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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-199898

AUGUST 29, 1980

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The Honorable Philip M. Klutznick
The Secretary of Commerce AGC00014

Dear Mr. Secretary:

Subject: Improvements Needed in NOAA's Long-Range ADP Plans (CED-80-136)

We are currently reviewing the National Oceanic and Atmospheric Administration's (NOAA's) management of its AGC00068 automatic data processing (ADP) resources. We are focusing our attention on the adequacy of NOAA's efforts to plan for and meet its current and future ADP needs and to ensure the efficient use of such resources.

As you know, NOAA relies heavily on ADP resources in carrying out its broad responsibilities in many diverse areas, such as weather forecasting, environmental research, and fisheries management. As a result, NOAA uses more than 500 computer systems for both general and special management purposes and obligated about $54 million in fiscal year 1979 for the purchase and maintenance of ADP services.

Our review has shown that NOAA has certain organizational weaknesses that have hindered past efforts to plan for ADP resources and may continue to limit its ability to effectively plan for its future ADP needs. Specifically, NOAA has not defined the central planning office's authority to prepare NOAA-wide ADP plans, which establish priorities and objectives and consolidate the ADP needs of various programs. Additionally, some of NOAA's main program elements, such as the AGC00117 National Weather Service (NWS), the National Marine Fisheries Service (NMFS), and the Environmental Research Laboratories DLG03034 (ERL), have not adequately planned to meet their own long-range ADP requirements. Improvements are needed in integrating separate ADP project plans and in defining and consolidating program requirements. AGC00093

We are bringing this matter to your attention because recent Department of Commerce initiatives to establish a long-range ADP planning system depend on the adequacy of planning by NOAA and other Department agencies. Therefore,

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effective planning by agencies such as NOAA would help the Department to successfully accomplish the goals and objectives established for its new planning system.

DEPARTMENT ADP PLANNING REQUIREMENTS

In March 1980 the Department established an ADP long-range planning system to improve the management of its ADP resources. The objectives of the planning system, according to Department instructions, are "to provide a centralized, consistent and reliable information mechanism for the Department and its operating units to identify and express their current and projected ADP requirements." The ADP planning system is to

--assure that sufficient ADP resources are available when and where required,

--provide a sound information base for justifying ADP resources,

--allow the operating units (such as NOAA, National Bureau of Standards, and Bureau of the Census) to keep the Department informed of their ADP requirements,

--allow forecasts of total Department ADP requirements, and

--provide for cost-effective use of Department ADP resources.

According to Department instructions, each operating unit will establish a central review function to evaluate and consolidate its requirements for ADP resources and to develop and adjust its ADP plans. This information is to be submitted to the Department's Office of Procurement and ADP Management. Other than requiring the central review function, the Department has left it to each operating unit to establish its own internal policies, procedures, and processes for collecting ADP information.

NOAA's ADP PLANNING SYSTEM

The idea of a central review function with responsibility for agencywide ADP planning is not new to NOAA. It established regulations in 1976 which provided for a central review staff--the Office of Management and Computer Services (OMCS)--to be responsible for preparing NOAA's long-range ADP plans. Each of NOAA's main program elements, including NWS, NMFS, ERL, the National Ocean Survey, the Environmental

Data Information Service, and the National Environmental Satellite Service (NESS) was to plan, fund, and manage its own ADP resources. Each main program element was also required to submit annual plans to OMCS for a 5-year period. The information was to be consolidated by OMCS and presented as an overall NOAA plan which would "include goals, objectives, evaluations and projected management/policy implications as they pertain to NOAA ADP and telecommunications planning."

NOAA, in responding to the Department's ADP planning requirement, is essentially following its 1976 procedures, in which the main program elements submit planning information for OMCS to consolidate into a NOAA-wide plan.

IMPROVEMENTS ARE NEEDED IN NOAA's ADP PLANNING SYSTEM

NOAA has not been successful, in the past, in establishing a long-range ADP plan. In a diverse, decentralized organization such as NOAA, the planning office must have adequate authority to prepare ADP plans that will meet program needs on an agencywide basis. We found that while OMCS is responsible for NOAA-wide ADP plans, its authority over ADP planning at NOAA's main program element level has not been defined. As an example, NOAA has not established OMCS' authority to require permanent ADP planning structures at the main program element level. Additionally, NOAA has not defined OMCS' authority to establish NOAA-wide objectives and priorities and to consolidate the ADP needs and plans of the main program elements.

We believe that OMCS' lack of authority in these areas has been a factor in NOAA's past failure to prepare long-range ADP plans, and may very well impede NOAA'S current planning efforts to meet the Department's current ADP planning requirements.

We found that the main program elements submitted planning material to OMCS in 1976 and 1977 but did not provide followup data during succeeding years. Furthermore, OMCS did not consolidate the information into an overall plan with goals, objectives, and priorities. According to the Chief, ADP Management and Planning Office, OMCS, the material was not consolidated because of its poor quality. He said OMCS did not follow up during succeeding years because of its uncertainty as to the type of information needed. An OMCS staff member said that the reluctance on the part of some main program elements to provide planning

information was another reason why OMCS did not request information after 1977.

According to the Chief, ADP Management and Planning Office, the quality of information submitted by the main program elements in the current planning effort is much improved. He said that the increase in quality results from a greater commitment to planning by main program element managers. However, this official said that due to Department-imposed time constraints, OMCS accepted what was provided by the main program elements and did not analyze the information for consolidation purposes.

While the information being submitted to OMCS by the main program elements is improved over prior submissions, our review disclosed that additional improvements are needed in the main program elements' plans and the system used to prepare them. Specifically, improvements are needed in integrating individual ADP project plans, consolidating plans of different organizations, and defining program requirements for ADP support. Details of ADP planning weaknesses at some of NOAA's main program elements are described below.

National Weather Service

NWS relies on ADP support for data acquisition, analysis, forecasts, and dissemination. NWS uses minicomputers to process upper air observations and large-scale processors for forecast models. It is in the process of implementing the Automation of Field Operations and Services (AFOS) program and plans to provide ADP support to radar stations and River Forecast Centers. These activities are planned on a project-by-project basis and have no consolidated ADP plan. NWS officials informed us that no single organizational unit is responsible for integrating ADP project plans into an overall NWS plan for ADP support. Without a consolidated plan, NWS does not have assurance that individual projects can be efficiently integrated into the NWS information system.

In a letter to the former Administrator of NOAA, dated August 4, 1976, we pointed out the need for plans to integrate data observation and acquisition projects with the AFOS program. Additionally, a 1978 study, performed jointly by the Department's Office of Budget and Program Evaluation and NOAA's Office of Program Evaluation and Budget, pointed out the need for long-range planning for NWS in program areas and noted:

> "NWS under the lead of NOAA/OAS [Office of Oceanic and Atmospheric Services] might wish to jointly do some long-range planning to define what NWS should be doing some five to ten years from now. In particular, the two organizations might seek to determine (1) what NWS's objectives are with respect to ultimate data acquisition, data processing and forecast preparation and dissemination capabilities; (2) where it presently stands and what steps must be taken, including required technological developments, to attain those capabilities; and (3) the resources needed including NWS resources as well as those of other NOAA major program elements which support NWS: e.g., NESS and ERL."

The National Research Council in its July 1980 report entitled "Technological and Scientific Opportunities for Improved Weather and Hydrological Services in the Coming Decade" stated that:

> "There is little long-range planning that addresses in a comprehensive and integrated way such items as data sources and their communications support, computers at Suitland and in the field, networking of computers and network standards."

The report recommended that NOAA begin formal, comprehensive planning for the computer-communication networks.

Similarly, a study by Richard L. Deal and Associates of AFOS implementation, dated November 1979, was critical of AFOS planning. The study stated that:

- --The "AFOS Program Development Plan" was largely outdated and had not been revised since June 1976.
- --A process was needed to evaluate new capabilities desired by the field and incorporate them in the future versions of AFOS.
- --An overall system development plan was needed to establish realistic resource requirements and implementation schedules.

Pursuant to a congressional request, we are currently conducting a separate, detailed review of the AFOS program which will address improvements in AFOS planning.

The NWS section of the NOAA ADP plan being prepared for the Department focuses on the planned upgrading of the central computer facility. While the plan states that NWS will continue implementation of AFOS, future plans for implementing or upgrading the system are not provided. Similarly, the NWS plan does not address future computer-communication networks, areas which the National Research Council recommended as needing planning activity.

We discussed the lack of overall NWS planning with the former Director, Office of Systems Development; the Chief, AFOS Implementation Staff; and the Chief, Hydrologic Services Division. These officials agreed that NWS needs an ADP planning process and stated that more effort will be put into such planning. The Chief, AFOS Implementation Staff, stated that future plans for AFOS will be prepared when the basic system has been implemented.

National Marine Fisheries Service

NMFS regions (the Northwest and Alaska regions are combined for data-processing purposes) and headquarters are autonomously preparing plans to meet their own requirements for ADP support, and coordination is done through a committee. No single organization in NMFS is responsible for overall ADP planning. As a result, efficient use of ADP resources may not be realized.

For example, NMFS' Northwest fisheries office is acquiring a large-scale processing system that may exceed current ADP needs. Officials informed us that no plans for sharing the system have been agreed on. The Northwest office ADP manager told us that he had asked the Southwest fisheries office for its support requirements to determine whether the new system could meet the needs of both offices. He said, however, that he had never received any information. Subsequent to our discussions, the Northwest ADP manager made a proposal to share the system with the Southwest office. The issue is still under consideration.

The NMFS portion of the NOAA plan being prepared for the Department contains separate sections for NMFS headquarters and each region. The Northwest office's section of the plan proposes over the 6-year planning period to augment the computer system with additional equipment, such as storage capacity to meet the needs of outside users, including the Southwest office. However, the Southwest has not committed itself to using the Northwest ADP system. The Southwest plan states that a contractor is evaluating methods of obtaining ADP support.

Environmental Research Laboratories

We found that because ERL had failed in the past to plan for future needs, present ADP equipment is not adequate to support its research. According to ERL scientists, the present ADP equipment results in long turnaround time for jobs, slow interactive response time, poor continuity of service, and lack of resources. The former Chief of Computer Services stated that ERL has never acquired new ADP equipment through budget initiative because of its lack of long-range planning.

In 1976 ERL informed NOAA that it did not have any reporting requirements for the NOAA long-range plan. However, in 1977 ERL headquarters initiated a study to determine the need for additional ADP support at its central facility in Boulder, Colorado. This study was expanded to include other laboratories when ERL recognized that the laboratories outside Boulder needed new ADP support. In July 1979, ERL published a modernization plan which covered general-use computing resources through fiscal year 1987. We were told by ERL officials in ADP planning that the plan is updated several times a year.

While we believe that ERL's ADP planning is improved, our review of the revised plan disclosed that the program requirements for ADP support are not established fully enough to justify the ADP systems proposed in the plan. Without fully defining such requirements, ERL has no assurance that its planned acquisition of ADP support is the most efficient and effective means of satisfying ADP support requirements.

ERL officials in the Office of ADP and Telecommunications Management Services informed us that, through discussions with users of ADP support and a questionnaire, information was obtained on program requirements. These officials stated that a permanent planning staff is working on obtaining the information.

CONCLUSIONS

Prior NOAA efforts to establish long-range ADP plans have not been successful because of (1) OMCS' lack of authority over the ADP planning activities of the main program elements and (2) inadequate planning by the main program elements. These factors continue to exist and we believe will hinder NOAA's current efforts to satisfy Department requirements for long-range ADP plans.

The Department's efforts to prepare long-range ADP plans depend on the adequacy of planning by NOAA and other Department agencies. While we limited our review to NOAA, our earlier reports dealing with ADP planning in the Department have pointed out planning weaknesses similar to NOAA's at the Bureau of the Census and the National Bureau of Standards ("Inadequacies in Data Processing Planning in the Department of Commerce," FGMSD-78-27, May 1, 1978; and "National Bureau of Standards Needs Better Management of Its Computer Resources To Improve Program Effectiveness," CED-79-39, Apr. 17, 1979). We believe that inadequate planning by agencies such as NOAA will impede the Department in realizing its goals and objectives in establishing the ADP planning system.

RECOMMENDATIONS

We recommend that the Secretary of Commerce, in evaluating the plans provided by NOAA and other Department agencies, review the organizational structure, policies, procedures, and processes used to collect the information to assure that actions proposed in the plans are the most efficient and effective alternatives.

We recommend that the Secretary direct the NOAA Administrator to give OMCS the authority necessary to require the main program elements to provide information for the NOAA-wide plans. As a minimum, OMCS should have the authority to require formalized ADP planning structures for ADP at the main program elements.

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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen, Senate Committees on Commerce, Science, and Transportation and on Governmental Affairs; and the Chairmen, House Committees on Science and Technology and on Government Operations.

Sincerely yours,

Henry Eschwege

Henry Eschwege
Director