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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D C 20548

GENERAL GOVERNMENT
DIVISION

JAN 17 1977

The Honorable H Guyford Stever
Chairman, Federal Coordinating Council
for Science, Engineering and Technology 754

Dear Dr. Stever:

2 We have reviewed the procedures followed by the Committee on Water Resources Research (COWRR) in carrying out the functions assigned to the Executive Branch under Section 305 of the Water Resources Research Act of 1964 (P.L. 88-379). These assigned functions are designed to coordinate and increase the effectiveness of the Nation's water research activities. Although our review focused on COWRR's activities, we also obtained information from other Federal agencies regarding water resources research activities, including the basis for data submitted to COWRR for its research classification system. 758

During our review we interviewed officials at the following Federal agencies which have representatives on COWRR. the Departments of Agriculture, Commerce, Defense, Housing and Urban Development, the Interior, and Transportation, the Energy Research and Development Administration, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Science Foundation, the Smithsonian Institution, and the Tennessee Valley Authority. Also, COWRR meetings are attended by observers from the Water Resources Council, the National Academy of Sciences, and the Office of Management and Budget.

We believe that improvements are needed in the procedures followed by COWRR in carrying out the requirements of section 305 of the 1964 act. We were told that your office is reviewing the structure and functions of COWRR in an effort to make it more effective. We are bringing our observations to your attention for consideration during your review.

INTRODUCTION

COWRR was established in 1963 in order to assist the Office of Science and Technology and the Federal Council for Science and Technology in fulfilling their responsibility for interagency coordination

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of water resources research. COWRR's role was to coordinate the Nation's many and diverse water research activities conducted at the various departments and agencies within the Federal Government involved in water resources research. Within these departments and agencies, 23 distinct organizations either conduct or sponsor water resources research.

The Federal water research budget for these organizations has increased from \$64.7 million in fiscal year 1964 to an estimated \$214 million for fiscal year 1976 (as reported to GAO by the individual COWRR members). Since current Federal spending for water research and development is so large, the interagency coordination of Federal water resources research funds and assignments is essential.

In the Water Resources Research Act of 1964 the Congress stipulated that the President should clarify agency responsibilities for Federal water resources research and make arrangements for implementing the interagency coordination of such research. In addition, the law stated that such coordination should include

- Identification of technical needs in various water resources research categories,
- A continuing review of the adequacy of the Government-wide water resources research program,
- Actions to facilitate the interagency communications at management levels;
- Identification and elimination of duplication and overlaps between two or more agency programs;
- Recommendations with respect to allocation of technical effort among Federal agencies,
- Review of technical manpower needs and findings concerning the technical manpower base of the program, and;
- Recommendations concerning management policies to improve the quality of Government-wide research efforts.

These functions are restatements of the seven functions assigned to COWRR when it was established.

Until recently, COWRR carried out its responsibilities under the direction of the Federal Council for Science and Technology. On May 11, 1976, the Congress enacted the National Science and Technology Policy,

Organization, and Priorities Act of 1976 (P.L. 94-282). This law established the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) to replace the Federal Council for Science and Technology. The 1976 act did not amend section 305 of the 1964 act and that section is still in effect. COWRR will now be discharging its functions under the direction of FCCSET.

We found that COWRR had addressed the first four functions, mentioned above, while directing very little attention toward fulfilling the other three. COWRR had not prepared guidelines or designed an action plan for carrying out its assigned functions. The Chairman of COWRR told us that little attention had been given to the last three functions because of staff and funding limitations. The methods used by COWRR to carry out the other four functions are discussed below.

CONTINUING REVIEW OF THE ADEQUACY
OF THE GOVERNMENT-WIDE WATER RESOURCES
RESEARCH PROGRAM

The COWRR Chairman told us that since 1964 COWRR has been using information obtained for its annual reports as its basis for reviewing the adequacy of the Government-wide water resources research program. The first six reports covered fiscal years 1965 through 1970. The information obtained for these reports were issue-oriented and attempted to address multiagency research efforts and, in a general way, future research needs. These reports also included some analysis of the water resources research expenditures. In 1971, COWRR began preparing its annual reports on a calendar-year rather than fiscal-year basis and changed its reporting format. Since that time the reports have been primarily a compilation of agency program descriptions and budgeted amounts submitted by agency representatives.

We found no evidence that the information obtained by COWRR was used to evaluate the adequacy of research programs and none of the annual reports included an evaluation of the adequacy of the research conducted to date. Also, the reports have not been issued in a timely manner. For example, the 1971 report was issued in January 1974 and the 1972 report about three months later. If the reports are to serve as useful documents for obtaining improvements in water research activities of the various Federal agencies they should be timely and should include an analysis of the adequacy of the research being conducted.

IDENTIFICATION AND ELIMINATION OF
DUPLICATION AND OVERLAPS BETWEEN
TWO OR MORE AGENCY PROGRAMS

COWRR uses a research classification system as its primary means of identifying duplication and overlaps. Our review indicated that the system is not adequate to serve its intended purpose. For each annual report, COWRR members use ten major categories and 60 subcategories to classify their research project expenditures (individual projects are not listed). The categorized lists are then submitted to COWRR which reviews them for any indications of duplication or overlap.

COWRR's classification categories do not adequately reflect all water research performed by its members. For example, an official from the U.S. Forest Service told us that not all of the Forest Service's water research is reported because the categories are not adequately defined. Other agency officials told us that since their research generally fits into more than one COWRR category, they arbitrarily allocate their research to several categories. Since the classification system is COWRR's primary means of identifying duplication and overlap, the classification system should be sufficiently comprehensive and the categories defined clearly enough to serve their intended purpose.

More recently, COWRR has been developing a two-dimensional matrix classification system, but has suspended its work temporarily because it permits widely different classifications of similar data. COWRR's matrix is based on one used by the Office of Water Research and Technology, Department of the Interior which the Interior's Office of Audit and Investigation determined to be unreliable because of similar problems. If COWRR decides to implement the matrix, it should resolve the classification problems.

COWRR members also told us that they have used their monthly meetings as a means of identifying possible duplication. Until four years ago, COWRR held oral reviews of each agency's research activities at regularly monthly meetings. About four meetings were required to review the research activities of all agencies. This review process was performed every 2-3 years but the practice was discontinued about 4 years ago although monthly meetings were continued. We believe that COWRR should consider reinstating the oral reviews of each agency's research activities as they would make members more aware of all research activities currently being conducted and provide a better understanding of the exact nature of the activities.

IDENTIFICATION OF TECHNICAL
NEEDS IN VARIOUS WATER RESOURCES
RESEARCH CATEGORIES

In 1966, COWRR issued a report entitled "A Ten-year Program of Federal Water Resources Research." This report presented a basis for long-range planning of a research program; a discussion of 14 major water research problem areas and recommendations for research in each area; a summarization of then current programs, divided into nine major research categories and 44 research subcategories, as well as recommendations for the size and scope of research work for each subcategory and for increased expenditure levels for the five-year period 1967 to 1971 inclusive. The ten-year program did not contain specific recommendations as to which agency should be responsible for performing specific research assignments or as to individual agency expenditure levels.

COWRR's 1970 annual report discussed the need for revision of the ten-year program because new problems were emerging, existing research requirements had been satisfied to some extent, the recommended government-wide budget amount in the ten-year program did not go beyond 1971, and shortcomings had been identified in the ten-year program. The 1970 report identified ten problem areas and five specific problems which COWRR identified as warranting immediate research support.

COWRR is presently supporting the development of a five-year water resources research plan. The program, to be implemented over a five-year period (1976-1980, inclusive), will identify those areas in which research should be done and recommend expenditure levels for research effort. The COWRR Chairman said the new plan may be published in early 1977.

COWRR had not designed a monitoring system for ascertaining the extent to which its program was being implemented in the budget process. We believe that such a system should be implemented and should provide a means for obtaining current information needed to aid in clarifying which agencies are conducting research in a specific problem area, identifying those areas needing more research, providing a means to assess the impact of research activities, and keeping the program up-to-date.

ACTIONS TO FACILITATE INTERAGENCY
COMMUNICATION AT MANAGEMENT LEVELS

COWRR facilitates its interagency communication primarily through monthly meetings. These meetings provide a forum for discussion among the members. At these meetings agency officials are informed of new

developments in their fields and in other interdisciplinary areas relating to water resources research as well as notification of new publications, upcoming seminars, or agency annual meetings which the members can attend.

Minutes of the meetings are sent to all members. For those who do not attend a meeting, the COWRR Chairman said that the minutes are one way of learning what transpired at the meeting and of keeping abreast of current developments in the water area.

However, our review indicated that the minutes contained comments mainly on reorganizations, reassignments, and recent publications. For example, in the period from September 1974 to January 1976, agencies' research projects or programs were mentioned in only seven instances. Also, the minutes contained very little detailed information of what transpired at the meetings.

Occasionally, the COWRR Chairman also establishes ad hoc work groups as part of the effort to facilitate interagency communication. The work groups study specific, relevant problem areas and write a report which is distributed to COWRR members for comment and discussion. The COWRR Chairman told us that he felt the completed ad hoc studies have contributed to interagency communication.

We believe COWRR could better facilitate interagency communication by encouraging increased discussion of research projects at monthly meetings and by preparing more detailed minutes of its meetings.

RECOMMENDATIONS

Because of the large number of Federal departments and agencies involved, and the large increase during recent years in Federal funding of water resources research activities, we believe it is important that improvements be made in the procedures followed by COWRR to ensure the coordination and effectiveness of such activities. Therefore, we recommend that COWRR

--Prepare formal guidelines and action plans for carrying out each of the seven functions set forth in Section 305 of the Water Resources Research Act of 1964.

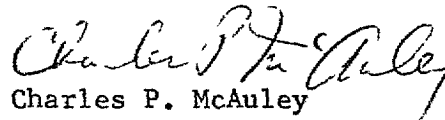
--Issue its annual reports in a more timely manner and include in such reports the results of the continuing analysis of the adequacy of research being conducted by the various Federal agencies.

- Improve its research classification system so that it is sufficiently comprehensive, and define the categories clearly enough to provide information needed to assist in identifying and eliminating duplication and overlap. In addition, reinstitute the oral review process during the monthly meetings at which each member agency's research activities are reviewed.
- Design and implement a monitoring system for ascertaining the extent to which its recommended program for water resources research is implemented in the budget process. Such system should provide for obtaining current information needed to aid in clarifying which agencies are conducting research in specific problem areas, identifying those areas needing more research, providing a means to assess the impact of research activities, and keeping its program up-to-date.
- Encourage increased discussion of research projects at monthly meetings and prepare more detailed minutes of such meetings.

We are sending copies of this report to those Federal agencies which have representatives or observers on COWRR

- -- We appreciate the cooperation received during our review and would like to be informed of any action taken on our recommendations. We would be glad to discuss this report with you or your staff. If you have any questions please contact Mr. Carl Bannerman on 693-8287.

Sincerely yours,


Charles P. McAuley
Assistant Director