate in accordance with law and policy. When project costs are less than certain limits specified in law, general authorities are available to the secretary of the army and chief of engineers to develop and authorize small projects, as further outlined below, without returning to congress for approval. Surveys are made entirely at Federal expense except for use of suitable locally developed data.

Comprehensive river basin studies by the corps stem from specific congressional authorization, and the water resources planning Act of 1965. Studies are coordinated with other Federal and local agencies and seek the objectives of the 1944 and subsequent flood control Act and Public Law 89-80. Section 206 of the flood control Act of 1960 as amended, authorized the secretary of the army and chief of engineers, at the request of the State and responsible local governmental agencies, to compile and disseminate information on floods and flood damages, and provide general criteria for local guidance in planning the use of flood plains and engineering advice on reducing the flood hazard. Such studies are made largely at Federal expense within the limits of appropriated funds. Local interests are encouraged to provide mapping, aerial photography, stream gauges and similar relevant assistance and information.

Adoption of a Federal project generally requires findings of economic feasibility in survey reports made in response to specific congressional authorization. Studies are coordinated with local interests and other Federal agencies, and are reviewed by the office of management and budget. Following congressional consideration and authorization of recommended projects, usually in omnibus river and harbor flood control Acts, funds for Federal design, construction, operation and maintenance, consistent with the authorized conditions of local cooperation, are subsequently appropriated by congress after consideration of the president's budget.

Authority reports specify the recommended Federal participation and local cooperation deemed appropriate. Local interests are required to provide necessary lands, easements and rights-of-way for the project and for spoil disposal where needed, relocation or alteration of utilities, public terminals, and maintenance of berthing areas. Special contributions may be required for single-user projects and where land enhancement results from spoil disposal. Railroad and highway bridge alterations are financed cooperatively under public Law 647, 76th congress, as amended. Recreational harbors may be recommended where feasible, and local cash contribution of 50 percent of the first costs of the general navigation facilities allocated to recreational boating is required in addition to other cited requirements of cooperation. Maintenance of navigation projects is at Federal expense.

The Federal interest in nation-wide flood control was established by the flood control Act of 1936. That Act states that the Federal government should participate in flood control "if the benefits to whomsoever they may accrue are in excess of the estimated costs, and the lives and social security of the people are otherwise adversely affected." The 1936 and subsequent Acts established the basis for the common policy on local cooperation followed by the corps of engineers. For proposed local protection projects, local interests are generally required to give assurances that they will provide lands, easements, and rights-of-way including relocations and alterations of highways, highways bridges, and utilities; hold and save the United States free from damages due to the construction works; and operate and maintain the project after construction. These three requirements are known as the "a-b-c" requirements of local cooperation. Flood control reservoirs, however, are generally exempt from such requirements except in special cases where the benefits are confined to a single locality and the project is in lieu of local protection works. Special local cooperation, usually as a cash contribution, may be recommended for flood control projects that produce windfall benefits to a few beneficiaries, or that involve land drainage benefits. The 1944 flood control Act requires the secretary of the army to prescribe regulations for operation of flood control and navigation storage at all reservoirs constructed with Federal funds, except those of TVA.

The flood control Act of 1944 defined flood control to include "major drainage." Federal major drainage improvements are defined to mean major outlet channels serving local land drainage systems. Administration policy, based on economic and reason for reclamation by irrigation in the west, provides for equal sharing of the first costs of the major outlets, including lands between the Federal government and local interests, with the latter to operate and maintain the project after construction, and to provide all upstream drainage improvements. Power development may be recommended in reservoir projects if economically justified. Where power is not immediately feasible, penstocks in dams may be included for future power development upon the recommendation of the Federal power commission. In multiple-purpose projects, the costs allocated to power are the basis for establishing rates by the Federal marketing agencies. Municipal and industrial water supply is considered the primary responsibility of the States and local interests. However, storage may be recommended in multiple-purpose reservoirs pursuant to the water supply Act of 1958, as amended. Such storage may be reserved entirely for water supply, or may be provided by joint use of seasonal flood control or other storage. Costs allocated to water supply may not exceed 30 percent of the total project construction costs, and are reimbursable by the water users, through a local public agency, over a 49 to 50 year period at
Federal interest rates. A 10-year interest-free development period is permitted under the law. Interm use for irrigation in the western States may be considered under the terms of reclamation law.

Storage for streamflow regulation to improve water quality may also be recommended in multiple-purpose reservoirs pursuant to the water pollution control Act of 1956, as amended. The law provides, however, that such storage may not be provided as a substitute for adequate local treatment or other methods of controlling waste at the source. Such storage upon the advice of the Federal water quality administration may be reserved entirely for streamflow regulation, or may be provided by joint use of storage serving other purposes. Costs allocated to water quality control may be assumed by the Federal government if the benefits are widespread.

In water resource developments, executive order 11288 states that the secretaries of agriculture and the army shall present for the consideration of the secretary of interior any plans that they propose to recommend with respect to authorization of construction of any Federal water resource development projects in the United States. The report of the secretary of interior shall accompany any report proposing authorization or construction of such a water resource development project. Outdoor recreation, including enhancement of fish and wildlife for fishing and hunting, may be recommended as a proper purpose of Federal water resources projects pursuant to the Federal water project recreation Act of 1956. If local interests agree to cooperate in recreational development, the separable costs of recreational facilities may be shared equally between Federal and non-Federal interest, and the joint costs allocable to recreation may then be assigned to the Federal government. Cost-sharing in recreational development of authorized projects depends on the specific authorizing legislation, the status of completion of the basic project, and the applicability of general legislation. Recreational facilities at non-reservoir projects may be provided if local interests will share equally in the costs, and will assume operation and maintenance of the basic facilities. Recreational facilities at Federal expense, but legislative and administrative policy seeks to encourage local interest to develop recreation areas and facilities at Federal projects at local costs. The land and water conservation Act of 1965, fees collected from the public for admission to Federal water projects are returned in part to the States for recreational development thereby.

Pursuant to the fish and wildlife coordination Act of 1958, the corps of engineers may recommend inclusion of certain project modifications and lands for fish and wildlife purposes in proposed projects. Justified measures to mitigate any project-caused damages to the fish and wildlife resource are included in the costs allocated to the purposes involved; measures for the development of the resource require specific legislative authorization. The Act of July 28, 1956, (P.L. 826, 84th Congress), as amended by the river and harbor Act of October 23, 1962, authorized the Federal government to assume up to 50 percent of the cost of construction for protecting publicly owned or publicly used beaches; and up to 70 percent for protection of publicly owned shore parks or conservation areas subject to certain conditions in section 103 of the 1962 Act. Non-Federal interests are required to assume all remaining costs, including lands, maintenance and repairs, and provide assurances that they will hold and save the United States free from damages, remedy pollution conditions that would endanger the health of bathers, and maintain public ownership and use of the protected shores on which Federal aid is based.

General authority is provided in several laws that permit the secretary of the army and the chief of engineers to authorize projects of limited scope within fiscal year appropriations specified in the laws. A project is adopted for construction under one of these authorities only after investigation clearly shows its engineering feasibility and economic justification. An investigation is made upon request of the chief of engineers to authorize the Federal government to share in the joint costs allocable to recreation. An investigation is made upon request of the secretary of the interior shall accompany any report proposing authorization or construction of such project. Costs allocated to water quality control may be assumed by the Federal government if the benefits are widespread.

Section 107 of the river and harbor Act of July 14, 1960, as amended, provides authority for the chief of engineers to develop, construct, and maintain small navigation projects that have not already been specifically authorized by congress. Each project selected must be economically justified, complete within itself, and limited to a Federal cost of not more than $500,000. Section 103 of the river and harbor Act of 1962, as amended, provides authority for the chief of engineers to develop and construct small shore and beach restoration and protection projects that have not already been specifically authorized by congress. Each project under section 103 must be complete, economically justified, and limited to a Federal cost of not more than $500,000 including any Federal share of periodic nourishment cost. Local cooperation is otherwise based on the same requirements as for regularly authorized larger beach erosion control projects. Section 3 of the rivers and harbors Act of 1946 authorizes clearing and straightening of stream channels, and the removal of accumulated snags and other debris, in the interest of navigation. Each project must be economically justified. The maximum allotment is not to exceed $300,000 from any appropriations made for any one fiscal year for improvement of rivers and harbors, for removing accumulated snags and other debris, and for protecting, clearing and straightening channels in navigable harbors and streams. Local interests must agree to provide without cost to the United States, all lands, easements, and rights-of-way, and all required alterations and relocations in utility facilities; hold and save the United States free from damages; maintain the project under completion; assume all project costs in excess of the allotment limitation; and provide a case contribution toward construction costs where "windfall" land enhancement or other special benefits would accrue. The cash contribution, where required, is computed in accordance with existing policies for regulatory authorized projects.
Section 208 of the 1954 flood control Act authorizes clearing and straightening of stream channels and the removal of accumulated snags and other debris in the interest of flood control. Each project selected must be economically justified. The maximum Federal expenditure per project is limited to $100,000. A Section 208 project is designed to be complete in itself and not require additional work for effective flood control. The local sponsoring agency must agree to provide without cost to the United States all lands, easements, rights-of-way, and all required alterations and relocations in utility facilities; hold and save the United States free from damages; maintain the project under completion; assume all project costs in excess of $100,000; and provide a cash contribution toward construction costs where "windfall" land enhancement or other special benefits would accrue. The cash contribution, where required, is computed in accordance with existing policies for regularly authorized projects. Section 14 of the 1946 flood control Act provides special authority to the chief of engineers to construct bank protection works to protect endangered highways, highway bridge approaches, and other essential or important public works, such as municipal water supply systems and sewerage disposal plants, which are endangered by flood-caused bank erosion. A Section 14 project is designed to be complete in itself and to require no additional work for effective and successful operation. Each project must be economically justified. The maximum Federal expenditure per project is limited to $50,000. The local sponsoring agency must agree to provide without cost to the United States all lands, easements, rights-of-way, and all required utility alterations and relocations in utility facilities; hold and save the United States free from damages; maintain the project after completion; assume all project costs in excess of the Federal cost limit of $50,000 and provide a cash contribution in proportion to any special benefits.

In connection with natural "major disasters," determined to be such by the president pursuant to the National Disaster Act of 1974, the civil works organization of the corps of engineers may be called upon to participate in the program of Federal disaster assistance. Request for corps participation may be made to the chief of engineers by the director of the Office of Emergency Preparedness (OEPP), acting in behalf of the president. The authority of the OEP director has been delegated to OEP regional directors. Following presidential declaration of a "major disaster" at the request of a State governor, requests for assistance are made by local authorities through State channels to the appropriate OEP regional director. With the concurrence of the responsible army commander, division engineers of the corps may be directly requested by OEP regional directors to provide requested disaster assistance beyond statutory authorities of the corps. During the disaster fighting phase, action by the corps is normally through the army military command. Requested disaster operations are reimbursable from disaster relief funds appropriated pursuant to the Act and made available by the president.

Circumstances may justify immediate action to save human life, to prevent imminent human suffering, or to mitigate great destruction or damage to the property of the United States. Such action may be taken or assistance given by the corps of engineers pending declaration by the president of a "major disaster," or in connection with other disasters not designated by the president as "major disaster," or in connection with other disasters not designated by the president as "major disasters." Authority therefor stems from the statutory authorities of the corps for flood fighting and rescue operations, or the established policies and practices of the corps and the department of the army. Flood, and storm emergency operations, including advance planning, patrolling of levees, flood fighting, rescue operations, emergency repairs and protection of Federal projects, and supplementation of local efforts upon request in emergencies, are authorized by the flood control Act of August 18, 1941, as amended by public Law 99, 84th congress and other Acts. While emergency repairs of non-Federal flood control works are permissible, the law does not extend to reimbursement of local expenditures for flood fighting or post-flood repairs and improvements. Primary responsibility for disaster fighting rests with local interests. The corps of engineers seeks to encourage proper local maintenance of protective works and advance preparation for emergencies, including stockpiling of material and training of personnel. Local cooperation, substantially as required for regular flood control projects, is required for emergency rehabilitation work under Public Law 99, and for repairs which constitute betterments or accomplishment of deficient local maintenance.

Section 9 of the river and harbor Act approved March 3, 1899 requires the consent of congress, or State legislature, and the approval of plans for bridges by the chief of engineers and the secretary of the army. Section 502 of the general bridge Act approved August 2, 1946 authorizes the construction of bridges across any of the navigable waters of the United States, except international bridges (which must be authorized by special act of congress). This act is considered by the chief of engineers and the secretary of the army as basic authority for the approval of the plans and locating of all bridges proposed to be built, except those authorized by special acts of congress. Section 7 of the river and harbor Act approved August 8, 1917 authorizes the secretary of the army to prescribe such regulations for the use, administration, and navigation of the navigable waters of the United States as public necessity may require for the protection of life and property, or for operations of the United States in channel improvement, covering all matters not specifically delegated by law to some other executive department.

Section 10 of the river and harbor Act approved March 3, 1899 prohibited the placing of any structures in or over any navigable waters of the United States outside established Federal harbor lines, or excavating from or depositing material in such waters, unless the work has been recommended by the chief of engineers and authorized by the secretary of the army. The instrument of authorization is designated as a permit. Section 11 of the river and harbor Act approved March 3, 1899 authorizes the secretary of the army to cause harbor lines to be established where it is made manifest to him that establishment is essential for the preservation and protection of a harbor. The laws relating to removal of wrecks are contained in Section 8 of the river and harbor Act approved September 19, 1890, sections 15, 19, and 20 of the river and harbor Act approved March 3, 1899, and the Act approved September 17, 1965. The bridge alteration Act approved June 21, 1949, as amended, (Truman-Hobbs Act), provides for the alteration of lawful railroad bridges, and/or highway bridges, when found unreasonably obstructive to navigation. The Act provides for an apportionment of the total cost of the alteration between the United States and the bridge owner. This function has been reassigned to the department of transportation.

One of the environmental demands that has surfaced concerns greater enforcement of laws against water polluters. The army corps of engineers is deeply involved in this area because of the authority granted to them by congress before the beginning of this century to issue permits to persons...
or companies wanting to dredge, fill, erect structures or deposit refuse in the navigable waters of the United States. This authority is contained in the rivers and harbors Act of 1899. Section 13 of that act, more popularly known as the refuse Act, prohibits the discharge into navigable waters of refuse matter other than sewage, or any other materials without a permit.

In August 1969, the president appointed a cabinet-level council on environmental quality to put new emphasis on environmental concerns. This action was followed by the National environmental policy Act of 1969, which essentially states that every Federal agency shall consider ecological factors when dealing with activities which may have an impact on man's environment. The water quality improvement Act of 1970 knitted the States tightly into the pollution control fabric by providing that any applicant for a Federal license or permit to "...conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters of the United States" must obtain certification from the State, or other appropriate authority, in which the discharge originates that such discharge will not violate applicable water quality standards, before such Federal license or permit can be granted. With these developments, the corps of engineers received a clear legislative-executive mandate to consider environmental and other factors in evaluating any permit applications. On the judicial side, the fifth U.S. circuit court of appeals recently upheld the corps of engineers' authority to deny a permit on environmental grounds after a district court ruled that they must consider only navigation.

In the past, the corps has operated under the reasonable assumption that individuals or industries have the obligation to comply with all applicable laws and that it is incumbent upon them to apply for proper and necessary licenses or permits. Over 7,000 permits are issued each year on this basis. There is, however, an unknown number of industries that are discharging harmful wastes or effluents into navigable waters without having applied for a permit.

Recently, the president took positive action to control and reduce pollution of the Nation's waterways by issuing an executive order which established a new, coordinated program of water quality enforcement, under the refuse Act of 1899, designed to enhance the ability of the Federal government to enforce water quality standards. The order requires that all persons and firms proposing to commence or continue the discharging or depositing of any material into the navigable waters of the United States or their tributaries must secure a permit from the secretary of the army through the corps of engineers. Permits for new discharges will be required as soon as necessary regulations are promulgated and a July 1, 1971 deadline was established for submission of permit applications for existing discharges. Any person or firm failing to apply for or receive a permit for such discharges will be liable to criminal or injunctive proceedings under the refuse Act.

Prior to issuing permits, the corps will require certification from the appropriate State or interstate water pollution control agency that the proposed discharge will not violate applicable water quality standards. The newly formed environmental protection agency (EPA), will make all necessary determinations on behalf of the Federal government for the water quality aspects of the refuse Act program and no permit will be issued contrary to the recommendation of either the administrator of EPA or the appropriate State or interstate agency.

The corps is publicizing permit requirements on a wide-spread basis in an effort to encourage acceleration of anti-pollution efforts and applications for necessary permits. The congress has approved a corps request for additional funds that can be utilized in aggressively investigating and enforcing permit requirements and reporting pollution violators. As an interim measure, corps funds and personnel have been diverted from other missions. During fiscal year 1970, approximately 402 violations of the refuse Act were reported to the department of justice for prosecution. The greatest percentage of violations involved oil pollution, followed by refuse pollution, then chemical pollution.

The fiscal year 1970 program distribution of budget authority for the army corps of engineers is shown in table 8. According to the St. Paul district office, total corps of engineers expenditures for activities in Minnesota varied during the period fiscal year 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Expenditures (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>7.75</td>
</tr>
<tr>
<td>1968</td>
<td>7.46</td>
</tr>
<tr>
<td>1969</td>
<td>10.71</td>
</tr>
<tr>
<td>1970</td>
<td>4.70</td>
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</tbody>
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Fiscal year 1970 expenditure distribution according to appropriation or fund name is shown below:

<table>
<thead>
<tr>
<th>Appropriation or Fund Name</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Investigations</td>
<td>$600,704</td>
</tr>
<tr>
<td>Construction, General</td>
<td>949,520</td>
</tr>
<tr>
<td>Operation and Maintenance, General</td>
<td>2,909,195</td>
</tr>
<tr>
<td>Others</td>
<td>235,269</td>
</tr>
<tr>
<td>Total</td>
<td>$4,694,688</td>
</tr>
</tbody>
</table>

The organizational chart for the corps of engineers office in Minnesota is given in figure 1A.

<table>
<thead>
<tr>
<th>Program Category</th>
<th>Budget Authority (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England region</td>
<td>18.7</td>
</tr>
<tr>
<td>Middle Atlantic Region</td>
<td>58.2</td>
</tr>
<tr>
<td>Gulf and South Atlantic region</td>
<td>85.0</td>
</tr>
<tr>
<td>Ohio region</td>
<td>134.5</td>
</tr>
<tr>
<td>Great Lakes region</td>
<td>31.0</td>
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<tr>
<td>Upper Mississippi region</td>
<td>56.6</td>
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<tr>
<td>Souris-Red-Rainy region</td>
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<tr>
<td>Missouri River region</td>
<td>68.1</td>
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<tr>
<td>Arkansas-White-Red region</td>
<td>136.4</td>
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<tr>
<td>Lower Mississippi region</td>
<td>120.6</td>
</tr>
<tr>
<td>Rio Grande region</td>
<td>6.8</td>
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<tr>
<td>Texas Gulf region</td>
<td>34.7</td>
</tr>
</tbody>
</table>

(from Special Analyses, Budget of The United States Government, Fiscal Year 1972)
Colorado region 2.3
Great Basin region .7
California region 44.3
Columbia-North Pacific region 169.4
Alaska region 6.8
Hawaiian Islands region .6
Puerto Rico and Virgin Islands region .1
General support 67.1

Total distributed to programs above 1,043.0
1969 reserve (Public Law 90-364) -43.8
1970 budgetary reserve to be applied in 1971 157.4
1971 budgetary reserve to be applied in 1972 -7
Offsetting proprietary receipts

Total budget authority, Army Corps of Engineers, Civil

1,149.3

Programs in Minnesota

In Minnesota water resources projects fall into two major categories: flood protection works and the development and improvement of navigable waterways. However, often other purposes—such as pollution abatement, fish and wildlife conservation, improvement of recreation, and water supply control—are served.

Among the harbor projects which have been completed in Minnesota are Grand Marais harbor, Two Harbors, and Duluth-Superior harbor, all on Lake Superior. These projects have included improvements such as the construction of breakwaters, and maneuvering basins; the use of dredging to make deeper and wider channels; and/or the building of anchorage areas and basins for small boats.

The upper Mississippi river has been improved by a system of 28 locks and dams. The navigation pools are an important recreation facility, and the stable slack-water bank areas constitute one of the Nation's major flyways for waterfowl. Another important project is the St. Anthony Falls upper harbor project, which makes it possible for barges, towboats, and pleasure craft to ascend the falls of St. Anthony into the center of industrial Minneapolis.

Flood control is the other major concern of the corps in Minnesota. The Red river of the north drainage basin, Red River-Clearwater river, Lake Traverse and Bows de Sioux river, Mississippi river near Aitkin, and Redwood river at Marshall, are among the areas improved by corps' flood control projects. Straightening, clearing, and enlarging of river channels, creation of diversion channels, and construction of levees, floodwalls, and reservoirs are some of the ways in which flood control is provided. Flood control projects are underway on the Mississippi river at St. Paul and South St. Paul; at Winona, also on the Mississippi; and at Rushford, on the Root river and Rush creek, as well as elsewhere.

The corps offers emergency aid during floods or other disasters. This aid may include rescuing marooned people, removing property or livestock which is endangered, and repairing or strengthening of levees. During the record flood of 1964, corps officials directed flood fighting in many Minnesota towns along the Mississippi and its tributaries.
Projects completed by 1971 by the corps are listed below:

Navigation - Baudette harbor, Baudette river; crooked slough harbor at Winona, Mississippi river; Duluth-Superior harbor, lake Superior, Minnesota and Wisconsin; Grand Marais harbor, lake Superior; Hastings harbor, Mississippi river; Knife river harbor, lake Superior; Lake City harbor, Mississippi river; Minneapolis harbor below St. Anthony Falls, Mississippi river; Minnesota river; Red Wing harbor, Mississippi river; reservoirs at headwaters of Mississippi river; St. Anthony Falls, Mississippi river; St. Croix river, Minnesota and Wisconsin; St. Paul harbors, Mississippi river; Two harbors, lake Superior; Wabasha harbor, Mississippi river; Warroad harbor and river, Lake of the Woods; and Winona harbor, Mississippi river.

Flood Control - Mustinka river; Orwell reservoir, Otter Tail river; Otter Tail river; Sand Hill river; Wild Rice-Marsh rivers; Lac qui Parle reservoir, Minnesota river; Lake Traverse and Bois de Sioux river, Minnesota, North Dakota, and South Dakota; Lost river; Mississippi river near Aitkin (diversion channel); Red lake river, including Clearwater river; Redwood river at Marshall; Root river at Rushford; St. Paul and South St. Paul, Mississippi river; and Winona, Mississippi river.

Projects underway in 1971 by the corps are listed below:

Navigation - Harriet Island harbor, Mississippi river and Mississippi river between the Missouri river and Minneapolis, 9-foot canalization project.

Flood Control - Big Stone lake - Whetstone river; Mankato and North Mankato, Minnesota river; Root river; Warroad river and Bull Dog creek; and Zumbro river.

Active authorized projects as of 1971 by the corps are listed below:

Navigation - Beaver Bay harbor, Lake Superior and Lutsen harbor, Lake Superior.

Flood Control - East Grand Forks, Minnesota; south branch Wild Rice river - Felton ditch; and Twin Valley lake, Wild Rice river, Minnesota.

Projects and reports by the corps under continuing authorities in 1971 are listed below:

Small Navigation Projects - Grand Portage harbor, lake Superior; Lake City harbor, Mississippi river; and Pine creek at Angle Inlet, Lake of the Woods.

Small Flood Control Projects - Chaska, Minnesota river; Elk river, Mississippi river; Hastings, Vermillion river; Hutchinson, South Fork of Crow river; Jackson, west fork of Des Moines river; Okabena creek, Worthington; Oslo, Red river of the north; Perley, Red river of the north; Redwood river below Marshall; and south branch of the Yellow Medicine river.

Clearing and Straightening for Navigation - Crow Creek, Lake of the Woods.

Snagging and Clearing Projects

Emergency Repairs and Rescue

Flood Control - Bassett creek; Big Stone lake; Cannon river; Des Moines river; Iowa and Cedar rivers; Lake Minnetonka; Minnesota river; Blue earth river; Mississippi river, Winona; Buffalo river; Red river; Root river; St. Croix river; St. Louis river; Snake river; upper Big Sioux; Whitewater river; Yellow Medicine - Lac qui Parle rivers; and Zumbro river.

Comprehensive Basin Studies - Great Lake region; Missouri river basin; Souris-Red-Rainy region; and upper Mississippi river basin.

Special Studies - Great Lakes harbors study and water levels of the Great Lakes.
Introduction

The department of commerce was designated as such by an Act of March 4, 1913, which reorganized the department of commerce and labor, created by the Act of February 14, 1903, by transferring all labor activities into a new, separate department of labor.

The mission of the department is to promote full development of the economic resources of the United States. It does this through programs and actions that encourage and assist States, regions, communities, industries, and firms towards economic progress. Specific programs carried out include the collection, analysis, and dissemination of demographic, economic, business, scientific, and environmental information; the promotion of exports and increased travel to the United States; and the provision of financial and technical assistance to regions and communities with lagging economies.

Other important functions include promoting policies for strengthening the international economic position of the United States and the healthy growth of the private economy; providing incentives for private commercial investment in new technology; assuring maximum use, growth, and transfer of the Nation's scientific and technical resources; fostering development of the American merchant marine; and coordinating Federal programs in the field of minority business enterprise.

Commerce also administers the National patent and trademark systems, provides weather and other environmental services, exercises controls over the export of strategic materials, and carries out materials priorities and industrial mobilization programs. A further important aspect of its mission is the conduct of scientific research and services in physical measurement standards, in engineering, product, and commodity standards, in extending knowledge of the oceans, earth, and atmosphere, and in advancing selected fields of technology. ("United States Government Organization Manual - 1970/71," Office of The Federal Register, General Services Administration, Superintendent of Documents, Government Printing Office, Washington, D.C.).

The fiscal year 1970 program distribution of budget authority for the department of commerce is shown in table 9. Budget authorities in fiscal year 1970 for selected agencies of the department are:

<table>
<thead>
<tr>
<th>Office of Business Economics</th>
<th>$3,505,000 Federal funds</th>
<th>$68,000 trust funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Development Administration</td>
<td>$272,439,000 Federal funds</td>
<td></td>
</tr>
<tr>
<td>National Oceanic and Atmospheric Administration</td>
<td>$223,387,000 Federal funds</td>
<td>$2,170,000 trust funds</td>
</tr>
</tbody>
</table>

(from The Budget of the United States Government, Fiscal Year 1972)

According to data presented in the publication "Federal Outlays in Minnesota," office of economic opportunity, National technical information service, total Federal outlays in connection with the department of commerce water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<p>| Table 9. Fiscal Year 1970 Program Distribution of Budget Authority, Department of Commerce |</p>
<table>
<thead>
<tr>
<th>Program Category and Subcategory</th>
<th>Budget Authority (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose Data Production and Economic Analysis:</td>
<td></td>
</tr>
<tr>
<td>Current data production</td>
<td>20.2</td>
</tr>
<tr>
<td>Periodic data production program</td>
<td>165.9</td>
</tr>
<tr>
<td>Reimbursable data production and statistical services</td>
<td>3.9</td>
</tr>
<tr>
<td>Construction and analysis of National economic accounts</td>
<td>3.6</td>
</tr>
<tr>
<td>Category total</td>
<td>193.6</td>
</tr>
<tr>
<td>Economic Development Assistance:</td>
<td></td>
</tr>
<tr>
<td>Urban programs</td>
<td>17.8</td>
</tr>
<tr>
<td>District programs</td>
<td>106.3</td>
</tr>
<tr>
<td>Indian programs</td>
<td>16.7</td>
</tr>
<tr>
<td>Other area assistance</td>
<td>83.0</td>
</tr>
<tr>
<td>Research</td>
<td>2.3</td>
</tr>
<tr>
<td>Regional programs</td>
<td>30.7</td>
</tr>
<tr>
<td>General administration</td>
<td>21.0</td>
</tr>
<tr>
<td>Category total</td>
<td>279.8</td>
</tr>
<tr>
<td>Promotion of Industry and Commerce:</td>
<td></td>
</tr>
<tr>
<td>Domestic business activities</td>
<td>7.2</td>
</tr>
<tr>
<td>Trade adjustment assistance</td>
<td>21.6</td>
</tr>
<tr>
<td>International business development</td>
<td>5.8</td>
</tr>
<tr>
<td>Export control</td>
<td>3.2</td>
</tr>
<tr>
<td>Field program operations</td>
<td>4.5</td>
</tr>
<tr>
<td>Participation in U.S. expositions</td>
<td>1.2</td>
</tr>
<tr>
<td>Foreign direct investment regulation</td>
<td></td>
</tr>
<tr>
<td>Promotion of travel to the United States</td>
<td></td>
</tr>
<tr>
<td>Pollution control</td>
<td></td>
</tr>
<tr>
<td>Promotion of minority business enterprise</td>
<td></td>
</tr>
<tr>
<td>Category total</td>
<td>49.5</td>
</tr>
<tr>
<td>National Oceanic and Atmospheric Services:</td>
<td></td>
</tr>
<tr>
<td>Environmental prediction and warning</td>
<td>108.4</td>
</tr>
<tr>
<td>Mapping, charting and marine description</td>
<td>31.8</td>
</tr>
<tr>
<td>Solid Earth monitoring and services</td>
<td>10.5</td>
</tr>
<tr>
<td>Ocean fisheries and living resources</td>
<td>53.9</td>
</tr>
<tr>
<td>Environmental satellite</td>
<td>9.7</td>
</tr>
<tr>
<td>Sea grant</td>
<td>1.2</td>
</tr>
<tr>
<td>Data buoy</td>
<td></td>
</tr>
<tr>
<td>Tropical experiment</td>
<td></td>
</tr>
<tr>
<td>International Field year for the Great Lakes</td>
<td></td>
</tr>
<tr>
<td>Retired pay, commissioned officers</td>
<td>10.1</td>
</tr>
<tr>
<td>Executive direction and administration</td>
<td></td>
</tr>
<tr>
<td>Category total</td>
<td>225.6</td>
</tr>
</tbody>
</table>

(from Special Analyses, Budget of the United States Government, Fiscal Year 1972)
Physical measurements and standards:
Basis for Nation's physical measurement system 24.8
Scientific and technological services for industry and government 7.8
Technical basis for equity in trade 2.0
Technical services to promote public safety 1.3
Technical information services 2.5

Category total 39.3

Technology:
Grant and issuance of patents and registration of trademarks 48.7
Dissemination of technical information 4.4
Telecommunication research, engineering, analysis, and technical services
State technical services 0.2

Category total 53.3

Promotion of the merchant marine:
Fleet development 34.7
Fleet operations 209.6

Category total 244.3

General administration
Total distributed to programs above 1,092.2
Deductions for offsetting receipts -29.6
Intragovernmental transactions -6.7

Total budget authority, Department of Commerce 1,055.9

Fiscal Year 1970 program summaries for agencies are given below:

<table>
<thead>
<tr>
<th>Agency and Program</th>
<th>Federal Outlays (100,000 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Oceanic and Atmospheric Administration</td>
<td>8.76</td>
</tr>
<tr>
<td>Weather and Climate Guidance</td>
<td>8.61</td>
</tr>
<tr>
<td>River and Flood Forecasting</td>
<td>0.15</td>
</tr>
<tr>
<td>Economic Development Administration</td>
<td>19.60</td>
</tr>
<tr>
<td>Grants and Loans for Public Works and Development</td>
<td></td>
</tr>
<tr>
<td>Facilities and to Business or Development Companies</td>
<td></td>
</tr>
<tr>
<td>Economic Development - Technical Assistance, Administrative Assistance, Research and Information and Regional Action Planning Commissions</td>
<td>2.50</td>
</tr>
<tr>
<td>Total</td>
<td>28.36</td>
</tr>
</tbody>
</table>

Office of Business Economics

The office of business economics (OBE) was established by the secretary of commerce on December 1, 1953, and operates under department organization order 35-1. The organization of the office includes six divisions: National income division, regional economics division, National economics division, current business analysis division, business structure division, and balance of payments division.

The office of business economics provides basic economic measures of the National economy, summarized by the gross National product (GNP). The basic summary measures are elaborated in the input-output estimates which show how the industries of the Nation interact to produce the GNP, in the regional data which measures local area economic activity and progress, and in the balance of payments estimates which provide information on U.S. transactions with the rest of the world. The office of business economics also provides measures of business investment plans and prepares analyses of the current business situation and outlook. OBE's monthly journal, survey of current business, contains the results of its research and analysis. As an example of its participation in comprehensive river basin studies, OBE is working directly with the water resources council in the economic aspects of water resources development.

Economic Development Administration

The economic development administration (EDA) was established September 1, 1965, by the secretary of commerce to carry out most of the provisions of the public works and economic development Act of 1965, as amended. The assistant secretary for economic development is the head of the economic development administration.

The primary function of EDA is the long-range economic development of areas with severe unemployment and low family income problems. It aids in the development of public facilities and private enterprise to help create new, permanent jobs.
In addition to its headquarters organization, the economic development administration has 6 regional offices and 46 field representatives located throughout the United States and Puerto Rico. The regional offices and field representatives provide direct assistance to State and local agencies and private firms concerned with, and engaged in, economic development activities.

The EDA program includes public works grants and loans; business loans for industrial and commercial facilities; guarantees for private working capital loans; and technical, planning, and research assistance for areas designated as redevelopment areas by the assistant secretary.

Areas designated under title I are eligible only for public works grants.

Redevelopment areas in designated multicounty economic development districts are eligible for bonus grants for public works projects. Cities designated as growth centers for such districts are eligible for EDA assistance for projects which provide employment opportunities and services for residents of redevelopment areas.

EDA technical assistance is available to help alleviate or prevent excessive unemployment, underemployment, or outmigration in any area confronted by any of these problems.

The public works and economic development Act of 1965 authorizes the setting up of economic development districts—usually composed of 5 to 10 counties—to help solve the job and income problems in areas of high unemployment or low family income. Groups of adjacent counties with similar or related economic problems are invited to combine into a district. The prime mover in the early stages of forming a district is usually the State, or a consortium in the State. At least 2 of these counties must be designated redevelopment areas. That is, they must be eligible for EDA grants and loans. There must also be a development center—a city or center of economic activity that contains a population of not more than 250,000 and has the potential to provide jobs and services for the unemployed or underemployed of the redevelopment areas.

EDA is authorized to pay up to 75 percent of the administrative expenses of district organizations. An overall economic development program (OEDP) clears the way for local action to overcome problems and to help doors to all available Federal, State, and private aid programs—not just those of EDA. When the OEDP meets EDA requirements, the district is officially "designated" by the secretary of commerce and becomes eligible for additional financial assistance provided by the Act.

Beyond administrative assistance and the aid generally provided to designated redevelopment areas under the EDA program, two tools especially designated to help districts are provided. A 10 percent bonus on public works—depending on the seriousness of their economic distress, single county development areas—under general provisions of the EDA Act—are entitled to grants ranging between 50 and 80 percent of the project cost to help finance public works projects of an economic development character. However, when such areas are part of a designated economic development district, these grants may be increased by 10 percent of the total cost of the project. In no case, though, may the total grant exceed 80 percent. Special help to development centers - these are communities whose economic growth will relieve economic distress for the people of redevelopment areas. When not a part of a redevelopment area, a growth center designated as an economic development center becomes eligible for EDA public works grants and loans, and business development loans (but not the 10-percent bonus for public works), for projects which will directly improve employment opportunities for unemployed and underemployed residents of the district’s redevelopment areas.

EDA offers technical assistance to enable a community or organization to evaluate the resources at hand and make the best use of them, thus laying the foundation for economic growth. Technical assistance from EDA may involve a feasibility study to determine the effects of a proposed industrial park in a rural area, administrative funds to enable a non-profit group to counsel minority businesses in a hard-core unemployment area of a city, or a comprehensive study of an area’s resources to determine the best means to achieve economic growth. The technical assistance program is not limited to operations in designated areas or development districts.

EDA can provide technical assistance in the form of outside services, or it can grant funds directly to the applicant to carry out the approved program. When a service is provided, it may be carried out by Federal personnel, or by private individuals, partnerships, firms, corporations, or service institutions under contract with the EDA group. Grants are made to State, public or private nonprofit district organizations willing to provide employment opportunities and services for unemployed or underemployed residents of the development areas.

Grants under section 301(h) of the public works and economic development Act of 1965 may be made to provide for staff salaries and associated administrative expenses of organizations devoted to economic development planning. Grants are made to State, public or private nonprofit district or local organizations that have been organized under State law. Grants cannot exceed 75 percent of the overall expenses of the project or program for which the grant is being sought. Grants may be made to economic development districts.

Grants may be made to one organization in qualified redevelopment and other depressed areas when such areas are not included in a multi-county economic development district. Grants may be made for staff salaries and associated administrative expenses of one appropriate area-wide organization. Functions of the redevelopment area organization may include: preparation of an overall economic development program (OEDP) for the area, continuing work on the OEDP, planning and programming of economic development projects within the area, and assistance (non-financial) to economic development organizations within the area.
The attention of the economic development administration is focused primarily on communities and areas burdened by high unemployment or low family incomes. A program under which EDA may provide grants and loans for public works and development facilities is designed to help spur economic and social growth in these areas. Without adequate water, a good sewer system, modern roads, or other public works facilities, which more fortunate areas take for granted, a distressed community lacks the foundation required for industrial growth.

To be eligible for EDA grants and loans for public works and development facilities, a project must be located within an EDA-designated area or designated economic development center and must be consistent with the approved overall economic development program (OEDP). The principal requirements for designation are high unemployment or low family incomes. Areas also may be designated if they have experienced or are expected to experience a sudden rise of unemployment due to the closing of a major source of income, or if they have suffered a substantial loss of population due to the lack of job opportunities.

Grants and loans may be used to acquire and develop land and improvements for public works, public service, or development facility usage, and to acquire, construct, rehabilitate, alter, expand or improve such facilities, including related machinery and equipment. Industrial park development, such as utilities, streets and access roads; water and sewer facilities; and other serving industrial and commercial users must be consistent with pollution control facilities needed principally for the treatment of industrial waste; port facilities for industrial expansion; industrial streets and related roads not included in Federal-aid highway programs that will result in immediate substantive economic expansion in the area; regional airports; skill centers to be used primarily for the training or retraining of unemployed and underemployed adults; certain research facilities related to industrial development, such as an oceanographic laboratory or a wood-use demonstration center; and tourism facilities that are an integral and essential part of a comprehensive tourism complex to be developed by a State agency or a qualified nonprofit organization with past involvement in tourism.

Eligible projects in designated areas may receive grants of up to 50 percent of total eligible project costs. Eligible projects In severely disadvantaged areas may receive a supplementary grant to augment basic grants from EDA or from other Federal agencies when applicants are unable to supply the required local share.

The combined Federal grant may not exceed the maximum grant rate that EDA has established for the area in which the project is located. All requests for grants in excess of 50 percent of eligible project costs are subject to a fair-user charge determination. Public facility loans may cover all or part of the total project cost. The term of the loan may not exceed 40 years, or the maximum term imposed by statutes governing the applicant, whichever is the lesser. Loans may be made only if funds for the project cannot be obtained from private lenders or from other Federal agencies on terms that will permit accomplishment of the project.

Business development loans are one of the basic tools that the economic development administration can offer private industry to expand or locate in these areas—generally burdened with high unemployment or low family income. Long-term, low-interest loans may be obtained for businesses and industries seeking to establish or expand operations in areas designated by EDA as eligible to receive financial assistance. Tourist and recreational facilities loans are important to the growth of many economically lagging areas.

Businessmen, public agencies, Indian tribes, and local development groups are eligible to apply for EDA business loans to establish new businesses or to expand existing firms. New businesses or expanded firms must be located in EDA redevelopment areas or development district centers. Although there is no limitation on the amount the agency may lend to any one applicant, EDA may not lend more than 65 percent of the cost of land, buildings, machinery and equipment for industrial and commercial enterprises.

The EDA midwestern regional office is in Chicago; economic development representative's offices are in Duluth and Bemidji.

National Oceanic and Atmospheric Administration

NOAA, the National oceanic and atmospheric administration, was created within the department of commerce on October 3, 1970, by presidential reorganization plan number 4 of 1970. Its formation brought together the functions of the commerce department's environmental science services administration (including its major elements: the weather bureau, coast and geodetic survey, commercial fisheries, marine game fish research program, and marine minerals technology center; the navy-administered National oceanographic data center and National oceanographic instrumentation center; the coast guard's National data buoy development project; the National science foundation's National sea grant program; and elements of the army corps of engineers' U.S. lake survey. The president's reorganization plan, dated July 9, 1970, was sent to the congress with this description of the new agency:

"(NOAA) would make possible a consolidated program for improving our understanding of the resources of the sea, and permit their development and use while guarding against the sort of thoughtless exploitation that has past laid waste to so many of our precious natural assets. It would make possible a consolidated program for achieving a more comprehensive understanding of oceanic and atmospheric phenomena, which so greatly affect our lives and activities. It would facilitate the cooperation between public and private interests that can best serve the interests of all."

"I expect that NOAA would exercise leadership in developing a National oceanic and atmospheric research program and development. It would coordinate its own scientific and technical resources with the technical and operational capabilities of other government agencies and private institutions. As important, NOAA would continue to provide those services to other agencies of government, industry, and to private individuals which have become essential to the efficient operation of our transportation systems, our agriculture, and our National security."

Functions combined in the new agency are being reshaped to meet the broad NOAA mission. NOAA's organization includes: the National ocean survey, combining the activities of the ESSA coast and geodetic survey and the U.S. lake survey; the National weather service, formerly the ESSA weather
bureau; the National marine fisheries service, composed of the bureau of commercial fisheries and marine game fish research program; the National environmental satellite service, formerly ESSA's National environmental satellite center; the environmental research laboratories, formerly ESSA's research laboratories; and the environmental data service, combining the ESSA environmental data service and the National oceanographic data center. The organization establishes staff locations for other new functions. The office of sea grant administers and directs the National sea grant program, the National oceanographic and atmospheric satellite center; the environmental research laboratories, formerly ESSA's ocean area. It maps and charts American coastal waters, the Great lakes, and navigable waters of the New York State Barge canal system, Lake Champlain, and the Minnesota-Ontario border lakes. The National ocean survey fleet conducts mapping and charting operations and provides ship support to NOAA's environmental research laboratories. Its major facilities include the Atlantic and Pacific marine centers, at Norfolk, Va., and Seattle, Wash.; the Albuquerque seismological center in New Mexico; the National tsunami warning center in Hawaii; the Great lakes research center in Detroit; and a network of geophysical observatories.

The National weather service reports the weather of the United States and its possessions, provides weather forecasts to the general public, issues warnings against tornadoes, hurricanes, floods, and other weather hazards, and records the climate of the United States. The weather service also develops and furnishes specialized weather services which support the needs of aviation, maritime navigation, agriculture, and other economic activities. These services are supported by a National network of observing and forecasting stations, communications links, aircraft, satellite systems, and computers. The weather service's 5,000 employees are located at approximately 400 facilities within the 50 states, at 14 overseas stations, and on 20 ships at sea. Special facilities include the National meteorological center in Suitland, Md.; the National hurricane center in Miami, Fla.; and the National severe storm forecast center in Kansas City, Mo.

The National marine fisheries service seeks to discover, describe, develop, and conserve the living resources of the global sea, especially as these affect the American economy and diet. The fisheries service conducts biological research on economically important species, analyzes economic aspects of fisheries operations and rates, develops methods for improving catches, and, in cooperation with the U.S. department of State, is active in international fisheries affairs. With the U.S. coast guard, the National marine fisheries service conducts enforcement and surveillance operations on the high seas and in territorial waters. It also studies game fish behavior and resources, seeks to describe the ecological relationships between game fish and other marine and estuarine organisms, and investigates the effects on game fish of thermal and chemical pollution. The National marine fisheries service conducts a voluntary grading and inspection program under which fishery products that meet established quality standards and product specifications can bear a special shield that is the shopper's guarantee that the product was of high quality when it left the processor. A staff of marketing specialists and home economists provide services to Federal and State governments, industry, and consumer organizations in the use of fish and fishery products. The service also maintains a National program of fishery statistics and market news. The service maintains nearly 30 major laboratories and centers and more than 50 lesser installations such as statistics and market news offices, across the nation. It has a fleet of 29 research vessels equipped for various kinds of oceanographic research and fishery exploration.

The National environmental satellite service plans and operates environmental satellite systems, gathers and analyzes satellite data, and develops new methods of using satellites to obtain environmental data. As environmental satellite technology matures, sensors will be added to measure additional atmospheric characteristics and to provide data on solar, ionospheric, oceanographic, and other geophysical phenomena.

The environmental research laboratories, headquartered in Boulder, Colo., conduct the fundamental investigations needed to improve man's understanding of the physical environment. The atmospheric physics and chemistry laboratory (Boulder, Colo.), is NOAA's major focus for developing methods of practical, beneficial weather modification. The air resources laboratories (Washington, D.C.) house NOAA's principal efforts to identify, detect, predict, and control atmospheric pollution. The geophysical fluid dynamics laboratory (Princeton, N.J.) studies weather and climate, focusing on processes of the ionosphere and exosphere of the earth and other planets. The space environment research laboratory (Norman, Okla.) studies terrestrial processes related to space activity and other space phenomena, and conduct experiments in hurricane modification. The Pacific oceanographic laboratories (Seattle, Wash.) conduct research toward a fuller understanding of the global ocean and its interactions, study hurricanes and other tropical weather phenomena, and conduct experiments in hurricane modification. The National oceanographic and atmospheric laboratory (Miami, Fla.) conducts research toward a fuller understanding of the global ocean and its interactions, study hurricanes and other tropical weather phenomena, and conduct experiments in hurricane modification. The National oceanographic and atmospheric laboratory (Miami, Fla.) conducts research toward a fuller understanding of the global ocean and its interactions, study hurricanes and other tropical weather phenomena, and conduct experiments in hurricane modification. The National oceanographic and atmospheric laboratory (Miami, Fla.) conducts research toward a fuller understanding of the global ocean and its interactions, study hurricanes and other tropical weather phenomena, and conduct experiments in hurricane modification.
which receive data from cooperative investigations and other International sources. The environmental data service's major facilities include the National oceanographic data center, Washington, D.C.; the National climatic center, the seismological data center, and the geodetic data center, Asheville, N.C.; the geomagnetic data center, Rockville, Md.; and the aeronomy and space data center, Boulder, Colo.

The office of sea grant administers and directs the National sea grant program. This program provides support for institutions engaged in comprehensive marine research, education, and advisory service programs, supports individual projects in marine research and development, and sponsors education of ocean scientists and engineers, marine technicians, and other specialists at selected colleges and universities.

The data buoy project office manages the National data buoy development project. It is developing a National system of automatic ocean buoys for obtaining essentially continuous marine environmental data. This work is closely associated with satellite and sensor developments elsewhere in NOAA.

The marine minerals technology center at Tiburon, Calif., is concerned with the development of marine mining and related technology, with emphasis on the assessment of environmental impact of mining systems. A related activity is to develop the necessary tools and techniques for accurate delineation and economic evaluation of marine minerals deposits.

The National oceanographic instrumentation center provides the Nation with a focal point for knowledge of technology related to instrument measurement, evaluation, and the reliability of sensor systems for ocean use. The center performs laboratory and field testing and calibration, sponsors standards development, and enhances the quality of ocean systems by the dissemination of operational results and technical information.

Programs in Minnesota

Working together with, and utilizing data gathered by other Federal agencies, and agencies of the State, the National weather service monitors the meteorological and hydrological conditions affecting the river discharges in Minnesota. Serving the State are the river forecast centers, located in Kansas City, Missouri, the weather service forecast office at Fargo, North Dakota. Both Minneapolis and Fargo are river district offices. The Minneapolis weather service forecast office prepares and disseminates to the general public weather forecasts for Minnesota as well as for North and South Dakota. The Minneapolis and Fargo offices are coordinated with the river forecast center in Kansas City with respect to predicted weather conditions, river forecasts and/or flood warnings. Meteorological guidance is supplied via special communications with the weather service National meteorological center in Suitland, Maryland where computer models of the atmosphere, data from thousands of observations points around the Nation and the World, satellite pictures and radar observations are combined into accurate analyses of current weather conditions used in weather forecast and river flood forecasts.

To disseminate flood warnings received from the river forecast centers or developed within the river district offices, both the Minneapolis and Fargo offices are command centers for closed-loop teletype networks. To serve as base data, river stage data on 4 stations are prepared and printed daily. In the event of a general flood, these two teletype systems are capable of relaying stage information to more than 65 selected stations throughout the State. These reporting stations have been selected to permit evaluation of river stages at other locations through interpretation. The teletype network supplies stage data to all major newspapers, radio and television stations and State agencies such as civil defense and highway patrol.

National weather service hydrologists in the river forecast centers as well as in the river district offices have designed individual procedures for the flood problem areas for each river system within their jurisdiction and are continuously revising those procedures as natural or man-made alterations affect stream channels and their flow characteristics. These procedures have been developed by studying the past history of each stream and the relationships of storm, melting snow, soil, and river conditions to floods. Through these analyses, hydrologists develop river forecasting procedures for predicting the amount of water that will find its way into rivers and streams—and the time it will take to reach them under different conditions of temperature, soil moisture, and precipitation.

Within each river system the forecast procedures vary with individual areas. For the headwaters, early forecasts and warnings are based on radar observations and measured rainfall. Hydrologists project headwater and precipitation forecasts downstream. Forecasts of this type can usually be issued either hours or even days in advance. Stages on the main stems of rivers are predicted by combining all tributary forecasts and computing the time it will take the water to reach the forecast points. Main river forecasts can be issued several days or sometimes weeks in advance.

The National weather service river district offices have access to rather extensive data collection networks to monitor both meteorologic and hydrologic conditions. The combined offices can obtain river stage elevations and related data from over 400 locations throughout the State. In addition, the Minneapolis office is equipped to develop river stage forecasts for any stream within its jurisdiction, provided that the necessary data is supplied. Whenever the stream is not covered within the above network, a special station must be established to gather the necessary data. This may be accomplished by the weather bureau, a cooperating agency, such as the army corps of engineers, or the geological survey, or private concerns.

Rainfall and water content of snow measurements are obtained at regular intervals, or when special conditions warrant, by paid cooperative observers. The combined districts receive data of this nature from 164 stations throughout the State. In addition, during late winter and early spring, special agency teams, sent by either the weather bureau or the army corps of engineers, are sent out to problem areas to gather water-content data on accumulated snow.

Commercial fishing statistics for the Great Lakes area have been published since 1926 while biological research started on a continuing basis in 1927. A market news office was started in Chicago in 1938. The establishment of a Great Lakes-central regional office in Ann Arbor, Michigan marked the start of continuous, organized activity on meeting all facets of the National marine fisheries service's responsibility in this area, which includes Minnesota.
There are three portions of the State that are of importance from the commercial fishery standpoint. These are: the area bordering on Lake Superior and the International boundary waters including Rainy Lake and Lake of the Woods; the navigation pools of the upper Mississippi River and interior lakes and ponds; and the service has no installations in Minnesota, the closest being the biological station at Ashland, Wisconsin. However, a number of the service's programs are active in Minnesota, although to be properly understood, their scope and significance must be viewed on a regionwide basis rather than solely in terms of Minnesota impact. The various service programs and disciplines are grouped in four major categories: fisheries, economics, biological research and management, industrial research and management, and resource management.

**Economics** - Collection, analysis and publication of statistical information on commercial fishing production in Minnesota has been carried out over many years in cooperation with the Minnesota agriculture and commerce department. Improvements are constantly being made to increase the accuracy, reliability and flexibility of these data and more and more use is being made of automatic data processing techniques.

**Biological Research and Management** - Direct service activity in this field is restricted to Lake Superior waters and its drainage. Research vessels and biological research teams conduct continuous studies of the Lake Superior aquatic environment and the fishery resources dependent upon it. These studies are part of an overall effort on the Great Lakes as an integrated unit and are closely coordinated with related work carried on by State conservation agencies, the Great Lakes fishery commission and university research efforts. Under contract with the Great Lakes fishery commission, the service is engaged in a sea lamprey control program throughout the Great Lakes and including the Minnesota portion of Lake Superior and its drainage. Restoration of the formerly productive lake trout, whitefish and chub fisheries is dependent upon control of this voracious predator. This had led to intensive work on lamprey spawning streams. Lake Superior's tributaries in Minnesota provide very limited spawning and larval habitat for sea lamprey. A majority of the streams have waterfalls near their mouths that are barriers to the upstream spawning migration of sea lampreys. Only 2 of 28 major streams along the north shore were found with small populations of lamprey larvae. The 2 streams, Split Rock and Arrowhead rivers, have been treated twice in the past 4 years with the selective lampricide, 3-trifluoromethyl-4 nitropheno1. Post-treatment inspection of these streams confirmed destruction of the larval lampreys. Periodic surveillance of the north shore streams is maintained for now, and reestablished populations of larval lampreys. A thorough survey of the St. Louis river was completed in the summer of 1964. No evidence of sea lamprey was found. Caged sea lamprey larvae were placed in the river and they all died within 6 weeks of confinement. Water temperatures in the low 80's and oxygen depletion at the site undoubtedly caused the mortality. There are no service research and management programs in the Mississippi river and inland lakes commercial fishery areas.

**Industrial Research** - The key to betterment of the once flourishing commercial fishery industry of the Great Lakes in general and Lake Superior in particular lies in development of modern, efficient and selective harvesting methods to replace traditional techniques and equipment. This must be supplemented with up-to-date processing and marketing procedures to insure that what is basically a highly nutritious source of protein food can be made available to the public as an appealing product by modern consumer standards. Related research by the service is also involved with investigating the potential of the wool fish products in non-human food, and industrial fields such as fish meal, animal food supplements and fish oils. Exploratory fishing activities by the service have already encouraged use of more efficient and selective trawling gears. Similar progress has been made in fish product processing fields with emphasis upon new automated methods of filleting, preservation and packaging combined with efforts to increase public awareness of the desirable qualities of fish products. While these service activities are oriented to the total Great Lakes area and the region as a whole, they have direct application to Minnesota.

**Resource Management** - The operation of the service's market news service, located in Chicago, assists resource management by providing timely information on the availability and movement of fish resources, including the quantities of marketable fish products. The service's growing interest in working with other agencies in the water resources field led to establishment of a river basin studies coordinator position in the service's Ann Arbor, Michigan regional office. By working closely and consistently with such agencies as the bureau of sport fisheries and wildlife, the corps of engineers, the public health service and the Minnesota conservation department, as well as such international bodies as the International boundary commission, the Great Lakes commission and the Great Lakes fishery commission, the contribution that can be made by sound management and development of commercial fishery resources as part of total water resources development can be realized. This has already resulted in greater service interest in Minnesota inland waters.

**Future Programs** - Large scale establishment of new service programs in Minnesota or throughout the region is not anticipated. However, adaptation and expansion of existing programs to meet new and changing conditions is contemplated. For example, while eventual control of the sea lamprey now seems certain, restoration of the valuable lake trout and other fisheries will require new and up-to-date management concepts including the principle of limited entry into the commercial fishery. Greater coordination and planning with the many other agencies interested in water resources management and development may be expected. Service participation in programs such as those of the area redevelopment authority which are designed to assist the economic rehabilitation of depressed areas of the Great Lakes, including Minnesota, is likely to get increasingly greater attention. The overall goal, in Minnesota, and throughout the region remains the efficient and balanced development and utilization of a rich and varied resource to meet modern needs.

The service's Federal aid program is authorized under three Acts.

The commercial fisheries research and development Act of 1964 (P.L. 88-309) - Authorize the secretary of the Interior to cooperate with the 50 States, the Commonwealth of Puerto Rico, and the governments of the Virgin Islands, Guam, and American Samoa in carrying out research and development of the Nation's commercial fisheries. Projects eligible for funding include research, development, construction, and coordination. Cost-sharing Projects are funded at either a 50 percent or 75 percent level of Federal participation, whereas projects to alleviate resource disaster and for...
Establishment of new commercial fisheries may be financed with 100 percent Federal funds. State-matching funds must be new monies not previously used for other commercial fishery research and development. The Act would have expired June 30, 1969; however, it is extended by the 90th Congress for an additional 4 years under Public Law 90-551.

The anadromous fish Act of 1965 (P.L. 89-304) - Authorizes the Secretary of the Interior to enter into cooperative agreement with State and other non-Federal interests for the conservation, development and enhancement of the anadromous fishery resources of the Nation and the fish in the Great Lakes that ascend streams to spawn. The program is administered at the Federal level jointly by the National Marine Fisheries Service and the Bureau of Sport Fisheries and Wildlife. Federal funds up to 50 percent may be used to finance project costs. State fishery agencies, colleges, universities, private companies and other non-Federal interests in 31 States bordering the oceans and the Great Lakes may participate under the Act. All projects must be approved by the State fishery agency concerned.

The jellyfish Act of 1966 (P.L. 89-720) - Authorizes the Secretary of the Interior to cooperate with and provide assistance to the States and the Commonwealth of Puerto Rico in controlling and eliminating jellyfish and other such pests in such coastal waters. The costs of projects are funded equally by the Federal Government and by the State. State agencies responsible for the management or administration of fish and shellfish resources or water-based recreation programs may participate under the Act.

Information concerning projects in Minnesota pertaining to research, development, improvement, conservation, and/or management of commercial fisheries resources is given below:

<table>
<thead>
<tr>
<th>Public Law</th>
<th>Project Title</th>
<th>Date Initiated</th>
<th>Estimated Duration</th>
<th>Total Cost</th>
<th>Completed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>88-309</td>
<td>Minnesota commercial fisheries improvement - Western Lake Superior</td>
<td>1965</td>
<td>3</td>
<td>49,216</td>
<td>Extended</td>
</tr>
<tr>
<td>88-309</td>
<td>Development of under-ice horizontal sonar scanning equipment and technique for locating fish schools</td>
<td>1966</td>
<td>2</td>
<td>11,500</td>
<td>1969</td>
</tr>
<tr>
<td>88-309</td>
<td>Lake Superior commercial fisheries assessment studies</td>
<td>1968</td>
<td>3</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>88-309</td>
<td>Minnesota commercial fisheries improvement - Lake of the Woods</td>
<td>1968</td>
<td>3</td>
<td>105,978</td>
<td></td>
</tr>
<tr>
<td>88-309</td>
<td>A physiological study of thermal stress in channel catfish</td>
<td>1968</td>
<td>2</td>
<td>14,500</td>
<td></td>
</tr>
<tr>
<td>89-304</td>
<td>Anadromous fish habitat development</td>
<td>1967</td>
<td>1</td>
<td>16,000</td>
<td>1968</td>
</tr>
</tbody>
</table>

In fiscal year 1970, $5,950,000 in Federal commercial fisheries grants-in-aid were made available to the States. They receive the funds as partial reimbursement for completed work on commercial fishery projects. Funds were appropriated by Congress under the commercial fisheries research and development Act of 1964 (P.L. 88-309) and the anadromous fish Act of 1965 (P.L. 89-304). Since 1965, nearly $28 million in Federal funds has been made available for 348 commercial fisheries projects under the two Acts. Minnesota received an allocation of $19,000 under P.L. 88-309.
Water resources activities of the department of health, education and welfare are handled by the public health service. The public health service is concerned with the overall public health aspects of river basin planning within the framework of authority contained in the public health service Act. In addition, other responsibilities pertaining to water resources planning and control have been acquired under other authority. Section 301 of P.L. 78-410 charges the public health service with responsibility to study methods relating to causes, control, prevention, and treatment of diseases and impairments of man including water purification, sewage treatment, and water pollution. The health-related aspects of water pollution control retained by the public health service have been defined in the water quality Act. Responsibility includes public health questions involved in determination by Federal agencies of the need for and the value of inclusion of storage for regulation of streamflow for the purpose of water quality control.

The service is responsible for investigating methods of vector control and the role of vectors in the spread of disease. In this capacity, the service advises States and Federal agencies regarding possible vector problems that may arise when specific water impoundments are constructed, and advises on methods to prevent vector problems. The service is authorized to certify the source of water supply and the watering point facilities where carriers engaged in interstate commerce may obtain water. The service is authorized to certify methods of water treatment aboard conveyances that do not use shore watering points. This authority includes the sanitation of water boats and protection of pier water systems and water loading facilities. The service established criteria for sanitary conditions aboard vessels engaged in interstate traffic. As part of the vessel certification, public health service personnel annually inspect vessels engaged in interstate commerce. Federal law delegates responsibility to the public health service to approve water supplies furnishing water to interstate carriers. As a corollary to its legal responsibility for classification of interstate carrier water supplies under the interstate quarantine regulations, the public health service also exercises a traditional role in the improvement of public water supplies to protect and promote the health of man. The service has been instrumental in promoting standards and practices that have been adopted by the States and water supply industry to the benefit of the public.

The public health service has been designated responsibility for preparing plans to assure provision of usable public water supplies for essential community use in an emergency. The activities include inventorying existing supplies, developing new sources, research, setting standards, and planning distribution. It provides grants for comprehensive State health planning, for area-wide health planning, and for training, studies, and demonstrations. It also provides grants for comprehensive public health services. Support for State water supply planning and program activities are covered as part of comprehensive health planning and services.

According to data presented in the document "Federal Outlays in Minnesota" office of economic opportunity, National technical information service total Federal outlays in connection with the department of health, education and welfare water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Outlays (Million Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>0.3</td>
</tr>
<tr>
<td>1968</td>
<td>0.2</td>
</tr>
<tr>
<td>1969</td>
<td>0.7</td>
</tr>
<tr>
<td>1970</td>
<td>0.8</td>
</tr>
</tbody>
</table>

A fiscal year 1970 program summary for the department is given below:

<table>
<thead>
<tr>
<th>Agency and Program</th>
<th>Federal Outlays (100,000 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health, Education and Welfare</td>
<td>Public Works and Economic Development Act 6.28</td>
</tr>
<tr>
<td>Health, Education and Welfare</td>
<td>Grants to State for Comprehensive State Health Plan 0.25</td>
</tr>
<tr>
<td>NIH General Research Support and Training Grants</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7.53</strong></td>
</tr>
</tbody>
</table>
The department of housing and urban development, created in 1965, is involved in problems relating to the Nation's cities and urban areas, and thus is involved in urban water resources problems in the fields of water supply, sewerage, and storm drainage. The urban planning assistance program is administered by the department of housing and urban development. It is popularly called the "701 program" because it was authorized by section 701 of the housing Act of 1954, as amended. That section makes available Federal grants to supplement State and local funds for comprehensive urban planning activities. These include the following, to the extent they are directly related to urban needs: preparation of a comprehensive development plan for the pattern and intensity of land use and the provision of public facilities, including transportation, long-range fiscal plans for such development are included; programming and scheduling of capital improvements, definitive financing plans for the improvements to be constructed in the earlier years of the program; coordination of all related plans of the departments or subdivisions of the government concerned; intergovernmental coordination of all related planning activities among the State and local governmental agencies concerned; and preparation of regulatory and administrative measures in support of the foregoing activities. Within this framework, eligible applicants are encouraged to devise a work program to meet the unique needs of each community. Applicants are also encouraged to develop new and improved techniques to deal with the problems they face. Urban areas, in many instances, have expanded across political boundaries. Within such areas, to the extent necessary, urban planning assistance projects for each political unit under the 701 program must be coordinated with planning for all other units. Metropolitan planning in particular must be related to the governmental bodies that are responsible for carrying out planning proposals. The urban planning assistance program generally provides grants of not more than two-thirds of the total cost of an urban planning project. In some cases, grants may go up to three-fourths of project cost. The higher percentage applies to localities in redevelopment areas designated under the area redevelopment Act or successor legislation, or in areas in which there has occurred a substantial reduction in employment as a result of a decline in government employment or purchases. Local or State sources must provide the balance in all cases.

The grant program provided in section 702 of the department of housing and urban development Act of 1965 is designed to assist communities to finance water and sewer lines that are, or can be, made part of an efficient, area-wide system. Water and sewer projects financed with Federal aid must be planned to fit in with a local program for comprehensive development of the community. Water systems for which basic grants may be obtained include works to store, supply, treat, purify, or transmit enough water of good quality needed for housing, business, and industrial use. Sewer facilities include sanitary sewer systems that collect, transmit and discharge liquid wastes; and storm sewer systems that collect, transmit and discharge water caused by rainfall and ground water runoff. Water or sewer lines connecting to houses or other buildings, or the local collection or distribution laterals are not eligible for grants. Direct grants may cover up to 50 percent of the cost of building the facility and for the land, easements, and right-of-way required for the system.

The secretary of housing and urban development is authorized, by section 702, housing Act of 1954, as amended, to make interest-free repayable advances of funds to States, municipalities and other local public agencies, to aid in financing the cost of plan preparation for specific public works projects. The making of an advance does not in any way commit the Federal government to appropriate funds to assist in financing the construction of any public work planned. Advances are repayable without interest by the applicant when construction is started. If a public agency starts construction of only a portion of a planned public work it repays such proportionate amount of the advance as the secretary of housing and urban development may determine to be equitable. If an advance is not repaid promptly upon the start of construction, interest at the rate of four percent per annum is charged. Advances are generally made for planning public works expected to be under construction within five years. However, advances may be approved for an individual region or metropolitan or other area-wide project when project complexities or difficulties of planning are such that it may be expected to take more than five years before construction may start.

Public facility loans are also made under section 1107 of the housing and urban development Act of 1965. This program provides long-term loans for the construction of needed public facilities such as sewer or water facilities. A variety of public works may be financed under this program. When aid is available from other Federal agencies, these loans apply only to those parts of the project not covered by other Federal programs. The term of the loan will be governed by the proposed facility, and may be up to 40 years. Local units of government may apply for a loan under this program. Private non-profit corporations for sewer and water facilities needed to serve a small municipality if there is no existing public body able to construct and operate the facilities may also apply. The population of the applicant community must be under 50,000 except for communities near a research or development installation of the national aeronautics and space agency, and communities located in redevelopment areas so designated in 1965.

According to data presented in the publication "Federal Outlays in Minnesota" office of economic opportunity, National technical information service total Federal outlays in connection with the department of housing and urban development water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Outlays (Million Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>3.8</td>
</tr>
<tr>
<td>1968</td>
<td>9.3</td>
</tr>
<tr>
<td>1969</td>
<td>3.9</td>
</tr>
<tr>
<td>1970</td>
<td>8.3</td>
</tr>
</tbody>
</table>

A fiscal year 1970 program summary for the department is given below:

<table>
<thead>
<tr>
<th>Agency and Program</th>
<th>Federal Outlays (100,000 Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing and Urban Development</td>
<td></td>
</tr>
<tr>
<td>Open Space Developed Land - Urban Parks</td>
<td>4,10</td>
</tr>
<tr>
<td>Public Works Planning Advances</td>
<td>0.45</td>
</tr>
<tr>
<td>Public Facility Loans</td>
<td>43.25</td>
</tr>
<tr>
<td>Basic Water and Sewer Facilities</td>
<td>33.86</td>
</tr>
<tr>
<td>Open Space Land Program</td>
<td>1.11</td>
</tr>
<tr>
<td>Total</td>
<td>82.77</td>
</tr>
</tbody>
</table>
Agencies of the department of transportation which have responsibilities in the field of water and related land resources are the Federal highway administration (FHWA) and the coast guard. The FHWA has substantial responsibility to assist the States in highway construction. Such construction includes culverts, ditches, and all drainage through land required for the roadways. The highway drainage program under the supervision of the FHWA through the State highway department is one of the largest governmental programs concerned with water control. Assistance to the States is carried out through regional offices.

The coast guard is a semi-military agency which becomes involved in water resources development through its responsibility for provision of aids to navigation in inland and coastal waterways. All reports of the corps of engineers recommending improvement of navigation facilities are required to include a section dealing with aids to navigation based on studies by the coast guard, and the coast guard generally constructs, operates, and maintains such aids to navigation.

In Minnesota, the Federal highway administration has responsibilities in the water and related land resources field in two areas: control of water pollution and use of public recreation land for highway construction. FHWA serves the State largely as a granting agency; State agencies do all planning and design work based upon criteria and review rules and regulations developed by FHWA.

Provisions for prevention, control and abatement of water pollution resulting from soil erosion as incorporated into all Federal-aid contracts involving earthwork. The department of transportation Act (Public Law 89-670) has the following provisions pertaining to the use of public recreation land for highway construction:

The secretary of the department of transportation shall cooperate and consult with the secretaries of the interior, housing and urban development, and agriculture, and with the States in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of the lands traversed. After the effective date of this Act, the secretary shall not approve any project which requires the use of any land from a public park, recreation area, wildlife and waterfowl refuge, or historic site unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use.

According to data presented in the publication "Federal Outlays in Minnesota" office of economic opportunity, National technical information service total Federal outlays in connection with the department of transportation water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Outlays (Millions Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>1.6</td>
</tr>
<tr>
<td>1968</td>
<td>1.8</td>
</tr>
<tr>
<td>1969</td>
<td>1.9</td>
</tr>
<tr>
<td>1970</td>
<td>2.5</td>
</tr>
</tbody>
</table>

The department of justice was established by an Act of June 22, 1870, with the attorney general as its head. Prior to 1870 the attorney general was a member of the president's cabinet, but not the head of a department, the office having been created under authority of the Act of September 24, 1789, as amended.

The chief purposes of the department of justice are to provide means for the enforcement of the Federal laws, to furnish legal counsel in Federal cases, and to construe the laws under which other departments act. It conducts all suits in the supreme court in which the United States is concerned, supervises the Federal penal institutions, and investigates and detects violations against Federal laws. It represents the government in legal matters generally, rendering legal advice and opinions, upon request, to the president and to the heads of the executive departments. The attorney general supervises and directs the activities of the United States attorneys and marshals in the various judicial districts.

The affairs and activities of the department of justice are generally directed by the attorney general. In the office of the attorney general are an executive assistant to the attorney general and a director of public information. There are offices, divisions, bureaus, and boards in the department.

**Land and Natural Resources Division**

The assistant attorney general in charge of the land and natural resources division supervises all suits and matters of a civil nature in the Federal district courts, in the State courts, and in the court of claims relating to real property, including not only lands but water and other related natural resources and the outer continental shelf and marine resources. This encompasses condemnation proceedings for the acquisition of property, actions to remove clouds and to quiet title, to recover possession, to recover damages, to determine boundaries, to cancel patents, to set aside ad valorem taxes and tax sales, to establish rights in minerals, including mineral leases, in oil reserves, and in other natural resources, to establish water rights and protect water resources, to abate water and air pollution, to defend actions for compensation for the claimed taking by the United States of real property or any interest therein, and to defend actions seeking to establish an interest in real property adverse to the United States.

The division is also charged with representing the interests of the United States in all civil litigation pertaining to Indians and Indian affairs, including the defense of Indian claims against the United States, whether in the court of claims or before the Indian claims commission. It defends officers of the United States, handles injunction and mandamus proceedings and litigation arising from contracts whenever those matters affect the rights of the United States in the use of title of its real property.
With certain exceptions specified by statute, the division passes upon the title to all real property and interests in real property acquired by the United States by direct purchase.

Among other functions of the division are the review of legislative proposals affecting matters within the scope of its litigation responsibilities and the rendition of legal advice to Federal representatives to interstate water resources compacts and commissions.
There are several independent agencies in the Federal government with major responsibilities in the field of water and related land resources. They are: environmental protection agency, water resources council, atomic energy commission, Federal power commission, interstate commerce commission, and National science foundation. (United States Government Organization Manual—1970/71, Office of the Federal Register, National Archives and Records Service, General Services Administration, Superintendent of Documents, Government Printing Office, Washington, D.C.).

Independent Agencies

Introduction

Under the terms of president Nixon's reorganization plan no. 3, the following Federal agencies were moved to the new environmental protection agency (EPA): the functions carried out by the Federal water quality administration (from the department of the interior); functions with respect to pesticides studies vested in the department of the interior; functions carried out by the National air pollution control administration (from the department of health, education, and welfare); functions carried out by the bureau of solid waste management and the bureau of water hygiene; and portions of the functions carried out by the bureau of radiological health of the environmental control administration (from the department of health, education and welfare); authority to perform studies relating to ecological systems vested in the council on environmental quality; certain functions respecting radiation criteria and standards vested in the atomic energy commission and the Federal radiation council; and functions respecting pesticide registration and related activities carried out by the agricultural research service and the department of agriculture. With its broad mandate, EPA also develops competence in areas of environmental protection that have not previously been given enough attention such as the problem of noise, and it provides an organization to which new programs in these areas can be added.

The environmental protection agency is charged with the control of pollutants which impair water quality; it is broadly concerned with the impact of degraded water quality. It performs a wide variety of functions, including research, standard-setting and enforcement, and provides construction grants and technical assistance.

Authority for research on the effects of pesticides on fish and wildlife were provided to the EPA through transfer of the specialized research authority of the pesticides act enacted in 1958. Interior retains its responsibility to do research on all factors affecting fish and wildlife. Under this provision, only one laboratory was transferred to EPA—the gulf breeze biological laboratory of the bureau of commercial fisheries. The EPA works closely with the fish and wildlife laboratories remaining with the bureau of sport fisheries and wildlife.

The environmental protection agency is the focal point for evaluation and control of a broad range of environmental health problems, including water quality, solid wastes, and radiation. Programs involve research, development of criteria and standards, and the administration of planning and demonstration grants.

EPA's pesticides program consists of setting and enforcing standards which limit pesticide residues in food. EPA has the authority to set pesticide standards and to monitor compliance with them as well as to conduct related research. However, as an integral part of its food protection activities, the food and drug administration retains its authority to remove from the market food with excess pesticide residues.

General ecological research helps EPA to measure the impact of pollutants. The council on environmental quality has authority to conduct studies and research relating to environmental quality.

The atomic energy commission was responsible for establishing environmental radiation standards and emission limits for radioactivity. Those standards have been based largely on broad guidelines recommended by the Federal radiation council. The atomic energy commission's authority to set standards for the protection of the general environment from radioactive material was transferred to the environmental protection agency. The functions of the Federal radiation council were transferred. AEC retains responsibility for the implementation and enforcement of radiation standards through its licensing authority.

The department of agriculture is currently responsible for several functions related to pesticides use. It conducts research on the efficacy of various pesticides as related to other pest control methods and on the environmental and health effects. Thus, EPA is able to make use of the experience and competence of these agencies. The department continues to conduct research on the effectiveness of pesticides. The department furnishes this information to the EPA, which has the responsibility for actually licensing pesticides for use after considering environmental and health effects. Thus, EPA is able to make use of the experience and competence of these agencies.

The Federal water pollution control administration was created by the water quality act of 1965 approved October 2, 1965, to administer the Federal water pollution control Act formerly handled by the public health service. The purpose of the Federal water pollution control Act, as amended, "is to enhance the quality and value of our water resources and to establish a National policy for the prevention, control, and abatement of water pollution." The clean water restoration Act of 1966 approved November 3, 1966 constitutes the latest amendment to the water pollution control Act.
Proposals for Federal legislation were deliberated intensively and extensively before and after World War II. Legislative efforts interrupted by the war, were continued until 1948 when the water pollution control Act was enacted. This Act gave the public health service in cooperation with many years of deliberation, it was the first such Act and was an experimental health. It actively supported waU,r pollution control, public awareness, and education programs, and advanced ideas including the inventory of Federal and industry, conservation groups, and interested private citizens. Under the Act, major industry groups have voluntarily organized a National technical task committee on industrial wastes. The advisory board, a statutory external group, has had as members some of the country's most distinguished persons from public life, government, industry, conservation, and health. It actively supported water pollution control, public awareness, and education programs, and added ideas including the inventory of Federal industry, conservation groups, and interested private citizens. The National technical task committee on industrial wastes has as its tanks and objectives: the development and adoption of practical methods of reclaiming, reducing, and treating wastes; promotion of more effective cooperation between industry and official agencies; dissemination of information on developments in the field; and preparing of industrial waste guides for industry groups. Although the 1948 Federal water pollution control Act was passed after many years of deliberation, it was the first such Act and was an experimental or trial effort. The appropriations were limited in relationship to the need. After further discussions, congress passed the first comprehensive water pollution legislation in 1956. It was signed into law by president Eisenhower on July 9, 1956, and became the Federal water pollution control Act of 1956. It established the Secretary of the department of health, education and welfare: reaffirmed the policy of congress to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution; authorized continued Federal-State cooperation in the development of pollution control strategies and legislation; authorized increased technical assistance to States and intensified and broadened research by using the research potential of universities and other institutions outside of government; authorized collection and dissemination of basic data on water quality relating to water pollution prevention and control; directed the surgeon general to continue to encourage interstate compacts and uniform State laws; authorized grants to States and interstate compacts and uniform State laws; authorized grants to States and interstate agencies up to $1,000,000 a year for 5 years for water pollution control activities; authorized Federal grants of $50,000,000 ayeur (up to an aggregate of $500,000,000) for the construction of municipal sewage treatment works, the amount for any one project not to exceed 50 percent of cost or $250,000 whichever is smaller; modified and simplified procedures governing Federal abatement actions against interstate pollution; authorized the appointment of a water pollution control advisory board; and authorized a cooperative program to control pollution from Federal installations.

Experience with the 1956 Act resulted in proposals to amend it to provide for a stronger Federal role in water pollution control. Congress enacted under President Kennedy's direction the Federal water pollution control Act amendment of 1961 on July 20, 1961. The new law permitted extending Federal authority to enforce pollution abatement in interstate waters, as well as interstate or navigable water, and also strengthened the enforcement procedures; increasing the annual authorized $50,000,000 Federal financial assistance to municipalities for construction of waste treatment works to $80,000,000 in 1962, $90,000,000 in 1963, and $100,000,000 for each of the four following fiscal years 1964-1967; raising the single grant limitation from $250,000 to $600,000; and providing for grants to communities combining in a joint project to a limit of $2,400,000; intensifying research toward more effective methods of pollution control; authorizing for this purpose annual appropriations of $5,000,000 up to an aggregate of $25,000,000 and authorizing the establishment of field laboratory and research facilities in many areas, seven specified major areas of the nation; extending the provisions to June 30, 1968 and increasing Federal financial support to State and interstate pollution control activities; authorized increased technical assistance to States and intensified and broadened research by using the research potential of universities and other institutions outside of government; authorized collection and dissemination of basic data on water quality relating to water pollution prevention and control; directed the surgeon general to continue to encourage interstate compacts and uniform State laws; authorized grants to States and interstate compacts and uniform State laws; authorized grants to States and interstate agencies up to $1,000,000 a year for 5 years for water pollution control activities; authorized Federal grants of $50,000,000 ayeur (up to an aggregate of $500,000,000) for the construction of municipal sewage treatment works, the amount for any one project not to exceed 30 percent of cost or $250,000 whichever is smaller; modified and simplified procedures governing Federal abatement actions against interstate pollution; authorized the appointment of a water pollution control advisory board; and authorized a cooperative program to control pollution from Federal installations.

The 1965 Act provided for increased assistance to metropolitan areas, studies for controlling wastes from combined storm and sanitary sewers, broader enforcement procedures, development of water quality standards for interstate waters, implementation and enforcement of these criteria. The 1972 water quality act of 1965 gave the Federal water pollution control administration in HEW, to administer the law under a powerful mandate from congress; authorized preparation of comprehensive programs for water resource development to conserve waters for all legitimate use; directed corps of engineers to include storage in reservoirs for regulation of stream-flow for water quality control, i.e., low flow augmentation; provided for consideration of costs of benefits from multi-purpose projects and encouraged research, investigations, training, information services, and demonstrations; increased grants for State and interstate pollution control programs; increased construction grants; doubling the maximum amount for a single project from $600,000 to $1.2 million, doubling the maximum grant for a multi-municipal project from $2.4 million to $4.8 million, making an additional 550 million available to States on a straight population basis, rather than on a population-per capita income basis; 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Federal agencies were specifically directed to bring existing installations and future installations into compliance with the water quality Act of 1965 by presidential executive order no. 11258, dated November 5, 1965. Under presidential reorganization plan no. 2, the Federal water pollution control administration was transferred from HEW to the department of the Interior on May 1, 1966.

Some of the major provisions of the clean water restoration Act of 1966 are: increased the annual authorization for construction grants from $150 million in fiscal year 1967 to $450 million fiscal year 1968, $700 million in fiscal year 1969, $21 billion in fiscal year 1970, and $2.25 billion in fiscal year 1971. Effective July 1, 1967 the Act eliminated dollar ceilings on construction grants. A municipality may be able to receive at least a 30 percent Federal grant and, under certain conditions, as much as 55 percent. Grant conditions were as follows: if a State agrees to put up 30 percent of the cost of all projects for which Federal sewage treatment plant construction funds are available, the Federal grant will be increased to 40 percent, reducing the State's share to 30 percent. In addition, a State adopts enforceable water quality standards for the stream on which a proposed sewage treatment plant is located, the Federal grant will be increased to 50 percent both the State's share and the city's share would then be reduced to 25 percent; the Federal government will increase the amount of a grant by 10 percent, to a total of 55 percent, if a project is certified by a metropolitan or regional planning agency as conforming with a comprehensive plan for a metropolitan or area. This would reduce the city's share to 20 percent with the State's share remaining at 25 percent; the Federal authorized $20 million a year for research and demonstration projects on pollution from combined storm and sanitary sewers and separate storm sewers. Raised the Federal share from 50 percent to 75 percent, and removed the ceiling; authorized $20 million a year for three years for States and interstate and local jurisdictions for projects demonstrating advanced waste treatment of municipal and industrial wastes. Allowed Federal grants of 75 percent of project costs; authorized $20 million a year for three years for industry or private persons to help develop or demonstrate new or improved ways to prevent pollution of waters by industry. Authorized Federal grants covering 70 percent of project costs. Maximum grant for any project is $1 million, and projects must have industrywide application; authorized $60 million in fiscal year 1968 and $65 million in fiscal year 1969 for general research, investigations, training, and information activities; and authorized $3 million for special study of pollution problems in estuaries.

Other provisions of the Act are: directed the secretary of the Interior to make grants of up to 50 percent of the administrative expenses of State or interstate planning agencies developing comprehensive water quality programs for entire river basins; authorized $5 million for fiscal year 1967 and $10 million annually for fiscal year 1968 through 1971 for grants to States and to interstate agencies to help the States improve their water pollution control programs, including the training of needed personnel; gave majority of conferences in an enforcement conference or public hearing the right to ask the secretary of the Interior to request an alleged polluter to file a report with him on the kind and quantity of discharges he is sending into a body of water; authorized use of enforcement conference machinery for pollution problems involving boundary waters or rivers which the United States shares with Canada and Mexico; transferred responsibility for administering the oil pollution Act from the secretary of the Army to the secretary of the Interior; authorized special studies in the following areas: the cost of carrying out the Federal water pollution control program and of the National requirements to obtain clean water; the need for additional training State and local government personnel to carry out water pollution control programs; pollution from boats and how to deal with it; and methods for providing incentives, including tax incentives, to help industry reduce its pollution; and amended the oil pollution Act of 1924 which prohibited the discharge of oil by vessels in the waters within the United States. The Federal water pollution control administration was made responsible for enforcement of this Act. Oil pollution in navigable waters from any source which is a hazard to navigation is the responsibility of the corps of engineers as authorized by the rivers and harbors Act of 1899. The coast guard provided support to both the corps and EPA.

The water quality improvement Act of 1970 (P.L. 91-224) is concerned with the control of discharges of oil and hazardous polluting substances into or upon the navigable waters of the United States, adjoining shorelines, or the contiguous zone; area acid and other mine water pollution control demonstrations; pollution control in the Great Lakes; Alaska village demonstration projects; cooperation by all Federal agencies in the control of pollution; and the office of environmental quality.

The fiscal year 1970 program distribution of budget authority for the environmental protection agency is shown in table 10. The environmental protection agency was established on December 2, 1970. The agency's fiscal year 1971 budget is $1.3 billion. The organizational chart for EPA is shown in figure 15. The regional office of EPA which is concerned with Minnesota is located in Chicago. EPA has about 6,000 employees, 2,000 are located in the Washington area and 4,000 are located in other areas. To insure that all of its efforts are responsive to local needs, EPA has established ten regional offices. Each office is headed by an interim regional coordinator who works closely with State and local officials, civic, service, and citizen organizations, industry, and other Federal agencies to assure maximum effectiveness of environmental programs and antipollution activities.

Since the 1956 enactment of the Federal water pollution control Act, the Federal government has provided over $1.5 billion in grants for construction and expansion of over 10,000 municipally owned and operated sewage treatment facilities. These funds have assisted the States and communities in the construction of $6.4 billion of treatment works. Of these totals, 268 projects have been made to Minnesota municipalities in the amount of $37,843,212 in Federal funds in support of total eligible project costs of $127,151,657. Under the $800 million Federal appropriation in fiscal year 1970, Minnesota was allotted $14,928,100 for distribution to local treatment works projects.

Programs in Minnesota

Federal grants of approximately $150,000 a year make up a sizable portion of the State's annual budget for water pollution control. In addition to the money paid to the State, towns and cities in Minnesota have received grants of $17.2 million to aid in constructing 195 waste treatment projects costing $17.2 million for the control of municipal pollution. At three institutions of higher learning—the University of Minnesota, Winona
Table 10. Fiscal Year 1970 Program Distribution of Budget Authority, Environmental Protection Agency

<table>
<thead>
<tr>
<th>Program Category</th>
<th>Budget Authority 1/ (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality abatement and control</td>
<td>881.2</td>
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<tr>
<td>Air pollution abatement and control</td>
<td>104.5</td>
</tr>
<tr>
<td>Pesticides abatement and control</td>
<td>.1</td>
</tr>
<tr>
<td>Radiation abatement and control</td>
<td></td>
</tr>
<tr>
<td>Solid wastes management</td>
<td></td>
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<tr>
<td>Facilities</td>
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</tr>
<tr>
<td>Program direction and support</td>
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</tr>
<tr>
<td>Total distributed to programs above</td>
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</tr>
<tr>
<td>Undistributed, proposed for separate</td>
<td></td>
</tr>
<tr>
<td>transmittal, existing and new</td>
<td></td>
</tr>
<tr>
<td>legislation</td>
<td></td>
</tr>
<tr>
<td>Total budget authority, Environmental</td>
<td>1,004.0</td>
</tr>
<tr>
<td>Agency</td>
<td></td>
</tr>
</tbody>
</table>

1/Amounts are for part year only, December 2 through June 30.

(from Special Analyses, Budget of The United States Government, Fiscal Year 1972)

State college, and St. Mary's college—a total of 11 water pollution research projects and training programs in sanitary engineering have received grant support approximating $200,000 a year. The Minnesota State department utilized still another grant to demonstrate the usefulness of the channel aeration process in the treatment of sewage.

Under recent legislation, the Minneapolis-St. Paul sanitary district received and matched a Federal grant of $870,750 awarded for a special project. The project seeks to develop and demonstrate new control methods for overflows from the Twin Cities' combined sanitary-storm sewer system, an increasingly troublesome factor in stream pollution in many cities.

The clean water restoration Act of 1966 gave a first-time, indirect subsidy to industrial waste treatment. At Minneapolis, the north star research and development institute used a $76,585 grant to demonstrate new waste treatment methodology for the food processing industry. The community of South St. Paul received a $450,000 grant to determine the efficiency and economy of polymeric sewage clarification in a system which will jointly treat municipal, industrial, and combined storm-sanitary sewer wastes.

Minnesota has often called upon the special research skills and technical services of the Federal water quality administration (FWQA). For example, at the request of Minnesota's governor, the FWQA's Cincinnati water research laboratory conducted technical investigations of two major oil spills on the Minnesota river which caused great losses of wildlife and damage downstream on the Minnesota and Mississippi rivers.

At Ely is located the Shagawa lake eutrophication control pilot project. Shagawa and other lakes of the boundary waters canoe area have shown signs of overfertilization and excessive algae growth since the 1930's. If the Ely project can stem the "aging" of these beautiful and heavily used recreational waters, it will set a useful pattern for many waterbodies similarly afflicted.
As required by the Federal water quality Act of 1965, Minnesota established quality standards for its Interstate waters in 1967, subject to Federal approval. The standards identify uses of waters, including agricultural, municipal, industrial, recreational, and fish and wildlife uses; indicate the water quality necessary to support each use; and include plans to implement and enforce these standards.

In letters from governor Rolvaag of Minnesota and governor Reynolds of Wisconsin to secretary Celebrezze of the U.S. department of health, education, and welfare on September 9, 1963, a request was made for action to abate pollution in the Twin Cities - upper Mississippi river area as provided in section 8 of the Federal water pollution control Act. In response to the request the governors, on September 23, 1963, secretary Celebrezze sent letters calling for a conference on the matter of pollution of the waters of the Mississippi river and its tributaries to official water pollution control agencies for Minnesota and Wisconsin. Based upon these actions, the Twin Cities-upper Mississippi river project was established to carry out the following objectives: to determine the extent of pollution in the river and the study area extending on the Mississippi river for 107 miles between its confluences with the Rum and Chippewa rivers, on the Minnesota river from its mouth upstream 110 miles to Mankato, Minnesota, and on the St. Croix river from its mouth 55 miles upstream to Taylors Falls, Minnesota; to investigate the principal sources of pollution and contributions from these sources; to determine the effect of pollution on the numerous water uses; and to develop programs for the achievement of various water uses on rivers of the study area.

The Twin Cities-upper Mississippi river project was initiated as a special project of the enforcement branch of the division of water supply and pollution control, public health service. Immediate supervision was provided by the project director at project headquarters in Minneapolis. Administratively the project was an activity of the region 5, water supply and pollution control program of the FWPCA at Chicago.

One of the recommendations of the conferees was the establishment of a technical committee. Experience in similar projects demonstrated the need for a group of appropriate persons whom the project could continually inform of its activities. In consideration of the length and character of the project plus the administrative procedures required for the establishment and operation of technical advisory boards, a decision was made to create the Technical Advisory Board (TAB) of Federal, State, municipal, civic, and industrial water oriented groups to a project committee. The principal purpose of this committee was to receive and disseminate information on project activities and to suggest areas of additional concern. Technical consultation was obtained from R.S. Engelbrecht, professor of sanitary engineering, university of Illinois; L.B. Polkowski, professor of civil engineering, university of Wisconsin; and specialists in the public health service.

Immediately following the assignment of a director and part of the staff to the project in late 1963, a conference report was prepared and procurement of adequate facilities, equipment, and personnel was initiated. Space secured at the U.S. naval air station in Minneapolis required extensive modification and renovation of office and laboratory areas before occupancy. Office facilities were completed by mid-January, 1964. Thus, what has become known as the upper Mississippi river - Lake Superior basin office was established.

The major past and current activities of the office have been devoted to necessary actions related to the Twin Cities - upper Mississippi river enforcement conference; necessary actions related to the Lake Superior enforcement conference; providing major input to the type I, upper Mississippi river, study concerning the need for and value of low flow augmentation on the Minnesota river and Mississippi river below Minneapolis - St. Paul; providing major input in the review and negotiations relating to the Interstate water quality standards for Minnesota and Wisconsin and to a lesser degree Iowa, South Dakota, and Michigan; providing support to the research and development activities of the FWPCA through role of project officer on several projects; and providing basic technical support to all regional programs as necessary to accomplish the FWQA mission (i.e., review of State program plans, review of interagency reports, public information, etc.).

Included in the activities planned for fiscal years 1971-75 are as follows. A program will be established to provide periodic reports on the status of compliance with water quality standards and particularly the implementation plans developed by the States. Vigorous surveillance on progress in meeting implementation plan goals will be required on a continuing basis. A detailed review on the progress will be required at least twice a year.

A number of standards revisions will be required to reflect changing conditions and changing information. Emphasis will be placed immediately on resolving issues which have resulted in exemptions from approved State standards and making the necessary revisions of studies and compilation of data as required to support the needed changes. Basic data must be collected, catalogued, and analyzed in order to determine effectiveness of the standards programs.

A program will be initiated by the EPA to develop a water quality criteria intelligence system of scientific and technical information appropriate for use in implementing decision making purposes and in determining need to the States under a continuing program of assistance. This office's role will be to establish the effective liaison with the State and Federal water resource agencies and other institutions in the area involved with water quality and use.

Necessary activities related to enforcement conferences activities will include the continuing surveillance of progress made toward achieving the established abatement schedule for the conference area, providing water quality sampling as necessary on the waste sources and streams in order to provide necessary information, and preparing for and participating in re-convened progress meetings as called for by the conferees.

The river basin water quality management program is being reoriented to reflect those pollution control planning actions most necessary in managing the Nation's clean waters. Since their establishment, water quality planning projects have provided the technical and scientific resources necessary to support the development of pollution control plans and programs. In addition, they have provided the resources and capability needed to support closely related pollution control investigations and activities. This has often involved studies of a more detailed technical nature than would be needed merely to support planning. More emphasis will be given to the non-technical ingredients of planning that are essential to effective pollution
control programs. Attention will be focused on minimizing technical inputs not essential to decision-making in the planning process and on strengthening staff planning capabilities. This does not mean, however, that some technical activities found not essential to planning will not be continued, if they are essential to support other related program purposes. For example, certain data collection and monitoring activities must be continued and expanded because of the need to support the implementation phase of water quality standards. There will be continued effort to identify such essential technical activities.

Water quality management plan development will be continued in association with interagency water resources planning and with State and interstate planning where appropriate. In some cases where interagency planning efforts are not underway or where State or local efforts are not adequate, the program must spearhead the planning tasks in order to meet the problem of pollution control in the shortest possible time.

Included under basin planning section will be the interagency reports and reviews that are necessary. Studies will probably be required to be carried out for Federal construction agencies concerning need for and value of storage for quality control in reservoirs. This will include assembling information on physical, economic, and demographic environment, water use and waste production, present uses, and estimating the ways in which these are expected to change in the future. Efforts will be devoted to encouraging the formation of planning agencies on the State and regional basis and to provide assistance in their formation, review applications of basin planning agencies to determine the need for and adequacy of proposed planning activities, and finally providing assistance in planning.

The EPA is responsible for providing the necessary technical advice and assistance to other Federal agencies in developing adequate methods and facilities for preventing pollution from their activities. The Minnesota office has heavy responsibilities and therefore will devote emphasis to the following areas: new and existing facilities and buildings—consult in the development of water pollution control measures for inclusion in plans for new or modified installations; review final plans for adequacy prior to construction; organize, coordinate, and conduct periodic on-site reviews of the waste treatment and disposal practices at Federal installations, Federal water resources projects—review plans and report on the potential impact on water quality, and pollution from vessel operations—review operations of and recommend pollution control measures to assure adequate treatment of wastes from Federally operated watercraft.

The objective of the Minnesota office's water quality surveillance will be to provide a system whereby technical pollution information and water quality data are collected, evaluated and disseminated for use within EPA particularly as these data relate to the enforcement and implementation of water quality standards, the effectiveness of waste treatment and control facilities, the establishment of water quality trends, and to the planning and management programs. This will require full coordination with State regulatory bodies and other Federal water data collection agencies including USGS. The specific immediate and long-range monitoring requirements will be defined in support of water quality standards, establishment of baselines, and planning and management programs. As stated previously there will be continued effort to define those technical surveillance activities found not essential to decision-making processes. Emphasis will be on developing basinwide pollution control programs and then assisting the State in establishing the necessary pollution surveillance programs.

Miscellaneous technical support as necessary to ongoing regional programs will include the review of the State program plans, review of miscellaneous other reports, public information duties, and other related ongoing activities of the regional program.

National Water Quality Laboratory

On October 5, 1962, representative John A. Blatnik of Minnesota's eighth congressional district announced that a National water quality laboratory would be located in Duluth, Minnesota. The authorization for the new water laboratories as described in the Federal water pollution control Act (P.L. 87-88) and passed in 1961 was sponsored in the house of representatives by congressman Blatnik. Construction of the laboratory was started in September, 1965 and completed in July, 1967. A small staff of technical personnel started the operations of the laboratory in old main hall of the university of Minnesota at Duluth (UMD) in 1965. Their preliminary task consisted of ordering and adjusting highly technical equipment and gathering pertinent material and data for use in the new facilities.

The research goals of the laboratory are: to detect and determine the variety and amounts of pollutants affecting all organisms in the aquatic food chain, including fish; to develop ways of detecting obscure indications of slow deterioration in environmental conditions in order to restore, maintain, or construct of our aquatic resources; and to develop more precise biological indicators of pollution, and develop rapid and effective autopsy techniques to determine what kills fish and other aquatic organisms.

Although the Duluth laboratory's research will range across the whole spectrum of requirements for water uses, its initial investigative concern is to determine the water quality necessary to support production of sport and commercial fish and for recreational uses. Scientific teams will work to develop methods of detecting causes of fish kills. Development of specific procedures similar to those used in human autopsies will be helpful to State and local officials in pinpointing the causes of death. The laboratory will seek to develop methods for diagnosing pollution-caused sicknesses in fish that inhabit polluted waters, and find the means of detecting subtle indications of slow deterioration in the aquatic environment.

Research into requirements for recreation will focus on health and aesthetic factors. Some impurities do not adversely affect water quality but do mar the beauty and uses of lakes and streams with discolorations and offensive smells. Algal growths, which not only discolor a vivid green but might also cause skin irritations and unpleasant odors, must be identified and controlled.
The subject of "safe" levels for swimming has been the target of controversy among water quality experts. Established bacterial counts considered unsafe for swimming are arbitrary and need refinement. Research has been skimpy in regard to certain chemical pollutants that may affect the eyes, ears, and skin of swimmers. The Duluth laboratory will attempt to fill knowledge gaps on these subjects.

Certain problems of water quality for industrial use have been identified and will be considered in the research program at the Duluth laboratory. The single largest use of water for industrial purposes is for cooling. As a result of certain chemicals or substances in the water, there are growths of slimes and scales in industrial condenser tubes. These growths require removal by chemical or mechanical means, increasing costs. The chemicals and substances causing the growths need to be identified, and acceptable concentrations determined. Such problems of water quality for cooling as well as similar problems in waters used for other industrial purposes will be studied at the laboratory.

The loss of water by evaporation and through continued re-use increases the concentrations of the common salts found in natural water. The concentration of the various salts can reach levels which impair the use of the water for specific purposes, such as irrigating sensitive crops. Water quality requirements are needed to establish the limits beyond which water becomes unsuitable for such uses as irrigation of live stock water. Problems such as these will also be studied at the laboratory.

Research has been performed to establish safe concentrations in water of various pollutants to selected aquatic organisms. Testing is so designed to ascertain the life stage of the aquatic organism which is most sensitive to a particular pollutant. Pollutants which have been and are being investigated include heat, depressed dissolved oxygen levels, pH (both basic and acidic), and specific chemicals and volatile heavy metals. Development of techniques and procedures to permit propagation and rearing of several test organisms under laboratory conditions were also needed.

The laboratory has produced the following significant accomplishments:

Thermal additions. With the ever-increasing demand upon the electrical power generating and transmission industry for increased production of electricity and the lack of available hydroelectric sites, the use of nuclear power or fossil fuels must become the source of additional electrical energy. Nuclear power or fossil fuel generating plants produce tremendous thermal energy which must be dissipated to the environment. This dissipation can be accomplished by use of receiving waters of sufficient quantity for dilution or erection of cooling towers. If receiving waters are to be used, criteria must be developed which will maintain a healthy, viable aquatic environment.

Studies have been completed for the maximum and optimum temperature for 10 species of aquatic insects. These studies show the critical life stage of these insects to be the emergence of the adult from the pupa and that constant elevated temperatures will cause premature emergence of the adults. Premature emergence of insects could eliminate a major source of food for fish during a particular period of the year.

Maximum, minimum and optimal temperature requirements for several of the life stages of the following fishes have been established: northern pike, largemouth bass, channel catfish, bluegill, emerald shiner, brook trout, yellow perch, white sucker, smallmouth bass and the fathead minnow. It can be concluded from these temperature requirements that the ecology of a stream may be drastically altered by the constant, elevated temperatures caused by thermal energy additions. Immediate death or extinction of a species is possible from high water temperature, however more subtle effects have been observed with elevation of water temperature at the lower extreme. Studies with certain fish species have revealed that a winter chill period of specific length and intensity is required for the fish to sexually mature and spawn.

Dissolved oxygen. The addition of waste effluents to receiving waters can place an extreme demand on the dissolved oxygen level of the receiving waters. This demand could deplete the dissolved oxygen concentrations to such low levels that desirable aquatic organisms might be partially, or fully destroyed. In order to establish the dissolved oxygen level necessary to maintain a healthy aquatic environment, selected aquatic organisms have been studied to establish their dissolved oxygen requirements through the life cycle.

Safe dissolved oxygen levels have been determined for egg, embryo and newly-hatched of the northern pike and white sucker. Non-lethal dissolved oxygen levels for freshwater mussels and leeches were established.

Heavy metals. The acute toxicity of many of the heavy metals to certain aquatic organisms is well known. However, the toxicity of some of the heavy metals to selected aquatic organisms has never been established and this toxicity must be determined to permit the establishment of water quality standards. The short and long-term toxicity of copper, cadmium, zinc, chromium and nickel has been established for the fathead minnow. The toxicity of copper and chromium to brook and rainbow trout has been established. The short and long-term toxicity of copper has been established for freshwater mussels, scuds, and snails. The short and long-term toxicity of 25 heavy metals has been established for Daphnia. The short-term toxicity of 11 heavy metals has been established for three aquatic insects. The maximum safe concentration of potassium for freshwater mussels was established. Extinction of this species in many areas of the United States can be related to the high potassium levels found in the water.

Organic compounds. Determination of the short and long-term toxicity of organic compounds to the aquatic environment is essential to the establishment of water quality standards. Substantial toxicology data is already available on some organic compounds, such as DDT. However, with the ever-changing chemical industry, development of toxicology data on new organic compounds becomes necessary to protect the aquatic environment. Short and long-term toxicity has been established for linear alkyl sulfonate (detergent) for scuds, snails, and the fathead minnow. Short and long-term toxicity has been established for malathion, a widely-used insecticide, with the brook trout, the fathead minnow, and the bluegill. Short and long-term toxicity has been established for 15 organic pesticides using Daphnia as the test organism. Short and long-term toxicity has been established for Sevin, an insecticide, with the fathead minnow. Short and long-term toxicity has been established for eight Aroclors (PCB's - polychlorinated biphenyls) with...
Daphnia as the test organism. Short and long-term toxicity has been established for NTA (nitrilotriacetic acid—a replacement for the phosphates in detergents) using the fathead minnow, snails, Daphnia and scuds. Short-term toxicity of NTA has been established for 10 of fish.

Short and long-term toxicity has been established for chloramine using scuds and the fathead minnow. Chlorination, which is the accepted procedure for sterilization of water, produces chloramines upon contact with ammonia or amino acids. The products of these reactions are extremely toxic to aquatic life; therefore, an alternative method for sterilization might be necessary if aquatic life is to be protected from effluents of sewage treatment plants that chlorinate their waste products.

pH. The effect of pH (acidic and basic) on the growth and survival of 10 aquatic insects has been established. These effects can be related to streams where acid and basic mine drainage have created pH problems.

Techniques and procedures were developed which permitted consistent growth of freshwater mussels and sphaerid clams under laboratory conditions. This breakthrough in laboratory rearing of these organisms now makes possible short and long-term toxicity studies with these species in the laboratory. Protection of the freshwater mussel is essential if the cultured pearl industry is to survive. The shell from these organisms provide the nuclei for the cultured pearl.

Techniques and procedures were developed by a grantee to propagate a species of snail, Physa parkeri, through a life cycle for the first time under laboratory conditions. This particular snail is a known carrier of one of the summer's itch flukes. With the ability to raise and maintain this snail, research can now be started which will make possible the control of swimmer's itch.

Hydrogen sulfide is a compound that is produced in water under anaerobic conditions and it is highly toxic to selected aquatic life. Criteria for hydrogen sulfide concentrations acceptable in water have been established using data accumulated from a grant awarded to the university of Minnesota. These criteria were used by the conference of the Lake Superior enforcement conference in establishing the standard for hydrogen sulfide in Lake Superior.

A state-of-the-art report on the relationship between chemical pollution of fresh water and health is now available. This report lists the known organic chemical compounds found in water, the acute and chronic toxicity of these compounds where known and available, as well as the carcinogenicity, mutagenicity and teratogenicity of these compounds. This report was prepared by Arthur D. Little company under a contract.

Laboratory staff members assessed the impact on Lake Superior created by the daily disposal of 67,000 tons of taconite tailings by reserve mining company, Silver Bay, Minnesota. It was the company's contention that these tailings were insoluble and were settling to the lake bottom immediately in front of their plant.

Procedures and techniques were developed which definitely proved the company's position was in error. Findings from these techniques showed widespread distribution of the fine fraction of the tailings over the western end of the basin, that green water was, and could be, caused by fine tailing suspensions, that the tailings were soluble, and the rate of solubility of the tailings.

Much of the data accumulated by laboratory personnel as well as data obtained from grants and contractors has been used by many of the states in helping to set their water quality standards.

In the Duluth laboratory, there are five sections engaged in water quality research, in addition to an administrative section and the office of the director.

Research sections of the laboratory are:

Plankton-Periphyton-Bacteria section: This section isolates and raises planktonic organisms (microscopic plant and animal life) in mixed and pure environments in order to expose them to sensitivity and long-term toxicological tests. It will conduct research into pollutants that trigger the growth of undesirable algae blooms. One of the Nation's major water pollution problems is caused by these blooms, whose growth is greatly accelerated by pollutants, which act as a fertilizer. Excessive algae growth speeds the aging or "dying" of lakes; Lake Erie is a prime example of this eutrophication process, in which a choking crop of algae has developed. Another function of the section will be to examine those microorganisms that produce taste and odor problems in water supplies.

Invertebrate section: This section carries on research to determine the environmental requirements of those fresh water invertebrates that can be seen without a microscope, such as aquatic insects and worms. It will seek to determine levels at which water pollutants become lethal to these forms of life.

Fish section: This section will rear fish, their fry and eggs to use in short and long-term tests which will seek to determine the relative sensitivity of different species to contaminants, and to establish levels of water quality to which different species of fish may be safely exposed.

Ecology section: This section will take field and laboratory findings and test them in natural or simulated environments, determining the short range and accumulative effects of toxic substances on total aquatic communities.

Research services section: This section supplies technical and consultative assistance, providing analytical, statistical, data processing, computer, library, publication, editorial, photographic, drafting and illustrating services.

Two field sites are directed by the National water quality laboratory: at Newton, Cincinnati, Ohio, known as Newton fish toxicology laboratory; and Willamette river, western fish toxicology station. The Newton fish toxicology laboratory staff consists of 5 fishery biologists, 1 research chemist, 6 aides, 1 secretary and 2 others. Funding at the level of $186,000 in fiscal year 1971 is through the National water quality laboratory. Research is aimed at studying long-term chronic toxicity among Warmwater fishes and experiments are being conducted to determine methods of assessing safe concentrations of materials in natural waterways.

The staff of the western fish toxicology station is 7 persons. Funding at the level of $108,000 in fiscal year 1971 is through the National water quality laboratory. The station is responsible for developing water quality criteria for Pacific northeastern aquatic life, particularly Pacific salmon.
Water Resources Council

The water resources council was established by the water resources planning Act of 1965 on July 22, 1965. The functions of the council are to: maintain a study and prepare a National water assessment; coordinate and review river basin, regional plans and programs prepared by Federal-State interests; coordinate water and related land resources planning policies and programs with 12 Federal agencies; administer Federal financial grants to States and river basin commissions; establish, coordinate, and review river basin commissions, interagency committees and coordinating groups. The purpose of the council is to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal government, States, localities, and private enterprise.

Water Resources Planning Act of 1965

The water resources planning Act of 1965, Public Law 89-80, 89th Congress, signed into law July 22, 1965, by President Johnson, provides for the optimum development of the Nation's natural resources through the coordination of planning of water and related land resources, through the establishment of water resources council and river basin commissions, and through financial assistance to the States in order to increase State participation in such planning. It has been declared to be the policy of the Congress to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned.

Under title I of the Act, there is established a water resources council. The functions of the council are to:

- Maintain a continuing study and prepare periodically an assessment of the adequacy of supplies of water necessary to meet the water requirements in each water resources region in the United States and of the National interest therein.

- Maintain a continuing study of the relation of regional or river plans and programs to the requirements of larger regions of the Nation.

- Appraise the adequacy of administrative and statutory means for coordination and implementation of the water and related land resources policies and programs of the several Federal agencies and to make recommendations to the President with respect to Federal policies and programs.

- Establish after consultation with appropriate interested Federal and non-Federal entities, and with the approval of the President, principles, standards, and procedures for Federal participation in the preparation of comprehensive regional or river basin plans and for the formation and evaluation of Federal water and related land resources project, including primary direct navigation benefits.

Coordinate schedules, budgets, and programs of Federal agencies in comprehensive inter-agency regional or river basin planning.

Carry out its responsibilities under title II of the Act with regard to the creation, operation, and termination of Federal-State river basin commissions.

Receive plans or revisions thereof submitted by river basin commissions, and receive and review and transmit them together with its recommendations, to the President.

Assist the States financially in developing and participating in the development of comprehensive water and related land resources plans in accordance with title III of the Act.

For the purpose of carrying out the provisions of the Act, the council may hold such hearings and act at such times and places, take such testimony, receive such evidence, and print or otherwise reproduce and distribute so much of its proceedings and report thereon as it may deem advisable. The council may establish administrative, technical, and consultant committees, subcommittees, and task forces; hearing panels; and other appropriate subordinate groups to aid in the performance of its work.

There are authorized to be appropriated to the council not to exceed $300,000 annually, to carry out the provisions of title I, not to exceed $7,000,000 annually to carry out the provisions of title II, and not to exceed $400,000 annually for the administration of title III. Provided, that, with respect to title II, not more than $750,000 annually shall be available for any single river basin commission.

The council is composed of the Secretary of the Interior; the Secretary of Agriculture; the Secretary of the Army; the Secretary of Health, Education and Welfare; and the Chairman of the Federal Power Commission. The chairman of the council may request the heads of other Federal agencies to participate with the council when matters affecting their responsibilities are considered by the council. The chairman of the council is designated by the President.

Under title II of the Act, the President is authorized to declare the establishment of a river basin water and related land resources commission (hereinafter Commission) upon request by the council, or request addressed to the council by a State within which all or part of the basin or basins concerned are located if the request by the council or by a State is concurred in by the council and by not less than one-half of the States within which portions of the basin or basins concerned are located. A commission terminates by written agreement of a majority of the governors of the States composing the commission, or by presidential order upon the recommendation of the council.

The basic objective of a commission is to encourage the conservation, development, and utilization of water and related land resources in its area on a comprehensive and coordinated basis by the Federal government, States, localities and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises and others concerned. Pursuant thereto, each commission will serve as the principal agency for the coordination of Federal, State, interstate, local and non-governmental plans for the de-
development of water and related land resources within the commission area; prepare and keep up to date, to the extent practicable, a comprehensive plan; recommend long-range schedules of priorities for the collection and evaluation of basic data and for investigation, planning, and construction of projects; make recommendations to the council and appropriate States on the relationship of individual projects to the comprehensive plan; include in the comprehensive plan an assessment of the adequacy of the supply of water necessary to meet the water requirement in the commission area and provide the bases for periodic national assessments; and foster and undertake such studies of water and related land resources problems within the commission area as are necessary in preparation of the plan.

"Related land resources" means that land which present or projected use or management practices cause significant effects on the quantity and/or quality of the water resource, and that land the use or management of which is significantly affected by or depends on existing or proposed measures for management, development or use of water resources. "Comprehensive plan" means a coordinated joint system or arrangement of structural and non-structural measures and programs, designed to guide and control Federal, State, interstate, local and nongovernmental conservation, development, and use of water and related land resources in a manner that will support and enhance the economic and social activities and general well being in the commission area.

Such a plan should include all levels of conservation, development, and use for current and anticipated conditions, and an evaluation of all reasonable alternative means of achieving optimum conservation, development and use of the water and related land resources and of implementing guidance and control thereof. The comprehensive plan may be prepared in stages and should evolve in an orderly manner, consistent with established practices and responsibilities, from elementary reconnaissance reports and inventories, through broad regional analyses of framework scope, to detailed analyses of possible alternatives adequate to support authorization for Federal and non-Federal action programs at all levels. The plan should include recommendations with respect to individual projects. The comprehensive plan should be developed so that at any time during the course of its evolution it would provide a source of sound guidance and control for conservation, development, and use commensurate with the physical and economic conditions, policies and constraints prevailing at that time.

Each commission will be expected to establish its own policies and procedures for self-management. It is recognized that the Federal and State participants in a commission will be subject to such policy and procedural direction as the statutes, applicable administrative regulations, and other guidance that their respective governments may provide. Each river basin commission is to be composed of members appointed as follows: a chairman appointed by the president who shall also serve as chairman and coordinating officer of the Federal members of the commission and who represents the Federal government in Federal-State relations on the commission and who shall not, during the period of his service on the commission, hold any other position as an officer or employee of the United States, except as a retired officer or retired civilian employee of the Federal government; one member from each Federal department or independent agency; one member from each State which lies wholly or partially within the area, river basin, or group of river basins for which the commission is established, and the appointment of each such member is made in accordance with the laws of the State which he represents. In the absence of governing provisions of State law, such State members are to be appointed and serve at the pleasure of the governor; State members of each commission elect a vice chairman, who serves also as chairman and coordinating officer of the State members of the commission and who represents the State governments in Federal-State relations on the commission; one member appointed by any interstate agency created by an interstate compact to which the consent of Congress has been given, and whose jurisdiction extends to the waters of the area, river basin, or group of river basins for which the river basin commission is created; and when deemed necessary to the president, one member, who shall be appointed by the president, from the United States section of any international commission created by a treaty to which the consent of the Senate has been given, and whose jurisdiction extends to the waters of the area, river basin, or group of river basins for which such commission was established.

Each river basin commission: submits to the council and the governor or each participating State a report of its work at least once a year. Such report is transmitted through the president to the congress, after such transmission, copies of any such report is sent to the heads of such Federal, State, interstate, and international agencies as the president or the governors of the participating States may direct; submits to the council for transmission to the president and by him to the congress, the governors and the legislators of the participating States a comprehensive, coordinated, joint plan, or any major portion thereof or necessary revisions thereof, for water and related land resources development in the area, river basin, or group of river basins for which such commission was established. Before the commission submits such a plan or major portion thereof or revision thereof to the council, it transmits the proposed plan or revision to the head of each Federal department or agency, the governor of each State, and each interstate agency, from which a member of the commission has been appointed, and the head of the United States section of any international commission if the plan portion or revision deals with a boundary water or river crossing a boundary, or any tributary flowing into such boundary water or river, over which the International commission has jurisdiction or for which it has responsibility. Each such department and agency head, governor, interstate agency, and United States section of an international commission has ninety days from the date of the receipt of the proposed plan, portion, or revision to report its views, comments, and recommendations to the commission. The commission may modify the plan portion or revision after considering the reports so submitted. The views, comments, and recommendations submitted by each Federal department or agency head, governor, interstate agency, and United States section of an international commission are transmitted to the council with the plan, portion, or revision. Submits to the council at the time of submitting the plan, any recommendations it may have for continuing the functions of the commission and for implementing the plan, including means of keeping the plan up to date. For the purpose of carrying out these provisions, each river basin commission may hold such hearings, sit and act at such times and places, take such testimony, receive such evidence and print or otherwise reproduce and distribute so much of its proceedings and reports thereon as it may deem advisable.
Under title III of the Act, in recognition of the need for increased participation by the States in water and related land resources planning, there are authorized to be appropriated to the council for the next fiscal year beginning after the date of enactment of the Act, and for the nine succeeding fiscal years thereafter, $5,000,000 in each such year for grants to States to assist them in developing and participating in the development of comprehensive water and related land resources plans. The funds appropriated for any fiscal year for grants to States are to be allotted among the participating States as follows: Fifteen percent of the funds are allotted to the States on the basis of the ratio of the population of the State to the population of all the States. For the purpose of this part the population of the State is determined on the basis of the latest official estimate of the U.S. Department of Commerce available on or before January 1 preceding the fiscal year for which funds are appropriated; fifteen percent of the funds are allocated to the States on the basis of the ratio of the land area of a State to the total land area of all the States; thirty percent of the funds are allotted to the States on the basis of the ratio that the reciprocal of its per capita income bears to the sum of the reciprocals for all the States. Per capita income is computed as the average of the most recent 3 years of official U.S. Department of Commerce information; and forty percent of the funds is allotted to the States according to the need for comprehensive water and related land resources planning programs in each State, as determined by the council. From each State's allotment for any fiscal year the council pays to each State an amount which is not more than 50 percent of the cost of carrying out its State program, including the cost of training personnel for carrying out such program and the cost of administering such program.

The council approves any program for comprehensive water and related land resources planning which is submitted by a State, if such program provides for comprehensive planning with respect to intrastate or interstate water resources, or both, in such State that meets the needs for water and water-related activities taking into account prospective demands for all purposes served through or affected by water and related land resources development, with adequate provision for coordination with all Federal, State, and local agencies, and non-governmental entities having responsibilities in affected fields; provides, where comprehensive statewide development planning is being carried on with or without assistance under section 701 of the Housing Act of 1954, or under the Land and Water Conservation Fund Act of 1965, for full coordination between comprehensive water resources planning and other State development planning programs and for assurances that such water resources planning and other State development planning are in conformity with the general development policy in such State; designates a State agency to administer the program; and provides State training of personnel, where necessary, to develop additional technical planning capability. "Comprehensive water and related land resources planning" as applied to the State planning effort, means those activities, investigations, and studies necessary for making decisions relating to the conservation, control, development, or use, including floodplain management, preservation as well as development, or water and related land within a State or a region, intrastate or interstate in nature; which consider the potential for all water and related land resource use from the standpoint of present and future need; and which include provision for participation by all public and private agencies or interests that may affect or be affected by resource management. Such planning may include the process of selecting between alternate proposals and may consider institutional changes leading to implementation of the selected plan.

Organization of Council

The office of the water resources council is composed of the water resources council, the chairman of the water resources council, the water resources council staff headed by an executive director, and field organizations within its jurisdiction. The following Federal agencies have full membership on the council: department of the interior; department of agriculture; department of the army; department of health, education and welfare; department of transportation; and Federal power commission. The following Federal agencies have associate membership on the council: department of commerce; department of housing and urban development; and environmental protection agency. The following Federal agencies are observers to the council: attorney general, office of management and budget and council on environmental quality. The secretary of the interior has been designated by the president to serve as chairman of the council.

The council staff is employed, assigned duties and responsibilities, and supervised by the executive director who also serves as chairman of representatives in council meetings. Field organizations are established by or operate under the council and include field committees formerly under the inter-agency committee on water resources and the offices of the chairman of Federal-State river basin commissions. The council headquarters is located in Washington, D.C.

The organization of the council is designed to assure that council members will meet at least quarterly and consider and decide major matters. It provides that representatives of council members together with the executive director can take action when necessary and appropriate and, after consideration, submit recommendations to the council members on matters requiring their action. It also provides that the council members shall be continuously advised of the actions of their representatives and the council staff.

The organization chart for the council is shown in figure 16. The professional staff of the council in April 1971 was 18 in number. In fiscal year 1970, the council's budget authority was $3,925,000 and outlays were $3,528,000.

Studies

The atomic energy commission was established by the atomic energy Act of 1946, as amended by the atomic energy Act of 1954, as amended. The purpose of the atomic energy Act is to provide by National policy that the development, use, and control of atomic energy shall be directed to make the maximum contribution to the general welfare and to the common defense and security, and to promote world peace, increase the standard of living, and strengthen free competition in private enterprise. The atomic energy commission has been established to provide and administer programs and to encourage private participation in such programs for research and development, international cooperation, production of atomic energy and special nuclear materials, and the dissemination of scientific and technical information. The commission has responsibility to protect the health and safety of the public, and to regulate the control and use of source, byproduct, and special nuclear materials.

The commission is composed of five members appointed by the president by and with the advice and consent of the senate. One of the members is designated by the president as the chairman. Total expenditures by the commission in fiscal year 1970 were $2,453,102,000.

The Federal power commission is an independent regulatory agency operating under the federal power Act, as amended, which was originally enacted as the Federal water power Act on June 10, 1920, and subsequently amended by title II of the public utility Act of 1935, and the natural gas Act, enacted June 21, 1938, as amended. Additional responsibilities relating to the statutory functions of the commission have been assigned by other legislation and by executive order.

The Federal power commission regulates the interstate aspects of the electric power and natural gas industries. The commission consists of five commissioners, appointed by the president with the advice and consent of the senate, serving 5-year terms. The chairman is designated by the president from among the members and is the principal executive officer. He is responsible for executive and administrative functions except those which, because of their program importance, are performed by the entire commission.
The commission issues permits and licenses for non-Federal hydroelectric power projects; regulates the rates and other aspects of interstate wholesale transactions in electric power and natural gas; and issues certificates for interstate gas sales and construction and operation of interstate pipeline facilities.

In addition, the commission prescribes and enforces a uniform system of accounts for regulated electric utilities and natural gas companies, except for independent producers of natural gas.

To assure an abundant supply of electric energy throughout the United States with the greatest possible economy and with regard for the proper utilization and conservation of natural resources, the commission has the power and directive to divide the Nation into regional districts for the voluntary interconnection and coordination of facilities for the generation, transmission, and sale of electric energy. It has the duty to promote and encourage interconnection within and between these districts. The commission also regulates the securities, mergers and consolidations, acquisitions, and accounts of electric utilities.

The commission studies plans for dams proposed by other Federal agencies and makes recommendations concerning the installation of penstocks and similar facilities for the development of hydroelectric power. The commission is responsible for allocating the costs of certain Federal projects, and determination of headwater benefit charges against owners of non-Federal water power projects benefited by upstream improvements built by the U.S. or other licensees.

The commission has review functions of rates for the sale of electric power from certain Federal hydroelectric projects. In addition, it participates with other agencies in coordinating the development and utilization of the Nation's water and related land resources.

Under the natural gas Act, the commission can direct pipeline companies to supply natural gas to local distributors. Commission authorization is required for the abandonment of facilities or the discontinuance of service.

The commission collects information on the entire electric power industry and on natural gas companies subject to its jurisdiction.

The commission also regulates the exportation of electric energy and the exportation and importation of natural gas, and issues permits for border facilities for these transactions.

The commission's expenditures in fiscal year 1970 totaled $17,910,000.

**Interstate Commerce Commission**

The interstate commerce commission was created as an independent establishment by the Act to regulate commerce, of February 4, 1887, now known as the Interstate Commerce Act. The commission's authority has been strengthened and the scope of its jurisdiction has been broadened by subsequent legislation, such as the Hepburn Act, the Panama Canal Act, the Motor Carrier Act of 1935, and the Transportation Acts of 1920, 1940, and 1958.

The commission was created by Congress to regulate, in the public interest, carriers subject to the Interstate Commerce Act which are engaged in transportation, in interstate commerce, and in foreign commerce to the extent that it takes place within the United States. Surface transportation under the commission's jurisdiction includes railroads, truck companies, bus lines, freight forwarders, water carriers, oil pipelines, transportation brokers, and express agencies.

The commission's activities are directed by 11 commissioners, each appointed by the president of the United States and confirmed by the Senate. The commissioners serve staggered 7-year terms so that no more than two terms expire in any one year. Only six commissioners may be from the same political party. Commissioners may be reappointed.

The chairman is designated by the president from among the commissioners. The commissioners elect their own vice chairman annually. The other nine commissioners serve on one of three divisions: operating rights; rates, tariffs and valuation; and finance and service. The entire commission acts on matters of National transportation importance. The commission may delegate certain duties and functions to individual commissioners or to boards consisting of not less than three eligible employees. The three divisions function as appellate divisions for action on petitions for reconsideration or rehearing of decisions of divisions or boards of employees. The commission's staff is organized into 5 bureaus and 6 offices. The commission's field organization consists of 6 regional offices and 76 area offices.

In broad terms and within prescribed legal limits, the commission regulates transportation economics and service. In the transportation economic area, the commission settles controversies over rates and charges among competing and like modes of transportation, shippers and receivers of freight, passengers, and others. It rules upon applications for mergers, consolidations, acquisitions of control, and the sale of carriers and issuance of their securities. It prescribes accounting rules, awards reparations, and administers laws relating to railroad bankruptcy. It acts to prevent unlawful discrimination, destructive competition, and rebating. It also has jurisdiction over the use, control, supply, movement, distribution, exchange, interchange, and return of railroad equipment. Under certain conditions, it is authorized to direct the handling and movement of traffic over a railroad and its distribution over other lines of railroads.

In the transportation service area, the commission grants the right to operate to trucking companies, bus lines, freight forwarders, water carriers, and transportation brokers. It approves applications to construct and abandon lines of railroad, and it rules upon discontinuances of passenger train service.

Outlays for commission activities in fiscal year 1970 totaled $26,607,000.

**National Science Foundation**

The National science foundation was established by the National Science Foundation Act of 1950, and was given additional authority by the National Defense Education Act of 1958 and by the National Sea Grant College and Program Act of 1966. The foundation consists of the National Science Board of 24 members, a director, deputy director, and four assistant directors, each...
The fundamental purpose of the National science foundation is to strengthen research and education in the sciences in the United States.

Among the activities of the foundation are:

- The development and dissemination of information relating to scientific resources, including manpower, aimed at facilitating National decisions relating to strengthening the scientific effort of the Nation.
- The award of grants and contracts primarily to universities and other nonprofit institutions in support of scientific research. Awards include those made for small and large research projects, for the construction of laboratories or specialized facilities, and for generally strengthening an institution's scientific endeavors. This activity also includes support of concerted research efforts that are planned, coordinated, and funded on a National program basis because of the scope of the research being performed and its relationship to National goals.
- The support, through contracts, of National centers where large facilities are made available for the use of qualified scientists. At the present time, the foundation is supporting the Kitt Peak National observatory, the Cerro Tololo Inter-American observatory, the National radio astronomy observatory, and a National center for atmospheric research.
- Maintenance of a current register of scientific and technical personnel and provision of a central clearinghouse for data on the supply and needs for scientific and technical resources.
- The award of graduate fellowships in the mathematical, physical, medical, biological, engineering, and social sciences, and the provision of support for graduate student traineeship programs at educational institutions.
- Programs aimed at improving scientific education in the United States through providing support for: special institutes to improve the competence of teachers of science, mathematics, and engineering; projects to modernize materials of instruction and courses of study; and projects to afford opportunities for high-ability secondary school and college students to secure added scientific experiences.
- A program aimed at strengthening research, education, and training in oceanography and exploitation of the marine environment. This area includes the activities of the International decade of ocean exploration.
- Programs supporting the development and use of computer and other scientific methods and technologies.
- A program aimed at improving the coordination of the various scientific information activities within the Federal government; developing new or improved methods of making scientific information available; fostering the interchange of scientific information among scientists of the United States and foreign countries; and providing support for the translation of foreign scientific information.

The foundation's expenditures in fiscal year 1970 totaled $462,611,000.
tific research program on water problems. Subsequently, the president
directed his science advisor and the Federal council for science and
technology to:

..... review ongoing Federal research activities in the field of natural
resources and to determine ways to strengthen the total government research
effort relating to natural resources.

Accordingly, the director of the office of science and technology, who
is chairman of the FCST, established a task group on coordinated water resour­
ces research and gave it the following charge:

..... to identify the applied problems in water management and control
that require research by the Federal government, to prepare an inventory
of present research and development programs in terms of their relevance to
these applied problems, to develop policy considerations for an expanded
research program, to compile a proposed national program of water resources
research for fiscal year 1964, and to suggest a policy framework for any
needed new legislation and mechanisms for further interagency coordination.

In its report the task group called attention to the importance of co­
ordinating Federal water resources research and recommended that:

The responsibility for encouraging interagency planning and coordination
of research in water resources should be assigned to the office of science
and technology and the Federal council for science and technology. Coordi­
nation should be accomplished through a coordinating committee on water re­
sources research which would--

-- identify technical needs in various research categories;
-- devise programs and measures to meet these needs;
-- review the adequacy of the overall program in water resources re­
search;
-- identify desirable allocations of technical effort among the agencies;
-- review and make findings concerning the technical-manpower base of
the program;
-- recommend management policies to improve the quality and vigor of the
research effort; and
-- generally facilitate interagency communication at management levels.

Appropriate provision should be made for involving in the committee's
deliberations both technical personnel and managerial personnel conversant
with water resources operational problems and needs requiring research. The
committees should be assisted by technical panels having competence in the
various research categories. It should coordinate its efforts with those
of other committees and be cognizant of other research programs within the
Federal government that may affect water resources.

In late 1963, the Federal council for science and technology established
its committee on water resources research with the above objectives.

Federal Radiation Council

The council was established by executive order 10831 of August 14, 1959,
and by section 274h of the atomic energy Act of 1954, as amended on Septem­
ber 23, 1959. It consists of the secretaries of health, education, and wel­
fare; defense; commerce; and labor; and the chairman of the atomic energy
commission. The secretaries of agriculture and of the interior were added
to the council by presidential letters of August 16, 1962, and January 16,
1968, respectively. The function is to advise the president with respect
to radiation matters directly or indirectly affecting health, including
guidance to Federal agencies in the formulation of radiation standards and
in the establishment and execution of programs of cooperation with States.

Migratory Bird Conservation Commission

The commission was created by the migratory bird conservation Act of
February 18, 1929, to consider and pass upon any area of land and/or water
that may be recommended by the secretary of the interior for purchase or
rental for migratory bird refuges, and to fix a price at which such area
may be purchased or rented.

National Forest Reservation Commission

The commission was established by an Act of March 1, 1911, to consider
and pass upon lands recommended by the secretary of agriculture for acquisi
tion as National forests by purchase or exchange under the Act, and to fix
the consideration to be paid.

National Park Foundation

The foundation, a non-profit, tax exempt corporation, was established
by Act of December 18, 1967, to accept and administer gifts of any nature
for the benefit of or in connection with the National park service, its
activities or its services, thereby furthering the conservation of natural,
scenic, historic, scientific, educational, inspirational, or recreational
resources for future generations of Americans.

President's Science Advisory Committee

The committee was established by the president on April 20, 1951, within
the office of defense mobilization. The committee was reconstituted as the
president's science advisory committee and an enlarged membership was an­
ounced by the white house on November 22, 1957. Its transfer to the white
house was effective December 1, 1957. The purpose of the committee is to
advise the president in matters relating to science and technology. The
committee secretariat is provided by the office of science and technology.
National Water Commission

Introduction

The National water commission was created on September 26, 1968 to study the Nation's water needs and water problems, and to recommend improved National policies so that future needs for water and water related services may be efficiently met. The commission was allotted five years and was authorized an appropriation of $5 million to accomplish its mission; this is believed to be the largest allotment of money and time ever made available to an independent commission for studying water resources.

The commission's work has been divided into four phases (see "The National Water Commission, Annual Report for 1970, Interim Report No. 2," December 31, 1970. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.). The first, which defined the scope of the commission's entire effort, was completed early in 1970. The second phase, which develops the factual and analytic background for the commission's recommendations, began soon after the commission was created; it is now well advanced, and is scheduled for completion early in 1972. This phase includes work in twenty-two fields that have been marked for special study to provide the commissioners with essential information for their policy deliberations and to furnish necessary documentation for the final report. Some of these studies are compilations of existing information, while others are original contributions. In the third phase (which ends late in 1972) the commission will establish its position on major policy issues and will develop its recommendations. In the last phase (which ends in March 1973) the commission will draft its report, solicit the views of related governmental agencies, test public reaction, obtain the views and comments of the water resources council (as required by the National water commission Act), and submit its report to the president and the congress. During the remaining months of the commission's life (which ends on September 26, 1973), the commission will be available to advise and consult with the executive branch and the congress on how to implement its recommendations.

All the commission's interim and final reports will be published by the government printing office, and copies may be obtained from the superintendent of documents. The most important reports by the commission's staff, consultants, and contractors will be available from the U.S. national technical information service (formerly the clearinghouse for Federal scientific and technical information).

Membership

The commission is composed of seven members, who are appointed by the president and serve at his pleasure. The chairman of the commission (Charles F. Luce) exercises the executive and administrative powers of the commission, subject to general policies adopted by the commission. The commission is an independent body, and its members are forbidden by law from holding any other position with the U.S. government. The president designates a chairman of the commission from among its members. Members of the commission may each be compensated at the rate of $100 for each day such member is engaged in the actual performance of duties vested in the commission. Each member is reimbursed for travel expenses, including per diem in lieu of subsistence, as authorized for persons in the government service employed intermittently. All the commissioners serve on a part-time basis, and have other continuing occupations.

Charles F. Luce has been chairman of the commission since its inception. Mr. Luce is chairman of the board of trustees and chief executive office of the consolidated Edison company of New York. The six other members of the commission are:

Huwail Appling, Jr., president of the independent distributors of Portland, Oregon, and former secretary of State for the State of Oregon
James R. Ellis, partner in the Seattle law firm of Preston, Thorgrimson, Storin, Ellis and Holman; general counsel to the municipality of metropolitan government committees, section of local government law, American bar association; president of Forward Trust, Inc.
Roger C. Ernst, consultant on land and water to the Arizona public service company; formerly assistant secretary of the interior
Ray K. Linsley, professor of hydraulic engineering and director of engineering-economic planning, Stanford university; formerly head hydrologie engineer for the U.S. weather bureau
James E. Murphy, partner in the Kalinepall, Montana, law firm of Murphy, Robinson, Heckathorn and Phillips; chairman of the legal committee of the Columbia Interstate Compact commission; chairman of the judiciary committee of the Montana house of representatives; and formerly a member of the Pacific Northwest River Basin commission
Josiah Wheat, partner in the law firm of Wheat, Wheat and Stafford in Woodville, Texas; president of the Texas water conservation association; and immediate past president of the Texas State Bar.

There are five past commissioners: Samuel S. Baxter (water commissioner for the city of Philadelphia, chief engineer of the Philadelphia water department, and current national president of the American Society of Civil Engineers), Frank C. Di Luccio (a business executive and former assistant secretary of the interior), Clyde T. Ellis (attorney and consultant in Washington, D.C., and former general manager of the national rural electric cooperative association), Russel E. Train (now chairman of the council on environmental quality), Byron A. Wright (a member of the board of directors of the new government postal corporation, and chairman of the board of humble oil and refining).

Duties and Powers

According to the Federal National water commission Act of 1968, Public Law 90-515, the commission shall (1) review present and anticipated National water resource problems, making such projections of water requirements as may be necessary and identifying alternative ways of meeting these requirements--giving consideration, among other things, to conservation and more efficient use of existing supplies, increased usability by reduction of pollution, innovations to encourage the highest economic use of water, interbasin transfers, and technological advances including, but not limited to, desal-
The commission consults with the water resources council regarding its studies and furnishes its proposed reports and recommendations to the council for review and comment. The commission submits simultaneously to the President and to the United States Congress such interim and final reports as it deems appropriate, and the council submits simultaneously to the President and to the United States congress its views on the commission's reports. The president will transmit the commission's final report to the congress together with such comments and recommendations for legislation as he deems appropriate.

The commission may (1) hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as it may deem advisable; (2) acquire, furnish, and equip such office space as is necessary; (3) use the United States mails in the same manner and upon the same conditions as other departments and agencies of the United States; (4) without regard to the civil services law and regulations and without regard to 5 U.S.C., Ch. 51, employ and fix the compensation of such personnel as may be necessary to carry out the functions of the commission; (5) procure services as authorized by 5 U.S.C., sec. 1309, at rates not to exceed $100 per diem for individuals; (6) purchase, hire, operate, and maintain passenger motor vehicles; (7) enter into contracts or agreements for studies and surveys with public and private organizations and transfer funds to Federal agencies and river basin commissions created pursuant to title II of the water resources planning Act to carry out such aspects of the commission's functions as the commission determines can best be carried out in that manner; and (8) incur such necessary expenses and exercise such other powers as are consistent with and reasonably required to perform its functions under this title.

The commission may, to the extent practicable, utilize the services of the Federal water resource agencies. Upon request of the commission, the head of any Federal department or agency or river basin commission created pursuant to title II of the water resources planning Act is authorized (1) to furnish to the commission, to the extent permitted by law and within the limits of available funds, including funds transferred for that purpose pursuant to section 4(a)(7) of the Act, such information as may be necessary for carrying out its functions and as may be available to or procurable by such department or agency; and (2) to detail to temporary duty with the commission on a reimbursable basis such personnel within his administrative jurisdiction as it may need or believe to be useful for carrying out its functions, each such detail to be without loss of seniority, pay, or other employee status.

Staff and Budgets

The commission has an executive director, who is appointed by the chairman with the approval of the commission and is compensated at the rate determined by the U.S. civil service commissioners. The executive director has such duties and responsibilities as the chairman may assign. The executive director is Theodore M. Schad, who was senior specialist in engineering and public works and deputy director of the legislative service of the Library of Congress before he assumed his duties with the commission. Mr. Schad had been staff director of the Senate Select Committee on Natural Resources, examiner for water resources programs in the bureau of the budget, and civil engineer on the staff of the bureau of reclamation and the army corps of engineers.

The staff supports the commissioners in reviewing the Nation's current and expected water resource problems and in developing material for the commissioners' policy deliberations. Since the commissioners serve on a part-time basis, the staff provides continuity for the commission's operations. The professional staff includes thirty ecologists, economists, engineers, lawyers, planners, and social scientists. The three principal technical groups are the engineering and environmental sciences division, the legal division, and the social and behavioral sciences division. The forecast division is an ad hoc technical group, and continuing support is rendered by the administrative division. The commission is also assisted by consultants, panels of experts, and contractors.

By the end of June, 1971 (the end of fiscal year 1971), the commission will have obligated $3,050,000; a balance of $1,960,000 will then be available for appropriation to complete the commission's work. The commission's expenses are summarized in the following table:

<table>
<thead>
<tr>
<th>Obligations by Fiscal Year (Figures in $1,000's)</th>
<th>1969</th>
<th>1970</th>
<th>1971 Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioners: Salaries</td>
<td>7</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Consultants: Salaries</td>
<td>4</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>Staff: Salaries</td>
<td>58</td>
<td>384</td>
<td>773</td>
</tr>
<tr>
<td>Study Contracts</td>
<td>11</td>
<td>289</td>
<td>877</td>
</tr>
<tr>
<td>Other Operating Costs: Equipment,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>furniture, printing, rent, travel, and other costs</td>
<td>70</td>
<td>198</td>
<td>191</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td>150</td>
<td>1,009</td>
<td>1,881</td>
</tr>
</tbody>
</table>

1/ Includes $41,000 carried over from fiscal year 1970.

Meetings

The commission is involved with three types of meetings. The regular meetings of the commissioners are the occasion for conferences among the commissioners and staff, during which the commission reviews work by the staff, its consultants, contractors, and panel members; and for inspection trips to water projects of exceptional relevance to the commission's work. The panel meetings provide expert and independent interdisciplinary analysis of the commission's studies, as well as recommendations and guidance from acknowledged authorities in all the principal disciplines that pertain to water policy and planning. At public and professional meetings, the commissioners and the staff present the commission's work to the professional community for discussion and informed comment, and bring the commission's
plans and programs before the general public.

There have been ten regular meetings of the commission during 1970: the nineteenth through the twenty-eighth meetings, one each month except August and December. Eight of these ten meetings were held in and around Washington, D.C., usually at the commission's headquarters in Arlington, Virginia.

The commissioners and members of its staff participate in many public and professional meetings so that the commission may keep the public informed of its activities and many benefit from comments, criticisms, and recommendations. In 1970, the members of the commission and its staff participated in more than thirty meetings, including those sponsored by the American society of America, the American water works association, the conference of State and Federal water officials; and the western States water council. The commission has also been represented at several seminars and colloquia sponsored by universities and by such governmental agencies as the Federal power commission and the National bureau of standards.

Special Studies

The commission has awarded forty contracts for research and analysis on six types: socioeconomic forecasts, impact of future technological advances on water supplies and use, political science and economics, ecological and environmental studies, water management, and water law. All these contracts apply to the commission's program of twenty-two special studies, which provide background for the matters that the commissioners must deliberate upon.

To provide expert, independent review and guidance on its studies, the commission has established six panels: ecological and environmental institutional arrangements, water resource planning, water pollution control, forecast procedures, and waste heat disposal. The panels meet irregularly, only as the occasion demands, for discussion and analysis of major interdisciplinary problems. The individual panelists are all consultants to the commission, and may be called upon in this capacity too. While the panels are convened for interdisciplinary analysis a few times during the life of the commission, consultants are called on whenever the occasion demands.

Work in twenty-one of the twenty-two areas marked for special study is now under way, and several reports are nearing completion. Special Study No. 1 will secure the opinions of experts on technological developments that might substantially modify future needs for water and water development. Special Study No. 2 calls for a forecast of changes in the life styles of the general public, and the effect of these changes on future water development. The staff is now formulating a study plan that will include a contract for part of the work. Special Study No. 3 is concerned with forecasting regional and National water needs to clarify the consequences of possible National policies and future technological developments; the results of Special Study No. 1 will establish the basis for the latter. Several sets of demographic, economic, and hydrologic data will be processed to determine the sensitivity of the forecasting techniques to them. To the fullest extent possible, the studies will be conducted with the cooperation of the water sources council. Special Study No. 4 will provide basic information on the values--not just economic values--of using water for various purposes in different regions. The results will be used to judge the desirability of chang-
gions; and legal aspects of ground water management, interbasin transfers, weather modification, water pollution, flood plain regulations, resolution of conflicts between environmental and developmental values, and recognition of new water values. Study No. 20 will show how future water policies can affect the Nation’s reserves of trained manpower—technicians, scientists, engineers, and administrators. It will attempt to define the manpower requirements of various policies (such as stringent legislation against water pollution), and will recommend training programs for meeting these requirements.

Special Study No. 21 is based on a critical review of the Nation’s program of water pollution control—Federal, State, regional, and local. Special Study No. 22 is providing information on public participation in the formulation of water policies and plans; the results will be used to draft recommendations for increasing public knowledge and involvement.

Citizen's Advisory Committee on Environmental Quality

In 1958, congress and president Eisenhower established the outdoor recreation resources review commission. The commission’s report of 1962 stressed the need for environmental quality in the everyday lives of people in both urban and rural areas. The report led to enactment of substantial new legislation, including the bureau of outdoor recreation, the wilderness Act, and the land and water conservation fund, which has provided over one-half billion dollars for new parks and recreation facilities in States.

In 1965 a White House conference on natural beauty focused increased National attention upon a variety of environmental factors—the townscape, water and air pollution, open space, wild rivers, highway location and design, undergrounding of utility lines, and numerous others. Many States followed up with similar conferences of their own.

The citizens’ advisory committee on recreation and natural beauty was established by president Johnson in 1966. It identified key environmental issues, and a number of its recommendations were adopted. But in spite of substantial progress, the committee felt that environmental considerations were still not being given sufficient weight in the Federal government. In its 1968 report it said:

“Nowhere within the Federal structure is there a clearly defined responsibility for environmental quality control...No single entity within the Federal structure can be counted on to weigh each decision or measure each new program objective against the impact that it will have on the natural environment. Federal programs are still being advanced with very little understanding of their impact upon the environment; some Federal projects are still going forward in full knowledge that they are disruptive or destructive of some element of man’s ecology or some irreplaceable value of his environment.”

Soon after taking office in 1969 president Nixon established by executive order the cabinet-level environmental quality council, which he personally chaired, and reconstituted the citizens' committee as the citizens' advisory committee on environmental quality. The new citizens’ committee submitted its first report to the president and the council in August 1969.

On January 1, 1970, president Nixon approved the National environmental policy Act which established a three-member council on environmental quality. He appointed Russell E. Train as Chairman, Robert Cahn and Gordon J. MacDonald as members and abolished the original environmental quality council. The statute provides that the new council consult with the citizens' advisory committee on environmental quality.

Since its August 1969 Report, the committee has held five meetings in Washington, one in San Francisco. The latter provided an opportunity to obtain first-hand knowledge of environmental problems in a particular region, and there are plans to hold some future meetings in other parts of the country.

As a means of focusing efforts on specific problem areas and permitting individual members to concentrate on subjects of particular interest to them, the committee, at its August 1970 meeting, established the following five sub-committees: land use planning and population distribution; water and air pollution; solid waste recycling and disposal environmental education, ethics, and ecology; and priorities and financing. At the March 1971 meeting another subcommittee was created to deal with the problems of energy (see Citizens’ Advisory Committee on Environmental Quality, Report to the President and to the Council on Environmental Quality, April 1971. 1700 Pennsylvania Ave., Washington, D.C.).

Meeting between sessions of the full committee, the subcommittees review problems in greater depth than is possible with the larger group and prepare reports and recommendations for consideration by the full committee.

Since publication of the committee’s 1969 report, President Nixon has appointed the following new members of the committee:

Henry L. Kiamond, Albany, New York
Rene J. Dubos, New York, New York
Jean Fassler, Redwood City, California (reappointed)
Arthur Godfrey, Leesburg, Virginia
A. Wesley Hodge, Seattle, Washington
Governor Tom McCall of Oregon
Willard F. Rickwell Jr., Pittsburgh, Pennsylvania
Lelan F. Sillin, Jr., Hartford, Connecticut
Thaddeus F. Walkowicz, New York, New York
Pete Wilson, San Diego, California

On August 1, 1970, Lawrence M. Stevens, formerly associate director of the bureau of outdoor recreation in the department of the interior, became executive director of the committee. At the same time Miss Linda K. Lee became counsel to the committee. In December 1970, Noel W. Beyle was appointed assistant director.

In early 1970 the committee published two reports entitled “A New Approach to the Disposal of Liquid Waste,” and “Community Action for Environmental Quality.”
The National Academy of sciences was established by an act of congress approved by president Abraham Lincoln on March 3, 1863. In 1916 president Woodrow Wilson asked the academy to organize, under the terms of its charter, the National research council as a measure of National preparedness. The research council was perpetuated by the academy on April 29, 1919, in response to a further request from president Wilson, and operates in accordance with executive order 2859 of May 11, 1918, as amended by executive order 10668 of May 10, 1956.

The National academy of engineering was established on December 5, 1964, when the council of the National academy of sciences, under the authority of its Act of incorporation, adopted Articles of organization bringing the new academy into being as a parallel organization, autonomous in its organization and election of members and closely coordinated with the academy of sciences in its advisory activities.

The National academy of sciences (NAS) is an organization of distinguished scientists and engineers dedicated to the furtherance of science and its use for the general welfare. Although not a governmental agency, the academy has long enjoyed close relations with the Federal government. Its congressional charter of 1863 specifies that "...the academy shall, whenever called upon by any department of the government, investigate, examine, experiment, and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments, and reports to be paid from appropriations which may be made for the purpose, but the academy shall receive no compensation whatever for any service to the government of the United States...."

The National academy of engineering (NAE) shares the objectives and responsibilities of the NAS by bringing to bear the leadership of the nation's most eminent engineers in sponsoring engineering programs aimed at meeting National needs, encouraging engineering research, and advising the Federal government upon request in matters of engineering.

The National research council (NRC) was organized by the NAS to facilitate the participation of a broader representation of scientists and technologists in carrying out its objectives. The NRC now serves the NAS in a similar capacity and has become, in effect, the principal operating agency for both academies. As outlined in executive order 10668, the purpose of the council is to stimulate research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the National defense, and of contributing in other ways to the public welfare.

The National academy of sciences comprises 18 sections: mathematics, astronomy, physics, engineering, chemistry, geology, botany, zoology, physiology, microbiology, anthropology, psychology, geophysics, biochemistry, applied biology, physical and mathematical sciences, and genetics. A maximum of 50 members, who must be United States citizens, and 10 foreign associates may be elected annually by the current membership in recognition of continuing achievement in scientific or technological research. As of July 1, 1969, the academy had 842 members, 5 members emeriti, and 103 foreign associates.

The National academy of sciences, bearing full legal responsibility for the activities of the academy and the research council, vests authority for the general conduct of its affairs in the council of the academy, consisting of the five elected officers of the academy and 12 other elected members. An election of officers and councillors is held annually.

The National academy of engineering had 329 members as of April 1, 1970; members are elected for their outstanding contributions to engineering theory and practice or to the pioneering of new and developing fields of technology. Authority with respect to the funds, activities, policies, and purposes of the NAE is vested in a council of 16 members, including the president and vice president of the NAE, the president of the NAS and the vice chairman of the NRC as ex officio members. Officers and councillors are elected every fourth year.

The members of the National research council, about 400, are appointed by the president of the NAS from academic, industrial, and government organizations throughout the country, following nomination by the various groups. The council is organized into the following divisions: behavioral sciences, biology and agriculture, chemistry and chemical technology, earth sciences, engineering, mathematical sciences, medical sciences, and physical sciences. A chairman, appointed by the NAE council, presides over the activities of each division. The eight chairmen, meeting jointly with the council of the NAS, the executive committee of the NAE, and the chairman of the advisory committee to the NRC office of scientific personnel, comprise the governing board which provides guidance in the planning of a program for the overall organization. The president of the NAS, as chairman of the research council, presides in the governing board; he is aided by a vice chairman designated by the NAE.

The NRC program is carried out by bringing together in appropriate groups the most competent scientists and engineers in the country to deal broadly with scientific and engineering problems and to exchange information in the furtherance of research. The undertakings vary widely in nature and in duration and type of effort required; the patterns of organization are kept flexible to permit each problem to be approached in a suitable manner. Work is carried on through permanent boards and institutes, committees, subcommittees, and panels, as well as ad hoc groups for special purposes. Most of these units are assigned to one or another of the eight divisions of the research council and receive general guidance from the appropriate division chairman. The office of scientific personnel, office of the foreign secretary, and office of documentation deal with problems in those areas common to all the sciences. A staff of about 850, including more than 275 professional, executive, and senior administrative employees, is maintained in Washington.

The research council does not maintain laboratories of its own but seeks to stimulate and support the work of individual scientists and engineers and to coordinate investigations dealing with broad problems in research both nationally and internationally. These purposes are carried out through a variety of means, including conferences, technical committees, surveys, collection and collation of scientific and technical data, the sponsorship of scientific and technical publications and research organi-
zations, and the administration of public and private funds for research
projects and fellowships. The research council provides unique means for
organizing attacks on scientific and engineering problems which involve
many specialized fields and for obtaining disinterested and objective
assessments of problems for groups representing dissimilar or conflicting
interests. The effectiveness of the research council is dependent on the
personal participation of thousands of American scientists and engineers
who collaborate in these undertakings, giving generously of their time and
effort without financial compensation.

The organization directly administers several million dollars annually
of funds provided by contributions, grants, and contracts from Federal and
State agencies, private industries and foundations, scientific societies,
and individuals for support of its committees and conferences, research
projects and fellowships—a small portion of which is used to supplement
endowment income and gifts in meeting general expenses.

President’s Departmental
Reorganization Program

President Nixon proposed reform of the Federal government in his State
of the Union message on January 22, 1971 (see "The Case for Executive Re-
organization - Reform Removal for the 70's", The Domestic Council, Execu-
tive Office of The President, Washington, D.C., 1971). He proposed the
creation of four new departments to replace the existing departments of
agriculture; commerce; health, education, and welfare; housing and urban
development; interior; labor and transportation. The president based his
proposals on recommendations from the Ash council, from his own domestic
council, and from previous presidential task forces on organization.

The Need for Executive Reorganization

The following are excerpts from president Nixon’s message to congress
on March 25, 1971, in which he called for a broad reorganization of the
Federal government:

"As we reflect on organizational problems in the Federal government
today, one seems to stand out above all others: the fact that the capacity
to do things—the power to achieve goals and to solve problems—is exceedingly
fragmented and broadly scattered throughout the Federal establishment. In
addressing almost any of the great challenges of our time, the Federal
government finds itself speaking through a wide variety of offices and
bureaus, departments, and agencies. Often these units trip over one another
as they move to meet a common problem. Sometimes they step on one another’s
toes. Frequently, they behave like a series of fragmented fiefdoms unable
to focus Federal resources or energies in a way which produces any concen-
trated impact.

Consider these facts: nine different Federal departments and 20 in-
dependent agencies are now involved in educational matters; several depart-
ments and eight independent agencies are involved in health; in many major
cities, there are at least 20 or 30 separate manpower programs funded by a
variety of Federal offices; three departments help develop our water re-
sources, and four agencies in two departments are involved in the manage-
ment of public lands; Federal recreation areas are administered by six
different agencies in three departments of the government; seven agencies
provide assistance for water and sewer systems; and six departments of
the government collect similar economic information—often from the same sources—
and at least seven departments are concerned with international trade.

While we cannot eliminate all of this diffusion, we can do a great
deal to bring similar functions under common commands. It is important
that we move boldly to consolidate the major activities of the government.

The programmatic jumble has already reached the point where it is vir-
tually impossible to obtain an accurate count of just how many Federal
grant programs exist. Some estimates go as high as 1,500. Despite impres-
sive attempts by individual legislators and by the office of economic oppor-
tunity, there is still no agreement on a comprehensive list. Again and
again I hear of local officials who are unable to determine how many Federal
programs serve their areas or how much Federal money is coming into their communities. One reason is that the assistance comes from such a wide variety of Federal sources.

What are the consequences of this scattering of Federal responsibility? There are many:

In the first place, the diffusion of responsibility makes it extremely difficult to launch a co-ordinated attack on complex problems. It is as if the various units of an attacking army were operating under a variety of highly independent commands. When one part of the answer to a problem lies in one department and other parts lie in other departments, it is often impossible to bring the various parts together in a unified campaign to achieve a common goal.

Even our basic analysis of public needs often suffers from a piecemeal approach. Problems are defined so that they will fit within established jurisdictions and bureaucratic conventions. And the results of government action are typically measured by the degree of activity within each program rather than by the over-all impact of related activities on the outside world.

The role of a given department in the policy-making process can be fundamentally compromised by the way its mission is defined. The narrower the mission the more likely it is that the department will see itself as an advocate within the administration for a special point of view. When any department or agency begins to represent a parochial interest, then its advice and support inevitably become less useful to the man who must serve all of the people as their president. Even when departments make a concerted effort to broaden their perspectives, they often find it impossible to develop a comprehensive strategy for meeting public needs.

Not even the best planners can set intelligent spending priorities, for example, unless they have an opportunity to consider the full array of alternative expenditures. But if one part of the problem is studied elsewhere, who decides which element is more important? If one office considers one set of solutions and a separate agency investigates another set of solutions, who can compare the results?

Too often no official below the very highest levels of the government has access to enough information to make such comparisons wisely. The result is that the government often fails to make a rational distribution of its resources among a number of program alternatives.

Divided responsibility can also mean that some problems slip between the cracks and disappear from the government's view. Everybody's business becomes nobody's business, and embarrassing gaps appear which no agency attempts to fill. At other times, various Federal authorities act as rivals, competing with one another for the same piece of "turf". Sometimes one agency will actually duplicate the work of another. For instance, the same locality may receive two or more grants for the same project. On other occasions, Federal offices will actually find themselves working at cross-purposes with one another: One agency will try to preserve a swamp, for example, while another is seeking to drain it.

In an effort to minimize such problems, government officials must spend enormous amounts of time and energy negotiating with one another that should be directed toward meeting people's needs. And even when they are able to work out their differences, officials often reach compromise solutions which merely represent the lowest common denominator of their original positions. Bold and original ideas are thus sacrificed in the quest for intragovernmental harmony. Scattered responsibility also contributes to the overcentralization of public decision making. Because competing offices are often in different chains of command, it is frequently impossible for them to resolve their differences except by referring them to higher authorities—a process which can mean interminable delays.

In an attempt to provide a means for resolving such differences and for providing needed co-ordination, an entire new layer of bureaucracy has emerged at the interagency level. Last year, the office of management and budget counted some 850 interagency committees. Even so, there are still many occasions when only the White House can resolve such interjurisdictional disputes. Too many questions thus surface at the presidential level that should be resolved at levels of government closer to the scene of the action.

Inefficient organization at the Federal level also undermines the effectiveness of State and local governments: mayors and governors waste countless hours and dollars trying to get along with a variety of Federal offices, each with its own separate procedures and its own separate policies. Some local officials are so perplexed by the vast array of Federal programs in a given problem area that they miss out on the very ones that would be most helpful to them. Many State and local governments find they must hire expensive specialists to guide them through the jungle of the Federal bureaucracy. If it is confusing for lower levels of government to deal with the maze of Federal offices, that challenge can be even more bewildering for individual citizens.

Whether it is a doctor seeking aid for a new health center, a businessman trying to get advice about selling in foreign markets, or a welfare recipient going from one office to another in order to take full advantage of Federal services, the people whom the government is supposed to be serving are often forced to weave their way through a perplexing obstacle course as a condition of receiving help.

Perhaps the most significant consequence of scattered responsibility in the executive branch is the holding effect it has on elected leadership and therefore on the basic principles of democratic government. In our political system when the people identify a problem, they elect to public office men and women who promise to solve that problem. If those leaders succeed, they can be re-elected; if they fail, they can be replaced.

Elections are the people's tool for keeping government responsive to their needs. This entire system rests on the assumption, however, that elected leaders can make the government respond to the people's mandate. Too often this assumption is wrong. When lines of responsibility are tangled and as ambiguous as they are in many policy areas, it is extremely difficult for either the congress or the president to see that their intentions are carried out.
If the president or the congress wants to launch a program or change a program or even find out how a program is working, it often becomes necessary to consult with a half dozen or more authorities, each of whom can blame the others when something goes wrong. It is often impossible to delegate to any one official the full responsibility for carrying out a specific mandate since the machinery for doing that job is divided among various agencies. As a result, there is frequently no single official even at the cabinet level—whom the president or the congress can hold accountable for government's success or failure in meeting a given need.

No wonder bureaucracy has sometimes been described as "the rule of no one." No wonder the public complains about programs which simply seem to drift. When elected officials cannot hold appointees accountable for the performance of government, then the voters' influence on government's behavior is also weakened.

The American people clearly pay a very high price for the incapacities of governmental structures—one that is measured in disappointment, frustration and wasted tax dollars. But how did things get this way? What happened, essentially, was that the organization of government—like the grant-in-aid programs which I have discussed in my special messages to the congress concerning revenue sharing—grew up in a haphazard, piecemeal fashion over the years. Whenever government took on an important new assignment or identified an important new constituency, the chances were pretty good that a new organizational entity would be established to deal with it.

Unfortunately, as each new office was set up, little or no attention was given to the question of how it would fit in with the old ones. Thus, office was piled upon office in response to developing needs: When new needs arose and still-newer units were created, the older structures simply remained in place. Of the 12 executive departments now in existence, only five can trace their origins to the beginnings of our country. The departments of state and treasury were set up in 1789; so was the war department—the predecessor of the department of defense. The positions of attorney general and postmaster general were also established in 1789, though it was not until later that the departments they head were set up in their present form.

One of these five units, the post office department, will soon become an independent corporation. But under my proposals the other four "original" departments would remain intact. It is the seven newer departments of the government which would be affected by the changes I recommend. These seven departments were set up to meet the changing needs of a growing nation—needs which have continued to change over the years.

The department of the interior, for example, was established in 1849 to deal with newly opened western lands and especially with the Indians who inhabited them. The department of agriculture was also added in the nineteenth century at a time when the overwhelming majority of our people were directly affected by the tremendous expansion of agricultural enterprises.

In the early years of the twentieth century, in a time of rapid and unsettling industrial growth, the department of commerce and labor was set up. The labor department was split off from it in 1913 in response to feelings that labor was suffering from an imbalance of power and needed additional influence.

The three newest departments of the government—health, education and welfare; housing and urban development and transportation—were all created after World War II. Each represented a first step toward bringing together some of the new Federal offices and agencies which had proliferated so rapidly in recent decades.

As we look at the present organization of the Federal government we find that many of the existing units deal with methods and subjects rather than with purposes and goals. If we have a question about labor we go to the labor department, and if we have a business problem we go to the commerce department. If we are interested in housing we go to one department, and if we are interested in highways we go to another. The problem is that as our society has become more complex we often find ourselves using a variety of means to achieve a single set of goals. We are interested, for example, in economic development—which requires new markets, more productive workers and better transportation systems. But which department do we go to for that? And what if we want to build a new city with sufficient public facilities, adequate housing and decent recreation areas? Which department do we petition then?

We sometimes seem to have forgotten that government is not in business to deal with subjects on a chart but to achieve real objectives for real human beings. These objectives will never be fully achieved unless we change our old ways of thinking. It is not enough merely to reshuffle departments for the sake of reshuffling them. We must rebuild the executive branch according to a new understanding of how government can best be organized to perform effectively.

Ever since the first settlers stepped upon our shores more than three centuries ago a central question of the American experience has been: How do we best organize our government to meet the needs of the people? That was the central question as the colonists set up new governments in a new world. It was the central question when they broke from their mother country and made a new nation. It was the central question as they wrote a new constitution in 1787. And at each critical turning point since that time it has remained a dominant issue in our national experience.

In the last 40 years, as the Federal government has grown in scope and complexity, the question of how it should be organized has been asked with even greater intensity and relevance. During this time, we have moved to formulate responsive answers to this question in an increasingly systematic manner. Searching studies of government management and organization have been made under virtually every national Administration since the 1930's, and many needed reforms have resulted. What is now required, however, is a truly comprehensive restructuring of executive organization—one that is commensurate with the growth of the nation and the expansion of the government.

In the last 20 years alone, our population has increased by one third and the Federal budget has quintupled. In the last two decades, the number of Federal civilian employees has risen by almost 30 percent and the domestic programs they administer have multiplied tenfold. Three executive departments and 14 independent agencies have been tackled on the Federal organization chart during that brief span. Yet it still is the same basic organization chart that has set the framework of governmental action for
decades. While there have been piecemeal changes, there has been no fundamental overhaul. Any business that grew and changed so much and yet was so patient with old organizational forms would soon go bankrupt. The same truth holds in the public realm: Public officials cannot be patient with outmoded forms when the people have grown so impatient with government."

The Proposed Department of Natural Resources


Rationale for the New Department

Federal natural resource programs have developed historically on a piecemeal basis in response to problems, specific needs, various pressures and urgencies over a long period. This has resulted in programs scattered among agencies with overlaps, duplications, inefficiencies, and also voids. Examples of this scattered array of agency responsibilities are:

Major water resources development programs are located in three different departments: agriculture, interior, and army. A separate agency, the water resources council, was established for the purpose of providing a mechanism to coordinate the several agencies' planning efforts and water resources policy. The council has had limited effectiveness since it is basically an interagency committee. While some improvements have been made, interagency rivalry, duplicative planning, and conflicting policies still persist. For example, in California and in Oregon, the corps of engineers and the bureau of reclamation each contended it should build certain projects. These jurisdictional problems, which necessarily involve the executive office of the president, need not arise if there were one water resources agency.

Nonmilitary Federal lands are administered by four agencies in two departments. Agriculture's National forest lands and interior's public domain lands generally involve the same types of resources and uses. These lands often are adjacent to each other and some times intermingled. Even though these lands are managed to meet similar objectives and frequently are used by the same clientele, management procedures and policies have been dissimilar and are not uniformly applied. Their separate administration results in unnecessary problems for forest and range users, overlapping efforts, and less effective land use planning for public uses. For example, BLM typically manages lands of lower elevation while the forest service manages the higher areas. Quite often, a rancher desires to graze his livestock in the lower areas in the spring and the higher areas during the summer. Dual management of these lands is an undue hardship to the rancher who must obtain two permits from the two agencies.

Federal recreation areas are administered by six different agencies in three departments and by one independent agency. Each agency tends to plan its own recreation development without appropriate recognition of the total public need or the interaction among Federal and non-Federal public and private facilities and programs to meet national needs.

A variety of marine resources and environmental programs were located in several agencies of the government, inhibiting the development of a cohesive National marine resources program. Many of these were transferred to the national oceanic and atmospheric administration by reorganization plan No. 4 of July 9, 1970. However, this still left the related offshore oil, gas, mineral resource and earth sciences programs separately managed by interior.

Energy programs consist of separate activities concentrating on particular sources of energy. They are scattered among several agencies with no single agency charged with formulating and implementing a unified policy and approach to assure effective energy resources utilization and conservation, and at the same time, to meet future energy requirements and the achievement of environmental objectives.

The present government organizational structure is not conducive to effective natural resource management because there is no mechanism for the effective coordination of policies, authorities, programs, activities, and services, as discussed above.

In the southeastern States, widespread stream channel straightening and deepening (agriculture) has been protested vigorously by the department of the interior, supported by conservation interests. The process of balancing fish and wildlife and scenic values against economic development needs is unnecessarily frustrated by fragmented planning and evaluation responsibilities within the Federal government.

A corps of engineers project for flood control and agricultural water supply had serious impacts on the Everglades National park and on fish and wildlife values in Florida as a result of incomplete planning and coordination. Settlement of the conflict would have been expedited had one department been responsible for consideration of all facets of the problem.

The grouping together of natural resources programs with broad common purposes and the establishment of a coordinated natural resources management policy through the department of natural resources will eliminate many of these problems, or enable the resolution of them within one department.

Over the past 30 years, a number of studies have focused on the management problems posed by the proliferation of natural resource functions among departments. For example, after laboring for several years, the congress' joint commission on reorganization of government departments rendered its report to president Harding who, in turn, transmitted it to the congress with his recommendation for adoption. The report recommended transfer of the nonmilitary engineering activities of the war department to the department of the interior and the transfer of the functions of the Federal power commission to interior. There were joint house and senate hearings on those recommendations but no further action.
Late in 1932, President Hoover submitted a plan to congress that among other things, would have transferred the corps of engineers' civil functions to interior and the general land office from interior to agriculture. All of President Hoover's reorganization recommendations, including those affecting natural resources, were disapproved by a house resolution of January 19, 1933.

The president's committee on administration management in 1937 recommended creation of a national resources board which was established in 1939. It functioned largely in the natural resources field and helped coordinate agency activities and Federal-State relationships until its abolition in 1943. The committee recommended a basic structure of 12 departments, one to be the department of the interior which was the department of conservation.

In 1940, a majority of the Hoover commission overrode the recommendations of its task force and its committee on natural resources which would have consolidated water resources and public land management functions in a department of natural resources. Instead, the commission recommended that public land management be consolidated by transferring the bureau of land management to the department of agriculture and that civil functions of the corps of engineers be transferred to interior. Three commissioners vigorously dissented, proposing consolidation of natural resources within one department.

The second Hoover commission, reporting in 1955, recommended creation of a water resources board and that the corps of engineers assume the soil conservation service function of constructing headwater dams for flood control. The proposal to establish a board was similar to a scheme going back to the inland waterways commission established by Theodore Roosevelt. The present water resources council represents the kind of coordinating mechanism advocated by the commission.

President Eisenhower, in his final budget message of 1961, recommended consolidating water resources functions of the corps of engineers, the department of the interior, and the river basin survey work of the Federal power commission.

The June 1970 report to the president by the public land law review commission (one third of the nation's land) recommended the establishment of a department of natural resources which would bring together the major public land agencies.

Proposed Administrations

Natural resources programs are conducive to being grouped into a small number of major components on the basis of common purposes. The reorganization will, therefore, bring together related resource functions in the following administrations: land and recreation resources; water resources; energy and mineral resources; oceanic, atmospheric and earth sciences; and Indian and territorial affairs. It should be pointed out that the environmental protection agency would not be included in the department of natural resources.

The land and recreation resources administration is divided into two related subcomponents: land resources and recreation resources. The "land resources" subcomponent of DNR will effectively group together the related land management agencies and functions.

The functions of this component are: formulation and implementation of National timber policy based on supply and demand projections; technical and financial assistance to States (including grants) for fire protection, forest management, tree planting, insect and disease control; research and information services; management of Federally owned lands and minerals: timber resource management; range resource management; provision of outdoor recreation resources and facilities; fish and wildlife management and preservation; mineral resource management; natural resource preservation; soil and moisture conservation; resource protection; and related environmental considerations.

The organizational entities that would be transferred to this component are: from interior: bureau of land management; from agriculture: forest service; economic research service—natural resources economics; agricultural research service—soil and water conservation.

The rapidly increasing use of forest lands for timber and forage, recreational areas, management of wildlife, preservation of scenic beauty, and protection of downstream lands from floods and erosion dictates their placement in the DNR, whereas all competing claims may be balanced, this is more likely to result in effective land management and a greater overall contribution to the public good.

Recreation Resources. —There is great national concern for the preservation and enhancement of the environment so it may be enjoyed. Part of this concern centers on having adequate amounts of parks, historic sites, open spaces, fish and wildlife, and other outdoor recreation resources and facilities.

The emphasis on outdoor recreation opportunities requires a focal point within the government for the formulation and implementation of National recreation policies. Recreation demand is increasing rapidly and varies widely depending on the desires of people and the nature of lands and facilities available. The provision of outdoor recreation opportunities depends on the private sector, local governments, States, and the Federal government.

The recreation resources subcomponent of the DNR will provide planning and coordination capabilities for the most effective use by the public of recreation areas managed by Federal agencies as in the following cases:

Water-based recreation is one of the most desired forms of outdoor recreation. Bureau of reclamation and corps of engineers water projects provide large amounts of recreation opportunities as part of National multiple-purpose water resources development. National forests and public domain lands provide outdoor recreation opportunities as part of multiple-use management of lands. The forest service and the bureau of land management also administer wilderness and primitive areas, wild and scenic rivers, fish and wildlife, historical wildlife refuges have the primary mission of preservation and availability of unique natural, historical, or scientific areas and fish and wildlife species for public enjoyment.
Critical to the realization of an integrated National policy for water resources management and use are the water planning and project evaluation functions. The responsibility for these functions needs to be transferred from the corps of engineers (army), the soil conservation service (agriculture), and the bureau of reclamation (interior) to the department of natural resources. That department would then be responsible for evaluating water resources projects for their economic and other benefits, and for making decisions as to which projects should be recommended for implementation.

The functions of the water resources administration are: formulation and implementation of National water resources policy; assistance (grants) to States and other resources planning, development, and management; provision of outdoor recreation facilities; fish and wildlife management; flood control; improvement of navigation; provision of water supply; conservation of soil; marketing of electric power from Federal water projects; research and informational services; and related environmental considerations.

The organizational entities and programs that would be transferred to this component are: from the interior: bureau of reclamation; office of salinity water; office of water resources research; and fundings. From army: corps of engineers—civil functions (planning, policy, and funding). From agriculture: soil conservation service; farmers home administration—watershed loans. From water resources council: all functions (planning, policy, and grants).

Energy and mineral resources administration.—Energy is a vital ingredient in our National life. Without it, nearly everything stops—as we discovered in the northeast blackout several years ago. Energy consumption is growing five times as fast as population, and countless industrial processes depend on increasing amounts of fuels and electric power. Our affluent society has come to depend upon conveniences using energy to a degree unknown a few decades ago.

Insuring an adequate energy supply to meet these future needs, while preserving the quality of the environment, is a fundamental priority for our Nation. The Federal interest in the energy field is all the more sharpened by the fact that more than half of our oil and gas resources, and over one-third of our coal and uranium, are on Federal lands.

The functions of this component are: formulation and implementation of National energy resources policy; development of energy production technology; development of resource development and utilization technology; management of uranium stockpile; production of enriched uranium; ore body and resource delineation and information; resource conservation; supply, demand, and other economic information; mining, recovery, processing and utilization studies; waste disposal, reuse, recycling and substitutes studies; protection and restoration of mined areas; research and informational service; fostering mining health and safety; fostering oil and gas pipeline safety; and related environmental consideration.

The organizational entities and programs that would be transferred to this component are: from the interior: bureau of mines; office of coal-research; office of oil and gas; oil import administration and appeals board; office of minerals and solid fuels; defense electric power; and underground power transmission research. From atomic energy commission: raw materials management; uranium enrichment; civilian nuclear power development (policy and funding); and plowshare program (policy and funding). From transportation: oil and gas pipeline safety.

Oceanic, atmospheric and earth sciences administration.—Federal efforts to increase knowledge of the physical environment and to improve our ability to predict and modify geophysical phenomena, would be brought together into one component. So organized, these programs can better serve to help us understand the earth, its waters and atmosphere, and the physical processes that govern our planet. There is now a realization of the interactions of the oceans, the atmosphere, and lands in predicting weather and understanding the causes of natural disasters.

The functions of this component are: national weather services; research and environmental remote sensing studies; operation of environmental satellites; geologic and soil investigations and surveys; water data collection and investigations; environmental data services; earth hazard programs (earthquakes, volcanoes, landslides, etc.); predictions of natural hazards and warnings for public health and safety; topographic and other mapping and charting services; ocean and lake surveys, investigations and research; fishery resource management, research, and assistance to industry; research and information services; and technical and financial assistance to States.

The organizational entities that would be transferred to this component are: from interior: geological survey, from commerce: National oceanic and atmospheric administration.

Indian and territorial affairs administration.—The social and economic needs of Indians, Alaska Natives, and territorial peoples are acute and require special handling. The president has enunciated his policy of providing Indians with greater self-determination over the management of their affairs. The challenge is to focus the resources of the Federal government to meet the unique needs of different cultures in ways that allow the recipients to determine their own priorities.

The functions of this component are: natural resources and economic development; education; public health and safety; job training and placement; and community services and facilities.

The organizational entities that would be transferred to this component are: from interior: office of territories; bureau of Indian affairs.

The Indian and territorial programs are included in the department of natural resources at this time because of their historical association with the natural resource functions of the department of the interior. Most Indians in the past have rejected proposals for transfer of the Indian program to other departments. In view of the current lack of existing capabilities by these other agencies, no convincing case for transfer can be made at this time. Any transfer proposal would have to have the full involvement and general concurrence of the Indian and territorial peoples. These programs therefore are proposed for inclusion in the department of natural resources, subject to further study.
The key officials of the proposed department of natural resources are as follows:

(a) The secretary who, once he has selected his key officials, will concern himself primarily with the strategy for his department, its goals, priorities, its overall performance, and be its spokesman to the president, the congress and the public.

(b) The deputy secretary who, as the "alter ego" of the secretary, serves as the general manager for the department with responsibility for allocating resources, assessing the quality of program performances, and harmonizing the efforts of the line and staff elements.

(c) Two under secretaries to serve as staff arms of the departmental leadership in such areas as the development of overall policy strategy and plans for implementation, and to be responsible for organization, business management, information systems, resources deployment, and the efficiency and effectiveness of the department.

(d) An assistant secretary for research and development who, in direct support of the departmental leadership, guides, promotes, evaluates, and coordinates the research, technology and technology transfer activities of the department.

(e) Administrators with line authority over programs representing broad subdivisions of the purpose of the department. There would be an administrator for each of the first tier organizations; for example, land and recreation resources administration, and energy and mineral resources administration. These key officials appointed by the president and confirmed by the senate will be accountable for the success or failure of those programs under their purview. They will be the managers and implementors of the department's programs.

(f) Regional directors reporting to the secretary with such authority as may be delegated by him together with regional administrators with line authority for each of the major program groupings.

Under this concept, the regional director would serve as a communicator of presidential and secretarial policy to other field officials of his department and provide a source of information to the secretary. He would be delegated authority by the secretary to coordinate and expedite matters, and to perform or insure performance of regional planning which cut across program lines, and to resolve conflicts between programs. He would be responsible for the evaluation of the effectiveness of programs carried out in his region, including management problems, and adequacy of resources. He would be the focus for receiving citizen complaints and for resolving complaints when they can be handled at the regional level.

The regional director would serve as the department's representative in relationships with governors, other State and local officials, and public interest and clientele groups. He would represent his department on the Federal regional council and other regional coordinating groups.

He could, as designated by the secretary, serve as a line official for special programs or functions. Otherwise, the line official is the regional administrator reporting to the administrator in Washington.

The various components proposed for inclusion in the department of natural resources have over 5,000 field offices, such as research laboratories, weather stations, fish hatcheries, reservoirs, wildlife refuges, National parks, National forests, public domain lands, irrigation projects, power projects and Indian reservations.

The proposed units of the department of natural resources have developed over the years their respective regional organizations so as to accommodate their individual administrative needs. In the past, no overall boundaries or regional organizational过去了 had been set. Now, the need for a coordinated and integrated approach to ensure that natural resources planning, acquisition, development, and use are consistent with environmental considerations and other national goals.

Under the Federal assistance review plan, 10 common regional boundaries have been established for six Federal departments and agencies with major grant programs. These 10 standard regions primarily are oriented to urban related socioeconomic problems rather than natural resource problems.

While all programs and functions of the DNR may not require a regional structure, a regional organizational level is necessary for most to carry out effectively the missions of the department. All possible actions will be taken to accommodate the approach toward uniform regional boundaries because of the advantages of such an arrangement. To provide adequate consideration for the unique characteristics of the department, regional boundaries should be established, based generally on river basins but adjusted to State boundaries, and allowing flexibility to accommodate the requirements of different programs.

The number of regions to be established for the department of natural resources probably should be about seven to 10 with flexibility to combine certain contiguous regions to accommodate the requirements of different programs and functions. These combinations can be accomplished without creating any new or unrelated regional boundaries. A more detailed study needs to be made to determine the exact number of regions and the locations of regional boundaries. Where possible, the regional headquarters cities for the DNR should be the same as the 10 standard regions.

Because of the interrelatedness of the various sectors of modern society and some commonality of purpose between the department of natural resources and other Federal agencies, coordination will continue to be required. For example, the responsibilities of the environmental protection agency relating to air and water pollution, pesticides, and disposal of solid wastes have an impact on the development program and technical expertise of the atomic energy commission bear some relationship to the civilian nuclear power programs proposed for transfer to DNR. Forest, water, and energy resources contribute to economic and community development.
It will be the function of the department of natural resources -- by providing National leadership and establishing effective working relationships with private organizations and individuals, State and local governments, and other Federal agencies:

To foster the conservation, management, and utilization of natural resources, based upon studies and analyses of supply and demand and alternative measures for meeting such demands.

To help assure maintenance of the ecological balance necessary to sustain human and unique plant and animal life systems.

To explore and survey the earth, the atmosphere, and the oceans and to assess their physical characteristics.

To conduct scientific research and to encourage development of natural resource technology to conserve and efficiently utilize natural resources with minimum impact on the environment.

To undertake programs for the optimal development of various energy sources, including research on nuclear power and managing uranium raw materials and uranium enrichment.

To provide physical and economic data, maps, charts, and hazard warnings, and other information regarding the earth, atmosphere, and oceans.

To manage Federal public lands and other resources, including national parks, forests, wildlife refuges, fish hatcheries, and minerals.

To preserve irreplaceable park, wilderness, scientific, historic, fish and wildlife, and other biotic resources.

To assist in providing outdoor recreational opportunities.

To plan and undertake programs for the conservation, management, and utilization of land, water, forest, range, mineral, fish and wildlife resources.

To facilitate the development and protection of commercial fisheries.

To foster the health and safety of miners.

To assist in achieving oil and gas pipeline safety.

To assist Indians, Alaska Natives, and territorial peoples to achieve their cultural and economic objectives.

Budget and Manpower

Total fiscal year 1971 outlays for the proposed department of natural resources, based on the president’s Budget, would be approximately $5.1 billion. Permanent employment would total approximately 111,700. Distribution by major program components would be approximately:

<table>
<thead>
<tr>
<th>Administration</th>
<th>1971 Outlays (Millions of Dollars)</th>
<th>Permanent Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land and Recreation Resources</td>
<td>1,365</td>
<td>37,600</td>
</tr>
<tr>
<td>Water Resources</td>
<td>2,160</td>
<td>29,800</td>
</tr>
<tr>
<td>Energy and Mineral Resources</td>
<td>685</td>
<td>5,100</td>
</tr>
<tr>
<td>Oceanic, Atmospheric, and Earth Sciences</td>
<td>375</td>
<td>20,600</td>
</tr>
<tr>
<td>Indian and Territorial Affairs</td>
<td>480</td>
<td>15,000</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>1,600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,090</strong></td>
<td><strong>110,700</strong></td>
</tr>
</tbody>
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Additional information concerning the budget and manpower of the proposed department of natural resources is given in table 11.

Table 11. Information Concerning the Budget and Manpower of the Proposed Department of Natural Resources.

<table>
<thead>
<tr>
<th>Fiscal Year 1971 employment (full-time, permanent)</th>
<th>Fiscal Year 1971 budget outlays (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From the Department of the Interior</td>
<td></td>
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<tr>
<td>Bureau of Outdoor Recreation</td>
<td>504 $229</td>
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<td>National Park Service</td>
<td>6,935 160</td>
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<tr>
<td>Bureau of Sport Fisheries and Wildlife</td>
<td>3,839 143</td>
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<td>Bureau of Land Management</td>
<td>3,678 204</td>
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<td>Bureau of Reclamation</td>
<td>9,290 324</td>
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<td>Bureau of Reclamation</td>
<td>144 29</td>
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<td>Office of Saline Water</td>
<td>4,42 12</td>
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<td>Office of Water Resources Research</td>
<td>8,201 110</td>
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<td>Geological Survey</td>
<td>5,588 2-8</td>
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<tr>
<td>Bureau of Mines</td>
<td>3,332 130</td>
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<tr>
<td>Power Marketing Agencies</td>
<td>14,574 993</td>
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<tr>
<td>Bureau of Indian Affairs</td>
<td>368 86</td>
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<tr>
<td>Office of Territories</td>
<td>23 17</td>
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<tr>
<td>Office of Coal Research</td>
<td>63 1</td>
</tr>
<tr>
<td>Office of Minerals and Solid Fuels</td>
<td>7</td>
</tr>
<tr>
<td>Oil Import Administration and Appeals Board</td>
<td>(1)</td>
</tr>
<tr>
<td>Defense Electric Power</td>
<td>6</td>
</tr>
<tr>
<td>Underground Power Transmission Research</td>
<td>2</td>
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<tr>
<td>Department Administration</td>
<td>1,324 9</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>57,920</strong></td>
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<tr>
<td>From the Department of Agriculture:</td>
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<td>Forest Service</td>
<td>21,430 612</td>
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<td>Soil Conservation Service</td>
<td>14,419 289</td>
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<tr>
<td>Agricultural Research Service (Soil and Water Conservation Division)</td>
<td>1,004 16</td>
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<tr>
<td>Economic Research Service (Natural Resources Economies Division)</td>
<td>160 3</td>
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<tr>
<td>Farmers Home Administration (watershed loans only)</td>
<td>41 6</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>37,054</strong></td>
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</table>

248
From the Department of the Army: Corps of Engineers (planning, evaluation, policy, and funding only)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranium raw materials</td>
<td>124</td>
</tr>
<tr>
<td>Uranium enrichment</td>
<td>226</td>
</tr>
<tr>
<td>Civilian nuclear power reactors</td>
<td></td>
</tr>
<tr>
<td>(policy and funding only)</td>
<td></td>
</tr>
<tr>
<td>Flowsheet (policy, funding and certain functions only)</td>
<td>21</td>
</tr>
</tbody>
</table>

Subtotal: 371


From the Water Resources Council: All sources rests largely with the committee on interior and insular affairs and the committee on public works. It is in these two committees and their standing subcommittees that most water resources legislation is considered.

From the Department of Transportation: Other committees include the commerce, merchant marine and fisheries; interstate and foreign commerce, and foreign relations; and house and senate committees on banking & currency. The appropriations committees of both houses, with their control over funds, have considerable jurisdiction over how water resources programs are effected, and the government operations committees, with investigatory powers may also play a significant role. In addition, several other committees in both houses, plus the joint committee on atomic energy, consider bills involving water resources from time to time.

The public works committees of the house and senate are responsible for navigation and flood control programs of the corps of engineers. There are two major exceptions, the watershed protection programs of the department of agriculture, which come under the agriculture and forestry committees, and the flood control projects on the U.S.-Mexican boundary, which come under the purview of the foreign relations and foreign affairs committees. The multiple-purpose projects of the corps of engineers are also considered by the public works committees, and in several instances substantial multiple-purpose authorizations for the bureau of reclamation have been included in omnibus flood control legislation handled by the public works committees.

The research and construction grant programs for the abatement of water pollution that are carried out by the Federal water quality administration also come under the public works committees. Road and highway drainage, which forms a significant part of the Federal aid highway programs, comes under these committees, as do the dams, reservoirs, and power plants of TVA. Authorization of the St. Lawrence seaway development was handled by the public works committee in the house and by the foreign relations committee in the senate.

In both houses, the interior and insular affairs committees are responsible for irrigation and reclamation projects, including multiple purpose hydroelectric power projects in the 18 western States, Alaska, and Hawaii. Other legislation reviewed by the interior and insular affairs committees includes the desalting program, wildlife preservation and stream pollution control in the national parks, waterbased outdoor recreation, public water supply and irrigation for Indian lands, fish and wildlife preservation and watershed protection on public lands, collection of basic data...
on surface and ground water, and recent legislation dealing with comprehensive river basin planning and water resources research.

The merchant marine and fisheries committee of the house and the commerce committee of the senate handle legislation on navigation aids to the coast guard, weather data, and research on weather modification on the weather bureau. Legislation dealing with inland and marine fisheries and the deer bureau. Legislation dealing with sport fish and wildlife interstate compacts comes under these committees. Inland waterways legislation is referred to the committee on interior and foreign commerce in the house and the committee on commerce in state and foreign commerce in the senate. Legislation dealing with hydrometry research in the bureau of both houses, whereas interstate compacts are generally referred to the judiciary committees in both houses. The ways and means committee in the house and the finance committee in the senate, handles bills to authorize Federal tax incentives to industry for water pollution abatement works.

Legislation is sometimes referred to 2 or more committees. Occasionally, legislation to authorize a proposed water resources project is presented in two bills, each for referral to the appropriate committee. More frequently, however, it appears that each committee works independently. Water pollution abatement is a subject on which several committees have apparently dealt independently with similar legislative matters.

The congressional committee structure for dealing with water resources has evolved over a long period of time. Through 1945, in more than a century and a half of legislative activity, the house had set up 67 standing committees and the senate 72. In 1945 congress undertook a review of its own operations through a joint committee on the organization of congress. In the legislative reorganization Act of 1946 that resulted, the 33 standing committees of the senate were consolidated into 15 new committees, and 46 standing committees of the house of representatives were consolidated into 19. The congressional structure for handling water resources is roughly parallel in the 2 houses. The committee structure established in the 1946 Act has continued to the present day with the exception that in 1958, to meet problems arising from increased involvement in space activities, the
committee on aeronautical and space sciences was created in the senate and the committee on science and aeronautics in the house. The senate committee has no responsibilities in the field of water resources but the house committee has jurisdiction over the bureau of standards and the national science foundation as well as over research generally, which may lead it into fields related to water resources. Thus, at present, there is a total of 16 standing committees in the senate and 20 in the house, of which 10 and 12, respectively, appear to have responsibilities that touch on water resources. In addition, there is a joint committee on atomic energy, which exercises all the functions of standing committees in connection with legislative matters involving nuclear energy.

Jurisdiction of Congressional Committees

The jurisdiction of congressional committees is specified in rule 25 of the senate and 11 of the house, which refer guidance for the referral of bills. Referrals of bills under the rules are made by the speaker of the house and the president of the senate, although in practice this function is carried out by the parliamentarian in each house. The jurisdiction of the committees is described in somewhat general terms, so that a considerable exercise of judgment is required in the referral of bills. The power of the congressional committees is such that the committee to which legislation is referred may have a considerable effect on its program.

Committees on interior and insular affairs, public works, and appropriations probably have the most significant effect on water resources legislation. All 3 of these committees in both houses have found it necessary to subdivide their work load by creating subcommittees. The subdivision of work related to water resources is most pronounced in the appropriations committees, where there are 8 subcommittees on the senate side and 7 on the house side that report bills including funds pertaining to some aspect of water resources.

Because of the large number of subcommittees, the water resources functions are subdivided. Table 12 shows the 29 Federal agencies having programs related to water resources and the legislative committees to which they report. Each agency also reports annually to the subcommittee of the appropriations committee that handles its annual and supplemental appropriations.

Table 12. Congressional Committee Responsibilities for Federal Water Resources Programs

<table>
<thead>
<tr>
<th>Department or Agency</th>
<th>Water-Related Work</th>
<th>Committee Having Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Service</td>
<td>Watershed protection</td>
<td>Agric. Interior &amp; Insular Affairs</td>
</tr>
<tr>
<td>Soil Conservation</td>
<td>Watershed protection</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Service</td>
<td>Irrigation,</td>
<td>Agriculture and Forestry</td>
</tr>
<tr>
<td></td>
<td>water supply,</td>
<td>Public Works</td>
</tr>
<tr>
<td></td>
<td>recreation, flood</td>
<td>Public Works</td>
</tr>
<tr>
<td></td>
<td>works</td>
<td>Public Works</td>
</tr>
<tr>
<td>Bureau of Commerce</td>
<td>Public Works</td>
<td></td>
</tr>
<tr>
<td>Office of Planning</td>
<td>Interstate &amp; Foreign Commerce</td>
<td></td>
</tr>
<tr>
<td>Standards &amp; Coordination</td>
<td></td>
<td>Commerce</td>
</tr>
<tr>
<td>Department of the Interior Office of Water Resources Research</td>
<td>Agric. &amp; Forestry</td>
<td></td>
</tr>
<tr>
<td>Office of Saline Water</td>
<td></td>
<td>Agric. &amp; Forestry</td>
</tr>
<tr>
<td>U.S. Fish &amp; Wildlife</td>
<td>Loans &amp; grants for Banking and Currency</td>
<td></td>
</tr>
<tr>
<td>Bureau of Sport Fisheries &amp; Wildlife</td>
<td>Planning</td>
<td>Interior and Insular Affairs</td>
</tr>
<tr>
<td>Bureau of Commercial Fisheries</td>
<td>Grants &amp; contracts for water resources research</td>
<td>Interior and Insular Affairs</td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>Research and development</td>
<td>Interior and Insular Affairs</td>
</tr>
<tr>
<td>Geological Survey</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Farmers Home Administration</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Bureau of Sport Fisheries &amp; Wildlife</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Bureau of Commercial Fisheries</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Geological Survey</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
<tr>
<td>Forest Service</td>
<td>Watershed protection</td>
<td>Agric. Interior &amp; Insular Affairs</td>
</tr>
<tr>
<td>Soil Conservation</td>
<td>Watershed protection</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Service</td>
<td>Irrigation,</td>
<td>Agriculture and Forestry</td>
</tr>
<tr>
<td></td>
<td>water supply,</td>
<td>Public Works</td>
</tr>
<tr>
<td></td>
<td>recreation, flood</td>
<td>Public Works</td>
</tr>
<tr>
<td></td>
<td>works</td>
<td>Public Works</td>
</tr>
<tr>
<td>Bureau of Commerce</td>
<td>Public Works</td>
<td></td>
</tr>
<tr>
<td>Office of Planning</td>
<td>Interstate &amp; Foreign Commerce</td>
<td></td>
</tr>
<tr>
<td>Standards &amp; Coordination</td>
<td></td>
<td>Commerce</td>
</tr>
<tr>
<td>Department of the Interior Office of Water Resources Research</td>
<td>Agric. &amp; Forestry</td>
<td></td>
</tr>
<tr>
<td>Office of Saline Water</td>
<td></td>
<td>Agric. &amp; Forestry</td>
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<td>U.S. Fish &amp; Wildlife</td>
<td>Loans &amp; grants for Banking and Currency</td>
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<tr>
<td>Bureau of Sport Fisheries &amp; Wildlife</td>
<td>Planning</td>
<td>Interior and Insular Affairs</td>
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<td>Bureau of Commercial Fisheries</td>
<td>Grants &amp; contracts for water resources research</td>
<td>Interior and Insular Affairs</td>
</tr>
<tr>
<td>Bureau of Indian Affairs</td>
<td>Research and development</td>
<td>Interior and Insular Affairs</td>
</tr>
<tr>
<td>Geological Survey</td>
<td>Int. &amp; Ins. Affairs</td>
<td>Int. &amp; Ins. Affairs</td>
</tr>
</tbody>
</table>
A number of recent legislative enactments show that congressional action tends to transcend boundaries set up by arbitrary divisions of responsibilities among several congressional committees, or among the different agencies in the executive branch of the Federal government that engaged in the same type of work. When necessary, special attention can be given to water resources outside of the standing committees. For example, in 1959 the Senate created a select committee on national water resources (Senate resolution 48, 1959), which made studies and reports on all aspects of water resources before ceasing to exist on Jan. 31, 1961. Similar action can be taken in the future by either house, if necessary, or a special joint committee could be created by concurrent resolution to consider all aspects of water within a single congressional committee. A certain measure of coordination in matters related to water resources is provided also by the service of members on more than one of the committees dealing with water resources. Furthermore, the rules of the Senate result in liaison between its appropriations committee and certain legislative committees through ex officio memberships.

Legislative Measures Introduced in 89th Congress

A cursory review was made of the titles and digests of all the legislative measures introduced in the 89th Congress, which ran from Jan. 4, 1965 to Oct. 22, 1966. For this purpose, the digest of public general bills and selected resolutions, 89th Congress, 1st and 2nd sessions, final issues, 1965-66, and the legislative calendars of the several committees were used. The review covered 18,551 house bills, 13,222 house joint resolutions, 3,931 Senate bills and 198 Senate joint resolutions, a grand total of 24,902 potential legislative enactments. House and Senate concurrent resolutions and simple house and Senate resolutions were not considered, as they do not form the basis for public laws.

Of the total number of bills scanned by title and digest, 1289 bills and resolutions were concerned with water resources development of one kind or another or had some other direct or indirect relationship to water resources. House bills and joint resolutions included in this category total 998 and Senate measures 291. Thus, a little over 5% of all the proposed legislation introduced in the Congress in 1965 and 1966 was concerned with water resources. When it is considered that about 6,500 of the bills in both houses were private bills, the percentage of potential public measures involving water resources is much greater, about 7.2% of 1 in 14.

The proposed water resource legislative measures were referred to a total of 13 committees in the house and 11 committees in the Senate, as indicated in Table 13. In addition to the bills originating in the Senate referred to Senate committees, the appropriations bills, which must originate in the house, were referred to the Senate committee on appropriations after passing the house. These have not been counted as Senate, as no attempt was made to tally the Acts referred to house committees. Since acts do not show up in the tally, this inventory should not be considered as covering the work load of any committee on measures to water resources. The number of measures not counted, of course, is far more often by identical bills introduced in the house to cover the same period.

The tabulations show that the house public works committee received for its consideration the largest number of water related bills in both sessions of the 80th congress, with the interior and insular affairs committee running a very close second, followed by the merchant marine and fisheries committees with a much smaller number of bills. The agriculture, appropriations, banking and currency, and ways and means committees ranked next with about an equal number of referrals, and a scattering referred to the other committees listed.

Table 13. Referral of Water Related Measures in the 80th Congress

<table>
<thead>
<tr>
<th>House Committee</th>
<th>Number of Bills</th>
<th>Senate Committee</th>
<th>Number of Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>31</td>
<td>Agriculture &amp; Forestry</td>
<td>14</td>
</tr>
<tr>
<td>Appropriations</td>
<td>37</td>
<td>Appropriations</td>
<td>1/</td>
</tr>
<tr>
<td>Armed Services</td>
<td>3</td>
<td>Banking &amp; Currency</td>
<td>12</td>
</tr>
<tr>
<td>Banking &amp; Currency</td>
<td>14</td>
<td>Commerce</td>
<td>25</td>
</tr>
<tr>
<td>Foreign Affairs</td>
<td>1</td>
<td>Finance</td>
<td>4</td>
</tr>
<tr>
<td>Government Operations</td>
<td>20</td>
<td>Foreign Relations</td>
<td>3</td>
</tr>
<tr>
<td>Interior &amp; Insular Affairs</td>
<td>399</td>
<td>Government Operations</td>
<td>4</td>
</tr>
<tr>
<td>Interstate and Foreign Commerce</td>
<td>11</td>
<td>Interior and Insular Affairs</td>
<td>113</td>
</tr>
<tr>
<td>Judiciary</td>
<td>10</td>
<td>Judiciary</td>
<td>3</td>
</tr>
<tr>
<td>Merchant Marine and Fisheries</td>
<td>4</td>
<td>Labor and Public Welfare</td>
<td>2</td>
</tr>
<tr>
<td>Public Works</td>
<td>399</td>
<td>Public Works</td>
<td>111</td>
</tr>
<tr>
<td>Science &amp; Astronautics</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ways and Means</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>998</strong></td>
<td><strong>291</strong></td>
<td></td>
</tr>
</tbody>
</table>

1/ Acts not counted in Senate


The largest number of individual water resources related bills referred to the house public works committee pertained to authorization of flood control or navigation projects of surveys that might lead to recommendations of projects. The total number of project and survey bills was 132. There were 51 bills having to do with pollution abatement, 49 relating with the St. Lawrence Seaway, and 41 on accelerated public works and regional development, including a number of Appalachian bills. There were 35 bills to authorize flood, hurricane, or other disaster relief. There were 41 bills of a general policy nature. The remainder of the bills referred to public works included a small number affecting TVA, the Arkansas river compact, and bridges and dams on navigable rivers. Many of the bills referred to of this committee were identical.

In the house committee on interior and insular affairs there were 117 bills related to the authorization of proposed reclamation projects or of surveys leading to such projects. The largest number of bills (168) referred to this committee involved water-based recreation, including such subjects as scenic rivers, national lakerores, national recreation areas, parks, and wild rivers. Some 58 of these were identical proposals for Federal cooperation with the State of New York and New Jersey to preserve the resources of the Hudson river, and there were 34 bills to authorize establishment of a Hudson highlands national scenic riverway. There were about 50 bills dealing with general policy on such matters as water resources research and planning, weather modification to increase precipitation, small reclamation projects, extension of desalting program, user fees in recreation areas, and similar matters. A few other bills referred to this committee covered miscellaneous subjects such as hydrologic surveys in the Delmarva peninsula, Federal participation in a desalting plant, and other individual water matters not included in the reclamation program.

The committee on merchant marine and fisheries, which had the third largest number of bills, received measures relating to anadromous fish, oceanography, inland waterway rules, interoceanic canals, pesticides, and pollution of navigable waters, as well as general bills relating to fish and wildlife.

The water related bills referred to the ways and means committee all dealt with providing tax incentives for water pollution abatement works through rapid amortization or an investment credit. The house appropriations committee had referred to it a number of bills and joint resolutions pertaining to specific water projects or programs, as well as the major appropriations bills containing funds for water resources related programs. The banking and currency committee had several bills proposing flood and other disaster loans, as well as legislation including loans and grants for water supply and sewerage facilities in connection with urban and suburban development or redevelopment.

The committee on agriculture had measures relating to the watershed program, recreation development in connection with watersheds and national forest lands, rural water supply, and sewerage facilities, as well as flood disaster and drought assistance for farmers.

The house government operations committee handled bills involving reorganization of Federal agencies having water resources responsibilities, in addition to investigations in several water related areas of Federal agency operation. The water related bills referred to the judiciary committee were to proclaim various public observances of water awareness or water conservation week or month.

The interstate and foreign commerce committee was concerned with solid waste disposal, jurisdiction of the Federal power commission over certain canals and waterways, and non-navigability of certain streams. The foreign affairs committee had measures relating to water resources development on the Rio Grande, as well as legislation involved in the water for peace conference. Some of the bills proposing establishment of National sea grant colleges went to the committee on science & aeronautics, but the legislation that finally became law was reported by the committee on merchant marine and fisheries.

The senate committee on interior and insular affairs received the largest number of bills, with the committee on public works having almost the same total, followed by the commerce committee, then by the agriculture and forestry committee.

The senate interior committee measures included 45 authorizations or modifications of reclamation projects, 33 involving water related recreation areas and 21 covering various aspects of general water resources.
policy, including the bill that became the water resources planning Act of 1965 and modifications to the water resources research Act. Other measures included 6 involving Indian irrigation, 3 for power marketing agencies, 2 interstate compact consent bills, and several miscellaneous items.

The senate public works committee had 53 bills authorizing projects, modifications of projects, or surveys of potential projects. There were 17 pollution abatement bills, 10 bills involving bridges and dams or navigable waterways, and 10 for economic development and public works acceleration programs. In addition to the omnibus river and harbor and flood control bill there were 10 other bills proposing changes in general policy for work related to water resources. The balance of this committee's bills included 5 disaster relief proposals, consent legislation for an interstate compact and modifications to TVA and St. Lawrence seaway financing. The calendar of the senate committee on public works also lists action of 69 resolutions approving small watershed plans of the department of agriculture under P.L. 566 and 103 resolutions requesting reviews of previous reports by the department of the army. These figures give some idea of the magnitude of the work load of these committees over and above the proposed legislative measures. Bills referred to the commerce committee covered subjects ranging from research on weather modification to control of jellyfish as well as more normal subjects such as enhancement of fisheries and wildlife resources, water for power plants, and changes in navigable waterways. The smaller number of water related bills referred to the committee on agriculture and forestry dealt with such matters as rural water and sewerage facilities, recreation and fish and wildlife conservation, agricultural and forest lands, watershed development, loans to fish farmers, and control of pesticides.

Because of the number of bills dealing with urban problems and with flood disaster assistance, the senate banking and currency committee was very close behind the agriculture and forestry committee in number of bills handled. 51 bills were referred to the judiciary committee in the senate included consent legislation for an interstate compact, as well as the proposed payment for a water filtration plant which was referred to the armed services committee in the house, and a proposed proclamation for a National clean water week. In the senate, as in the house, water related bills dealing with tax matters involving water resources went to the finance committee, reorganization of executive branch agencies went to the government operations committee, and bills dealing with water projects on National boundaries and a joint resolution on the water for peace conference went to the committee on foreign relations. The 2 bills referred to the committee on labor and public welfare involved grants for health and sanitation services and the National seagrant college proposal. Thus it can be seen that, although the basic referrals are similar in both houses there are several areas in which the jurisdiction is not identical.


